

**Nutritionism and the Making of Modern Pet Food**

**by**

**Jennifer Wrye**

**A thesis submitted to the Faculty of Graduate and Postdoctoral  
Affairs in partial fulfillment of the requirements  
for the degree of**

**Doctor of Philosophy**

**in**

**Sociology**

**Carleton University  
Ottawa, Ontario**

**© 2012**

**Jennifer Wrye**



Library and Archives  
Canada

Published Heritage  
Branch

395 Wellington Street  
Ottawa ON K1A 0N4  
Canada

Bibliothèque et  
Archives Canada

Direction du  
Patrimoine de l'édition

395, rue Wellington  
Ottawa ON K1A 0N4  
Canada

*Your file Votre référence*

*ISBN: 978-0-494-89315-9*

*Our file Notre référence*

*ISBN: 978-0-494-89315-9*

#### NOTICE:

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

#### AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

---

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.

Canada

## **Table of Contents**

Abstract	ii
Acknowledgements	iii
List of Tables	v
Chapter One Introduction	1
Chapter Two Overview of the Commercial Pet Food Industry	32
Chapter Three Conceptual Considerations in the Discursive Production of Pets	68
Chapter Four Nutrition, Food and Foodways	91
Chapter Five The Early History of Pet Food Manufacturing	123
Chapter Six Nutritionalizing Commercial Pet Food	164
Chapter Seven Selling Pet Food	207
Chapter Eight Conclusion	243
References	253

## **Abstract**

This dissertation considers the creation of nutritionally ‘complete and balanced’ commercial pet foods. Specifically, I am concerned with understanding the conditions that made it possible for pet animals to consume commercially-manufactured pet foods exclusively. I argue that nutritionism forms the basis of modern pet food and that it is operational because it behaves materially, discursively, and ideologically in mutually constitutive and reinforcing ways. Drawing on the insights of actor-network theory, I account for this by identifying alliances between human and nonhuman actants that together created a pet food network organized around nutrition. As I point out, pet foods in their early years were largely responsive to the desire of food companies to transform waste and generate nominal sums of money. However as pet foods grew in popularity – as they invested in ideas about humans’ responsibility to pets’ nutritional needs, as manufacturing technologies improved, and as appropriate research developed – nutrition became the fundamental concern in pet foods. In 1991, nutritional requirements began to dictate food production. This was the result of assemblages among actants, including corporate bodies, companies, entrepreneurs, legislators, farmers, research subjects, ideas about health, consumers, economic circumstances, animals, trade groups, packages, websites, relations between species, formulas, tables, and so on, forming a workable system in which nutrition could be identified, measured, and subsequently used as the basis for manufacture.



## Acknowledgements

Completing a doctoral degree has long been my dream. I'd be lying if I said that conviction never wavered. I know I would not have done so without many great people in my life. I'm indebted to every one of them!

I would like to thank my committee members for helping me develop into a better academic than I'd ever hoped. I could not have finished this project without their guidance and encouragement. Neil Gerlach has always been a steady and calming presence with the ability to make this challenging task seem possible. Bruce Curtis has helped me turn peculiar research interests into sound scholarship. He has pushed me harder than anybody, and my work is better for it. Daiva Stasiulis deserves special recognition for being an excellent advisor. She was always available to discuss ideas and to review drafts. Her thoughtful comments and interventions helped me write a thesis in which I can take great pride. I can't imagine a better supervisor and I'm lucky to have completed two degrees with her.

I would also like to thank my examiners, Matthew Bellamy and Mustafa Koç for making my defense a rewarding, rather than harrowing, experience. Their enthusiasm for my project was greatly appreciated and will surely produce a stronger book.

So as not to give all credit for this thesis to the humans in my life, at least a line should be dedicated to the nonhumans, including Pia & Spencer, who made this journey possible.

I'm really lucky to have a very large network of friends and colleagues in Ottawa. The Department of Sociology & Anthropology at Carleton is a vibrant and collegial environment. I'm grateful to have been surrounded by the warm & interesting faculty, staff, and colleagues. A special note should be made of the softball & intramural championship teams. I'm also really grateful to the lovely staff in Interlibrary Loans who managed to find every obscure resource I requested and never once charged me late fees, even though I really deserved them.

I have the privilege of knowing some of the funniest, coolest, & kindest people who mean so very much to me. It's been great playing soccer & softball with the Goonies & tigre/fox folks. My out of town crew, Bob, Jaim, Sarah Jaye & Sarah J, Gemo, Davio, and Matt&Mar have always been rock solid. Escaping to hang with them is a treat. But it's been my Ottawa peeps who have been the absolute best! Charlie & Hopper were great, great friends to pdl & I. There are always laughs when they're around. Mike was a great lunch buddy Carleton and a good friend otherwise. It was really awesome to work through the late stages of the thesis with him, and I continue to enjoy our breakfasts & phone conversations. Christian is my longest friend in Ottawa and nobody has helped me develop as a scholar more than him. His humour, intellect, & attitude are both humbling & inspiring. I'm glad to have taken this academic journey together & hope it continues. I'm ready for a seven-hour conversation anytime, will continue to win Superbowl bets, and will deny any accusations of being a negator. Finally, I would have left this program if not for my two girls, Holly & Tamy. There are too many moments to

summarize here, but I have really appreciated the mundane ones best: having silly fun or stupid laughs while playing games, having drinks, shopping, going to the farmers' market, a craft fair, or jewellery show, talking teaching, working through project problems, planning events, seeing the world, listening to H&O, worrying about the thesis or the future, or working in the uni0n. You will be my cb's for the long haul.

I wish to thank my parents for their unwavering support and unconditional love. You're both fantastic people to whom I owe so much. I hope I continue to make you both proud.

None of this would matter if not for my darling, Paul, to whom this work is dedicated. Thank you for everything you are. I would be lost without you. I love you.

## **List of Tables**

Table 1.1: Human Nutrition Panel

Table 1.2: Kibble-style Cat Food Guaranteed Analysis Statement

Table 1.3: Moist Cat Food Guaranteed Analysis Statement

Table 2: Nutrients Percentages of Two Cat Foods

Table 3: Complete Nutrient Profiles of Two Cat Foods

Table 4: Top Pet Food Corporations

Table 5: Top North American Pet Food Private Label Producers

Table 6.1: AAFCO Dog Food Nutrient Profiles Based on Dry Matter

Table 6.2: AAFCO Cat Food Nutrient Profiles Based on Dry Matter

Table 7: Pet Food Package Sample

## Chapter One: Introduction

Food has also been called as good to think as it is to eat. In recent years the topic has certainly captured the hearts and minds of the public. It is the subject of innumerable books, television programs, magazine articles, documentaries and popular films. It has become a notable political issue taken up by leaders and legislators. The study of food has accordingly proliferated in the social sciences. A variety of academic disciplines, including sociology, anthropology and geography, have historically treated food as an important aspect of human culture and society. But since the 1990s there has been an increase in the number of gastronomy and food studies courses and degree programs, as well as many new journals and books dedicated exclusively to the study of food.<sup>1</sup>

Understanding why and how we eat in the ways we do appears to be a preoccupation for which there is an insatiable appetite.

This cultural climate is probably partially responsible for the growing interest in pet food evident among pet owners and animal enthusiasts. The number of websites that treat pet nutrition as a direct gateway to animal health confirms that the time, money, and effort of veterinarians, animal health practitioners, scientists and the pet food industry are important and appreciated. However, social scientists have paid relatively little attention to the topic. The result is an imbalance in the field of knowledge concerning pet food. An abundance of scholarly work, mostly in the sciences, explains or explores what pets 'should' eat. These studies often focus on understanding how an ingredient, nutrient or additive affects biological markers of health, well being or bodily functioning. They may

---

<sup>1</sup> A couple of examples include *Food, Culture and Society*, *Gastronomica*, and the *Journal of Agriculture, Food Systems and Community Development*, *International Journal of Sociology of Agriculture & Food*, *Agriculture & Human Values*, *Appetite*, and *Sociologia Ruralis*.

even make recommendations according to their findings and justify or problematize what pets currently eat as proper or deficient. But virtually no attention has been paid to understanding how or why pets' eating arrangements emerged and what consequences pets' diets have for society. Most food scholars generally agree that what we eat, how we procure, produce or prepare food, and why we do so reveal a great deal about a society's structure or values. I believe this is true also of pet food. The invisibility of pet food in social scientific writing, while curious given the importance of pet food to our everyday lives and social organization, is somewhat predictable. Latour (1992) points out that the typical objects of sociological inquiry rarely include many of the "missing masses" that make extant social relations possible. Pet food is probably not quite a member of the mundane masses as he intended. Yet few would characterize pet foods as obviously meaningful in the lives of humans. This thesis will show otherwise. It will explain how pet foods contribute to social relationships as much as it explains how social circumstances have built pet foods.

Pet foods are related to a number of important social forces. Pet foods, for example, figure in relationships between human and nonhuman animals in a few key ways.<sup>2</sup> As unique products, their being establishes differentiation in the foods 'for' humans and pets. This helps to establish a boundary between different species of animals. Pet foods also position humans as pets' guardians. Feeding another being is a considerate act intended, probably, to improve life and health. This is specially so when those fed rely on others for sustenance, as is the case with most domesticated pet dogs

---

<sup>2</sup> Although this thesis will typically refer to human animals as 'humans' and nonhuman animals as 'animals,' it should not be forgotten that humans are biological animals!

and cats.<sup>3</sup> Commercial pet foods assume dogs and cats, instead of foraging for food autonomously, are *supposed* to be fed. Pet foods make animals dependent on humans. By doing so, they facilitate the cohabitation of hundreds of millions of humans and cats and/or dogs. Thus, they help make domesticated relationships with animals possible on a large scale because that number of dogs and cats are surely unable to eat independently.

Commercial pet food also implicates human food production systems. Because the pet food industry is provisioned with ingredients generated by human food production, the two are closely connected. It is also an integral part of the human food chain since many food products left over from human food manufacturing activities are used in pet foods instead of being discarded. The majority of pet food labels is owned by five of the world's largest food and personal care product corporations and contributes significantly to their profitability.<sup>4</sup> Alone, these five companies generated nearly \$35 billion in retail sales globally in 2009 – higher amounts than the Gross Domestic Products of nearly 100 countries (Taylor, 2011: 25-28)!<sup>5</sup> And unlike most industries that have faltered in the tough economic climate, the pet food industry is one that has sustained financial growth.

Finally, pet foods implicate the systems of nutrition measurement used in human foods, albeit somewhat differently than in ways familiar to us. The eating circumstances of people diverge from those of pets in a marked way. Pet foods are whole, nutritionally-

---

<sup>3</sup> Most dogs and cats are physically able to obtain their own food and water, but are prevented from doing so by the living conditions imposed upon them by humans.

<sup>4</sup> They are Mars, Nestle, Colgate-Palmolive, Proctor & Gamble Co. and Del Monte Inc.

<sup>5</sup> When all companies are considered, the value of pet food globally is estimated at roughly \$40-50 billion. This total does not include services for animals such as veterinary care, grooming, training, walking and boarding or other products like accessories, toys, and medicines.

complete food commodities. By comparison, very few human foods take this shape. Unlike humans, pets are expected to eat one thing only most their lives.<sup>6</sup> This food is designed to meet the predicted dietary needs of animals by keeping them healthy and invigorated, or at least not obviously making them sick. Most of the time, without much thought or attention on the part of the humans who feed them, billions of cats and dogs eat the kibble habitually poured into bowls or patés scooped onto plates, day in and day out, for the duration of their lives. This pattern is unique to pets insofar as it does not reflect models of human food consumption. When possible, people eat a variety of foods daily. In other words, mass-produced pet food is interesting because feeding pets commercially-produced food is convenient, increasingly commonplace, important economically, vital physiologically, nearly unique to animals, assured to be nutritionally sound for animals, and yet, mostly hidden.

With this in mind, my dissertation attempts to understand how it became possible for pets to eat the way they do. More specifically, I am interested in explaining how it became possible for people to provide commercial pet foods to their animals, more or less as an exclusive food source, without having to worry about their pets' health or nutritional needs. Commercially-manufactured, ready-made pet food is new in the history of animal feeding, even though humans have provided food to animals for millennia. Serpell (1989) argues it is likely the relationship between humans and dogs or cats was fostered by the indirect availability of food typical of human settlement. Tuan (1984) adds humans have actively housed and fed dogs and cats throughout history. But the produced-by-corporations, widely consumed pet foods we know today are an

---

<sup>6</sup> Pets may eat many different foods throughout their lifetime, but they usually eat only one or two at any given time.

invention of the last century (Thurston, 1996). My project considers which alliances had to be made or social forces put in place to allow pet foods to come together in this way. It examines how it became possible to feed animals a nutritionally sound diet in one food item.

Guided by assumptions of the Actor-Network Theory literature, I argue that pet food is the result of the mobilization of actants into a stable and cohesive network organized around nutrition. Pet foods and pet feeding could have developed in a very different way and may have ended up looking very different than it does today. This thesis will explain how, but not why, different actants became enrolled in a network to form the object, commercial pet food. It will explain how the now unquestionable assumptions about nutrition and animal-human relationships formed a working system for feeding millions of pets. This system has created nutritionism, a unique and contemporary approach to food, into something that is transhistorical. More specifically, my analysis tackles the coincidence of material and discursive forces that formed relationships with each other to produce this working system. Following Ross's (1980) analysis, I connect mass-produced pet food with the continuing reproduction of the human meat economy. I identify the pet food industry's importance in terms of waste redistribution and practices of food industrialization and commodification. However, my work extends Ross's analysis in a couple of notable ways. First, my project adds an additional dimension to Ross's original materialist analysis by accounting for the use of grains in pet foods. Grains must be acknowledged when considering both the industrialization of food and the development of pet foods. As Michael Pollan (2006) has aptly demonstrated, grains serve as the basis for most species' diets, in one way or



another. Far from being a secondary and inferior ingredient to meat or animal flesh, their use in pet foods is far more ubiquitous than industry represents. The history of pet foods and their production – in fact, the history of the industry – is as much a story about grains as it is about animal-derived products. The use of grains has generated challenges for the industry at times, and it was not always the case that grain sources constituted a significant portion of pet animals' diet. I identify some of the effects of their inclusion, measures the industry has taken to address problems arising from their increased use, and some strategies for obfuscating these contentious ingredients.

Meat and animal-derived substances are also important pet food ingredients. My analysis reveals their symbolic significance as well. I show that they are enrolled in the pet food network as both material substances and meaningful tropes for the vast majority of pet food makers. My thesis explores the way pet food companies represent animals and the significance of these representations. Pet food companies routinely tout the inclusion of meat and animal flesh in their products to such an extent that these appear to constitute the anchor of pet animals' diet. In fact, pet foods contain significant sums of grains, as stated. This thesis considers this disjuncture in terms of the nutritionalized pet food network. I explain how representations of animality sustain the commercial pet food network; how representations of animals can be understood in relation to processes of nutritionalization. That is to say, my thesis makes the case that pet foods rely on and reproduce specific ideas about both the foods and the animals eating them, which make pet foods, including their nutrition, plausible and understandable. The discourses of animals, of pets, and of food reproduced by pet foods stand in contradistinction to the reductionist nutritionism endemic to the manufacturing process.

One other dimension to the story of pet foods bears mentioning. My project seeks to explain the manufacturing, scientific, social, economic and cultural circumstances that shaped the emergence of pet food. As I said, a key characteristic of commercial pet foods today is that they are nutritionally complete in the sense that pets can subsist on them exclusively. Thus, nutrition is central to today's pet foods. As with human food, nutrition in pet food did not just appear. It took shape as a result of scientific processes, political negotiations and economic interests that will be detailed. The forces that influenced pet food are part of a larger societal concern for nutrition, diet, and health. As outlined by Mudry (2009), Pollan (2008), Scrinis (2008b) and Dixon (2009), today's nutrition regime, also referred to as a nutritionist paradigm, has helped to construct a human food industry designed largely in relation to a very narrow manifestation of nutritional health. Food companies, including pet food companies, make nutritionism appear normal or inherent to diet. This project shows how nutritionalization became important in, and then the defining characteristic of, pet food. I analyze how this drive became possible and point to the unification of three organizations based in the United States - the Association of American Feed Control Officials, the National Research Council, and the Pet Food Institute, possessing three unique mandates, in fostering its eventual acceptance.<sup>7</sup>

#### *Theoretical Framework: Actor-Network Theory and the Sociology of Translation*

Eating food is a biological necessity. The way in which we grow, produce, collect, distribute, and even eat foods are complex aspects of human existence that connect individuals with one another and with social structures and institutions. For

---

<sup>7</sup> There is a National Research Council (NRC) in Canada, which is not affiliated with the US's NRC.

these reasons, food has been central in a wide range of sociological subfields including rural and agricultural studies, health, human rights, development, globalization, citizenship, labour, consumption, and so on. Much of this work has been informed by different strands of political economy, which consider how the relationship between economic interests and social organization shape and affect food systems, or vice versa. Although such analyses have made significant contributions to the way we understand food relations, some scholars argue that these approaches possess limitations in their accounts of food and food relations (Lockie, 2002).

Another position that has taken hold, and which informs my project, is Actor-Network Theory (ANT). In the last two decades, Actor-Network Theory has become an important theoretical or epistemological approach in sociology and the social sciences. ANT readings can be found on diverse topics, including, gender, bodies, art, economics, science, animals, technology, and so on. Although ANT is more popularly known for its contributions to the study of science and technology, it should be noted that many influential ANT-inspired texts concern food and food chains - e.g., scallops and microbes, respectively in the works of Callon (1986) and Latour (1988). At the same time, the field of food studies is beginning to pay increasing attention to ANT (Mol and Mesman, 1996; Rudy and Gareau, 2005; Fine, 2005; Lockie, 2002; Roe, 2006; Rudy, 2005; Gareau, 2005). Its concern for relations, associations, and assemblages offers rich analytic possibilities for an inclusive understanding of food.

ANT is concerned with the process by which objects emerge, become stabilized and can be acted upon. ANT, therefore, works well for a study that takes seriously the idea that food is most appropriately seen as a series of relationships rather than a pre-

existing set of objects. This chapter outlines some principle tenets of ANT in order to think about the actant-network, pet food. That task does not mean ANT will be ‘applied’ to this case study. ANT resists easy summary, definition, pinning down, or permanence (Law, 1999). ANT is not itself an object, a collection of defined ideas, or anything else that can be mobilized and fixed to a scenario or situation. ANT generally opposes such language. It does not position itself as a vehicle for doing interpretive work, but rather as “a very crude method to learn from the actors without imposing on them an *a priori* definition of the world-building capacities” (Latour, 1999: 20). Any work beyond this can make us lose sight of the empirical phenomenon we wish to study. There is nothing worse. Accordingly, ANT also resists characterization as a resolute theoretical paradigm, although its strength lies in the epistemological foundations I will argue position it methodologically. ANT approaches are expectedly varied because the main purpose is to provide ways of thinking about and understanding how objects, ideas, things, facts, etc. come to be as they are (Law, 1991). ANT tends to favour a few guiding principles to help social scientists study and explain phenomena. The main one is to follow the actors.<sup>8</sup> This simple directive has noteworthy implications for the way ANT is oriented and performed. Indeed, ANT is not a thing itself. Rather, it acts as more of a sensibility about exploring the world and thinking about sociality and social organization than a guideline for doing research. This chapter sketches the tenets and vocabulary associated with ANT. It unpacks what it means for sociologists to follow actants – to proceed with an inclusive, process-oriented, relational, and descriptive approach to making sense of the world.

---

<sup>8</sup> It is probably more appropriate to say that a main tenet of ANT is to follow the actants. I will get to that.

How does one describe an approach such as ANT? ANT has many possible entry points. As Saldanha (2003: 21) notes, “ANT was never a fused ‘field’ but a catch-phrase for a loose collection of authors and tendencies...chiefly inspired by Latour, Law, Serres, Mol, Callon and others.” Two of the most striking points of ANT are its refusal to separate nature from society, and its challenge to dualisms. Under the label of symmetry, ANT adopts the provocative position that humans/society have no analytic or ‘agential’ privilege relative to the nonhuman, the technical, or nature (Fine, 2005). ANT interrogates and confronts approaches to knowledge formation that rely on the dualisms of nature-culture, agency-structure, human-nonhuman, and so forth. Understanding ANT as a grounded practice is crucial to its usefulness for this endeavour. It gained academic purchase because of the novel way it addresses steadfast divisions endemic to most scholarship. Of particular importance, ANT theorists contend that when scientists (in both the social and natural fields) account for objects, realities, interests, or intentions, in other words, create knowledge or write history, they typically reify a distinction between nature and culture (Latour, 1993). In science, the laboratory is pronounced the place where scientists purportedly find real or factual truths about objects or phenomena. Their conclusions are ‘objective’ and often removed from the messy realities of social interactions. ANT theorists see such divisions in the social sciences, as well. As Rudy and Gareau (2005) explain, ANT is a non-modern and relational mode of analysis. They continue: “The non-modern core of ANT focuses on a reasonable frustration with the many reified dualisms, from nature-society to science-politics, subject-object, and macro-micro attributed to Enlightenment, science, and philosophy. Quite properly, ANT is

interested in the material articulations and semiotic assemblages upon which an assumed-to-be asocial nature and equally un-natural society depend” (88).

ANT problematizes the nature-culture dichotomy by showing that realities are ensembles or collections of human and nonhuman players that are mobilized as units through changing and assorted networks. The resolution of these dualisms can be described as relational-materialism or a semiotics of materiality that conceptualizes objects in terms of their relationships (Law, 1999; Lockie, 2002: 281). Thus, ANT theorists hold that the notion of human exceptionalism inappropriately brackets off nonhuman actors, without whom certain events or objects could not emerge. Moreover, ANT warns against the perils of conclusive declarations which accept that the way things ‘are’ is the way things ‘ought to be.’ Instead, ANT is concerned with descriptions of shifting processes and relations. The approach is driven by accounts that highlight, as Law (1991: 6) puts it: “that all knowledges are shaped, contingent, and in some other world could be otherwise.”

The contingency of knowledge and reality helps to avoid the pitfalls of making causal description since causal descriptions inscribe essences into and onto such things as people, entities, events, and so on. For Latour, a stronger approach to knowledge brings together “...myths, ethnosciences, genealogies, political forms, techniques, religions, epics and rites...works simultaneously real, social and narrated” (1993: 7). For this reason, Latour’s work transcends science and is more an exegesis on the ‘modern Constitution’ (1993). This Constitution – and its attendant assumptions about phenomena – relies on a particular relationship between the ‘Great Domains’ of ‘Nature’ and ‘Society’ in which the two retain distinct ontological positions. He claims that

phenomena mix elements of both together in such a way that make such discrete categories meaningless and empty. Latour further explains that the concept of the social has been incorrectly delimited and assigned to human behavior or activity; considered a possession belonging to an entity. This is problematic. ANT seeks to “resolve the debate between realists and constructivists by viewing Nature and Society not as poles in a dualism but as symmetrical products of modernist articulations of the human and non-human (Rudy and Gareau, 2005: 89). A distinct separation between nature and society embedded in modernist thought must be rejected and replaced with a more inclusive idea of what constitutes a social entity and what constitutes social action. To properly represent the shape of social relations, the social must be expanded and relieved of its connection with humans and their institutions. This means rethinking what counts as action and the entities that do it. It means shifting from order, which brings with it established facts and endpoints, and toward ordering, which emphasizes process, heterogeneity and complexity.

### *Actants and Action*

The epistemological underpinnings that allow for the reconceptualization of action and intention form the most significant effect of adopting a symmetrical sociological imagination. I argue that the concept of the actant is central to this undertaking. In spite of its well-known name ‘actor-network theory,’ actants, rather than actors, bind ANT.<sup>9</sup> The concept of the actant, first introduced as an insight in the social study of science, has provided an important model for sociologists to explain social

---

<sup>9</sup> ANT has been variously called actant-network theory, the sociology of translation, or actant-rhizome ontology.

phenomena. As suggested earlier, ANT takes the position that all social relations are fostered and enabled by a wide range of human and nonhuman entities, which are called actants. Actants differ from actors in several respects. For Latour (1996), actors are typically understood as the people (or their institutions) to whom responsibility for the trajectory of social life is often and wrongly ascribed. In such instantiations, actors are said to make decisions, possess power, and cause events to happen. In short, actors have wishes and intentions that they can actualize and act upon in meaningful ways. To use an example, responsibility for the completion of a doctoral thesis may be attributed to the efforts of the author, the guidance of the supervisory committee, the encouragement of family and friends, or the structure of Canadian post-secondary education, as envisioned and constructed by policy makers and state officials. Thus, traditional sociological theorizing might account for life's circumstances by pointing to the work of many actors within relevant or significant institutions, including government, law, schools, or the economy, as the impetus for such circumstances.

ANT theorists would agree that sociologists need to look to people's behaviours within social institutions for answers about the trajectory of human life. However, they see undue credit for most activity in society being afforded to people and to the structures they create. In the case above, the student, the committee, her family and friends, and the publicly funded education system, each receive and rightly deserve credit for the doctoral degree's completion. But so do the many other entities, which Latour (1992; 1996) calls the missing masses: the actants. For ANT theorists, actants are the myriad autonomous figures that make up our world. As he explains, an actant is "something that acts or to which activity is granted by others. It implies no motivation of human individual actors,



nor of humans in general. An actant can literally be anything provided that it is granted to be the source of action” (1996: 373). Like actors, actants are endowed with the ability to act. But unlike actors, and this is crucial to ANT theorizing, actants may be human or nonhuman. The only limit to the category of actant is whether or not an entity has acted in a meaningful way and generated an effect. Thus, and this is where the principle of symmetry lies, actants might include any of the following: statements, inscriptions, artifacts, devices, concepts, animals, skills, biological materials, organizations, and so on. In the case of the completed doctoral dissertation, some actants beyond those mentioned earlier include computers, keyboards, writing materials, libraries, library cards, books and journal articles, desks, chairs, data sets, the canons of the field under study, departmental administrators, student account systems, or even eye glasses, to name only a few. Without such devices, instruments, ideas, or technologies acting in the intended ways, the doctoral dissertation likely *could not* be completed.<sup>10</sup>

The basis for attributing action to both human and nonhuman entities exists in ANT’s adherence to the principle of ‘generalised symmetry.’ Symmetry challenges the modernist myth that through rational action, human and social intentions are fully realizable. Symmetry works by exploding dualisms, including the separation of nature and society, and links action to actants instead of actors. But it much more importantly provides a way for sociologists to account for the missing masses by subtly reorienting the way in which the social is conceived. For ANT, networks are central to its conception of sociality – a point to which I return. Yet ANT does not wish to add social networks to social theory by imagining actants in the mold of actors. ANT does not

---

<sup>10</sup> Of course, many doctoral dissertations were completed before the existence of many of these technologies. This is really beside the point. This example is simply meant to outline some of the many entities that one might expect have played an important role in the completion of doctoral degrees.

speak about social relations as the actions of individuals or behaviours of systems.

Rather, ANT attempts to rebuild social theory out of networks. ANT argues that social relations reside in associations between entities: in networks of entities. Law (1992: 380) sums up its stance, claiming “The heterogeneous network lies at the heart of actor-network theory, and is a way of suggesting that society, organisations, agents and machines are all effects generated in patterned networks of diverse (not simply human) materials.”

In keeping with the principle of symmetry, humans and nonhumans are both equally integrated into and arrange networks. This point is what differentiates ANT ideas about networks from more common ones. The popular concept of a network tends to be reduced to computerized information systems such as the internet. According to this model, a network is a method or axis of transport that is rigid. In ANT, a network is simply a chain of translations that involve a series of transformations. These are organized around the idea of agency and interests and will be elaborated below. Thus, ANT theorists try to explain how networks are formed and how such networks create realities. Generally, they posit that social action occurs when actants are enlisted. This is because, as Callon (1999) and Dolwick (2009) argue, ANT posits no stable theory of the actor [or actant]. Actors are not seen as pre-existing, pre-social entities, but as relational effects. Actants do not themselves act outside any networks. Action instead emanates exclusively from the networks in which actants are enrolled. Thus, generalized symmetry recognizes that humans should not be conferred any unique capacities for causing results in the world because nonhuman entities, even ‘natural’ ones, are just as likely to be meaningfully active as those we label ‘social.’

One of the most important challenges posed ANT has been to confront the notion of human agency. In the modern canon, agency is viewed as the intentional activity of human subjects. Often humans are deemed exceptional on the basis of their possession of 'unique' capabilities, such as the ability to think abstractly, reason, or plan and execute tasks. ANT theorists respond to such claims in two ways. First, even if they would acknowledge that humans are in possession of distinct facilities, which they generally do not, they caution that these do not bestow upon humans a special ability to make concepts, objects, or to identify and act on their interests. The ability of individuals to perform certain tasks has little bearing on the creation or 'operation' of networks. In ANT, networks are the objects of study because they do the work and make the efforts usually afforded by sociologists to agency-possessing humans. But as Law (1992) notes, humans are not special. Humans gain and lose faculties all the time. Many other entities also possess capabilities attributed to humans exclusively and mistakenly (Latour, 1992). Likewise, the line that divides humans from nonhuman others is always shifting and moving such that the characteristics previously associated solely with humans come to be known or seen in others. This is most obvious among animal populations, in which research regularly 'uncovers' 'new' faculties.

The crucial analytical move in ANT is to realign and reconfigure the notion of the social and sociality. Classical conceptions of agency that venerate humans feed the modernist myth that reifies the separation of humans and others, nature and culture, etc. and intimates that humans mold the natural world as they choose. In other words, ANT holds that making concepts, objects, or identifying interests are network effects. ANT, therefore, offers a fundamental critique of classical notions of agency by claiming to

examine, at least in part, the attribution of agency. For ANT, agency is an effect distributed through the arrangement of materials (Law and Hetherington, 2000). Accordingly, the work of ANT is to study the network's formation and its actions. Ultimately ANT disagrees that there are intrinsic differences between humans and nonhuman others because taking such a view would ultimately inscribe each with separate essences and reify the dualisms ANT seeks to eradicate. But much more radically, any notion that humans and nonhumans are distinct simply eclipses the extent to which work done by others is appropriated by humans. As Law (1992) points out, what makes humans distinct and confers upon them anywhere from the simplest to the most advanced capabilities is really just the consequence of interactions with other objects in the world. As he elaborates, what counts as a person is really an "effect generated by a network of heterogeneous, interacting, materials...because all the attributes we normally ascribe to human beings are generated in networks that pass through and ramify both within and beyond the body" (383-84). Human actors require actants to be human. They require the proper action from others. For this reason, an actor is never alone, is always in a network, and only acts as a result of a network acting itself. Thus, for Law, an actor or actant is always and necessarily a network. The work that is done by many actants, together, makes the operation of the network and the seeming agency of humans possible. Networks regularly come to look like individual actors in possession of agency or power. But for ANT, the social is neither human nor linked to human agency. The social results from the constant formation of, and negotiation within, networks. The social is never ordered. The social is always in process. It is better to talk, then, about processes of ordering. To do this, human and

nonhuman actors must be looked at on the same plane. This can be done through the sociology of translation.

### *Sociology of Translation*

The idea that actants perform critical functions in network-formation, and therefore, generate action, is a potent one for food studies scholars who must account for the ways humans engage in complex relations with other matter and entities. Food is perhaps one of the most striking examples of a heterogeneous actor-network. Foods are immediately relational – they involve humans, animals, plants, machines, bacteria, microbes, land, experts, air, water, factories, laboratories, stores, mouths, money, shipping containers, cells, digestive systems, trash heaps, and so on, working together to make social realities. Sociologists must be prepared to plunge into these complexities to see the constitutive possibilities of networks. These are organized around interests.

Latour's work draws out the importance of interests to network-formation and action. Interests are conceptually vital to sociological theorizing. When social scientists explain social life, they are often addressing questions of real or perceived interests. Interests in ANT theorizing look a little differently. ANT does not see only the interests of the powerful and privileged, although this has been one of the most salient critiques of this approach. In fact, power is seen as a consequence of collective action (Latour, 1986). Power for ANT is emergent rather than already present. This is because ANT does not have an agential theory of interests that attempts to understand *why* the interests of one group come to be taken up or rejected by others. Rather, its aim is to determine *how* the interests of one group come to be taken up or rejected by others. As Callon and

Law (1982) put it “we are concerned with the manipulation and transformation of interests, since we see all social interests as temporarily stabilized outcomes of previous processes of enrolment” (622). ANT examines interests through the lens of translation.

Translations are central to ANT because they attempt to explain how social ordering happens.<sup>11</sup> Translations assemble heterogeneous materials together to produce a stabilized network. This appears as a ‘punctualized actor,’ to which agency may be attributed (Law, 1992). In a now classic piece of scholarship on the scallops of St. Brieuc Bay, Callon claims there are four ‘moments’ in translation: (1) problematisation; (2) interessement; (3) enrolment; and (4) mobilization. Problematisation represents the initial formation of a network where one actant identifies and frames a problem. If the other actants accept these definitions, this actant can become what ANT calls an ‘obligatory point of passage’ – an indispensable intermediary who enlists and invests others on its own terms. This may occur by appealing to the interests of actants to achieve their goals or by setting new goals for them. In either case, the reorganization of other actants’ priorities according to those of the principal actant’s problematisation represents the second moment of network-creation: interessement. Interessement means getting actors to accept their new roles and goals. It involves keeping them in line by invoking intermediaries. Intermediaries ensure actants perform their roles by binding them to the network more tightly. They help to define actants’ identities vis-à-vis the network and invest them in it. This is important because it helps to anchor actants and solidify the interests of the network. It leads to the third process of translation: enrolment. Enrolment is the process of interesting someone or something in something

---

<sup>11</sup> Ordering is an intentional concept designed to acknowledge Law’s claim that social structure is best understood as a verb, rather than a noun.

else. Enrolment involves producing allies that mutually agree to become a unified entity. Once this occurs, the final moment of translation, mobilisation, is reached. Mobilisation allows the desired representative to speak on behalf of the entire network of entities. At this time, the work of all of them together becomes erased and the action of speaking brought to the fore. In other words, the network is rendered invisible and replaced with the simple action of the visible actor (Law, 1992; Latour, 1987).

Latour's (1988) work on scientific practice, particularly Louis Pasteur's 'discovery' of the anthrax vaccine, provides an excellent explanation of the function of actants with networks and how these create social realities. In considering how the anthrax bacillus came into being, Latour argues that the first step is to make a previously invisible entity visible. Once this substance becomes detectable, Pasteur is able to develop a vaccine. However, Latour does not conclude that the anthrax bacillus is either 'socially constructed' in the laboratory or 'out there' waiting to be discovered by Pasteur. It is neither conjured up by, nor does it pre-exist, Pasteur. Instead, it, as well as 'Pasteur,' emerge and are modified simultaneously as a result of their immersion within a network. This is an important point because it reframes Pasteur as more than simply a leading scientist who discovers a virus and its treatment. Rather, he is a mediator who establishes a relationship among many diverse technological, biological, and political entities. Pasteur relies on the involvement and effort of many human and nonhuman others, all of whom must be systematically assembled together. Pasteur could only develop a vaccine if he brings a number of different agents into a properly organized and maintained network, and, if they acquiesced to such investment.

Latour (1988) describes the heterogeneous composition of the networks that shape both 'Pasteur' and the anthrax bacillus, and he shows that the identities of both these actants are modified in the process of network construction (Pasteur becomes 'great' and the anthrax bacillus becomes 'visible and 'autonomous'). The network is stitched together using social and natural elements and it relies on an exchange of properties between entities of both types. Moreover, the network extends so far that both society and nature are brought within its domain. Thus, Latour's study of Pasteur models some central aspects of ANT. Specifically Latour explains how Pasteur identifies and generally defines the conditions of the anthrax network's formation. But Latour also emphasizes co-construction, shows how heterogeneous entities are enrolled into networks, how networks come to take on 'actor-like' configurations, and so on.

In ANT, action – as the case of Pasteur indicates – arises from collective endeavour and the collective includes nonhumans as well as humans. This perspective is significant because it infers that the motivation for action may not always come from the human side of the collective. As Latour (1999: 192) puts it, "purposeful action and intentionality may not be properties of objects, but they are not properties of humans either. They are the properties of institutions, of apparatuses, of what Foucault calls 'dispositifs.' This relational (and symmetrical) view of action follows from the idea that 'nature' and 'society' are co-constructed in the laboratory." In the experiments conducted by scientists such as Pasteur, Latour notices that action comprises not just what people do, but encompasses what is accomplished along with others (1999: 228). Such a perspective has the methodological consequence that no *a priori* assumptions about who or what will act in any particular set of circumstances can be made. Action



will be the result of network construction and networks are constructed out of all kinds of entities, some of which we might label ‘social,’ others ‘natural’ others ‘technical’ and so on.

The sociology of translation provides a fruitful lens for examining sociality and the attribution of agency. After all, the concept of sociality, in the broadest sense, means *association* (Dolwick, 2009). ANT is useful because it reorganizes the social in such a way as to expand it and relieve it of its connection with entities, but especially humans. Instead, the social is “the name of a movement, a displacement, a transformation, a translation, an enrollment. It is an association between entities which are in no way recognizable as being social in the ordinary matter *except* during the brief moment when they are reshuffled together” (2005: 64-5). It is in this vein that my thesis examines the creation of pet foods as an object generated through actants’ associations and negotiations. My thesis follows the tenets of classical ANT theorizing to identify pet food companies and their manufacturing needs and capabilities as fundamentally tied to shaping modern commercial pet food. Where I diverge from Callon (1986), and this may be a reflection of fact that modern pet foods are network-objects still being formed and negotiated, is that all actants must have a coherent idea about the object. Mol’s work (2002) is instructive insofar as the object of analysis is never constant and coherent. Unlike early ANT studies that fix objects more rigidly and according to the precepts and interests of the principal actant, I agree with Mol that participating actants have more space to define and negotiate their role in, and contribution to, a network. Networks must, after all, adapt to different actants if they are to be conceived dynamically. We

must not be dogmatic, but take seriously the responses of the empirical phenomena under investigation. Social structures and actants must not have their actions circumscribed.

### *Methodological Approach*

My project considers the emergence of pet food as a nutritionalized network and is informed by the Actor-Network Theory. In keeping with one of its central imperatives, the method of this project is to ‘follow the actors’ (Latour, 2005). This method is an analytical one that positions the researcher to look at the traces left by actants. For this reason, this project does not find and attribute motivations to them, but follows and details their movements. The impetus is on seeing how humans and nonhumans work together to form webs of relations. It is on teasing out the messy complexities, often rendered invisible or natural, that helped create a stable system, even if it is one that could be otherwise (Law, 1992). This is a study about the pet food industry today, but much of the analysis is rooted in the historical origins and development of the business. For this reason, a number of data sources are excluded from this study. Above all, the geographic parameters of this project are limited, in spite of the global character of the pet food industry, to the North American context. The United States has historically served as the epicenter for industry operations. My analysis includes references to Canada where necessary. The laws and regulations have otherwise followed, and our industry developed around the American one. Globalization has eroded US hegemony in agri-food production to some degree, but the United States still houses many of the largest companies’ headquarters and is a hub for research and development. Perhaps

another project about pet food would pay closer attention to its global character. But in a story about network formation, this is an appropriate geographic limitation.

The actants to follow are of various types. I used a wide range of primary and secondary data sources for my project because these are the places where my actants' stories are told. For reasons that will become clearer, I looked for as many 'traces' as I could find (Latour, 2005). I reviewed books and articles written by people both inside and outside the industry about its operations. From these sources I sketched together a history of commercial pet food and an overview of its structure and operations. One of the most important pieces of data in this dissertation is the *Official Publication* (2008), which is the annual report of the Association of American Feed Control Officials (AAFCO). The AAFCO is a nonprofit corporation that establishes standards for the animal feed and pet food industries in the United States and Canada. The organizational structure is unique insofar as its membership is composed of state and federal officials, but it is not an arm of government in the traditional sense. In fact, the organization does not possess direct regulatory power or enforce its own standards. These tasks are taken on by the respective governmental bodies in each of the nation-states. Rather, the AAFCO acts as an organization that facilitates discussion and consultation between officials (and other invested parties) to define industry standards. These limitations are articulated in the *Official Publication*.

The *Official Publication* covers the feed industry, and I used material from several sections, including the history, the feed (ingredient) definition glossary, and the 'Model Regulations for Pet Food and Specialty Pet Food.' As a central document in the pet food industry, the *Publication* was important for this project. In addition to outlining

oversight and regulations, it also discusses the industry's history and helps to put the pet food/animal feed industry in context. I detail the industry's primary mechanism for understanding, communicating, and constructing nutrition, the guaranteed analysis statement, in Chapters Two and Six. That is to say, I explain how the pet food industry both creates and conveys nutrition to human customers. This is an important undertaking because the guaranteed analysis statement structures the rest of the industry. Its meaning and power are reflected through and created by packages as well as different groups, technologies, and texts. Accordingly, I used veterinary texts and industry publications to elucidate how the industry has made nutrition.

I also reviewed a number of trade journals from the pet food, veterinary, feed, and rendering industries. Since they communicate the approach and presumptions of the industry I am explaining, they are fitting data for a project seeking to comprehend how pet food manufacturers come to understand and behave in certain ways toward animals' nutrition. In addition to reviewing these primary and secondary sources about pet food and its assembly, I visited a pet food manufacturing facility, Chenango Valley Pet Foods, in May 2010. Chenango Valley is an independent, private-label dry pet food manufacturer located in New York State. It is the oldest, continuously-operating pet food production facility in America and promotes itself as a 'high- end' company with multiple certifications, including the capacity to produce organic foods.<sup>12</sup> My visit included a guided tour of the facility with the company's Quality Control Officer and Plant Manager. I observed all aspects of dry pet food production, including formulating, mixing, grinding, extruding, bagging, nutrition verification, nutrition assessment, etc.

---

<sup>12</sup> To learn more about this facility, visit <http://cvpetfoods.com/index.html>. The company has approved their identification in my dissertation.

My project also includes an examination of pet food packages and websites. The process I used to select my sample is outlined in Chapter Seven. This was done to better comprehend how the pet food industry positions itself and its products in terms of the commercial pet food network. The pet food industry represents itself in many places and ways. Pet foods advertise in print and video, for example. However, a review of pet food companies' advertisements was deemed redundant to this analysis. Likewise, I did not systemically review pet (mostly dog) food recipe books or pet enthusiast periodicals and only included these sources where or if fitting. They certainly implicate the commercial pet food industry, but largely fall outside its network of 'real pet foods.' These items are among the most popular resources on pets and make contributions concerning pet food and the commercial pet food industry to consumers. If the research questions were different, these might constitute useful or appropriate sources. They are, simply, outside the scope of this study.

It is worth noting that this project relied on a large number of industry data sources. As much as possible, the claims from these sources were verified in other, non-industry sources. However, this was not always possible. The pet food industry can be extremely secretive and proprietary. By no means are such qualities distinctive to the pet food business, but are also documented and lamented in human food, pharmaceutical, and other commercial industries. While access to documents rarely impinges on proprietary or operational issues, many industries seem to 'play it safe' and limit access to them. Legal structures make it permissible for companies in a wide range of fields to be secretive about their purported business interests. As Nestle and Nesheim (2010) found out, the interest of protection from competitors can make it difficult for outsiders to view,

participate in, and report on, in the public interest, even the basic operations of an industry. In this respect, competitors will act cohesively. In the pet food business, the result of limited third-party accessibility to primary documents is that the industry itself has produced a lot of work about its business. Some of this is laudatory and provides very little critical commentary on salient issues related to food safety, quality, or other matters. Some, and most of the data used for this project, is matter-of-fact. As much as possible, assertions of any merit were substantiated elsewhere. But the nature of my research is an examination of the industry. In this sense, the documents used were fitting, and appropriately scrutinized.

The second problem in researching pet food is the dearth of some primary documents or critical analytical work in the social scientists. There is limited scholarship on commercial pet foods. This is particularly so for the decades leading up to the 1960s. Grier (2008) explains four related reasons that data and information about the pet food industry, particularly when it was in its infancy, are difficult to find. She notes that until after WWII the industry: a) was regionally-driven; b) was considered to be outside the meat, feed or grain industries by the compilers of agricultural statistics; c) was initially of relatively small economic value to some of the producers; and d) used ingredients that were unpopular to the point of being taboo. For these reasons, records were produced inconsistently and kept sparingly. Such problems have waned in recent years as the importance of the industry has become clearer. But again, data access remains an issue.

The most common resources by far are analyses driven by the industry or veterinary organizations that primarily concern foods' nutritional characteristics. Since this project is not an assessment of the nutritional quality of the foods but an elaboration

of how the industry came to accept nutritionalization as its organizing feature, these latter resources were of limited use to me. Until rather recently, relatively little attention to the pet food industry has been paid by industry outsiders. Today, critical pieces which offer sustained examinations of the industry, its operations, and practices do exist (Ross, 1980; Martin, 2008; Fox, Hodkins and Smart, 2009; Martin, 2001). These provide insightful reflections and necessary challenges to self-congratulatory businesses that are largely autonomous and have exhibited some problematic activities. Unfortunately, many of the critical books could be characterized more as treatises in absolute opposition to the pet food industry than as robust and reliable scholarly sources. Many do not follow common referencing conventions and at times make speculative claims rather than arguments rooted in verifiable data. The industry certainly deserves many of the criticisms leveled against it. But social scientists must be equally hesitant when third party critics cannot robustly support their contentions. This is especially so when criticisms are rooted in oppositional claims about nutrition, diet, and health. Far from being a settled matter, and as will be explained, the healthfulness of foods for a species is understudied and contested. The basis for some critiques of these foods reads speculatively. Documents critical of the industry are valuable, but social scientists must be cognizant of their limits as well. Nevertheless, some of these authors are positioned to level critiques and make assessments as researchers, veterinarians, or interested experts. My concern, again, was to avoid some of the debates over the healthfulness food and to focus on understanding how the industry structure creates a particular product defined largely in terms of its unique relationship with nutrition.

## *Chapter Overview*

My dissertation is organized into eight chapters. In Chapter Two I provide a general overview of the commercial pet food industry and highlight some of the most salient aspects of the industry for the reader. I describe the different types and segments of pet foods available today, discuss the relationship between human and pet food systems, how the industry is regulated by the state, how pet food is produced, and by whom it is made. I explain the basic nutritional indicator, the guaranteed analysis statement, and outline its function. I also provide a sketch of one of the most important issues in modern pet food: the 2007 melamine recall. In Chapter Three I explore how relations between animals are constructed in western modernity. I discuss some of the ways scholars have come to understand the differentiation of animals that make some the objects of love and devotion and others the objects of consumption. Chapter Four discusses the ways in which diet and nutrition are understood by food scholars. I claim that eating in contemporary society is dominated by a nutritionist approach to dietary health. I will argue that this approach renders food consumption subservient to reductionist quantification systems that selectively privilege nutrient levels over all else, including culture, history, and tradition. I will also point to how this orientation serves to bring food and eating under the control of corporate interests. Chapter Five traces the early origins of the pet food industry. I explore the economic imperative underlying the business's growth, the limitations placed on the industry, and the emergence of two technological innovations that had an impact on the pet foods animals eat today: rendering and the commercialization of meat and bone meal as an animal feed. In Chapter Six I elaborate on this history and point out how the creation and organization of



different regulatory bodies made nutritionalization possible in pet foods. I also explain how pet foods integrate nutritionism in their manufacturing techniques through pre-processing formulation rather than as a form of measurement. In Chapter Seven, I show how some of the ideas about nutrition and animal-human relations are represented on pet food packages and websites. I explore how pet food packages create nutritional realities starkly different from those that dominate the manufacturing process. Although these representations do not reduce food to its nutrient composition, they likewise invest in the nutritional pet food network by enlisting humans with, and therefore integrating, various tropes concerning both animals and nature.

As this dissertation will demonstrate, the pet food industry offers many fruitful opportunities for social scientific research. Pet food is the result of the mobilization of actants into a stable and cohesive network organized around nutrition. By sketching how the industry emerged, how it has changed, and who is involved in its operation, this project will show the importance of pet foods to human social life. Pet food is invisible. This work will begin to remedy that problem.

## **Chapter Two: Overview of Commercial Pet Food**

Pet foods are a familiar artifact of the 20<sup>th</sup> and 21<sup>st</sup> Centuries. Commercially prepared pet foods provide more than 90% of the calories consumed by pets in North America, New Zealand and Australia, Japan and Northern Europe (Zicker, 2008). In spite of their ubiquity, few people know more than a few basic details beyond a couple of company names, jingles or perhaps that there was a major North American product recall in recent years. Who makes pet foods? Out of what are they fashioned? What laws govern their production? This chapter will attempt to answer these questions by sketching some details about these products and the industry that makes them. Pet foods emerged as specialized products. This occurred over time and is the result of processes of what ANT theorists call 'enrollment' (Callon, 1986; Latour, 1988). This chapter provides a preliminary overview of the shape of the industry to better understand some of the central actants operating within the network. I will talk about the major companies and producers, what some of the foods look like, the structure of regulatory oversight, and the main mechanism for assuring pet foods' nutritional quality. Each of these topics should offer an important understanding of the industry and its structure. I will then address the 2007 pet food melamine recall. The recall illuminates how nutritionalization is the central organizing point of the pet food network, including a folly of this being so.

### *What is 'Pet Food'?*

What is pet food? There are many different attitudes about what constitutes pet food and what does not. Pet food could simply refer to any substance that makes up a

major nutrient category (in addition to water, nutrients are protein, fat, carbohydrate, fiber, vitamin or mineral) and, when ingested, fulfills a pet's metabolic and nutritional needs (Willard, 2003a: 76). According to this definition, a very long list of organic and inorganic materials potentially constitutes pet food. In this project, pet food is much more than this. I am not merely grappling with the nourishment consumed by dogs and cats. Dogs and cats might eat grass, bugs, feces, rodents, birds, pieces of cheese, or other food morsels, and yet none of these are pet foods in the way commonly thought. We would more likely characterize them as among the foods that can be eaten by pets. What I am taking on is the commodity - the product of a global business worth billions of dollars. This work attempts to understand the economic, social, technological and cultural forces that shaped commercial pet foods' being. I consider how pet food has been shaped and defined by relationships between humans (nutritionists, policy-makers, marketers, food company lobbyists, consumers, etc.), technologies (machines, packages, measurements), nonhuman animals (particularly cats and dogs, but also the chickens, swine, cattle and fish that are eaten by humans and pets) and other entities. To invoke the terminology of ANT, my project explains how pet food is enabled and enacted as a network with actants.

It is worth noting that my project is concerned only with foods made for cats and dogs. Consumers can find commercially-prepared and/or packaged pet foods for a wide range of species, including birds, rabbits, ferrets, fish, gerbils, hamsters, mice, rats, turtles, amphibians, and so on. These foods comprise a small subset of the pet food industry. They generate some, but relatively little, revenue. They are subject to somewhat different oversight structures. Many include different ingredients and use

different production technologies for their fabrication. The packages tend to be bland and the foods, unadvertised. In short, while foods for such animals are technically commercial pet foods, they are a separate branch in myriad ways and beyond the scope of my analysis.

What are commercial pet dog and cat foods? The pet foods that will be discussed in this thesis refer to pre-packaged food items composed of a combination of grains, animal-derived materials, vegetables, fruit, water, vitamins, minerals and other additives that are 'necessary' to maintain the integrity of commercial pet foods, such as binders, humectants, preservatives, etc. Commercial pet foods take one of three forms, depending on their moisture content: dry, moist or semi-moist. The former two comprise the majority of pet food sales, with dry foods making up approximately four fifths of the market (Ockerman and Hansen, 2000: 364). Dry pet foods contain between 7% and 11% moisture (water); moist pet foods contain at most 78% moisture, and semi-moist pet foods contain 20% to 45% water (Case et al., 2000: 187-192). Moisture is important to the industry for packaging and preservation purposes, but also because the nutritional quality of a food is affected by how much water the product contains.

The ingredients available for use in pet foods number in the thousands. They are not all of equal nutritional value and will create products of higher and lower quality. Nestle and Nesheim (2010: 69-89) provide a useful typology of the ingredients used in pet food. They note that most pet food ingredients fall into one of the following categories: fresh meats, fresh animal by-products, animal meals, animal by-product meals, vegetables and fruit, grains or other carbohydrate sources, binders and thickeners, vitamins and minerals, and preservatives. Fresh meats or fresh by-product ingredients

include raw and unprocessed components derived from animals, including meat cuts, tissues or organs. Meals and by-product meals, by comparison, are the dried, ground products left over after animal tissue is rendered and the fats and water are removed. The primary nutritional function of both these ingredients is to fashion proteins and fats. The rest are relatively straightforward. Grains provision carbohydrates (fiber) as well as some protein and fat. Vegetables and fruits are included for their fiber and vitamin content. Fillers and binder hold the products together and preservatives keep the foods from spoiling. Vitamin and mineral additions are necessary because the ingredients may lack diverse nutritional quality or because cooking processes can remove some of the naturally-occurring vitamins and minerals. The industry adds vitamin and mineral supplements to be 'certain' there are no deficiencies in the foods labeled 'complete and balanced.' This practice is legally required of the industry.

Pet foods can either act as 'complete and balanced' or 'supplemental' food sources. The two differ in their nutritional profiles and their dietary intentions. Complete and balanced foods must include added compensatory vitamins and minerals to provide a nutritionally complete meal. Accordingly, they are nutritionalized in the sense that they are turned into 'nutritional' products as a matter of law. Supplemental foods are considered appropriate only as a secondary and complementary food source (Hussein, 2003a). They tend to be simpler formulations of only a couple of ingredients, although this is not always the case. The overwhelming majority of all types of pet food are formulated and sold as 'complete and balanced.' All dry foods must take this form, so the very small percentage of pet foods that are appropriate only as supplementary food is either moist or semi-moist. Supplemental pet foods may be relatively marginal to most

pets' overall diet, but they possess an important symbolic role. Some humans feel that wet foods are more 'natural' and healthier for animals. Others believe that a dry diet alone becomes too boring or bland to their pet. Adding a spoonful or two of a product that looks like meat or stew will help some owners believe they are making meals more enjoyable for their pet (Case et al., 2006: 190). Some experts say that wet foods are somewhat easier for animals to digest, generally more palatable for animals, or made with more nutritionally fitting ingredients. Most of these characteristics, if they are so, are probably the function of their greater water content since wet foods are not categorically different from semi-moist or dry foods (Fox et al., 2009: 57). Supplemental foods, even when produced by pet food makers, sit on the edge of the nutritionalized pet food network. Nutritionalized pet foods require the addition of vitamins and minerals. The production of dietary alternatives, I argue, is not a challenge to the network. Rather, it represents the reconciliation between potentially competing interests in the formation of the network. The inclusion of these foods situates nutrition as the obligatory point of passage.

The final characteristic shared by all pet foods is their common sourcing of materials that are the so-called 'by-products' of the human food chain. Pet food is a special foodstuff category – it is considered an animal feed and is governed almost entirely as if it were completely removed from the human food chain. That is not to say that pet foods are completely distinctive from human foods. The agricultural products used in pet foods are generally of the same source as human foods, although experts claim humans do not really compete with pets for food directly. Instead, pet foods are considered an outlet for converting (inedible) human food waste into another commodity

(Nestle, 2008). The reliance of the pet food chain on the human food chain has long been the case. But the symbolic connection between the two emerged in the 1920s when dog food maker, Ralston Purina, banned the use of 'feed' in reference to any foodstuff produced by the company (Grier, 2006: 370). This marked the beginning of an important move for pets – away from 'other' animals and toward humans. In other words, turning feed into food helped create a boundary between pet and non-pet animals while simultaneously aligning pets more closely with humans. Pet food companies reinforce this alignment by discursively constructing pet food as both healthful and of high quality; as using 'choice' grains and animal materials equivalent to those fashioned by nature and eaten by humans. Chapter Seven will investigate the manner in which companies construct their products in such a way, albeit not exclusively.

What are by-products and what does it mean to characterize pet foods as inedible by-products? To properly understand pet foods, each of these terms must be clarified because they are important to today's commercial pet food industry. The term, by-product, is common in the agriculture, livestock feed, and pet food industries. By-products are defined as secondary products obtained during the manufacture of a principal commodity. In animal agriculture, meat is characterized as the driving force of this manufacturing industry, which means by-products refer to "everything produced by or from an animal, except dressed meat" (Ockerman and Hansen, 2000:4). This offal may include, but is not limited to, internal organs, cavities, skin, hair, blood, fat, feet, hooves, feathers, heads, shells, fur, glands, intestines, muscle, fat or connective tissue, bones, some meat cuts of poor aesthetic quality, and so on. Aberle et al. (2001: 311) say animal by-products include "everything of economic value, other than carcasses, obtained

from an animal during slaughter and processing.” When pet foods include by-product meal, this should be taken to mean the rendered materials are derived from animal materials besides main cuts from the carcass. At the same time, to say pet food is a by-product of the human food production chain is to assert that it is a secondary offshoot of the main industry, which exists to provide meat for human consumption.

The nuisance of this definition is it elides the value of the by-product to the larger production chain. By-products are often normatively less valued, but generally not less valuable economically, and frequently in the case of food, nutritionally. In the animal food industry, the ‘non-meat’ parts of the animal are relegated to a secondary worth even though their sales are critical to the continuity of the ‘primary’ industry. In the main, only about 40-50% of a steer’s body is turned into human food (Hamilton, Kirstein and Breitmeyer, 2006). To suggest pet food or other animal feed is secondary misses the critical point that animal feed actually makes these meat-based food chains possible because meat would be exorbitantly priced without them. Walker (2000) suggests the term, ‘co-product,’ more fittingly reflects the importance of some by-products. A co-product can be defined as “a product that is usually manufactured together or sequentially with another item because of product or process similarities...A portion of the profit returned to animal production and processing industries depends on the utilization of the by-products or co-products ancillary to the production of meat, milk, and eggs for human food production” (2). This term removes these materials from normative categories of consumption and more correctly situates them centrally in production. It also makes visible conceptually what are otherwise invisible, but highly economically important,



aspects of production. This is critical to my project since there is a wide misconception that meat is and always was the main industry of livestock rearing.

Perhaps the reason meat is the privileged commodity in the animal agriculture production chain is because many other animal parts are classified as inedible. Edibility is the complicated concept that engrosses many physiological, biological, cultural, psychological, economic, ideological, legal and chemical processes simultaneously. No agreed upon definition of edibility can be detected within or between most disciplines. What has been widely acknowledged is that humans seem to construct the categories of edibility and food according to an always changing host of stated and unstated rules (Douglas, 1999; Levi-Strauss, 1965; Roe, 2006). At a physiological level, edibility relates to whether or not particular organic or inorganic items are safe and suitable for consumption. Edibility also relates to whether there is a nutritional benefit to the food. Social scientists, then, focus on discerning the conditions under which individual items or whole food categories come to be consumed or not. Often perfectly safe and highly nutritious foods are not consumed for cultural, aesthetic, or ideological reasons. Many of the ingredients used to make pet foods fall into this category. So the contention that the inedible by-products or waste of human food production used in pet foods are somehow dangerous is at least somewhat misleading. As Hill reminds us, “many [animal] feed ingredients are by-products of the food processing industry, so the petfood [sic] and feed industries are generally in the position of using products that do not meet human food standards for a variety of reasons” (2003a: 92). The reasons such substances are relegated to animal feed may be irrational because many are nutritionally sound foods

insofar as they possess digestible nutrients. But their inclusion in pet food allows humans to consume only the desired parts of animal bodies or other ingredients.

As a derivative of the human food industry, pet food makers do not choose most of the ingredients at their disposal. There is also significant nutritional variation in many of the items they are allowed to use. The nutritional suitability of their ingredient choices is hotly contested. Pet food makers tout the nutritional benefits of all their ingredients while critics argue that many are physiologically indigestible or unreasonably low in nutritional benefit (Martin, 2001; Martin, 2008; Fox et al., 2009). Determining what type and how much nutritional benefit animals can actually obtain from any given ingredient is difficult because both the digestive abilities and nutritional needs of animals differ. Some items may be a wonderful food source for one species, but not another. Nutrition research is incredibly complicated since digestion does not occur in a vacuum. While it is possible to measure the nutritional content of a food, it is quite another to measure it in the bodies of different species. So a great deal of how nutrition comes to be known is shaped by politics – by a constant negotiation of science, values, economics, and aesthetics.<sup>13</sup> This thesis does not weigh in on the appropriateness of ingredients much. But it does comment on the ways in which they are taken up and included in the network. Pet food makers, as I said, hail all their ingredients. Below I examine how this is at least a little disingenuous; how many ingredients become pet food ingredients not because pet dogs and cats can obtain significant nutritional value from them, but because it is financially expedient to redirect these products into the animal food chain. In spite of their classification as opportunistic omnivores (dogs, humans) and obligate carnivores (cats), all three species are unable to digest many foods, particularly if they are untreated

---

<sup>13</sup> It should be noted that these are not mutually exclusive categories.

or uncooked (Dzanis, 2003a). So one way the industry makes the foods more digestible is through a production process called rendering. Indeed, some of the most important ingredients in pet food and animal feed are enabled by rendering. Even though pet and animal feed ingredients are sourced from the same place as human foods, the former usually include the parts deemed inferior, distasteful, low in nutritional benefit or even revolting. Rendering makes them useful and useable. How rendered products came to be included in pet and animal feed will be explored in Chapter Five.

### *Legal Regulation of Pet Food*

As with all commercial products, pet foods are subject to a range of laws and guidelines. In both Canada and the United States, pet foods are legally classified as animal feeds, and therefore, subject to unique legal structures. The regulatory framework in the pet food industry is a significant source of contestation. Some pet food analysts have described the industry as ‘unregulated,’ and thus, the food as poor quality and potentially deleterious to companion animals (Martin, 2008; 2001; Fox et al., 2009). Those critical of the commercial pet food industry also say that regulation is lax, enforcement virtually nonexistent, and government bodies hardly intervene in any aspect of these businesses. Pet food industry insiders dispute this portrayal, calling pet foods some of the most tightly controlled products on the market (Dzanis, 2008a). They add that limited government involvement does not mean the food products are assembled recklessly or carelessly. Rather, their assertion is that most pet food manufacturing facilities spend a great deal of time and money time making healthy, high quality products which align with a very strict and specific set of requirements. The veracity of

such claims will not be tackled on their face, but explored within the scope of a nutritionalized pet food industry.

The regulatory structure surrounding pet food plays an important role in how pet foods are made. Human foods are subject to laws designed to protect consumers' health and vitality. These laws prescribe the manner by which companies communicate their products' ingredients, what ingredients may or may not be included in the products, how companies must communicate the nutritional value of their foods, and so forth. These types of laws extend to pet foods, although arguably to a lesser degree (Nestle and Nesheim, 2010). What is unique about pet food is that there is a coincidence between the products' nutrition and the regulatory framework. The manner by which pet foods are regulated extends to how the foods are made such that pet foods' nutritional qualities are not freely determined by pet food manufacturers. In other words, these products are manufactured according to a set of regulations that circumscribe how they must be made. The reasons for this, including when, how, and why it became the case, constitutes the better part of this project. But this regulatory coincidence is imperative because it makes lucid much of how pet foods in both the United States and Canada are regulated.

The mainstream commercial pet food industry has its origin in the turn of the twentieth century in the United States. Pet foods, as stated, are considered distinct from human food products. Still, they are subject to some of the rules of the main federal authorities that govern human food: the Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA). The former has a particular branch, the Center for Veterinary Medicine (CVM), which possesses a pet food division. The division of regulatory powers over feed also bestows American states with some

autonomy and oversight. Thus, pet foods are also subject to state laws, which today, have a great deal of consistency. State authority subsequently provides a non-governmental organization, the Association of American Feed Control Officials (AAFCO), a great deal of its own authority. According to Roudebush et al. (2000), AAFCO is a voluntary, nonprofit corporation comprised of officials of any federal, state, or provincial government agency within North America who are charged with the task of “regulating the production, labeling, distribution, or sale of animal feeds or livestock remedies” (2008: 65). AAFCO articulates feed definitions while the FDA, with the authority of the Food, Drug and Cosmetic Act, determines which substances are ‘generally recognized as safe’ (GRAS).

There is regulatory overlap between the FDA and AAFCO, although their respective roles differ. The FDA has formal, legal authority over pet foods while AAFCO’s involvement is more indirect. AAFCO has the authority it is given by the FDA and other federal officials, as applicable. It emerged as an organization with a particular function: AAFCO helps to determine whether an ingredient is a feed, but the FDA decides whether it is generally recognized as safe (GRAS), and therefore, acceptable for use in pet foods. The FDA also possesses responsibility for establishing certain animal food labeling regulations, specifying certain permitted ingredients such as drugs and additives, enforcing regulations concerning contamination, coordinating recalls, and overseeing health claims in pet foods.

Compared with laws in the United States, regulation of pet foods in Canada is lenient. AAFCO is still a relevant organization in Canada, although even its inadvertent regulatory power is seriously diminished because of national jurisdiction. While

Canadian government officials are represented in AAFCO, and the rules set out by AAFCO apply in Canada to the degree that they are adhered to, AAFCO does not possess the official authority in Canada that it does in the US. In Canada, only three federal departments have any legal authority over pet foods: Health Canada, The Canadian Food Inspection Agency (CFIA), and The Competition Bureau (within Industry Canada). Health Canada's oversight is limited to controlling the use of health claims. It prohibits the use of unsubstantiated health claims in the advertising and labeling of any consumer product. The CFIA only deals with pet foods to the degree that it has authority over safety issues within the meat industry. It prohibits the inclusion of inedible animal by-products in consumer goods, particularly those associated with bovine spongiform encephalopathy or what are technically termed, specified risk materials (SRM). The strongest restrictions on pet foods appear legally through Industry Canada, in particular in the *Consumer Packaging and Labeling Act* and the *Competition Act*. These are similar laws that apply to the communication of human food and other products. They are designed to prevent companies from providing false information about their goods to consumers. These laws do not address the production of pet foods, but simply mandate the package labels. They are legally required and emanate from the movement of government toward empowering consumers to 'know' exactly what they are buying. Specifically, the regulations require pet food companies to provide certain basic types of information on product packages, including the food name, contact information for the brand, the list of ingredients, feeding instructions and a guaranteed analysis of the product's contents. This last requirement is fundamental to the regulatory framework of pet food. This dissertation will show how it is imperative to its structure as a whole. To

do both, a detailed examination of the guaranteed analysis is required. More will be said about it in Chapter Seven.

### *The Guaranteed Analysis & Preliminary Nutritional Matters*

The guaranteed analysis is one of the most important features of pet foods and their labeling. The guaranteed analysis statement is a small formulaic statement printed on pet food packages. Its basic function is to outline (guarantee) the product's nutritional constitution. It first appeared in the early twentieth century and today is used throughout the animal feed and pet food industries, as well as in other products (like fertilizer) where a chemical profile is being communicated. The guaranteed analysis is legally required of all animal foods in Canada and the United States. Under these regulations, the guaranteed analysis statement has become the primary mechanism by which pet foods' healthiness is communicated and supposedly achieved. It is designed to provide an assurance of nutritional quality. However, it is only one part of a pet food package. As with human food products, pet food packages must outline their contents in two ways: by ingredients and by nutrients. In one section of the package, a product's ingredients are listed in descending order by weight as mixed. This is also legally required in both Canada and the United States. In another, there is a panel that resembles the 'Nutrition Fact' panel on human food packages, which likewise breaks down the main macronutrients and micronutrients comprised by the food. Most people living in either country would recognize the nutrition panel on human food packages as this is what describes the numbers of calories and quantities of nutrients in a food. On pet foods, this is the guaranteed analysis statement. For comparison purposes, Table 1.1 represents a

‘Nutrition Facts’ panel for a hypothetical box of rye crackers, Table 1.2 represents a possible ‘Guaranteed Analysis’ statement for a hypothetical bag of dry kibble-style cat food, and Table 1.3 provides a ‘Guaranteed Analysis’ for a hypothetical can of wet cat food.<sup>14</sup>

**TABLE 1.1: Human Nutrition Panel**

*JEN’S RYE CRAKERS*

<b>Nutrition Facts</b>	
<b>Per 3 slices (30 g)</b>	
<b>Amount</b>	<b>% Daily Value</b>
<b>Calories 120</b>	
<b>Fat 1 g</b>	<b>2%</b>
Saturated 0 g	
+ Trans 0 g	
<b>Cholesterol 0 mg</b>	
<b>Sodium 100 mg</b>	<b>4%</b>
<b>Carbohydrate 25 g</b>	<b>8%</b>
Fiber 5 g	20%
Sugars 1 g	
<b>Protein 3 g</b>	
Vitamin A	0%
Vitamin C	0%
Calcium	2%
Iron	6%

**TABLE 1.2: Kibble-style Cat Food Guaranteed Analysis Statement**

*KITTY CAT KIBBLE*

**GUARANTEED ANALYSIS**

Crude Protein (minimum).....	32%
Crude Fat (minimum).....	10%
Crude Fiber (maximum).....	5.5%
Moisture (maximum).....	10%

<sup>14</sup> The Nutrition Facts Panel must appear exactly in this format and with these nutrients. The Guaranteed Analysis does not have to have one ‘look’, although it must express numeric values for certain nutrients.



Vitamin E (minimum).....	300IU/kg
Taurine (minimum).....	0.1%
Omega 3 Fatty acids* (minimum).....	1.5%
Omega 6 Fatty acids* (minimum).....	0.35%

¶ Animal feeding tests using AAFCO procedures substantiate that *Kitty Cat Kibble* provides complete and balanced nutrition for maintenance

\*Not recognized as an essential nutrient by the AAFCO Cat Food Nutrient Profiles

**TABLE 1.3: Moist Cat Food Guaranteed Analysis Statement**

---

***CUDDLY CAT CANNED FOOD***

**GUARANTEED ANALYSIS**

Crude Protein (minimum).....	10%
Crude Fat (minimum).....	5%
Crude Fiber (maximum).....	1%
Moisture (maximum).....	78%
Ash (maximum).....	2.3%
Taurine (minimum).....	0.1%
Magnesium (maximum).....	0.025%
Omega 3 Fatty acids* (minimum).....	0.3%
Omega 6 Fatty acids* (minimum).....	0.65%

¶ Formulated to meet the nutritional levels established by the AAFCO Cat Food Nutrient Profiles for maintenance

\*Not recognized as an essential nutrient by the AAFCO Cat Food Nutrient Profiles

As shown in the first two tables, human food packages in Canada will measure nutrients per serving and in two ways: for all nutrients by weight (g) (or volume (mL)) and for some nutrients by percentage of daily recommended value (DRV). The guaranteed analysis expressly enumerates the ‘guaranteed’ minimum and maximum crude percentages of certain nutrients by weight of the product. The designation, ‘crude,’

refers to a specific method of testing the product for the presence of those nutrients and does not attest to the quality of the nutrient itself (Dzanis, 1994).<sup>15</sup> In other words, this statement provides an assurance that the food contains a minimum (or maximum, where applicable) level of certain nutrients.

It differs from human nutrition facts panels in several fundamental ways. First, pet foods' guaranteed analysis statements must outline the lower and upper limits of a unique selection of nutrients provided by the food; the analysis statements must guarantee their contents are made up of at least (or at most) a certain percentage of one nutrient or another. According to Table 1.2, *Kitty Kat Kibble* is composed of at least 35% protein and, at most, 10% water, for instance. Some listed nutrients overlap with those on human nutrition panels while others, such as ash (mineral remnants, including calcium and phosphorus) or taurine (an amino acid), for example, are unique to pets' foods.<sup>16</sup> Many pet food companies also opt to tout more than the minimally required, particularly those which are believed to confer 'special' health benefits (as is the case with Omega-3 or Omega-6 fatty acids, for instance) (Hill, 2003b).<sup>17</sup> In human foods, the nutrition facts

---

<sup>15</sup> The nutrient quality determination process will be addressed below. It is worth stating initially that the quality of a nutrient depends on the food source from which it is derived as well as the digestibility of that food source for the consumer. The crude testing method for protein does not count actual protein levels, but measures the nitrogen and makes a best estimate by using pre-determined correction quantities. More on this matter will be said later in the chapter.

<sup>16</sup> The Canadian human nutrition fact table now requires information on calories and 13 nutrients: fat, saturated fat, trans fat, cholesterol, sodium, carbohydrates, fiber, sugars, protein, vitamin A, vitamin C, calcium and iron. One significant macronutrient omission on pet food labels is carbohydrates. This will be addressed shortly.

<sup>17</sup> The supposed biological differences between species must be recognized as both a physiological and discursive fact. It is understandable why macronutrient levels like protein, fat, or fiber are clearly identified. However, the AAFCO only requires the enumeration of a handful of vitamins and minerals in the guaranteed analysis statement, even though cats and dogs, like humans, need a large array to remain healthy. It is generally recognized that the nutrients singled out for inclusion in the guaranteed analysis statement have been chosen because they have been present or absent in problematic and health-compromising levels in the past (Remillard, 2008).

panels for packaged foods are standardized and may not deviate from the applicable standardized templates.

Another difference between the nutrition facts panel on human foods and the guaranteed analysis statement on pet foods is the meaning of the nutrient percentages on their respective packages. In contrast with human food panels, the nutrient percentages outlined on pet food packages are not percentages of overall daily recommended intake allowances. Whereas human food nutrient panels give the nutritional constitution contained within a serving size by weight, pet food packages express the percentages as minimum (or maximum) amounts in the product. This is essential because these foods are *not* made to be part of a varied diet; rather, they alone are purportedly formulated to meet animals' biological and nutritional needs. Accordingly, the values ultimately reflect more than simple percentages of daily recommended intake or the packages' contents.<sup>18</sup>

An example should make the distinction clearer. Consider the hypothetical box of rye crackers with a 30g serving size in Table 1.1. The nutrition panel outlines that, among other nutrients, one serving of this food provides 1g of protein and 5g of fiber. It also says that these amounts, respectively, represent 2% and 20% of the total amount of those nutrients an 'average' individual needs to consume on a daily basis.<sup>19</sup> Thus, a person should meet their minimal requirements for fiber by consuming five servings of crackers,

---

<sup>18</sup> The rules outlined only apply to those foods that are formulated to meet the nutritional levels established by the AAFCO Dog Food or Cat Food Nutrient Profiles for all lifestages. These are reproduced in Table 6.1 and Table 6.2, respectively. This means that supplementary foods or treats are not contained in this statement. They, too, possess guaranteed analysis statements, but must also "warn" that the food is intended only for supplementary feeding.

<sup>19</sup> The label does not say how these percentages were determined or explicitly articulate which governance body makes the recommendations. The agencies responsible are Health Canada in Canada and the Department of Agriculture and Food and Drug Administration in the United States. Detailed discussion of who counts as 'average' is beyond the scope of this project. It should be noted that the nutritional requirements appear to align with a 2,000 calorie diet. It is generally recognized this is more in line with the nutritional requirements of 'average' adult [probably white] men.

for a total of 25g of fiber. Such a measure was included to make the health benefits of one serving clear to consumers for whom it would be difficult to ‘know’ the nutritional qualities otherwise. By contrast, consider the hypothetical dry cat food in Table 1.2 that is formulated to meet the AAFCO Nutrient Profiles. It contains a minimum of 32% protein, 10% fat and has a moisture level of 10%. These numbers are not a percentage of daily intake allowances such that roughly three servings would satisfy a cat’s daily protein requirements. Rather, these numbers reflect the minimum (or maximum, in the case of some nutrients) *levels* of the nutrients in question for the finished product ‘as sold.’ This is unlike human food packages, which list more definite quantities of nutrients.

In fact, because the guaranteed analysis expresses nutrient levels in minimum and maximum percentages, the actual nutritional amounts of a food can only be measured by scientific testing or assumed to be equivalent with the number reported. In my examples, *Kitty Cat Kibble* has a *minimum* of 32g of protein per 100g serving while *Cuddly Cat Canned Food* contains a *minimum* of 10g of protein per 100g serving. These may not reflect the actual amounts protein, but will only represent the lower quantities of each product such that they provide *at least* 32g and 10g of protein, respectively, per 100g serving.<sup>20</sup> Protein is reported as a minimum because there is particular biological need

---

<sup>20</sup> The guaranteed analysis statement only offers percentage measurements for nutrients. These figures are based on the simple conversion of the percentage measurements into weighted amounts. Assuming the reported figures are true, if 100g of the kibble were scooped into a bowl and subsequently tested for nutrient composition, we should expect to find a minimum of 32g of it would be protein, 10g fat, and so on. This is because the label guarantees the product is composed of at least 32% and 10% of each, respectively.

for both animals to get certain amounts of protein, *and*, its sources are comparatively more expensive than water.<sup>21</sup>

The way that nutritional levels of pet foods are constructed and managed will be elaborated more fully in Chapter Seven. But two designations bear mentioning at this point because they are integral to nutritional understanding in the pet food and animal feed industries. These are dry matter and ‘as sold’ (or ‘as fed’) designations. The guaranteed analysis deals with the latter and tells consumers the macronutrient or micronutrient amounts based on the total level of water in a product. Pet foods are classified as dry, semi-moist or wet foods, according to their moisture levels. Moisture will vary from 8-11% for dry foods and nearly 80% for wet foods. Water is an essential part of all animals’ diets, of course. It serves a number of physiological functions, but possesses no energy or micronutritional value. For this reason, animals must eat more wet food to obtain nutritional benefits comparable to those provided in relatively small amounts of dry foods. The following table compares the nutrient percentages for Example 1.2: *Kitty Cat Kibble* and Example 1.3: *Cuddly Cat Canned Food*, as reported on their guaranteed analysis statements.

**TABLE 2: Nutrients Percentages of Two Cat Foods**

	Moisture	Protein	Fat	Ash <sup>22</sup>
--	----------	---------	-----	-------------------

---

<sup>21</sup> Of course dogs and cats have a biological need for water, fats, proteins and sugars (although their digestive systems allow them to produce sugars from non-carbohydrate sources. The guaranteed analysis lists water as a maximum because it is cheaper than solid inputs. Fats are listed as minimums because they are minimally required. But unlike proteins, they are inexpensive. Carbohydrates are not listed on cat or dog foods, even if they constitute the major macronutrient category of most dry foods.

<sup>22</sup> Ash is neither a macronutrient nor an ingredient. Rather, ash is the term used to describe the mineral residue left after the foods have been burned (which is a test performed to determine mineral levels). At

Example 1.2: <i>Kitty Cat Kibble</i> (as sold %)	10%	32%	10%	not stated*
Example 1.3: <i>Cuddly Cat Canned Food</i> (as sold %)	78%	10%	5%	2.3%

\*KCK assumes 1% vitamin & mineral content

The water levels shape the amount of food animals must consume. Because there is significantly more water in the canned food, a cat would have to eat more of it to consume the same *amounts* of fat or protein. Yet this difference does not mean a dry kibble is a more nutritious food. A wet food may have higher nutrient levels or the foods possess nearly identical nutrient levels. Foods' nutritional characteristics can only be compared once 'corrected' for water content when the products are measured on what is termed a 'dry matter' basis. The dry matter amount never appears on a pet food package, or any food package, for that matter. It is, nonetheless, a central measure for nutritional purposes. The dry matter amount is a label given to a food or food product without consideration for the water that exists naturally in, or that has been added to, that item. In human foods, dry matter levels are somewhat less relevant because humans simply eat foods that have nutritional levels reported on a per serving basis. This is not how nutrition works in commercial pet foods. For the purpose of understanding the nutrient levels of two different types of pet foods, the dry matter levels must be compared.

We know a cat would obtain greater quantities of nutrients from the kibble by consuming the same weight (100g) or volume of the two foods. But the cat would be less satiated from the wet food and willing to consume more of the latter. The question is which food would provide more (and potentially better) nutritional value if the water

---

high temperatures, macronutrients will be incinerated, but certain essential micronutrients that are contained within meat will remain.

were not counted?<sup>23</sup> The ‘dry matter’ nutrient levels can help us to answer this question.’

Dry matter conversions are critical to the industry’s operation. They help to clarify the overall dietetic constitution of any food and allow the relative nutrition of foods to be compared. Converting to the dry matter basis is essential because all three types of food may be fed exclusively to animals and, most crucially, because the overall nutritional quality of a food is constructed by the industry on its dry matter basis.<sup>24</sup>

Determining dry matter nutrient levels requires calculations involving all major nutrients. However, the guaranteed analysis statement does not list the carbohydrate levels of pet foods.<sup>25</sup> Since all foods have constituent macronutrients, carbohydrate levels can be ascertained if the amounts of water, fat and protein are known, added together, and then subtracted from 100.<sup>26</sup> This means the dry cat food from Table 1.2 is roughly 47% carbohydrates while the wet cat food from Table 1.3 is roughly 4.7% carbohydrates. Again, these levels represent the ‘as sold’ or ‘as fed’ amounts that include

---

<sup>23</sup> Evaluating the healthfulness of foods will often pit different nutrition evaluation paradigms against one another. How one determines whether the nutrients measured on a pet food package are ‘good’ involves complex debates surrounding the biological appropriateness of particular foods, the availability of specific nutrients to different animals, and so on. Some of these matters will be discussed in the subsequent chapter and will be teased out throughout the thesis. For what it is worth, this thesis is primarily invested in showing how the nutritionist paradigm came to dominate and shape the pet food industry.

<sup>24</sup> As said, all dry foods must be formulated to meet the complete nutritional needs of the animal for whom it is prepared.

<sup>25</sup> Carbohydrates are likely left off of pet food labels because AAFCO does not designate minimum carbohydrate consumption requirements for either species. It is not clear why AAFCO lacks requirements for carbohydrates. It could be that animals simply convert other nutrients to saccharides, which means carbohydrate food sources are less necessary than they are in humans. It could be that the industry has always used grains and they are expected. It could also be that there is an expectation that at least some cereals will appear in products made by an industry with a significant cereal production infrastructure. It could be so to hide the industry’s heavy reliance on grains and other ingredients from non-animal sources and to make the foods appear to contain higher levels of meat.

<sup>26</sup> Any portion equals the sum total of all macronutrients and micronutrients, or, 100% of the portion. It must be highlighted that the macronutrients added together will not quite comprise the full 100% because pet food makers add vitamins and minerals to their products. When those levels are articulated on packages, a more accurate estimation of the carbohydrate quantities is possible. Often, as in this case, they are unspecified and must be estimated. I assigned 1% in this example.

water. To compare the nutrient levels of two foods, the dry matter amounts of each nutrient must be identified by removing (correcting for) water. It is relatively easy to compute the dry matter levels of nutrients by weight. First, the overall product's dry matter amount must be calculated by subtracting the product's moisture percentage from its overall macronutrient percentage of 100. Since the kibble has 10% water content, the overall dry matter content is 90%. The macronutrient percentages can then be determined by dividing the percentage of the macronutrient by the percentage of the entire product's dry matter. Table 3 provides these calculations for the major nutrient categories for both the dry and wet cat food exemplars in both their 'as sold' and 'dry matter' forms.

**TABLE 3: Complete Nutrient Profiles of Two Cat Foods**

	Moisture	Dry Matter	Carbs	Protein	Fat	Ash
<i>Kitty Cat Kibble: As Sold/Fed</i>	10%	n/a	47%	32%	10%	not stated*
<i>Kitty Cat Kibble: Dry Matter</i>	n/a	90%	52.2%	35.5%	11.1%	n/a
<i>Cuddly Cat Canned Food: As Sold/Fed</i>	78%	n/a	4.7%	10%	5%	2.3%
<i>Cuddly Cat Canned Food: Dry Matter</i>	n/a	22%	21.4%	45.5%	22.7%	10.3%

\*KCK assumes 1% vitamin & mineral content

In this context, two points are significant. First, the nutritional profile of a food may look different when the water is not counted. Second, even though these are hypothetical foods, their guaranteed analysis statement is constructed in such a way as to designate them appropriate for exclusive feeding according to AAFCO. In other words, both foods



are formulated in such a way as to meet the complete nutritional needs of animals; they are both formulated to provide purportedly optimal levels of complete nutrition. And yet, they have very different nutritional profiles. The dry food has significantly more carbohydrates while the wet food has significantly more fat, protein, and ash. How can two foods so different in their base nutritional profiles be created to provide animals with appropriate and optimal nutrition? According to the industry, this is possible because the foods meet the minimum nutritional standards set out by AAFCO. The constitution of foods beyond that is deemed apparently irrelevant. This is one of the main sources of criticism among industry opponents. In their view, such wide disparities cannot be defended from a physiological standpoint. The foods are not organized around ideal nutrition, but reflect industry priorities. They claim these foods are largely biologically inappropriate for pet animals and a reflection of the concentration of ownership over pet food labels among large food companies that specialize mostly in manufacturing cereal-based foods. This point is worth considering given the structure of pet food ownership and manufacture.

### *The Ownership of Pet Foods*

The pet food industry is a large and complex global business that generates annual global sales in the range of \$65 billion. It is largely made up of multinational corporations concentrated primarily in the global West, but in the United States, in particular. In recent years the industry has seen a great deal of expansion in both production and sales in 'emerging' and 'nontraditional' markets of China, India, and Brazil, for example. For the industry, globalization is key to fuelling ongoing growth to

keep pet food lucrative (Woon, 2011). Worldwide, there are perhaps hundreds of thousands of pet food labels if one includes very small, specialty, or family-owned companies. However, there are only a few hundred larger scale commercial labels in Canada and the United States, and most pet food will be purchased from among this group. This market is best divided into three segments: multinational brand names, private label brands and small producers.

#### Multinational Pet Food Labels

The most popular, recognizable and best selling pet foods fall into the first category of multinational corporate brand names. They are owned by multinational conglomerates with highly diverse business interests. The structure of these businesses varies, but each has significant assets in personal care, dry food goods and/or other consumables, including human food products (Aldrich, 2006). The world's ten largest pet food companies, which are listed in Table 4, had worldwide retail pet food sales above \$36 billion last year (Taylor, 2011).

**TABLE 4: Top Pet Food Corporations**

	Petfood Operations World Headquarters	Approximate Retail Sales 2009 (USD)
Mars	Franklin, Tennessee	\$13.4 billion
Nestlé (Nestlé-Purina)	St. Louis, Missouri	\$12.9 billion
Colgate-Palmolive	Topeka, Kansas	\$3.5 billion
Proctor & Gamble Co.	Cincinnati, Ohio	\$3.3 billion
	San Francisco,	

Del Monte Foods Inc.	California	\$1.8 billion
Agrolimen SA	Sant Cugat del Vallés, Spain	\$0.74 billion
Uni-Charm Corp	Tokyo, Japan	\$0.42 billion
Nutriara Alimentos Ltd	Arapongas, Brazil	\$0.34 billion
Total Alimentos SA	Corações, Brazil	\$0.32 billion
Nisshin Seifun Group Inc	Tokyo, Japan	\$0.26 billion

Adopted from Taylor (2009)

The top five globally - Nestlé, Del Monte, Mars, Proctor & Gamble, and Colgate-Palmolive - are also the largest pet food companies in North America. An estimated 70% of all food purchases are made from these brands. Their economic success can be attributed to a few factors. These corporations can dominate the industry because they advertise extensively, have sophisticated retail distribution system networks, and enjoy brand recognition and loyalty. They also have the ability to buy up competitors and make lucrative alliances with the nonprofit sector. Chapter Six will provide an overview of how these alliances fit into the nutritionalized pet food network.<sup>27</sup> Perhaps most importantly, these large corporations are competitive within all market segments, although they have done better in some than others. Indeed, they span vet or specialty pet food markets, yet remain strong in supermarkets, which helps explain how they came to be common household goods. Hitting the mass grocery market was, in fact, critical to pet foods' initial acceptance. Today that is perhaps less true. National brands have struggled somewhat in the rising premium and 'superpremium' markets, where their mass appeal

---

<sup>27</sup> Quite briefly it is worth saying that they cultivate an image that extends far beyond simply selling a food product. Rather, they present themselves as pet experts; overall wellness authorities. In addition to partnering with other nonprofit organizations that also have such a mandate, the major pet food companies have developed extensive resources and guides dedicated to such themes.

may negate some of the specialty qualities associated with being higher value, smaller, more specialized, etc. Economically, then, the viability of this sectors rests in part in the acquisition of smaller specialized brands.

### Private Label Brands

The second category represents all the pet food brands on the market that are not part of any large multinational conglomerate. Private label products include any goods or merchandise that are manufactured by one company but sold by another. Typically, private label production in the human food industry is done for grocers or retail chains. The products are sold under the in-house labels of the respective company. These private label goods are often positioned as lower cost alternatives to the (inter)national brands with which they compete. The cost difference could be linked to product quality, but more likely is the result of (inter)national brands spending significant amounts of money on advertising and marketing and passing those costs onto consumers. In the pet food industry, private label production is nearly ubiquitous. This is even true among multinational corporate pet food makers, which contract out production. Most pet food is made this way and pet food *brands* can be differentiated according to the target market: in-house or grocery brands and small company brands.

Pet foods made for grocers, supermarkets or other retailers represent a relatively small segment of the market and are valued at less than 10% of all retail sales. As suggested, private label has tended to hit the lowest economic end of the market, but not exclusively. For this reason, Linthicum (2007) predicted that this market would decline in light of the trend toward premiumization. His prediction was not incorrect, although

the sector has shifted as expansion into pet foods is becoming increasingly attractive to higher-end retailers. A lot of other pet foods are made according to this model as well. In fact, it is not just retailers who are expanding into this business, but also nonprofit organizations such as the Humane Society of the United States, figures like Cesar Millan, the so-called 'Dog Whisperer,' or recognized companies from the human food sector. Private label pet foods, then, include both newer actors and well established labels. Some family-owned smaller companies have simply grown their businesses over time to become established brands. What all foods within this latter subcategory have in common is they fall in the mid-to-high range in terms of quality and cost, and are generally sold in specialty pet stores or veterinary offices. While they make up a large number of pet food makers, they collectively only hold about another 10-15% of the market share. This amount would probably be higher but multinational corporations have kept such a large share of the pet food market and stayed lucrative within the growing and profitable premium and superpremium sectors by acquiring these brands.

### Small Producers

There is a third category of pet food maker that bears mentioning, but which holds only a small segment of the market: private companies. Private companies differ from private label pet food companies because they actually manufacture their own foods. Although early pet food makers took this form, the size of today's industry makes them a nearly extinct category on the broader scale. The strict regulations and the equipment costs make small-scale operations difficult to sustain. But a few companies still exist among former private label brands that have transitioned into producing their own

products. Their market share is difficult to know exactly, but would be marginal. In fact, they have probably remained in business by contracting out their facilities; by what is called 'co-packing' for others as well as producing for themselves.

### *The Production of Pet Food*

Pet food production today, like other animal feed production, is highly mechanized and very closely resembles the processes used to make packaged human foods. This is certainly no coincidence as commercial pet foods were born from the packaged food industries. Many pet foods are produced by other companies. Many companies that own pet food labels, including multinational companies, frequently do not make them. Rather, they contract with others to do so in what the industry calls 'co-packing.' These private label producers or co-packers are never credited for their work. Their names, company contact information, and any other signs they are involved in production do not appear on any packages, including private label brands.<sup>28</sup> Co-packers are widely used in human food and other manufacturing industries and are equally uncredited there. Their invisibility is not evidence that the food quality is inferior. Some of the most expensive and highest quality commercial pet foods are made by contract producers while some of the least expensive and lowest quality foods are manufactured in plants owned by the pet food companies themselves. Ownership over the label is no guarantee that the food will be of either exceptional or substandard quality. Some of the largest private label producers are listed in Table 5.

---

<sup>28</sup> The degree to which pet food labels employ third parties to produce their foods was only revealed after the 2007 pet food recall scandal. The news was not received well by the public since the actual pet food makers were revealed to be doing work for different companies in different price points using exactly the same ingredients.

**TABLE 5: Top North American Pet Food Private Label Producers**

C.J. Foods, Inc.
Menu Foods
Chenango Valley Pet Foods, Inc.
Triple T Foods Inc.
Diamond Pet Foods*
Simmons Pet Food Inc.
Hagen
Doane Pet Care (Mars)**

\*Produces its own line

\*\*Formerly a private label producer

The co-packing model works well in pet food for many reasons. Private label producers make it possible for companies of all sizes to avoid the risks and responsibilities associated with manufacturing. Pet food production equipment is expensive to purchase and maintain, and many of the other costs, such as labour and inputs, are unpredictable. Profits in pet food reside primarily in ingredient buying. Even though pet foods provide an outlet for food co-products, the ingredients are sourced from elsewhere and not owned or fashioned by the companies themselves. As with human food production, pet food makers buy agricultural inputs on the commodities market. They must purchase ingredients that will then be combined and cooked into finished and saleable goods. They have no role in slaughtering animals, rendering, growing grains, making or synthesizing preservatives minerals or vitamins, developing palatants

(flavouring agents that make the foods enticing for animals to eat), or anything else related to pet food production. The co-packing business model allows companies to mutually share the benefits of large-scale and competitive purchasing while avoiding the difficulties associated with building or upgrading a facility. Co-packing also makes it easier to buy or sell pet food labels.

Historically, food companies have attained and exchanged pet food labels as their companies grew or reorganized (Nestle and Nesheim, 2010). Depending on a company's other holdings and operations, the pet food model may or may not work well. This is particularly salient when manufacturing facilities are attached to a company.<sup>29</sup> This is not to say that manufacturing is not cheaper than outsourcing production or that there are no benefits to self-production. But it is to say that the self-production model only makes financial sense for companies under certain conditions. Even when circumstances are right, many companies opt for a hybrid model of production. They may contract out production periodically, self-produce under some labels or some types of food and contract out for others, or even partner full-time and long-term with a co-packer.

Co-packing need not be a nefarious business practice, although it certainly looked like, and perhaps became, one in the last decade. In fact, co-packing led to an event that precipitated the most serious challenge to the reputation and security of the commercial pet food industry in its history: the 2007 melamine pet food recall. It is an event that had a startling effect on the industry and called into question the appropriateness of this feeding model. In ANT terms, the 2007 melamine pet food recall threatened the durability of the nutritionalized pet food network. The scale of contamination, failure of

---

<sup>29</sup> For example, Quaker Oats Co. was involved in the pet food business from until 1995, when they sold their pet food shares to Heinz Co. Heinz has since sold off some of its pet food rights to Del Monte.



manufacturers to detect the problem or its cause in a timely manner, and lack of significant government legislative response revealed deep fissures in this system. The melamine pet food contamination scandal and recall are important not in making the pet food network. Instead, the pet food recall reveals nutritionism as the pet food network's hub of stabilization. The melamine pet food contamination catastrophe reveals the way the network reconciles tensions.

### *2007 Melamine Pet Food Recall*

This project concerns itself with the history and structure of the pet food industry. While the 2007 pet food recall represents a critical incident for both the industry and pet owners, it is only one, albeit significant, moment in the story.<sup>30</sup> This section will offer a short snapshot of what happened. I will return to the matter again in the last chapter to examine the implications of the recall within the larger context of the pet food network. Nestle (2008) provides the most thorough examination and timeline, but many news outlets and internet sites also offer dependable and relevant information about the event. Nestle even claims pet enthusiasts' activities on the internet played a more significant role than either pet food industry representatives or US or Canadian government officials in identifying the problem, providing resources about potentially safe and unsafe foods, effective veterinary treatments, etc.<sup>31</sup> Accordingly, she uses these sites extensively in her book and other writings.

---

<sup>30</sup> While these circumstances were unique, it would be wrong to call the 2007 melamine recall an anomaly. The reason for this should become clearer over the next couple of pages.

<sup>31</sup> Among the most prominent was [www.petconnection.com](http://www.petconnection.com).

The 2007 pet food recall was a complex incident involving a number of parties operating within a long food supply chain. The pet food industry processes primary or secondary agricultural products into pet foods. Any agricultural product can create epidemiological and physiological problems for humans. Of course foods are supposed to nourish. But they can also be toxic and poisonous. While industrialization and mechanization of food production have helped to resolve some food safety problems, these processes have also caused or exacerbated many others (Nestle, 2002; Schlosser, 2001). Large scale production activities designed to maximize efficiency can often result in shortcuts that cause food contamination (Imhoff, 2010). Major commercial pet foods have long sourcing and supply chains. They use both processed and unprocessed ingredients, in addition to a number of other additives. Like other food products made this way, pet foods are susceptible to many forms of spoilage and contamination, with salmonella and mycotoxin (mold) contamination being the most common. Salmonella is caused primarily by undercooking of certain ingredients or cross-contamination while mycotoxins often develop in foods that are too moist when packaged. In other words, these, as well as other food contamination problems are mostly, but not entirely, preventable.

The 2007 pet food recall stemmed from a different sort of contamination – one that was much less ‘accidental.’ The crisis began somewhat quietly, with dogs and cats becoming seriously ill or dying unexpectedly all over the United States and Canada early in the year. Somewhat suddenly, on Friday, March 16<sup>th</sup>, a co-packing company few had heard of recalled thousands of food packages under many different brand names (Fitzgerald, 2009). The problem, the company and FDA said, was the foods caused

kidney problems or renal failure in cats and dogs. It would take months to identify the underlying cause, in part because the recall kept expanding. Ultimately, it would become the largest recall in the history of any consumer product in Canada or the United States. It would affect hundreds of brands from dozens of different companies at all price points, and total tens of millions of pet food containers in Canada and the United States (Gillis and Kingston, 2007). In fact, these circumstances proved perhaps as shocking as the cause of the recall in the first place. The recall revealed not just the centralization, globalization, or consolidation of the pet food industry. It also exposed what many found to be a problematic aspect of co-packing: that one company, Menu Foods in this case, can make the same food for many different brands – ranging from the least expensive to some of the priciest – with more or less exactly the same ingredients.

The cause of the initial recall was found to be adulteration of wheat gluten product that was sold to Menu Foods by a US-based company, ChemNutra, which supplies North American feed manufacturers with Chinese ingredients. ChemNutra claimed to have known nothing about the matter and vowed it believed it was buying wheat gluten. What it was buying was wheat laced with two industrial chemicals: melamine and cyanuric acid. Neither is an approved feed ingredient nor appropriate for use in human or most animals' food (AAFCO, 2008).<sup>32</sup> In pet foods they are both recognized to be adulterants added for deceptive purposes. Those two chemicals together, even at very low concentrations, can form crystals in the kidneys. They disrupt renal functioning and can cause severe reactions, including vomiting, lethargy, appetite loss, urination problems, kidney stones, kidney failure, and death (Rovner, 2008: 41). To

---

<sup>32</sup> Some claim that these food sources may be benign or have nutritional benefits in rumen animals because of the nature of their unique digestive processes.

be more precise, melamine and cyanuric acid were added to wheat flour to make that ingredient appear to be the higher quality, more proteinaceous, and much more expensive, wheat gluten. Melamine and cyanuric acid are used, especially together, because they can 'trick' the common test that is supposed to measure protein levels. As Nestle (2008: 71) explains, the most commonly used test, the Kjeldahl test, does not gauge the actual or true protein amounts in a food product. It instead estimates the protein by calculating the nitrogen levels of a food and correcting for the presence of non-protein nitrogen at a set factor. Both melamine and cyanuric acid contain high levels of non-protein nitrogen, so when added to protein-containing foods like wheat, soy, corn or rice, they make the foods appear to be higher protein isolate by-products such as wheat gluten, soy protein, and so on by artificially raising the non-nitrogen levels.

Initially, the contamination was limited to the wheat gluten included in products made by Menu Foods, which suggested this was perhaps just a 'problem' company. Later, melamine was also found in rice and corn 'proteins' funneled through another US-based distributor of Chinese ingredients, Wilbur-Ellis, which caused subsequent waves of recalls. This meant that the contamination extended beyond Menu Foods to other manufacturers, which explains at least some of the confusion figuring out the source of the problem.

The use of melamine and cyanuric acid in pet foods is quite intentionally deceptive and done in spite of food standards. The problem is that this was not the first incident of melamine adulteration in North American pet food. Brown et al. (2007) report that roughly one thousand dogs and cats were thought to have died from the same problem in 2004. It was even a poorly kept secret that melamine was routinely added to

different flours and meals by ingredient providers to increase the amount of money pet food manufacturers paid for the products (Nestle, 2008). But the levels were not detected in high levels to explain such disruptions. In both the 2007 and 2004 cases, the results were particularly fatal because the concentration of melamine was especially high, but mainly because its by-product, cyanuric acid, was also present. The 2007 pet food recall was not even the last time melamine was used to mimic protein in a consumer product either. In 2008, a large scale outbreak occurred in China's milk supply to cover up water dilution and resulted in the death of nearly 10 infants and hospitalization of hundreds of others.

The recall put pet food under a proverbial microscope and cast doubt on the industry as a whole. Martin (2008) has argued the recall reflects not an aberration, but the industry's true nature. In her view, pet food manufacturing is driven by greed with little concern for the health or nutritional needs of animals. Pet food companies simply sell and market foods that give an appearance of nutritional adequacy while relinquishing control over their foods and allowing their products to be dominated by cost-effectiveness to the point that fraud and deception become regular business practices. Martin's point is an important one. How can hundreds or thousands of dogs and cats who ate different types and brands foods become sick from the same contaminant?<sup>33</sup> This project will not address this question directly, but will point to some of the reasons by explaining how the pet food industry emerged and what structure and form it takes. Thus, the pet food recall represents a notable rupture point where it becomes possible to ask broader questions about the story of pet food and its production.

---

<sup>33</sup> The US FDA only acknowledges the deaths from the 2007 recall of about a dozen cats and dogs because 'conclusive' evidence is required for those records. According to pet owners' reports and civil lawsuits, the actual number of fatalities is estimated in the thousands.

## *Conclusion*

This chapter has provided an overview of pet foods and the industry that makes them. It has described the different types of pet foods available, briefly accounted for the construction of the industry, considered the relationship between human and pet food production, explained the governance of the industry by the U.S. and Canadian states, including the guaranteed analysis statement, outlined the relationship between producers and pet food label owners, and provided an overview of probably the most important public moment in the history of the industry: the 2007 melamine pet food recall. As this discussion has begun to convey, the commercial pet food business is a complex one that engages myriad actants. This thesis will discuss the way they have operated together to make the industry as it is. By so doing, I will explain how the industry has come to be organized around particular ideas about animals and (their) nutrition. The next two chapters will help to further contextualize the industry. I explain contemporary perspectives on animal-human relations to frame how many sentient actants are assembled in the pet food network.

### **Chapter Three: Conceptual Considerations in the Discursive Production of Pets**

My project is informed by a perspective that affirms the importance of nonhumans in making social life. My central claim is that nutrition is imperative to the operation of the pet food network. I also maintain that animals play an important role in constructing social relations. In the story of pet food, there are three major groups of animal actants: humans, pets, and the animals eaten. Although these categories may not seem immediately relevant to a project concerning nutrition, this chapter explains the relation between animality and humanity as it pertains to pets, animals, and animal products in the pet food network. As I will make clear, nutritionalized commercial pet food is the sum of both material and representational practices by pet food manufacturers. The human-animal divide is a salient marker of nutritional appropriateness that helps to make the food intelligible. In order to explore how pet foods cast animality and how discourses of animality shape pet food, I consider the conceptual issues underlying such issues and consider the question: how do we understand animals and our relationships with them? As most scholars in the field acknowledge, the production of animality and animals more generally is rife with contradiction and ambiguity. Two of the most obvious examples of this complexity relate to eating animals and loving animals. These two clashing acts, producing meat animals and producing pet animals or what I have termed 'petness,' strike at the heart of relationship between humans and animals in modernity (Wrye, 2009). This chapter considers this relationship more closely in order to outline how the processes work in the case of pet foods.

This chapter will structure Chapter Seven, which considers how commercial pet foods represent and constitute pets and other animals. In doing so, one point must be kept in mind. Pet foods are uniquely positioned with regard to animal relations as they are products made (partly) from animals that are designed for consumption by other animals. Perhaps this is true of any food product fashioned from animals' bodies or their bodily products. After all, since humans are technically animals ourselves, animal-derived food for us is 'for' animals. By constituting animals as appropriate consumption objects, pet foods are not particularly distinctive. But they do situate some non-human animals as consumption subjects, and this is rather unique. Pet foods, therefore, create multiple animalities. These constructions – of animal subjects and objects – define our relationships with animals and make pet food knowable.

### *Animals and Animality*

To proclaim that animals are important in society is rather obvious. Many people live with, eat, or wear them. An indeterminate number of consumer or medical goods are tested on or made from their bodies. We are involved with them for work or even for leisure. In sum, animals structure a great deal of human existence. Thinkers have long wrestled with the question of what differentiates humans from other animals. Until recently, however, sociologists have demonstrated little interest in considering the importance of animals to human societies. As Clifton Bryant put it, sociologists have been “myopic in their observations of human behaviour, cultural patterns and social relationships, and unfortunately have not taken into account the permeating social influence of animals in our larger cultural fabric, and our more idiosyncratic individual



modes of interaction and relationships in their analyses of social life” (1979: 400). This is not to say that animals have not figured strongly in other disciplines. As mentioned, nutritionists have typically concerned themselves with animal bodies. Likewise, other scientists, including biologists, ethologists and medical practitioners have recognized the similarities between bodies of different species and have studied animals for myriad reasons. In philosophy, animals have served as the ultimate ‘other’ in considerations of ethics or morality. Psychologists have developed theories about cognition or behaviour as a result of animal research. Even anthropologists have recognized that animal figures among different populations can provide clues regarding cultures and social structures (even if such attributions may have Eurocentric origins or racist underpinnings). Yet in the fields where relations and relationships constitute the focus of inquiry, the only ‘real’ subjects of law, politics, or economy have historically been humans.

Since Bryant presented his challenge, sociologists and other scholars throughout the social sciences have begun to take more serious note of the ‘zoological component’ in social systems. Interactions with animals permeate nearly every aspect of human life and are expectedly inconsistent. Some animals are loved and revered while others experience the opposite of positive affect. If research on animals has revealed anything, it is that even animals of the same species are not treated consistently – simply sentimentalized or objectified – across different places and times. The question is why and how some animals come to be protected and cared for while others are not. Yet such actions are not simply about animal bodies, *per se*.<sup>34</sup> Rather, they are about how value and worth align, particularly along axes of power and privilege.

---

<sup>34</sup> Biological/species disposition (animal size, ferocity, food or habitation needs, etc.) should not be completely discounted from such processes.

There is a strong division between animals and humans. In fact, the ontological separation between them is a core belief in Western society. The basis for this split probably resides in Judeo-Christian religiosity, where nonhuman animals were presumed to lack souls. In the modern era, however, the many rationalizations for the split find their origins in Enlightenment beliefs surrounding the possession of physical or cognitive abilities. Most animal theorists identify the first scientific differentiation in the writing of René Descartes (Baker, 1993; Wolfe, 2003; Ingold, 1988). They claim that Descartes viewed animals as soulless machines that act from instinct, not thought. For example, in *Meditations*, Descartes argued that animals were “automatons” – physical entities that lacked mental substance. He reasoned that since animals had no consciousness, and were unable to speak, think, reason, feel pleasure, pain and even suffer, they were similar to humans only in anatomical constitution. In other words, all animals became fundamentally different from humans.

Despite the fact that these beliefs persist, a large body of research has challenged the view that animals and humans are definitively physiologically different. Discriminating between animals and humans because of physiological similarity or difference would not likely lead to the animal/human split as we know it. Humans are more biologically similar to a number of non-human animals than they are to each other.<sup>35</sup> For instance, humans are remarkably genetically close to gorillas, orangutans and chimpanzees. Moreover, xenotransplantation – the transplantation of animal cells, tissues or organs into human beings – is becoming commonplace. Mani, Mathew, and Homer-Vanniasinkam point out pigs make ideal organ donors because they “are physiologically similar to humans in cardiovascular and pulmonary function, renal

---

<sup>35</sup> For example, non-human animals occupy a number of different taxonomic classes.

anatomy and excretion, digestion, and susceptibility to disease” (2003: 56). Scientists have also used tissue from other animals, including dogs, cats, cattle, rabbits, rats, some bird species, and even frogs, on humans. And of course the primary justification for testing on animals is that tests with other animals provide insights into how medicines, consumer products or others treatments will affect humans by how other animals react to them. All of this simply acknowledges that animals are a lot like humans; that humans, in fact, are animals (Jones, 2000). Given the considerable evidence which links human and many animals’ anatomy quite closely, there seems to be little reason to summon up biology as a basis for setting humans apart from other animals. As suggested, the domain of animals itself includes humans. It appears that even if we recognize that animals exist as physical entities, they do not wholly exist apart from humans or human processes of knowing.

If animals and humans cannot be differentiated according to physiological traits, and are not even distinguished consistently along species lines, certainly some other process is at work. I suggested earlier that it is the concept of the human that demarcates the concept of the animal. Yet this assertion could be reversed to suggest that the concept of the animal defines the human as well. Indeed, Haraway (2003) claims we must recognize that knowledge about animals has historically been used by Western philosophers to generate and legitimate the class of humans. For her, ‘animality’ is not necessarily tied to animal bodies, but to the discursive production of both that which is ‘animal’ and that which is ‘human.’ According to Philo and Wolch (1998) then, animals can be considered our abject and ultimate other. Nast (2007) suggests that anthropocentrism is responsible for the ongoing reproduction of differences between

humans and animals. Anthropocentrism can generally be defined as the inclination among humans to view the world from their own perspective and to treat themselves as the most significant being or entities. Accordingly, anthropocentrism is responsible for differentiation between animals and humans. One way to recognize its prevalence is to distinguish between animals and animality. Here, animals can be defined as the live, material beings and animality as a trait or 'beingness.' As Wolfe puts it, there is a distinction between "the *discourse* of animality.... and the living and breathing creatures who fall outside the taxonomy of *Homo sapiens*" (2003: xx; emphasis in original). By separating animality from the bodies onto which such traits are projected, Wolfe acknowledges that much of the divide between humans and animals rests in ways of knowing rather than fundamental and natural differences. His claim suggests that animals the beings, and animality the characteristic, are different. Ingold notes that we have a tendency to employ two unique definitions of animality: we refer to it as a domain that includes humans *and* as a state or condition opposed to humanity (1988: 3-7). Both Wolfe's and Ingold's latter characterization are applicable to the way in which animals are taken up as both subjects and objects in pet food.

That is not to say biological similarity or closeness is completely irrelevant in animal classification systems. But biology must not be seen as determinative of worth or the predominant mechanism by which animals and humans are distinguished. Rather, the best way to understand the treatment of animals is with respect to processes of classification. Classifications are important because humans' perceptions play a significant role in the way they negotiate the world. Bowker (1999) and Starr offer a useful overview of how classification systems help shape humans' worldview. They

argue there are two sorting techniques by which most classifications are made: the Aristotelian technique and the prototypical technique. The Aristotelian technique involves the use of oppositions or dualisms. It works “according to a set of binary characteristics that the object being classified either presents or does not present. At each level of classification, enough binary features are adduced to place a member of a given population into one and only one class” (62). It is the strongest and most salient mode of discrimination. The prototypical technique involves sorting heterogeneous objects according to metaphors, symbols or analogies. Bowker and Starr argue that prototypical classifications are most common, mainly because Aristotelian classifications do not work very well in practice. Therefore, most categories are overlapping and messy configurations. Dualistic categorizations might provide an initial layer and shape initial processing, but eventually most categories become distinguished by virtue of parallels.

The earlier discussion about the supposed physiological distinction between animals and humans suggests that the Aristotelian method of sorting is at work. Baker (1993:78) agrees that the human/animal dualism is one of a number of primary oppositions operative in Western culture. Animals are perceived to lack that which humans possess – rationality, cognition, language, emotions, the ability to feel pain, and so on. Yet Aristotelian classification has some problems when applied to this case reveals its practical limits. For one thing, this method of classification does not make clear why some animals are loved and cared for while others are not. In other words, the Aristotelian method does not speak to the contradictions and disjunctions that occur in categorical organization – the unclear areas or overlapping barriers that would make it

impossible to categorize accurately, again, subverting the utility of the structure that classifies in the first place.

The animal/human split is a salient organizing principle. However, there is no shortage of examples in which animals are referred to in less species-distinct ways. Prototypical approaches to classification are frequent in the ways in which certain animals are imagined. As Elder, Wolch and Emel (1998:186) point out, “certain sorts of animals (such as apes, companion animals, dolphins, other revered species) become positioned on the human side of the metaphorical line, rendering some practices unacceptable.” In contrast, Armstrong (2002) recalls that tropes of animalization have historically been crucial to colonial and imperial domination. African, indigenous, Middle-Eastern, Asian, in short, non-European and non-white peoples generally, have all been equated with the animal or the bestial. Animals are also invoked in reference to gender, often as a mechanism for denigrating the characters of both men and women. In both cases, animalization acts to dehumanize populations. Such tricky processes of humanization and animalization reveal the complicated divide between the human and the animal that employs shifting dualisms and metaphors at the same time. The referent then, is not the (biological) category of *Homo sapien*, but instead, that which is associated with the human. Some groups of people are dehumanized despite the fact that they are *Homo sapiens* while some classes of animals are humanized despite the fact they are not members of this taxonomy. The human gets defined by the animal or the bestial, in short, by its opposite.

The treatment of some animals confirms there is a gap between animals and animality. Hence, it is not actually animals, but the human interpretation of which

animals mean what and when that shapes our ideas of animality. Wolfe (2003a) explains this intricacy quite nicely.

...One might well observe that it is crucial to pay critical attention to the discourse of animality quite irrespective of the issue of how nonhuman animals are treated. This is so, as a number of scholars have observed, because the discourse of animality has historically served as a crucial strategy in the oppression of *humans* by other humans – a strategy whose legitimacy and force depend, however, on the prior taking for granted of the traditional ontological distinction, and consequent ethical divide, between human and non human animals....even though the *discourse* of animality and species differentiation may theoretically be applied to an other of whatever type, the consequences of that discourse...fall overwhelmingly on nonhuman animals, in our taken-for-granted practices of using and exploiting them (xx: emphasis in original).

In his view, the discourse of animality is a collection of signifiers that constitutes how humans understand their other. This other is identified, albeit unpredictably, through language and according to solipsistic visions of the human. And as Wolfe's comments reveal, the animalization of people, that is, neglecting ontological commitments to humans as a distinct class does not weaken 'the human.' The animal and human are invoked in such diverse ways that the animal refers to many different things. The rhetoric of animality or the bestial persists, and cultural constructions of the animal will invariably figure as the negative term of a dualism when used in binary oppositions. Comparison to an animal is usually insulting because it suggests being subhuman, lesser, and even marginal (Armstrong, 2002). Even so, animality as a conceptual boundary that distinguishes the human is paradoxical. What is interesting is that debates concerning the naturalness or cultural constructedness of the borders between the animal and the human are also widespread in theorization about both animals used for food and those taken as

pets. As the next section will explain, the presence of the animal in both meat and in pets is much less straightforward than one might imagine.

### *Animals and Meat*

The central purpose of this chapter is to explain how scholars have come to understand the way humans behave toward certain animals. The preceding discussion suggests that how we come to classify essentially similar creatures in different ways shapes our treatment of them. The processes are not straightforward according to biological or physiological traits, species, capacities, and so on. Rather, they are about human interventions that are contradictory and often irrational. Heimer (2001) insinuates that the creation of an individual rather than collective relationship is critical to ways of valuing. Although somewhat simplistically, she argues that animals are constructed as either classes or individuals; as undifferentiated species or family members with individual stories. Those in the former grouping receive few safeguards while those in the latter enjoy humans' protection and concern. In her view, animals essentially transcend animality by becoming individualized. It is true that of all engagement with animals, the consumption of their bodies or bodily products is perhaps the most evocative because it involves the integration of one being into another. Eating is highly personal, although sharply shaped by socio-cultural values. Some theorists suggest that animals used in or for food are either lesser or loathed animals. For them, animalization is inherently de-individualization. But perhaps de-individualization and animalization are not quite objectification. The manner by which animals are changed into objects of consumption suggests animals are altered in such a way as to distinguish them *from* meat.



Adams (1990) has provided an instructive analysis of the manner in which meat is formed. She argues that animals and meat have a different cultural meaning in the West. Whereas the former are distinctive sentient subjects, the latter is a mass entity that lacks individuality or intrinsic worth. Meat is 'made' by a process in which the sources of the consumable unit, animals, are disconnected from the end product. They become 'absent referents' often in two turns. By virtue of their deaths, they become objects of human consumption; they become things. The processes typical of supermarket meat consumption, where humans find cuts of cleaned and dressed meat in cellophane packages, allow humans to further distance themselves from animals whose bodies have been disassembled. In her view, the absent referent allows us to continue consuming 'food' (which she suggests is a pleasurable thing) with little thought to the violence or pain inflicted on individual animals. Likewise, Heimer (2001: 60) insists that animals and food (animals) are meticulously divided... "by physical segregation (pets live in our homes; food animals live on factory farms), by the use of euphemisms (we eat pork, not pigs, and certainly not Wilbur), and by packaging (we see cuts of meat, not dead animals)." Again, classes or groupings of animals become differentiated from individuals with names and life stories. Elias (1978: 97-99) also points out that the manner in which meat is served has changed drastically within Europe from the Middle Ages to "modern" times. He argues that most reminders that the meat dish has something to do with killing an animal become obscured. This means that the presentation of whole or large parts of animals at the table ends, and that many carving and other preparatory activities are moved to behind the scenes places in the house or to specialists.

Such writing about the detachment of meat from animals warrants consideration. The contention that the animal is always intangible in meat eating has been contested. Fiddes (1991) calls meat a powerful representation of animals, even if in an inanimate(d) form. He says its origin is not, in fact, unclear. Rather, it is the source of its power as a food. Likewise, in an approach informed by structuralism, Twigg (1983) claims that meat consumption is closely tied to notions of consuming animals, or more specifically, animality. She argues that meat is understood to possess certain qualities and eating it more than the literal absorption of animal flesh. Ordered along a food hierarchy where red meats are of highest value, vegetables of lowest, and poultry, fish, and animal derivatives somewhere in between, Twigg surmises the ingestion of these entities is expressed in terms of life, blood, strength, nature, and so on. Thus, animals are central in meat. This is exemplified further with vegetarians whose revulsion is uniformly directed toward one of the highest acceptably consumed animals in the hierarchy: cows. She continues, "...despite their expressed principle of rejecting fish, flesh and fowl equally, the central imagery...revolves around red meat – steak dripping with blood is where the revulsion is focused" (17). Twigg suggests that eating some animals is taboo because such consumption troubles the human-animal boundary. Such foods include raw meat or uncastrated animals, but most importantly for this project, carnivorous animals. Each of these are precluded because they are too animal and the ingestion of too much animality is dangerous because it brings into humans perilous animality.

The recognition of animals in meat consumption is not specific to vegetarians but is similarly epitomized by meat eaters. While vegetarians are disgusted by the 'animalness' in meat, this can be the attraction for meat eaters. For Fiddes (1991), meat

eating and vegetarianism are two sides of the same coin – each being significant in opposition to the other. Maurer (2002: 8) adds that another important reason to consume meat is to acquire status and standing. Historically, many of the world's peoples have had very limited access to meat and animal products. Its consumption has accordingly been associated with social standing, particularly economic wealth (Patel, 2007). Meat consumption for many is tied very closely to privilege and the ingestion of 'better' foods, although what will constitute meat will vary across time and place.

There are other examples of cases in which animals and meat are not entirely independent. Although scholars often rightly point out that there is a disconnection between animals and meat in the context of eating their bodies, growing attention to knowing where one's food comes is arguably changing this. Foodies or others interested in contemporary food issues are encouraged to 'know' their food, including the face on their plate (Kingslover, 2008). This means that a larger number of people are becoming more closely linked with the animals they consume. The question is do such connections make the animal more real to these eaters or are they still ingesting the abstract class of meat? One could justify the latter view by pointing out, as Smith (2002: 53) does, that this group and even the farmers who raise the animals do not actually kill them or face others' death on a regular basis. However, taking Adams' point that animals and meat can be differentiated by their respective subject or object statuses, foodies and farmers present something of a contradiction because animals are not valueless or devoid of a life history, even if they are eaten. The overall point is that there is a gap that makes the understanding of the meaning of devouring animal flesh complicated. Animals can seemingly be disembodied and turned into meat or food, but not uniformly.

The connection between humans and the animals they eat is not simply about the symbolic meanings. Rather, there are serious implications of meat eating today. For many, abstaining from meat and animal products is an ethical imperative. A detailed discussion of the myriad reasons one may refrain from eating animals is beyond the scope of this work, but it is worth acknowledging that the conditions of animal-rearing in modernity are most principally implicated. Aside from a small percentage of the market, most meat and animal by-products are produced under highly industrialized and mechanized conditions. This, critics assert, has turned farming and animal slaughter into exploitative and intensive operations dominated by agribusinesses.<sup>36</sup> Each year billions of animals are raised for food, frequently under quite gruesome conditions. Many of these animals live in very restrictive indoor settings, with little room to move around or opportunity to socialize with other animals. Because they are confined, animals are subject to invasive physical procedures to prevent injurious behaviour toward themselves or others. They are also given non-therapeutic doses of antibiotics and/or hormones to limit medical issues caused by such unsanitary conditions. These are also administered to help improve animals' feed conversion rates, which is as high as 4:1.<sup>37</sup> Most of these conditions are meant to decrease the high amount of feed necessary to raise animals.<sup>38</sup>

Concentrated animal feeding operations (CAFOs) are further said to pollute the

---

<sup>36</sup> Agribusiness is a term used to describe the myriad industries and businesses, from equipment and supply manufacturers, to growers, processors, and distributors, necessary for modern food provisioning. The classic model of agribusiness centers on the vertical integration of all stages in the food production process, in which the growing, processing, sales and marketing of foodstuffs are managed by a single corporate entity.

<sup>37</sup> This means that it takes 4 kilograms of grain to generate 1 kilogram of animal flesh. Each species has different feed ratios. Cattle convert foods at a rate that is roughly 4:1 whereas certain (noncarnivorous) fish are be much closer to 1.5:1.

<sup>38</sup> As discussed earlier, subsidized feed makes raising animals for food incredibly lucrative and keeps meat inexpensive. Many believe subsidies have more impact on today's food policies than most others.

surrounding air and groundwater while slaughterhouses are among the most dangerous workplaces in America. In these cases, our regard for animals is clearly eclipsed by a taste for meat or animal products. While the degree to which people truly 'know' animals in factory farming conditions seems to be rising, the appetite for their bodies or tissues refuses to wane. Indeed, meat may represent animals, even if only marginally. But the animals that meat represents are those for which humans have the least concern and investment. The continued increase in animal consumption in spite of the problems associated with such conditions suggests many humans have little concern for these animals.

### *Pet Animals*

If meat animals are those we have among the least concern for, pet animals are said to be the opposite. How are these two groups distinguished and where does animality fit in? There is nothing definitively different about a cow or a pig that warrants its inhumane living conditions in concentrated animal feed operations (CAFOs). It is well documented that certain breeds of pig are kept as pets. As I have argued elsewhere, perhaps the only characteristic of pets is that they become so by virtue of human processes (Wrye, 2009). Pets are so because of social relations rather than their particular qualities. However, this is true of other animals and objects. This section will outline the literature on pet relations further and explore how pets can be defined and why they are kept. Addressing both questions will be important to understanding how petness helps pet food makers to construct their products.

As I suggested, one of the most popular properties that purportedly distinguishes pets from other animals is their status as nonfood entities. This is not to say that any one animal is universally recognized as a pet protected from consumption. The pets of one region may be the dietary staples of another. Instead, pets are seen to be animals that are never eaten; they are subjects rather than objects of consumption. Serpell (1986:53–55) summarizes some of the key reasons pets are nonfood entities, and suggests that the taboo is linked to proximity. Humans become attached to animals and are able to experience them as unique beings. Others argue that pet animals are seen to resemble humans too closely. Belk (1996) remarks that competing metaphors whereby animals move between the human civilized world and the chaotic animalistic one make pets indeterminates. Thus, eating them would be too close to a form of cannibalism. While the idea of eating a beloved pet cat may be sickening, according to Lawrence (2003) this boundary is far from rigid. For instance, she points to school programs where children raise farm animals, and in effect deem them pets. Yet these animals eventually will be sold for slaughter and eaten. It is also quite common for people to nurture their future dinners. Noske (1997b) points out that the practice of protecting or coddling and caring for animals intended as food is ordinary among some pastoralists in Africa, while Wright (2004) documents similar behaviour among farmers in the American Midwest. Animals' statuses and destinies have also been known to change quite rapidly depending on the circumstances.<sup>39</sup>

---

<sup>39</sup> To some degree these examples do not really speak to the idea of eating pets. It might be entirely different to take on an animal as a companion and subsequently eat it than to care for an animal that, at birth, is known to be food. The former is almost taboo while the latter, less so.

It has long been recognized by the pet food industry that rewarding pet relations are the key to economic success. Without an economic or emotional link, why would people care enough to spend their money on these animals? Pet love certainly preceded the pet food industry. But this dissertation makes the case that pet food makers have at least accelerated and exploited the love of pets. This does not quite make clear why people keep pets, particularly dogs and cats, and not cows or chickens. Some theorists believe humans are drawn to animals. Tuan (1984) claims humans take delight in animals because they allow us to control nature in an ambivalent way. For Tuan, our connection is fundamentally rooted in our desire for a plaything in which we can delight. Others claim that biological factors create a much more profound relationship with animals. They impress upon us that biological capacities influence our (putatively exclusive) social relations. Accordingly, a few types of animals, particularly cats and dogs, may be popular, in part, because of their characteristics. In examining the rise of pet keeping, Serpell (1986) wonders what made small carnivores appealing companions, and offers several reasons for their attractiveness. To begin with, he appreciates that the domestication of dogs and cats is an accident of history driven by the coalescence of harmonious forces, which include elements of their species-specific dispositions. They're not too large or too small, do not need to be caged continuously, are not overly or indiscriminately violent, and "like" to be around humans because they are either highly social (dogs) or because they are tied to certain territories (cats). He further notes that they were likely useful for keeping away pests or doing other important work, which helped to foster more affective relationships. Kruuk believes that cats and dogs are more suitable as companions than other animals for several critical reasons (2002:144). They

impose few limitations on humans' lives since they are only active for a few hours each day. They are also highly intelligent, adaptable, and readily trained. These animals can fit in to humans' lives and dwellings, whatever shape they take, quite easily.

While such speculation may provide some insights into how animals emerged as widespread household companions, it does little to actually explain contemporary relationships between animals and humans whereby pets are bred, sought out, live luxuriously, and are of little or no instrumental utility (Nast 2006). Other authors recognize that pets today are generally "useless" economically and instead contend that their appeal lies in more sentimental and visceral factors. Wilson (1984) certainly adopts this perspective. He argues that biological processes compel humans toward a love of nature, calling this phenomenon, biophilia. He claims that there is an instinctive bond between humans and other living entities, particularly animals. This can help account for why humans keep pets, and also engage in a whole host of other behaviours, including such mundane practices as tending gardens, taking hikes, going to zoos, etc. In his view, our love for life forms and our desire to be around them is natural and may even serve evolutionary purposes. Serpell (1986) acknowledges this as a distinct possibility in accounts of pet ownership. He argues that pet keeping is habitually deemed a silly aberration because it seems to serve no recognizable purpose. However, he wonders whether humans are generally predisposed to love other creatures and if cruel and exploitative treatment, such as those associated with animal consumption, is the deviation that has slowly become accepted through rationalizing processes. Again, claims to universal and biological dispositions must be met with caution, particularly given the context in which pets have proliferated. For instance, Wilson's recognition of humans'



love for the natural world may not be instinctual, but rather a simple reaction to seemingly endless urbanization or a feature of humans' increasing concern for an environment under threat.

While pets are seen to be close companions with whom we share our time, energy, love, and lives, others characterize these relationships as exploitative (Irvine 2004b). Explanations that highlight beneficial aspects of pet relationships are not the only ones influenced by evolutionary theory. Archer (1997) maintains that the combination of humans' and animals' innate qualities is responsible for pet ownership. In his opinion, pet-human relationships are difficult to understand because attachment and devoting resources to another species are fitness-reducing activities (in evolutionary terms), at least in theory. Nevertheless, humans are highly attached. He argues this is because pets manipulate responses that have evolved to facilitate human relationships, particularly between children and parents. He claims: "the initial appeal of the pet arouses the owner's interest and sets off the subsequent train of interactions" (1997:251). This appeal is found in some mammalian pet animals' neonatal physical characteristics: their proportionally large heads, big circular eyes, soft fur, seeming astonishment at small wonders, spontaneous and inquisitive character, and so on (Hart, 2003). Archer describes pets' relationships with humans as parasitic since they exploit innate human tendencies to care for and nurture young humans. He accepts that pets serve an emotional purpose and provide love and companionship to people (whether real or perceived), but he doubts whether this role compensates for the economic resources they use. Dogs and cats can be expensive to house, feed and otherwise care for. Holdbrook and Woodside (2008) put the cost of dog or cat ownership at "...roughly as much as the purchase of a slightly used

Buick (over \$10,000 per animal) [which] adds up collectively in the United States alone to annual outlays that dwarf many other industries (close to \$40 billion per year).”

The company and affection provided by pet animals are doubtless the most recognized of their qualities. Many researchers have wondered whether there is a link between these qualities and pets’ ability to improve health, well being, and the quality of humans’ lives. While the data on the health effects of pet ownership do not paint a consistent picture, Siegal (1993) claims that most studies demonstrate some mental or physical health advantage to the practice. In her own work, Siegal is most interested in the link between attachment and stress reduction. She argues that people learn to become attached to pet animals because they consistently provide positive responses. Their association with feeling good, wanted, and so on, “leads the owner to view the animal as a source of comfort” (1993:163). Accordingly, pets provide security and reassurance, which decrease people’s anxiety, reduce stress, and therefore, may improve health. Others have focused on the immediate physical benefits of owning pets. For instance, Friedmann et al. (1980) found that pet ownership increased one’s chances of surviving a heart attack by over 20%. Most notably, other factors, such as whether patients were married, did not produce significant results in this study.<sup>40</sup> Pets enhanced the recovery of their owners irrespective of the severity of the original heart attack. Katcher et al. (1983) linked watching fish in aquariums with a reduction in blood pressure, most markedly among people suffering from hypertension. McNicholas et al. (2005:1252) observe that pet ownership has been associated with lower use of medical services and a reduced risk of cardiovascular disease, to name a few benefits. It is no wonder that pet-assisted

---

<sup>40</sup> Plenty of other research shows marriage or long-term relationships are beneficial to people’s health. The point of this reference is simply to point out that pet animals can have a similar impact. There is a large body of research on these questions more generally that is beyond the scope of this work.

therapy and companion animal visitation programs are ballooning across North America. It appears that the links between pet companionship and human health or happiness underscore the reality that pets make most people happier and healthier.

In spite of these conclusions, most researchers remark that pets are not principally valued for their role in health improvement. Rather, they are appreciated for the companionship they offer for its own sake. In the main, pet animals are viewed as humans' friends or companions, which is evident in their treatment throughout life and upon death. Many pets are indulged with a variety of specialty foods, toys, medicine, clothing, and other accessories intended to improve their quality of life. In these instances, they become subjects of need, a turn which has the effect of highlighting their species distinctiveness (i.e. animalness) within an anthropomorphized framework where these matter. Their value to people is most evident with their parting. People who lose their pets often experience immense sadness, grief, or even depression. Deceased pets are given funerals (even beside the toilet bowl for pet fish) or graves with markers bearing special messages (Shell 1986:122).

These behaviours are not new to the modern period. Grier (2006) highlights the long history of affect and emotion bestowed upon pets throughout the eighteenth, nineteenth and twentieth centuries. Many pets are certainly treated harshly or inhumanely. In addition to the love and adoration bestowed upon pets, they are also regularly subjected to violence. For example, tens of thousands of them are regularly killed by individuals, veterinarians or shelters for being 'unwanted.' Pets are certainly actively and immensely loved. Yet they may not be loved at all. They may be treated like possessions, as they are in Canadian law. They may be taunted, teased, ignored,

neglected, or cruelly abused. Pets, much like humans, seem to exist in a state where they can be loved ones, family members, friends, throwaways, companions, sources of support, objects of frustration, pests, nuisances, or victims (Shell 1986). But in the idealized world of pet food, the only appropriate discourses are those that equate pets with affection and responsibility. Pets do, according to Rollin and Rollin (2003:107), have a domestic quality that attaches them in relations of protection and liability, to individual humans. Pets are seen as residing with or in close proximity to humans and in this respect differ from wild, captive, and food animals. In this way, they have unique stories and stewards.

### *Conclusion*

This chapter has provided an overview of the relationship between animals and humans in late modernity. It has outlined the complexity surrounding the divide between humans and nonhuman others. There are notable disparities in the way different animals are thought about and treated by humans. However, few of these have a logically certain basis. They are certainly not linked to the bodies or dispositions of animals. Rather, the central organizing principle seems linked to humans' fickle values, ideas and emotions. I locate petness outside animal bodies or dispositions and within messy and shifting processes of classification. This conclusion echoes ideas popularized by ANT, which admonish the anthropocentrism of sociological theorizing. The tendency of humans to place their perceptions and agency at the centre of social life has both epistemological and ethical consequences. These are played out in the pet food network where shifting ideas about animals inform products' manufacture. They are also played out in the way

in which nutrition operates. The next chapter provides an overview of contemporary nutrition. As I will illustrate, nutrition is as much a biological phenomenon as a social, political, economic, and cultural one. Nutrition, expectedly, is its own network. I explain its organization broadly. I argue that the interests of capital have defined contemporary nutrition and health, and I identify nutritionism as the operative that reconciles the tensions between the two. Nutritionism has an important role in the human food landscape. I will make the case that it is absolutely integral to pet food.

## **Chapter Four: Nutrition, Food and Foodways**

This project examines the formation of the commercial pet food actor-network. I identify nutritionism as the principal operator of this network. To make this case, a longer exploration of how sociologists and social scientists understand nutrition is necessary. I will present a history of nutrition and situate it in relation to other important and related concepts, including health, food, food production and waste. These concepts are contested in the social and health sciences, as well as within the public and among other medical, health and lifestyle practitioners. Moreover, our understanding of each is specific to this time, space, place and culture. They are shaped by economic systems of supply and consumption, property ownership and resource distribution, and the interests of multiple actants. In other words, this chapter explains another important network that happens to have been enrolled in commercial pet foods, and now drives it: nutrition. It explains how ideas about nutrition emerged and came to be connected to the point of interchangeability with food and health, albeit not unproblematically. I highlight the points of tension that exist between food and health, particularly as food comes to be reduced to nutrition and nutrients. I explain how nutritionism – an approach to eating ‘well’ that reduces the healthfulness of consumption to the numeric representation of nutrient categories and the individual managements of their intake levels – links to food commodification and has become the cornerstone of today’s foodscape.

### *Nutrition, Food and Health*

What does it mean to eat 'nutritiously'? As social scientists, how can we understand nutrition? Although nutrition is widely talked about, it has a number of dimensions and is conceptually tricky. The American Medical Association has a specific definition of nutrition, terming it a "science of foods, the nutrients and the substances therein, their action, interaction and balance in relation to health and diseases...[it] is the area of knowledge regarding the role of food in the maintenance of good health."

According to the AMA, scientists, and health professionals, nutrition is foremost a field of study that tackles questions concerning the integration of substances, called nutrients, by bodies. Nutrients are chemical compounds that allow the body to operate properly. They can be broken down into seven categories: water, protein, carbohydrates, fats, fiber, minerals and vitamins (Case, 2003: 291). Their primary purpose is to provision the body with energy and contribute to growth, tissue maintenance, and general bodily functions. Although nutrients tend to come from external sources by processes of consumption or respiration, some may be created when other ingested nutrients are broken down by the body.<sup>41</sup> The synthesis of food and oxygen causes endless chemical reactions in the body's cells that feed the cells, result in growth, carry waste away, and so forth. Nutrition science attempts to determine not only how this works, but also how the processes can be improved. Defining nutrition as a field highlights that it seeks to enhance physical well being through the mobilization of knowledge. It attempts not just to understand how food affects bodily processes but it also hopes to understand how foods contribute to desired physical outcomes and to minimize undesired ones.

Nutrition is also commonly regarded as a quality - especially of particular foods or meals, but also of diets, dietary regimes or food systems (Crotty, 1995). In such

---

<sup>41</sup> Oxygen is clearly not a food, but is considered a nutrient because it is necessary for bodily functioning.

instances, one might hear, for example, that the ‘Mediterranean diet’ is most nutritious or that one ought to eat nutritious foods to avoid cancer, heart disease or other physical ills. In these cases, nutrition is treated as a measurable and tangible property of the object. It is outside human systems of valuation and is deemed a state that can be quickly identified as present or absent. Nutrition, or more precisely, the supposed property of being nutritious, becomes a judgment of a food’s wholesomeness and worth. Foods are categorized as more or less nutritious and subsequently promoted as being good to eat or unhealthy.

Both characterizations of nutrition include undertones about the ability of scientific researchers to know what eating ought to look like. However, nutrition is culturally, historically, social and individually contingent. A nutritious diet is not transhistorical or even homogenous across a population within a society. What counts as nutritious is fleeting, variable, and subject to disagreement. Even the link between food and health is a new one. Nutrition emerged as a secondary category associated with food and health. Until the 19<sup>th</sup> century, few doctors, scholars, health practitioners, and other people of high social standing agreed about the relationship between food and health. At times, linking the two was regarded as foolish at best and heretic at worst. Before the 19<sup>th</sup> century, eating was more likely to be an act associated with religious or spiritual benefit. As Cannon (2005) writes, the Renaissance era ushered in a scientific and technological revolution that had a profound impact on diet. The body came to be regarded as a machine that could be deconstructed, explored, probed and known. Through the mid-19<sup>th</sup> century, scientists were separating foods into their constituent parts and assigning specific physiological functions to each nutrient. For example,



carbohydrates and fats were regarded as the body's fuel and protein deemed tissue-repairer (Levenstein, 1988: 46). This new field, dietetics, was an expression of a newly formed scientific process whose ultimate goal was mastery over nature.

The entrenchment of the nutrition and dietetics fields (stemming from physiology, chemistry, biochemistry, medicine) has been linked to the participation of corporate and state actors in food provisioning, as both connected and separate entities (Nestle, 2002). For example, the British government harnessed nutritional knowledge to better provision poorly fed soldiers in late 19<sup>th</sup> century wars. Widespread troop malnutrition came to be regarded as a matter of national priority justifying significant economic investment in food and nutrition research, food distribution, and so on (Levenstein, 1988). Investments were also made in civilian programs and were seen to serve the interests of the ruling classes insofar as leaders feared widespread starvation among the working classes would cause further riots and uprisings. Cannon (2005: 72) argues political and socio-economic factors, particularly fear of dissent among large sectors of the economically deprived population, helped to tie conceptual and experimental chemistry science with nutritional programs. Cannon additionally claims nutrition programming was the direct result of state intervention in the interests of perpetuating the welfare of capital by quelling civil unrest. The mid-1850s and beyond initiated scientific programs concerned as much with human diet as understanding how to breed plants and make foods more widely available (particularly in the form of animal proteins).

Discoveries and developments in the nutritional sciences through the latter half of the 19<sup>th</sup> century and into the period of the First World War were many.<sup>42</sup> These included

---

<sup>42</sup> An extended discussion of the emergence and history of nutrition sciences is beyond the scope of this dissertation.

experiments on food energy with the calorimeter, attention to vitamins and minerals, studies on digestion and metabolism, and even concern for the relationship between food and certain health afflictions. Such pioneering work was fundamentally designed to address problematic food consumption patterns among many residents in the US, Canada and Western Europe. Too few people ate what would come to be seen as adequate or nutritionally balanced meals. Vast numbers of people outside the ruling classes were chronically hungry and undernourished, dramatically so in times of war, drought, flooding, and so on. Unlike today, where nearly all food insecurity is the result of the unequal distribution of food supplies and wealth, before the twentieth century food insecurity was caused by a mix of unjust resource allocation and processes in nature that interfered with agriculture or caused food to spoil rapidly (Albritton, 2009). Regular access to a satiating diet was a luxury reserved for only a small minority. Thus, poor eating in the 19th century can be broadly attributed to poverty, a limited understanding of diet, crop failure and inadequate or limited food distribution systems.

While economic conditions of the early 20<sup>th</sup> century were difficult, the period was also affected by scientific discoveries with achievable results. Hoping to minimize nutritional uncertainties caused by these forces, scientists explored a number of techniques to extend the life of foods (Belasco, 2006). At the same time, government and health officials, nutritionists and a growing food industry had the same interests – to encourage people to eat more of all kinds of food (Nestle, 2002: 2). Discoveries in biology, chemistry, pharmacology, and so on, often funded by or for large food manufacturers, made it possible to synthesize, preserve, or otherwise adulterate foodstuffs. Such changes, as well as the introduction of domestic refrigeration devices

and an improved understanding of microbes and pathogens, made harvests and extractions last much longer. Concomitantly, a better appreciation of genetics, as well as the mechanization and industrialization of agricultural activities, including the use of machinery and chemical fertilizers, increased agricultural yields greatly (Smith, 2009). These developments had the overall effect of making the food supply larger, more secure, stable, and cheaper for individual consumers.<sup>43</sup> Within a generation, populations in the West had steady and reliable access to an extensive array of foods, offering unheard of nutritional possibilities.

The state also took growing interest in circumscribing diet. The consequence was what can be described as an overt attempt by the state to instruct the population on ‘proper’ nutrition and diet (Crotty, 1995). In this era, nutrition thus referred to and addressed deficiency – as lack or want. The response to the problem by American policy-makers, as Mudry (2009) reminds us, included the introduction of a quantified system of eating. The USDA developed and publicized numeric categories and standards to which eaters could aspire. The modern American was encouraged to be a rational food consumer who fulfilled his or her dietary needs while minimizing both financial and food waste. The era of ‘new nutrition’ was marked by “recommendations for selecting food on the basis of its chemical composition rather than other considerations such as taste or appearance. The mission of the movement was to educate members of the populations about exactly what types of food they should eat for good health...aiming to achieve a ‘balanced diet’” (Lupton, 1996: 71). While the waste and monetary elements of the recommendations waned, and guidance concerning the excessive consumption of certain

---

<sup>43</sup> Other processes that transformed Westerners’ diets include the globalization of food production and distribution, which offered year round access to most foods at all times of the year.

foods came to be introduced over time, the USDA and allied nations' health departments continued to define a 'nutritious diet' in terms of deficiency until the 1970s.<sup>44</sup>

This transition coincides roughly with the time that individual foods, on their own, came to 'possess' nutritional properties. Since all foods contain nutrients, all food is by definition, nutritious. Yet this characterization presumes that the item is edible and has a biochemical constitution that permits the integration of the substance into a body. Edibility is the complicated concept that engrosses a host of biological, chemical, physiological, cultural, psychological, economic, ideological, legal and chemical processes simultaneously. No agreed upon definition of edibility can be detected across most disciplines. Humans seem to construct the categories of edibility and food according to an always-changing host of said and unsaid rules (Douglas, 1999; Levi-Strauss, 1965). At a basic level, edibility relates to whether or not particular organic or inorganic items are safe, suitable and nutritious. The role of social scientists is to discern the conditions under which foods come to be consumed or not. Often safe and highly nutritious foods are not consumed for cultural, aesthetic, religious or moral reasons. Most anthropologists would emphasize the importance of this sharply cultural dimension to defining food; what is nourishing from a physiological perspective often does not coincide with individual or cultural values. Conversely, what is eaten as food may carry little physiological benefit, depending on the dietary advantages one is seeking. What is significant about any definition of food, however, is that it must be defined relationally. Food becomes such socially, culturally, and biologically, only because of another entity. This point is made by Roe (2006) who claims that foods lack inherent qualities, but

---

<sup>44</sup> Canada began to integrate energy-related (calorie) messages in the late 1970s and early 1980s. The dietary balance focus was situated in relation to a new discourse on consumption moderation.

emerge in relation to how they are handled by humans and in the process of being consumed. She continues:

The term, 'food' is used to convey the 'thing' caught up in the process of being eaten by a consumer. Foodstuff is what this material is before it becomes engaged in the actual process of eating. Although consumers may not know in detail how the food they eat is produced, they have accepted the properties of the material as edible, properties it has gathered on its journey from production to consumption, from being thing to being food, once eating begins. It is difficult to apprehend the properties of edibility by discussing this...because edibility is a process, something that is performed, something enacted, and not something that necessarily demands rational, logical reasoning (112).

Edibility ties directly into how food is defined; into questions concerning what makes something a food or not. By distinguishing food from foodstuffs, Roe's analysis suggests that edibility is not an inherent quality, but involves passing items through production processes toward human consumption. This movement is actualized by human and material practices, which transform objects, although not necessarily into food. For example, a slaughtered cow will be physically transformed into beef regardless of whether or not its body is consumed. For Roe, then, edibility is an embodied practice and another determining mechanism for defining food.

The significance of edibility to understanding foods and shifting definitions of nutrition cannot be underestimated. If we consider foods to be of nutritive value physiologically, but only considered such socially under certain circumstances, then deprivation would influence the breadth of a society's definition of food. This is a conclusion drawn by Marvin Harris (1985), whose controversial perspectives on taboo acknowledge that the designation of food is widened or narrowed in direct relation with the security of a food supply. Nutrition, then, must include recognition that biological, environmental, psychological, technological, political and economic factors influence the

foods that will be consumed in any given context. For Harris, food choices and avoidances must be considered in terms of the particular historical conditions that may determine food practices. During periods of pronounced food insecurity, most foods are nutritionally efficacious and fewer are avoided. However, as a society contending with insufficient caloric intake or extensive nutritional deficiencies begins to enjoy a more diverse and stable food supply, consumption patterns tend to become more selective of the least 'desirable' foods. Greater diversity in the food supply will shape, although not absolutely, people's attitudes toward food and edibility. The shift toward more food, and then better food, tends to make attitudes toward individual foods more discerning. Suddenly, being nutritious (i.e. possessing nutritional properties) can be taken for granted if nutrition is ubiquitous.

### *Nutrition and Contemporary Foodways*

As the previous section indicated, nutritious food is a primary need. The processes by which we procure, produce, and consume food are significant and extraordinarily complex. What we eat, as well as why and how we eat, reveal a great deal about our society, history, values, economies, and so on. Likewise, our ideas about how to decide which foods to consume or forego, which are best for us and which are poorer, are fundamentally connected with how we get our foods. This section considers the relationship between food, nutrition and contemporary food habits or practices, which Murcott (1988: 3) defines as "cover[ing] the widest possible range of food choice, preferences, meal patterns and cuisine." I am most interested in considering how food production and availability have shaped nutrition. Populations may have nutritious

dietary patterns or they may be malnourished – seriously deficient of one or more macronutrients or micronutrients. Malnourishment, according to this definition, is the consequence of dietary patterns and not a food characteristic. Recently, however, there has been greater talk about ‘innutritious’ foods, or, foods lacking in nutritional or nourishing qualities. As I alluded to earlier, foods possess or ought to possess nutrients of some sort. This section will further tackle the question of how the foodscape makes innutritious diets and ‘foods’ possible.

Most food scholars agree there have been meaningful changes to how most of the world’s people eat. Albritton (2009) argues that processes of globalization, and specifically the triumph of corporations and global capital over food provisioning, are the most important forces shaping today’s foodscape. The term ‘foodscape’ has been used variously. Johnston and Baumann (2010) define it as “a social construction that captures and constitutes cultural ideals of how food relates to specific places, people and food systems” (3). To Winson (2004) foodscapes are the not as broad to refer to social institutions of food, but more specifically refer to the sites or spaces where food is consumed or displayed for purchase. My use of the term aligns most closely with Burgoine et al. (2009), who use foodscapes in the broadest sense to refer to the various structures in society forming the food environment. It is an inclusive term that will signal the time- and place-specificity of a food system.

In examining today’s food system, Beardsworth and Keil (1997) outline three characteristics that differentiate it from its traditional roots. First, small-scale and limited crop production involving a high proportion of the population in agricultural activities has transformed into a large-scale, global, de-localized business where the majority of

most populations have limited contact with food production. Second, control over food distribution has shifted away from small-scale social networks and kinship to international markets representing global business interests. Finally, consumption patterns have shifted away from local, seasonal availability where costs reflect limited or abundant availability to a system where food is accessible to the consumer at all times of the year at a relatively fixed price. Thus, since WWII, production, distribution, and consumption chains have expanded rapidly to suit the needs of food oligopolies. These new food provisioning patterns have transformed social processes in a number of ways – solving some problems while creating or exacerbating others.

Above all, innovations in agriculture, food preservation, distribution and preparation have changed the nutrition of those in affluent nations significantly. Until recently, food surpluses and shortages were commonplace and nutrition varied by season. Technological advancements, particularly food industrialization, elongated food chains and globalized ‘monocrop’ agricultural policies have meant an abundance of healthful and nutrient-rich food is available year round, albeit to those who can get or pay for it.<sup>45</sup> These changes have invented dietary realities previously unimaginable. As Nestle (2002) remarks, it is an absolute and unprecedented achievement that food supplies (in the West, at least) are plentiful, varied, readily available, mostly safe, and relatively inexpensive. These changes to the food supply and distribution chain have reoriented nutrition. Whereas nutrition campaigns and initiatives have historically tackled inadequate caloric intake among large segments of the population, as outlined earlier, today the focus of

---

<sup>45</sup> This statement assumes that a nation is food secure, which means its inhabitants have access to regular or stable food supplies. Food insecurity is a complex problem that is far beyond the scope of this work. For a rich discussion of food security and the relationship between abundance and scarcity, see Patel’s *Stuffed & Starved* (2007) or Albritton’s *Let Them Eat Junk* (2009).



nutrition is on the consumption of adequate and varied quantities of different types of nutrients. In other words, the energy levels of most people in the West are being met. Yet these food excesses and tightly woven global food chains have not had the effect of making people with more access to more food healthier because nutritional needs are more than simply caloric. According to a number of measures, Americans and Western Europeans are less healthy than they were 25 years ago (Pollan, 2006). Their bodies are generally larger and contain more fat. They also suffer from epidemic levels of preventable diseases such as diabetes, heart disease, high cholesterol or blood pressure, cancer, and so on. Above all, they eat poorer foods.<sup>46</sup>

Part of the reason many people in the West may be less healthy is because of the way in which more traditional eating activities have changed. Transformations in family dynamics partially account for this emerging foodscape. Higher rates of divorce and the increased participation of women in the workforce have decreased the regularity of the homemade, family meal. As a result, families' familiarity with and knowledge of food has been transferred to outside authorities, including health professionals, scientists, and even food companies. Food preparation has likewise been 'outsourced' to a seemingly endless number of companies, grocery stores and restaurants, which have gladly substituted families' time-consuming meal organization and preparation with snacks or inexpensive, but highly processed and preserved, standardized meals that are frozen or 'fresh' to-go. The industry cleverly refers to these as 'solutions to meals,' which replace the traditional ingredients for meals. Lang and Heasman estimate that at least half of all food consumption is done outside the home (2004: 34). Dixon and Banwell (2004: 123)

---

<sup>46</sup> According to Hirshberg (2009), conventional agricultural practices have depleted the nutrient levels of many foods in the last fifty years.

recognize that as populations are increasingly separated from their food, and manufactured global foods displace traditional diets, reliance on outside sources escalates. These trends have initiated what Fischler (1980: 948) has termed, 'gastro-anomy.' He argues the absence of norms or generalized social guidance governing food selection has made eating more difficult by disembedding consumption from social relations. Constraints such as ecology or environmental forces, seasonality, socio-cultural rules and community networks no longer exist. Today, Fischler says, separation from food has compromised many Westerners' ability to judge what, when, or how much to eat. Eating practices and rituals are no longer social or necessarily tied to the activities that make them possible, but are completely individualized. Nowhere are these trends more obvious than in the explosion and globalization of junk food, fast food restaurants or in the increasing size and number of aisles dedicated to frozen or pre-packaged meals in grocery stores. Today's foodscape includes considerable space for both snacks and prepared meals.

The food supply has also changed dramatically over the last century (Smith, 2009). Corporate food conglomerates have been blamed for worsening dietary patterns, deteriorating health conditions, and even undermining food. As remarked earlier, powerful pressure to eat in certain ways is exerted by the food industry, often with the complicity of the state's favourable policy decisions. Nestle (2002) maintains the food industry's work extends far beyond making, marketing and selling food into lobbying, research, or even defining health or nutrition. Food companies make and promote products, as might be expected. But they also support and influence programs and laws, or engage in other activities to suit their financial interests, often to the detriment of

people's well being. They help create, and simultaneously benefit from, favourable political-economic conditions to earn substantial revenue selling products of relatively low nutritional value. The ready availability of such foods, which are often preserved artificially, processed, or high in dietary qualities such as calories, sodium, fat and/or sugar, but low in other vitamins and minerals, is a serious concern. The types and sheer number of foods that have these attributes have exploded, chiefly since the 1980s. Some growth can be attributed to a more robust corporate 'junk' food market – mass producing dessert-style commodities and parallel products or expanding flavours within the same food line. Most of it, however, can be attributed to the shifting nature of 'food' available for consumption.

Again, definitions of food and nutrition illuminate how the supply has changed, why people eat differently than they have for most of history, and what it means to talk about junk food. As detailed above, there is no agreed-upon definition of food, in part because food shares some properties with other consumable or inconsumable articles, particularly medicine. Physically, foods should be digestible and non-toxic to the consuming population, and should offer some nourishment or satisfy energy requirements when consumed. As argued earlier, a relational approach to classifying food can help us understand how acceptance of an object as food is both an individual and cultural phenomenon, and how new substances come to be consumed and consumable. Many scholars have identified the introduction and acceptance of new food items as a fact of modernity. For example, Pollan (2008) claims the widespread recognition of junky food as simply, food, is a characteristic of dietary patterns in late capitalism.

That we can call any food ‘junk’ is an interesting and recent development. The very term suggests some food is rubbish, extraneous to basic nutritional needs, or an indulgence, to name a few possibilities. It, too, implies a secure food supply with consistent access to requisite, preferential or perhaps even excess calories. According to this logic, junk food should possess qualities that make it supplementary to food. Junk food, then, is born of technological or scientific advancements and achievements related to securing food production and provisioning elaborated earlier. The benefits of having a well-fed population are obvious. But contemporary changes in the food supply have seemingly caused new dietary and health issues. Indeed, the foremost problem appears to be that too many members of the population are too ‘well’ fed – eating too many calories, and such ‘junk’ calories, in particular. Albritton (2009: 91-2) defines junk foods as “foods that are either relatively empty of nutrients or high in calories relative to nutrients.” Periodic consumption of calorie-dense meals is beneficial to malnourished populations, and generally harmless to populations that consume at levels relatively equal to their energy outputs. But Americans and other Westerners have steadily and considerably increased their overall caloric intake, eating considerably more than their energy requirements on a near daily basis.<sup>47</sup> Mudry (2009) claims overconsumption was first recognized as a public health challenge in the 1960s. However, the USDA waited until the early 1970s to introduce, for the first time, nutrition guidelines that advised Americans to curb their overall food intake and limit certain ‘problem’ foods. Nestle

---

<sup>47</sup> The diets and production systems across ‘the West’ have varied considerably over the last 50 years. A few Western nations, such as Canada, Australia, and the U.K., have always had foodscapes that closely resemble the American model. Other nations, including Greece, France, Italy, Scandinavia, the Netherlands, Taiwan, South Korea and Japan have had more unique experiences, at least until recently. Brownell and Battle Horgen (2004) argue it is increasingly clear that ‘American-style’ food production and consumption is evident in all but the world’s poorest countries, creating a worldwide crisis of ‘globesity.’

(2002) argues excessive consumption forced the government to adopt a formal 'eat less' message between 1970 and 1990. Its adoption was not unproblematic and was vigorously opposed by the meat, dairy and sugar industries. Any government advice to reduce overall food consumption and restrict certain foods is in direct conflict with companies' business interests. Indeed, the 'eat less' message has somewhat waned over the last twenty years, largely as a result of the work of the food industry.

There have been other changes to the food supply beyond its sheer expansion. Food security has also been bolstered by industrialization and advances in food manufacturing and development technologies (Blay-Palmer, 2008). The manipulation of agricultural products has created more than just longer lasting crops. Rather, scientific and nutritional research and innovation have played a key role in the growth of pre-packaged meals and other processed foods (Belasco, 2006). Scientists have deconstructed, manipulated, extracted, synthesized and otherwise changed foodstuffs in ways that have led to completely new consumable items; items that simply did not exist until very recently (Pollan, 2008). Many of these foods fall under the category of 'junk,' although Albritton (2009: 91-2) identifies fast and processed foods as two other dominant food categories that are not necessarily junk in the sense outlined above. He defines them, respectfully, as "foods that are almost immediately ready for consumption and adulterated foods that tend to be less nutritious the more they are processed, although sometimes nutrients are added back in." Most adulterations involve one or more rounds of heating, although other chemical manipulations and flash freezing are also popular.

Neither fast nor processed foods are novel to contemporary Western societies. Ready-made or "fast" foods are widely available all over the world, and have long been

so. Because processing can involve many types of manipulation, including the simple application of heat, food adulteration or 'denaturing' dates to pre-historic times (Levi-Strauss, 1965). Yet the fast and processed foods widely available in the West today differ significantly from their cross-cultural or pre-modern predecessors. Industrially processed foods materialized at the turn of the 20<sup>th</sup> century, alongside Fordist-style food companies like Kellogg's, Post, Coca-Cola and Pepsi (Blay-Palmer, 2008: 44). The capitalist imperatives underlying food production seem to have intensified in the last 60 years. Today's foodscape is not accidental, but the consequence of sustained efforts by corporations to transform the food system. Schlosser (2001) insists it came to be modeled after the highly successful structure of industrialized fast food companies. Accordingly, all aspects of food production have come under the control of a relatively small number of globalized food-chemical oligopolies. Second, the ways in which these foods are made are completely industrialized, and involve long commodity chains, multiple heat and chemical manipulations, substance additions, and so forth (Blay-Palmer, 2001). Food provisioning has become subservient as the needs of corporations become increasingly profitable, and has resulted in the regular production, manufacture and subsequent consumption of highly synthesized substances. Winson (2004) identifies several consequences of this style of industrialization, but expresses most concern over the ubiquity and constant availability of poor quality foods in almost any location.

Many scholars and activists object to the characterization of these products as food, and vigorously differentiate 'real' food from 'junk,' 'processed,' 'fast' or 'fake' food. They call these latter products 'pseudo foods' or 'laboratory foods' (Winson, 2004). Pollan (2008: 147-157) characterizes them as 'foodlike substances.' He notes

that while they share many of the attributes of traditional food, they differ in several fundamental ways: they would be unrecognizable as food before WWII; they look different from one another, but contain very similar base ingredients<sup>48</sup>; they include more than five ingredients; they include high-fructose corn syrup, unfamiliar or unpronounceable additives; or they make health claims. Certainly the categories of junk, fast, and processed foods often overlap. But Pollan has described the characteristics of foodlike substances in response to a growing processed or 'ready-made' health food market, which he sees as a contradiction in terms. This subset of food will be considered momentarily.

The devastating consequences caused by excess food production and processing, as well as individualized and unstructured eating patterns, have not gone unnoticed. Although health measures vary widely and are subject to intense debate, many indicators suggest there has been a collective decline in the physical health of most Westerners, but among North Americans in particular. For instance, roughly half of Canada's population is classified as overweight or obese, with excess body weight affecting over 27% of children (Elliott, 2008a). Populations in most other developed countries are similarly sized and as well said to be eating more, moving less, and suffering exceptionally high rates of diabetes, heart disease, and other largely preventable diseases. Nestle (2002) dubs diet the single most important factor in creating or managing chronic health problems. She estimates that medical expenditures would shrink significantly with even minor dietary changes. Classical indicators of the type of malnutrition conventionally associated with insufficient caloric intake are present among members of the population who consume sufficient amounts of food. Hidden hunger, or qualitative

---

<sup>48</sup> Most processed food is made from wheat, soy, corn or milk products.

undernourishment, is emerging as a significant problem with pernicious effects. Obesity and dietary ill health have become disasters that are expected to worsen over time.

As a response, governments, medical and health practitioners, scientists, nutritionists and many others are confronting general unhealthiness and obesity. The proposed strategies and solutions are multi-faceted and aim to address any one or a combination of the many causes of these problems. Arguably, the site of greatest proposed intervention and contestation concerns food and diet. Many scholars and health advocates link weight gain and chronic sickness to the availability of poor food options. Accordingly, both junk and pseudo foods are regularly blamed for encouraging what Swinburn et al. (1999) have termed, obesogenic environments. The 'obesogenicity' of an environment refers to "the sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations" (564). Brownell and Battle Horgen (2004) calls these toxic food environments, which they suggest overtly or covertly encourage people to choose unhealthy, highly manufactured foods more regularly than healthy, fresh ones. In their view, epidemic obesity is largely inevitable given the toxicity of the environment combined with human physiology. Winson (2004) further highlights the difficulty of making healthy food choices. He claims proliferation of junk-style foods extends far beyond small sections of grocery or specialty stores and restaurants to include most grocery store spaces, variety store, malls, schools, and even hospitals! He continues, "the exceptional profitability of pseudo foods has driven the spatial colonization of the foodscape by these products, and the creation of a veritable pseudo foodscape in new institutional domains" (2004: 308). In other words,



virtually every public space imaginable has become a pseudo food retail space that encourages the consumption of excess calories, fat(s), sugar and/or preservatives.

This framework stands in sharp contrast to the individualizing or responsabilizing discourses surrounding obesity and health that emanate from the food industry and dominate popular culture (Sobal, 1995). Whereas ecological models of healthfulness and food choice recognize the inextricability of food, health and environment, the responsabilized body is solely accountable for its own failures and achievements (Crotty, 1995). The food industry has certainly mobilized this narrative in defending its merchandise. It has also responded in a number of other ways that acknowledge their (limited) culpability in today's obesity crisis. For instance, food makers are constantly introducing (and subsequently marketing) 'healthier' versions of their popular food products. Some examples include reductions in fats, including trans fats or saturated fats, sodium, sugars, or even carbohydrates. There has also been voluntary agreement to limit advertising to young children and eventually eliminate the sale of some products in elementary and middle schools (Elliott, 2008a). Rejecting the prevailing critique that industry-produced foods cause health problems and then making new healthier versions of said products may seem, on the part of the food industry, to be actions that are at odds. However, I contend these are complementary actions that began with the introduction of 'diet products' in the 1960s. The food industry, largely the cause of the poor health and obesity we see today, discursively repositions itself twice: denying its responsibility for poor health yet offering up the potential solutions. It does so by operating according to a

logic of health that is defined by nutritionism, which can be contrasted with the countervailing discourse of health through real food.<sup>49</sup>

The approach to health that focuses on nutritionism is linked to the explosion of an industry concerned with the basic components of foods and providing ‘diet’ and ‘value-added’ foods. Managing the minutiae of one’s overall dietary intake is seen as the best means to achieve health as the body is regarded as a machine with certain nutritional needs. Nutritionism relies on the assumption that “the hidden chemical elements, and quantities of those elements, of a food are its more important features and that understanding these hidden chemical constituents will inevitably improve our health” (Mudry, 2009: 16-17). This requires consumers to seek out specific food and nutrition information and subsequently to measure or manage intake. There is focus on knowing which nutrients are problematic and which are beneficial. Accordingly, the latest discoveries, innovations, and hypotheses concerning food are critical. The supposed scientific basis that underscores these food initiatives is their prized characteristic. For Dixon (2009: 321) the food supply is wholly nutritionalized, by which she means “dedicated to the enumeration, enrichment and promotion of both single foods and national food supplies in terms of a nutrient values profile (amounts and types of energy, protein, fats, etc).” Existing foods are regularly reconstituted, and new foods made altogether, to add the desired nutrient or remove the offending one. Food packages provide information beyond the products’ ingredients. Foods are also broken down and labeled according to certain nutritional profiles. Consumers can learn the per serving caloric, fat, sodium, protein, etc. content of any packaged food, and companies can make

---

<sup>49</sup> It should be noted that there is some overlap between these two perspectives, and neither is completely unique to this time period.

health claims accordingly. As Levenstein puts it “food processors have responded, churning out foods in low-calorie, low-sodium, low-cholesterol, low-fat, caffeine-free, high-fructose, high-protein, high-calcium, and high-fiber forms (1988: 205; quoted in Retzinger, 2008: 153). Such foods purportedly identify the causes of obesity or ill health and offer therapeutic remedies to combat them. Thus, diet foods respond to the excesses of overeating poorer foods without eliminating either. While individuals are guided toward and away from certain nutrients, they are not actually guided toward or away from the actual foods that actually contain these nutrients.

Detractors of this approach call it reductionist. This is not to say that a focus on nutrients or nutrition is wrong. Rather, the problem is that nutrients have become the pre-eminent and sole mode of evaluating the healthfulness of a diet. This has the effect of reshaping foods into mysterious nutritional component parts, leading consumers to value nutrients over actual food (Pollan, 2008). Accordingly, those who promote whole food consumption believe that only by eating a simplified and diversified diet rich in whole, recognizable foods can one successfully combat obesity and poor health. Scrinis (2008a) goes so far as to challenge the basic premise of unscrupulously basing our food system on the triumph of scientific research. He asserts:

The myth of nutritional precision – the degree of precision of scientists’ understanding of the relationship between nutrients, foods and the body at the biochemical level is greatly exaggerated, and the limitations and imprecisions of nutrition science are concealed or ignored.... The claim that nutrition science can define the difference between some sort of ‘baseline’ or ‘adequate’ state of health on the one hand, and an ‘enhanced’ or ‘optimised’ state of health on the other...relies upon and indeed promotes this myth (Scrinis, 2008a: 543-4).

Even if the premise of measuring health is not as questionable as Scrinis suggests, the mechanism by which scientists generate nutritional knowledge is problematic. Nestle

(2002) has identified several contentious issues in nutrition research, including conflicts of interest between researchers and industry, poorly designed or methodologically flawed studies, and unjustifiable conclusions being drawn from the research. But Cannon (2005) questions whether nutrition and health can even be studied according to the 'proper' scientific method. Like Scrinis and Nestle, he questions the precision of science and wonders whether studies examining nutrition have been designed well. But he extends their criticisms and questions whether generating scientific nutrition is a contradiction of terms. He claims: "the recent drive originating in the USA to give pre-eminent credibility to the results of randomized controlled trials, a type of study whose main use is to test the efficacy of drugs, would if generally accepted have the effect of vitiating most epidemiological and experimental studies designed to establish causal relationships between food and nutrition, and health and disease" (Cannon, 2005:704). In his view, the scientific method serves industry more than dietitians, doctors and health professionals. He believes it undermines itself because its sole purpose is to make nutrient-based claims 'factual.' In so doing, supposed scientifically proven nutrition research would likely detract from useful nutrition and health research.

Indeed, if studying nutrition at least serves a marketing purpose, those who focus on natural health through food find nutritionism deeply troubling. They believe health is best achieved by eating a varied diet comprised mainly of staple foods. They call 'functional' foods, which emphasize the health benefits of added nutrients, fads or crazes that pass quickly and often, confuse individuals and pervert genuine nutritional knowledge. Functional foods refer to foods or constituents that purportedly offer physiological benefits beyond basic nutritional functions. Today we commonly see them

described as foods that are fortified, enriched, or high in certain nutrients. These were first developed by Japanese scientists in the 1980s. Concerned about deteriorating eating patterns and the growing influence of the Westernized fast food industry on the population, Japanese researchers created the category ‘food for specific health use’ (FOSHU) to “subsume foods that had documented evidence of aiding specific physiologic functions beyond whatever conventional nutrients [fats, protein, etc.] exist in the food” (Etkin, 2006: 207-8).

These ‘pseudo foods’ or ‘foodlike substances,’ no matter how advantageous they may seem, are seen to compromise our collective health severely. This is true for a few reasons in addition to those outlined above. First, within the nutritionalized dietary paradigm that has come to dominate over the last twenty years, food has become eclipsed by nutrients. According to this model, a ‘balanced’ diet can be achieved simply by obtaining basic nutrient levels, regardless of their source (Nestle, 2002). Without respect to what they are made from (whether the foods are synthetically-produced), there are ‘good’ and ‘bad’ nutrients, but no ‘good’ or ‘bad’ foods (Scrini, 2008b: 44).<sup>50</sup> Pollan (2008: 32) summarizes the problem, explaining, “nutritionism supplies the ultimate justification for processing food by implying that with a judicious application of food science, fake foods can be made even more nutritious than the real thing.” Any foods can be manipulated according to a nutritional profile to provision in predictable and desirable ways, whatever that means at any given moment. The nutritionalized food system, which

---

<sup>50</sup> This may seemingly contradict my earlier claims that individual foods can become ‘unhealthy’ within the nutritionist paradigm. These foods become bad, unhealthy, etc. as a result of a reductionist approach to their nutritional qualities. For example, eggs are deemed unhealthy because they have ‘high’ cholesterol or avocados, fat.

relies on the quantification of food, is completely flexible. Thus, nutrients come to stand for food, and by extension, health.

At the same time, food distinctions are becoming blurred, either because transgenic manipulations combine different species or processed foods or pre-packaged meals include multiple food groups and additives. Caswell and Padberg (1992: 466) continue: “the traditional nutrition education format has been to classify foods into four groups based largely on animal or plant origin. Staple foods are relatively easy for the consumer to place in this system. It works less well for complex products such as formulated or fortified foods, combination products such as frozen dinners and many snack items.” This means that most people’s nutritional knowledge is severely disconnected from what they are actually eating, as nutri-biochemical knowledge undermines and displaces food-level knowledge (Scrinis, 2008b: 40). Likewise, the overall nutritional quality of processed meals or products becomes additionally obscured by focus on only one or two nutrients. Eating, then, is decontextualized; separated from food and body knowledge, and steeped in the ideology of nutritionism. Building on the quantified language generated in the early part of the twentieth century, modern food wraps up and communicates healthy food in completely technical and measurable terms. Healthiness then comes to require this technically rational approach to nutrition that emphasizes package labels, measurements, amounts, and so on. Again, the food becomes absent and its nutrient profile dominates. As Stacey so eloquently expresses, in a nutrient obsessed world, food is “not merely tasty, filling, and sustaining of life but a force that can either steal life away or prolong it indefinitely. Food is no longer simply food but

preventive medicine, a scientific abstraction, a moral test, and, sometimes, a literally mortal enemy” (1995: 15).

None of these developments have occurred outside larger social, economic or political interests. Tarasuk (2008) acknowledges that functional foods support novel and ongoing nutrition research, which promotes the dietary management of chronic diseases. The primary application of this research is commercial. Corporations have a great financial stake in propagating a nutrient-based food system: Simply owning land and growing basic commodity foods is not particularly financially lucrative. Commodities are unstable in either their yields or their value, considering the perpetual uncertainty of labour, fuel, fertilizer costs, political circumstances and environmental conditions. However, “highly processed goods with more ‘value added,’ have more attractive rates of return to retailers and processors. Many unprocessed foods or foods that have undergone minimal levels of transformation (e.g., table potatoes, milk, eggs, flour, and tomato paste)...have fairly thin profit margins” (Winson, 2004: 302). Food companies can sell basic staples with small processing alterations at a comparatively higher price. Such a foodscape also permits the inclusion of a number of related industries, including synthetics, chemicals, pharmaceuticals, farmaceuticals, neutraceuticals, and so on. This foodscape is always involved in nutritional research. Processed and value-added foods help global corporations with a range of holdings maximize their profits by connecting different fields. Even charity and research funding is integral to most food companies’ profit structure because both are tax deductible. At the very least, this research helps to fuel their marketing campaigns by providing the ‘scientific proof’ for health claims, as discussed earlier (Nestle, 2002).

Dixon and Banwell (2004) argue that partnerships among corporations, nutritionists, health and medical researchers, and professional associations, often with government support, promote acceptance of reductive corporate-controlled diets. Their analysis further suggests such mutually beneficial agreements, even when well intentioned, must be understood as commodifying and reifying limited notions of health. As they further explain, “corporations seek to value-add ‘health’ to the products to distinguish them from competitors’ products. In this way, the symbolic value of health, acting as cultural capital, is used to accumulate finance capital” (126). Herrick (2009) adds that corporate responsibility strategies in the food and drink industry have deepened and become more visible in the last decade, now responding to a range of social issues, including labour practices, environmental sustainability and stewardship, corporate control over the food supply, health and so on. Corporate responsibility strategies, where the advertisement of certain social or cultural values differentiates consumer products and brand names, exemplify the shift toward new forms of responsibility and even citizenship. As Margaret Scrammell (2000: 351) explains, the act of consumption is increasingly politicized as “the site of citizens’ involvement is moving from the production side of the economy to the consumption side.” Social responsibility has become a marketing tool that “overtly plays out in marrying dollars to political projects: purchasing environmentally friendly products, socially responsible brands, pink ribbon goods, or organic foods” (Elliott, 2007: 142).

The most salient problem with nutritionism and even broader consumer-based social responsibility narratives is they conceal their existence. Determining what foods are healthy is difficult as food fads emerge and disappear regularly, all the while



sanctioned or disparaged by so-called ‘authorities.’ Research also becomes increasingly contradictory and confusing to negotiate. People have come to rely on food producers, scientific experts, the media, and governments for guidance as to what and how to eat in a healthy manner (Klein, 2010). Unfortunately, these professionals and ‘informants’ often tout the benefits of certain foods, nutrients, or products according to thinly disguised economic interests. The advice given by uninvolved health or medical professionals may also overlap significantly with the messages offered by the food industry, rendering individuals’ decisions surrounding healthy food choices more difficult. Experts’ recommendations to consume certain nutrients can turn typical junk foods into more expensive ‘health’ products. With or without adulterations, functional foods come to display the characteristics of other healthy foods, in spite of the fact that they are chemically-derived, processed or exceptionally high in certain nutrients. Yet the discursive landscape paints a different picture.

As I have outlined above, food has been nutritionalized – quantified in such a manner as to divorce food from eating without similarly separating eating from health. The prioritization of nutrients over food reflects a foodscape dominated by scientific discoveries and developments in nutrition, food production and manufacturing. Truly, this is not the only story and processed foods are not singularly privileged. There is strong countervailing advice within the nutritionalized consumption economy to eat whole and natural foods. A quick perusal of grocery store aisles and food product packages suggests that food corporations have appropriated and packaged such advice. Food companies use nature and representations of natural environments, whole ingredients, pristine landscapes, and so forth, to sell or advertise their goods. To some

degree, doing so can be explained by a need to represent, in the best way possible, the agricultural products from which a food is fashioned. After all, there is a wide range of processed foods on the market, each with a unique chemical and preservative profile. Processing, then, can be a very minor or a more involved process. Representations of nature, however, may also be used to obscure the fact of manufacturing altogether. In conjunction with narratives of quantification, some foods may be presented as nature-science hybrids that embody the proverbial ‘best’ of both worlds. These are not processed in the sense of being ‘fake’ foods; rather, they can be interpreted as (light) improvements on, and mobilizations of, nature. It seems that the closer a food can get to nature without compromising the ability to quantify, know, or control, the better.

Johnston and Baumann’s (2010) analysis of ‘foodie’ culture can help explain this tendency. They claim markers of authenticity are important in food and food consumption. Authenticity is the quest for the real or the true, however untenable a goal. Their focus is on the manner by which self-proclaimed gourmands (food lovers or experts) mark food as culturally authentic or inauthentic and how that category relates to their self-identity and broader cultural identities. However, their analysis is instructive by revealing how foods, or perhaps more appropriately food-like substances, become acceptable objects of consumption. Like nutrition, food itself is relational, socially constructed, and lacking in inherent qualities. Foods are organized around shifting values and ideas. The meanings that surround foods are constructed through people’s perceptions of themselves, the food’s origins, its producers, manufacturers, etc. As they point out, “people understand food as being authentic if it can be characterized in certain ways in relation to other foods, particularly inauthentic foods” (70). In their view,

authenticity is the prized quality, which becomes attributed to certain foods vis-à-vis judgments that situate foods in relation to cultures. I argue that authenticity can also be determined by positioning foods close to nature. Foods can be defined by comparison with that which is immediately unadulterated: nature and natural foods.

The contrast between fresh or natural foods and processed foods may have the effect of making some manufactured foods look more or less adulterated in contrast. Again, the type and degree of processing varies a great deal. Yet the way one defines processing would make the line between natural and fresh foods quite moveable. It is a classification that moves a great deal, although seems to be a straightforward binary distinction. This is the position of Susanne Freidberg (2009), who argues the concept of freshness has changed in the last one hundred years. She claims the freshness we know and value today is a creation of refrigeration devices that allowed humans to transport and keep foods in their natural state much longer. The important point to remember, again, is that being 'natural,' 'fresh,' or otherwise 'unprocessed' as a broad category is most privileged. Manufactured foods gain standing by virtue of their likeness to unadulterated foods. Few processed foods tout themselves as entirely authentic, or most certainly, inauthentic. Rather, the more frequent claim is that the foods taste 'like' homemade, the real thing, and so forth. As such comparisons demonstrate, processing is designed to be as minimal as possible and homemade is whatever is true or real. Authenticity of origin, taste, or essence becomes most valued and nutritionism fits in where it can offer benefits to the foods. Freshness, authenticity, nature, and nutrition are intertwined in a complex material, technical and discursive relations. Nutritionism is the entrenched food system that shapes the technological, manufacturing, production,

communication, consumption and health aspects of food while nature, predominantly, is the central promotional and marketing tool.

### *Conclusion*

In this chapter I outlined how food scholars understand today's food and nutrition landscape. The goal was to show how the nutrition network integrates nutritionism as a critical and primary approach to food today. As I have argued, nutritionism has rendered diet and health subservient to reductionist quantification systems that selectively privilege nutrient levels over all else. It has conferred some important health and wellness benefits on populations, but has also meant that other valuable aspects of diet, such as sociality, cultural expression, etc. (as well as alternative understandings of health) are becoming increasingly less relevant. It is no coincidence that nutritionism governs food and diet in today's society; people are losing their sense of how to eat (well) because processed and fortified foods are becoming even more ubiquitous.<sup>51</sup> Nutritionism simultaneously finds fault in individual's food choices and allows science to solve these problems with new nutritional products and inventions, thereby reinscribing the system that helped to create such challenges in the first place. Nutritionism allows nutrients to represent food. The numeric and quantified food system replaces simple eating with convoluted systems where food companies are positioned as authorities proffering health advice to wary and weary consumers. Within pet food, this system is even more obvious. While human food companies compete with a range of voices insisting that food consumption need not be so complicated or even packaged, relatively fewer remarks are made about pet foods.

---

<sup>51</sup> Of course there are a significant number of people, particularly in the middle classes, who are increasingly meticulous about their food and/or weight. The world of food, nutrition, and health is complex. Discussion of these groups is beyond the scope of this work.

Rather, pet food companies possess near complete authority over pet health and nutrition. Pet foods are also fashioned in a manner to adhere much more strictly with nutritional recommendations. Nutritionism is more salient in pet food. But it was not always this way. In the next chapter, I consider the emergence of pet food manufacturing. I provide an overview of the important companies involved in its production, the various technologies that developed, and some of the socio-economic constraints that shaped these developments. In other words, the next chapter begins to sketch the history of the network and identify some of the prime actants involved in it.

## **Chapter Five: The Early History of Pet Food Manufacturing**

In the preceding chapter, I explored the relationship between nutrition, varied notions of edible food and animals, and conceptions of health. Following Scrinis (2008b) I provided an overview of how the nutritionist paradigm privileges nutrients above all else. I explained how the food industry understands nutrition and argued that its idea of ‘healthy’ food is dominated by nutrients. Eating to fulfill one’s nutritional needs is important. Many scientific and nutritional discoveries have improved health and well-being. However, nutritionism tends to ignore other worthwhile properties of food and eating relations. It adheres to what Ferrie (2010) describes as nutritional reductionism, which is an approach driven by the shaky assumption that science has identified all the nutrients we require, established their effects on our bodies, and that the best approach to diet is in individuals’ relationship with nutrients rather than of whole foods or food systems. I will argue that nutritionism drives the commercial pet food network and becomes the point around which the network is organized and through which actants must pass. This chapter moves away from this discussion to consider the early underpinnings of the pet food industry before the network emerged and became stable. I examine the actants that make this particular manifestation of nutrition possible. This chapter offers a history of the product’s development and the beginning of the pet food network. Accordingly, I point to notable individuals and companies that developed commercial pet food commodities – a portion of the story that is well known. Of course, their role in assembling the network should not be underestimated. Neither should the role of other nonhuman actants, which I also identify. As I note, the industry underwent

a significant transformation as a result of ongoing changes to social, cultural, and economic circumstances. This chapter, therefore, also outlines two manufacturing developments that appeared during the earlier years of the pet food industry that would help to frame the network. They are the commercialization of rendering and its products in animal feed and the use of extrusion technologies in making pet foods. As I will show in the subsequent chapter, these were necessary to carry the nutritionism that is central to the pet foods we know today, yet which did not materialize until later.

It is well recognized that extrusion and rendering are integral to the mainstream pet food industry. Most of the contestation surrounding pet foods either directly or indirectly implicate these aspects of the industry. My project will examine both, but will not address how these technologies affect pet food quality, as most work in this field tends to. My project also differs from other work in this field in a couple other ways. I consider these technologies and products as emergent networks of their own. There is focus on individuals, organizations, companies. But these are entrenched in associations with machines, animals, and other inanimate objects. This means the pet food network materializes not because some manufacturers know and identify certain needs, as other histories on the topic hypothesize. The pet food network, in this thesis, develops over time as the interests of actants become translated into the pet food network. The stability and organization of this network develops and changes constantly. In this chapter, I am outlining the beginning of this process. Thus, my discussion of this history is divided into two sections. The first focuses on the emergence of the large-scale rendering business that is so important to pet food production today. In particular, I will show that the expansion of livestock animal populations starting in the mid-19<sup>th</sup> century, the

commercialization of meat and bone meal as an animal feed beginning in the early twentieth century, the expansion and industrialization of animal agriculture in the mid 1950s, and the subsequent passage of grain price support systems that favoured meat production helped pet foods materialize in the way they have. In the second section, I explore the history of pet food production until the late 1950s. I detail the companies, innovations, processes and ingredients that were important in the early pet food business. I sketch out this young industry's growth and explain why cereal makers, instead of meatpackers, were increasingly interested in pet food manufacturing. As I point out, this has not compromised the important role played by pet food companies in the animal food production sector. Quite the contrary is true: the increasing ownership of pet food labels by cereal and grain companies meant the industry focused on seeking a balance between customer convenience, product consistency, profitability, and most especially, nutrition. I will claim it found that balance with extrusion.

### *Commercial Pet Foods: Preliminary Matters*

Before the story of commercial pet foods can be told, two points must be emphasized. First, this chapter explains the early underpinnings of the commercial pet food network. Because I argue the network hinges on nutrition, the discussion that follows points to the materials and technologies that turn into actants in the pet food network. These are the early underpinnings of the pet food network. But to my mind, a different type of pet food than the network we see and understand now. I highlight the continuities between them, some of which are obvious because of overlapping companies or ingredients. But this dissertation makes the case that the modern pet food industry



became an industry distinct from its past because of the associations and assemblages that developed. Accordingly, I maintain that it is not until much later in the twentieth century that the requisite translations occur to configure this network as it is today.

It must also be emphasized that I will only discuss the people, companies, technologies, and relationships that have left significant traces in shaping today's commercial pet food. In keeping with the principles of ANT, actants and actions are only as important as the traces they leave (Latour, 2005). However, a potentially infinite number of marks may be left during the formation of any network. Since the pet food industry appeared, there likely have been somewhere in the neighbourhood of several hundred thousand commercial brands. I cannot talk about the majority of them. Many of those companies have disappeared – the proprietors simply quit, declared bankruptcy, and so on. A great many have been purchased by other larger companies. Pet food labels have been developed, abandoned, renamed, repackaged, bought, traded and sold at a significant rate over the last one hundred years. Today, five multinational corporations - Nestlé, Mars, Proctor and Gamble, Del Monte and Colgate-Palmolive - hold roughly three quarters of the commercial pet food market share (Nestle, 2008: 42-43).<sup>52</sup> Several other major food producers, including Heinz, General Mills/ General Foods, Lipton, Campbell's Foods, Post and Carnation, to name a few, have had significant pet food holdings at one time or another. Some of these businesses, which are known for products other than cereal or feed, underwent corporate restructuring to increase or divest their pet food holdings. Their businesses thrived at least in part because of these foods, which fit

---

<sup>52</sup> Nestlé controls 32% of the North American industry while the other four companies have sales between 9-12%, each. Worldwide, Mars is the largest pet food maker, however.

with their business models at the time. Some of these stories will be told below to illuminate the emergent assemblages that formed the pet food network.

There have also been a variety of manufacturing processes and technologies that have helped shape today's pet food industry, but have been supplanted for one reason or another. While I provide an overview of these, this project will focus on those technological innovations and manufacturing processes which have been most important to the industry as it is today. This is because my project is an account of how a pet food industry of such a nutritionalized, commercialized, globalized, and consolidated character came to be. This is a social history of how the pet foods most people know and provide became possible. Accordingly, some of the eclipsed companies or developments are so because they did not fall in line with processes of commercialization that are central to the story.

This dissertation pays greater attention to the animal-derived substances used in pet foods in the sense that less space will be devoted to explaining the origin of grains' inclusion in these products. This is not because grains are less important in pet food today or were less important to their development. Quite the opposite was true, in fact. Many pet food companies used grains when and because they were abundant and available. Many used them because they were the very companies who produced other foods from these substances. But for a brief period between WWI and WWII, dry foods have dominated sales. The first mainstream commercial pet foods were even heavily grain-based. The concentration of ownership among cereal companies quite plainly explains why dry foods have always been part of the industry's ambition. Grain use is purposeful, even though animal-derived ingredients have higher status and tend to be

more attractive food sources for dogs and cats (Fiddes, 1991). The rationale for focusing on animal-derived substances reflects the changes to pet food and its organization as a network based around nutrition. Until the 1960s, the nutritional properties of pet food ingredients were not a paramount concern. That is not to say that nutrition was not at all considered or advertised. It was. But the inclusion of nearly all ingredients in these products, and indeed the story of pet food until that time, is a tale about the agricultural products that are available for use. Grier (2008) claims most pet food manufacturers were opportunistic in their sourcing and obtained ingredients from whatever sources were available, convenient, and inexpensive. Ingredients varied over time, space, according to both the manufacturer making the food, and the resources and technologies available. The pet food industry is a shadow of both the human food and animal feed industries, which incorporate significant cereals in their operations. Pet food makers used the leftovers. This project explains how grains became integrated with animal nutrition; how more grains came to be used and in conjunction with certain forms of animal-derived products. What follows is an explanation of this latter actant. My contention is that the commercialization of rendering has fundamentally changed how animal tissue is incorporated into pet foods. I explain how it materialized.

### *Rendering: Its History*

Commercial pet food production today would be impossible without rendering or a large-scale rendering industry. Rendering ties pet food production to livestock agriculture more broadly. Although pet foods and animal feeds include a variety of both plant and animal-derived substances, the products generated through rendering have been

instrumental to the growth of all animal food sectors. Still, rendering remains largely invisible outside the industry in spite of its crucial place in animal production. This section will explore how the rendering industry emerged, how it has changed, and how it became integrated in pet food manufacturing.

Renderers convert dead animals and animal parts that would otherwise require disposal into ingredients for a wide range of industrial and consumer goods. It is a simple procedure that involves heating animal matter in order to separate fat from meat tissue and water. Animals' bodies contain large amounts of water, so heat is used to remove the moisture and facilitate fat separation from their carcasses (Hamilton, Kirstein and Breitmeyer, 2006: 82). Rendering allows for the biological processing of animal body parts that are either physiologically difficult for animals to digest or commercially unwanted. These materials can be combined, cooked and then turned into other materials. The main yields are solid, high protein material called greaves and 'liquid' lipid material known as tallow.<sup>53</sup> The tallow (fat) separated during the rendering process can then be manipulated and used to create other items, which helps account for the long history of rendering across a range of ancient and modern civilizations around the globe (Bisplinghoff, 2006: 17-18). The proteinaceous greaves that is turned into meat and bone meal today, or tankage as the end product may also be called, is a more recent commercial product tied to the emergence of a 'for profit' rendering industry in the nineteenth century. Before that time, rendering was a small-scale activity performed by individuals or small companies to produce tallow candles or soaps. Indeed, fat was the coveted commodity of rendering while the protein and water-rich leftovers were

---

<sup>53</sup> Tallow and other animal fat materials become liquid under heat, but solidify at room temperature. Technically, tallow is fat derived from cattle.

sometimes used as secondary products, but more often discarded as unusable waste (Aberle et al., 2001: 316).

While tallow-based soaps eventually became the primary product as the rendering industry took off through the nineteenth century, tallow-based candles were the principal products before that time. Soaps initially emerged as by-products of candle production likely because of a need for illumination before electricity became common. According to Ockerman and Hansen (2000: 88), the soap manufactured as derivative of candle creation was used exclusively for personal hygiene. Burnham (1978) claims that both soap and portable candles were heavily taxed luxury items used sparingly even by aristocrats and the wealthy until the nineteenth century. This was because tallow was not yet widely available. Indeed, Burnham adds that hides and tallow were exceptionally lucrative until beef production increased - worth twice as much as dried meat around 1860 (1996: 7-8). From the available animal population, the parts of the animals that could be rendered using extant methods were eaten by the poorest peoples and/or other animals, while other inedible by-products, such as heads or hooves, were still discarded because sufficient rendering technology was lacking.<sup>54</sup> Given these shortfalls, any little product left was used cautiously.

Between mid and late 1800s, the rendering industry experienced significant changes, for a few notable reasons. Above all, the world's population of cattle expanded significantly. This was especially true in the United States and Canada where westerly expansion, facilitated in part by new fencing, population booms, improved transportation, and 'uninhabited' land, allowed herd sizes and ranching operations to soar (Netz, 2004). More cattle meant there was much more cheaply available fresh meat for a continent with

---

<sup>54</sup> Bones, hooves, etc. can be cooked down further to extract marrow or other nutrients.

a seemingly insatiable appetite. Yet it also meant a lot more animal waste. But as Horowitz (2006) explains, the meat packing and processing industries that grew and centralized in tandem helped address this issue. He continues:

As firms expanded beef and pork output in the late 19<sup>th</sup> century, better utilization of meat trimmings, internal organs and other by-products became a pressing issue. Rather than dispose of this material, the national meatpacking companies decided to turn them into profits by adding the necessary technology and personnel to their factories. Lard, glue, hides, grease and fertilizer were among the new product lines that the large meatpacking firms introduced around 1900 as they widened the scope of their manufacturing operations (82).

Also during that period, “meat men soon discovered” they could also transform animal by-product material into farm fertilizer (Ockerman and Hansen (2000: 88). Tallow-based fertilizers, and then protein-based fertilizers became very profitable, even surpassing the profits generated through meat packing.

However, the product responsible for firmly establishing the rendering trade in the 19<sup>th</sup> century was soap. As mentioned, soap until mid century was a secondary product to candles. However, growing cattle numbers meant tallow became more widely available. Few animal producers tried to make soap, because, as Burnham (1996: 11-12) explains: “the industry as we know it came into being with the discovery that it was easier and more profitable to produce tallow and sell it to the soap manufacturer than to make the tallow, turn it into soap, and then sell the soap.” Technological innovations in rendering operations *became* more sophisticated to deal with the increased demand for soap such that when the “taxes were removed and it became available to the middle class, this gave rise to a greater demand, which *led to* more sophisticated rendering operations” (Bisplinghoff, 2006: 18; emphasis mine). In other words, the rendering industry of the 19<sup>th</sup> century developed new machinery and methods for generating a mass-produced

commodity. Because tallow was the primary ingredient in soap, the world soap and rendering businesses grew together until the 1950s. There was steady growth in the market as soap-makers developed new cleaning agents that could be used to wash laundry or household areas like countertops or toilets.

Scholars have rightly explained that rendering materialized because it turned waste into useable items. However, the socio-political climate that fuelled demand for this service and these products has not been widely discussed. Discourses of the Victorian era played a significant role in shaping rendering as an independent and lucrative business. Concerns for hygiene, health, cleanliness, and sanitation were paramount and linked with society's moral standing (Valverde, 2008). Diverting animal by-products into other commodities tackled these fixations in two related ways.

First, rendered by-products redirected the animal waste of butchers and slaughterhouses away from streets, rivers, parks and other public spaces (Day, 2008: 178). It was common for animals' excess flesh to be discarded carelessly since most cities lacked dumping prohibitions until the turn of the 20<sup>th</sup> century. Ockerman and Hansen (2000: 88) note that butchers and early meatpackers routinely buried or abandoned highly perishable waste adjacent to processing or butchering shops. Unusable and inedible parts were simply left to decay. Sanitization and sensitization initiatives in both North America and Europe relocated slaughter and larger butcher operations to 'clandestine' outskirts, somewhat addressing this problem. However, Vialles (1994) alleges that the banishment of abattoirs to city outskirts actually facilitated the industrialization of meat production. She claims, "the final corollary of this exile/confinement is the concentration of slaughtering activity and the reduction of the

number of abattoirs. The quantities dealt with were henceforth on an industrial scale and called for suitable organization. It was a development that led to the remarkable ‘vertical’ abattoirs in Chicago” (22). Exile may have moved animals from city-dwellers’ direct view, but it also facilitated the production of more carcasses. Johnson (2003: 222-3) adds that the eradication of animal waste up river or the use of offal in city projects, for example, was common well after these ‘offensive’ industries were displaced. This caused significant health problems and of course undermined efforts to expel offensive products, odors and ideas (Shukin, 2009: 62-3). Redirecting waste, therefore, improved sanitation considerably and curbed the spread of many diseases. At the same time, rendering was turned into a variety of soap forms for the masses. The middle classes demanded soap because cleanliness was associated with bourgeois civility. McClintock (1995) argues that soap was the symbol of decency through which the white middle classes differentiated themselves from degenerate ‘Others.’ Hygiene represented in individuals the highest form of decency. It was both a public project, tackled through state and social programs, as well as a private accomplishment and demonstration of personal integrity and proper citizenship. Soap, therefore, was both a model and metaphor for civility. Building on McClintock, Shukin identifies soap as a “mass commodity and material signifier of white supremacy” that simultaneously cleans and erases itself materially and ideologically (74-5). In these ways the rendering industry thrived on obsessions surrounding pollution and the effective utilization of animal by-products, and at the same time, played a significant part in shaping the material realities of Victorian era public health.



But by the mid 1950s, soap makers drastically reduced their use of tallow in soap, opting for synthetic, phosphate-based detergents instead. Bisplinghoff (2006: 18) claims that while renderers sold 1.1 billion pounds to soap manufacturers in 1950, that number declined steadily to an all-time low of 146 million pounds in 2000. Notably, efforts to “go green” today and curb the ecological impact associated with mining and consuming phosphorous have helped that sector of the industry rebound in the last decade (Caparella, 2000: 9). Ironically, animal flesh is touted as “environmentally friendly” and a “renewable resource” by the rendering and livestock-related industries. The United Nations Food and Agriculture Organization, on the other hand, claims livestock rearing make a very substantial contribution to air, soil, and water degradation (Steinfeld et al., 2006). These consequences are unlikely to even out the so-called advantages identified by the rendering industry.

As stated, rendering separates protein-rich from lipid material. Historically, the latter product has been highly desired while the former used under limited circumstances (although this was only the case because the soap industry was separate). Tallow was especially malleable to both personal interests and commercial possibilities – it was easily mass produced and commodified for large-scale markets. In contrast, the protein material leftover, greaves, is not very tasty, not manipulated as easily, and therefore, did not find an easy place in the market, at first. Certainly these leftovers were put to good use as food for poorer people and animals (Shukin, 2009). But the consumption was informal and happened outside the market. The leftover animal protein material was simply considered an unrecoverable cost of rendering production and treated as waste, particularly as industrialized meat operations took off and higher quality cuts became

cheaper and more readily available (Horowitz, 2006). This changed in the early 1900s when scientists began experimenting with rendering leftovers and systematically adding them to animals' food. Although individual farmers were probably feeding leftover rendered material to their livestock for a much longer period of time, the commercial market for the proteinaceous by-products of rendering only emerged at the beginning of the 20<sup>th</sup> Century (Bisplinghoff, 2006: 18-19).

Rendered animal material, particularly the protein-rich meal, became a popular animal feed supplement for several reasons. The protein-rich material left over from rendering was widely available because the number of animals being raised, and subsequently slaughtered, for human food exploded from the nineteenth century onward. Animals' bodies are notoriously energy inefficient and generate a lot of waste that is, as detailed earlier, inedible for humans and other animals. Only about 51% of the live weight of cattle, 56% of swine, and 63% of poultry are considered suitable for humans to eat (Hamilton, Kirstein and Breitmeyer, 2006: 72-82). They further claim that even after that leftover raw material is rendered down, about 40% of the pre-rendered by-product weight remains because of water evaporation. Of this amount, roughly half is tallow and the other half is proteinaceous material. In other words, the use of rendered proteins alone added value roughly the equivalent of 10% of an animal's live weight. Such an enormous volume of material cannot be ignored given the rapid rise in the kill rate from dozens to thousands and tens of thousands per week as early as the turn of the 20<sup>th</sup> century in the United States alone (Burnham, 1996: 13-14). Rendering increases the amount of animals' bodies that is physiologically digestible. However, rendered products

may be of poorer nutritional quality than unrendered animal flesh.<sup>55</sup> They are also said to be rather unappetizing to humans.

It must also be noted that feed represents the largest single cost item in all animal-rearing operations. Until the turn of the century, livestock fed more directly from nature (i.e. in open pastures) or from farmers' agricultural by-products. The grain feed industry started to take off, and where possible, supplement this feeding regime. But beginning in the 1950s, the consolidation of meatpacking companies and agricultural ownership coupled with increased mechanization and intensification of animal rearing processes further intensified feeding livestock animals' diets significantly (Horowitz, 2006). Food became feed - a much more closely watched and measured commodity input. Rankins (2002: 207) says feed accounts for "over 50% of the variation in profit or loss differences between herds" in beef operations. Feed input reductions are therefore crucial to profitability. Animal-derived protein material is an ideal feed source because it adds weight to animals quickly. It also contains some unique nutrients, particularly phosphorus and calcium, from (rendered) bones. Animals fed efficiently can be slaughtered earlier in life, thereby eliminating the costs associated with raising them. These include not only expensive feed, but also shelter, veterinary visits, medicine, etc. In sum, the use of rendered animal protein material in feed rations is immediately doubly cost effective because it decreases the costs of raising animals by hastening the growth cycle while simultaneously creating a novel post-slaughter product out of previously undervalued material.

---

<sup>55</sup> It is beyond the scope of this dissertation to assess the veracity of this claim. It should be stated that a lot of the contestation surrounds digestibility and the nutrient complement (particularly protein) within rendered products.

Vertically-integrated meatpackers were the most obvious beneficiaries of a commercialized food industry. Although the products of rendering were adopted by a separate feed industry, vertically-integrated meatpackers were the first to understand the value of this product. The Chicago meatpacker, Swift and Company, seemingly appreciated that by-product rendering shaved costs and drove up profit. It was the first to mass-manufacture and use rendered protein and also fat as animal feed, just following the turn of the century. Grier (2006: 132) adds, “by the 1920s almost all ‘high-grade’ tankage and 75 percent of the blood collected during slaughter and butchering went into the production of animal feeds. With their high protein content – from about 20 percent for raw bone meal to 60 percent for high-grade tankage – by-products created animal feeds that could be used to increase rate of weight gain for supplementing or ‘finishing’ livestock.” As this description highlights, the rendered actants of the pet food network appear as a material object resulting from relations between several other actants, including livestock, humans, heating systems, metal tanks, and so on. Networks like the one that constitutes the subject of this story, pet food, often collide with other semiotic-material ensembles.<sup>56</sup>

Although rendered by-products were common in livestock feed, they were not widely used in pet food until the 1950s. The loss of sales to the soap industry, which was using phosphate-based alternatives, threatened the rendering industry. It necessitated investment in new innovations and new markets, especially to address the now abundant fats. Bisplinghoff (2006: 25) identifies several significant outcomes that enabled the rendering industry to withstand the collapse of the animal-based soap industry. Fat products immediately earned greater importance in the livestock feed industry. Fats had

---

<sup>56</sup> The rationale for identifying this as a material-semiotic assemblage can be found in Shukin (2009).

been used in animal feed since the early 1900s, but rations for poultry, swine and feedlot cattle came to include higher and higher amounts of greaves. At the same time, rendered fats found a new home in an emerging fatty acid industry. Renderers further benefited from the growth of restaurants, which provided plenty of cooking fats and oils that could be reconfigured through rendering. By this time rendering technologies had sufficiently developed to allow the processing of a very wide assortment of agricultural and industrial goods. In fact, a significant characteristic of rendering today is it cooks at such a high temperature that almost anything can be melted down to form consumable products (Martin, 2001). Such technological innovations allowed renderers to process what had previously been waste for them. Finally, a large-scale pet food industry that used rendered animal fats and proteins materialized. The consequences of this development, and the newly formed relationship that developed as a result, will be detailed in the next section. This is not to say that pet foods up to this point did not use meat or meat by-products. Rather, pet foods, until the 1950s, did not include significant portions of *rendered* material but relied on the same slaughter by-products used in rendering. To some degree the two industries competed for materials. The coupling of pet food production and rendering helped both industries grow in tandem. Indeed, the modern pet food era provided a ready-made market for fats and what is now one of the pet food industry's principal ingredients: meat meal (or meat and bone meal). Meat and bone meal is a by-product of rendering that is composed of the dried proteinaceous material that remains after animal products are rendered and tallow is extracted. It is protein-rich material dried further and then ground into a sandy substance that can be turned into other food products. It is of little interest to human food producers, however, because of

its poor taste, comparatively lower nutritional quality, and regulatory barriers that prevent the inclusion of meat products processed outside approved facilities to enter the human food supply.<sup>57</sup>

The edible matter created through rendering generates tremendous value for the food and livestock industries. Rendering is much more than doubly valuable when one considers the worth of turning rendered products into feed. Hamilton et al. (2006: 73) claim rendering adds nearly \$2 billion in value to the U.S. livestock production sector alone when contributions from both proteinaceous feed ingredients and rendered fats and greases are considered, but further acknowledge that the less quantifiable economic contributions of rendering include the elimination of animal by-products as waste and the cost of other feeds. Quoting Randy Stuewe, CEO of rendering corporation, Darling International, Caparella (2009: 8) summarizes rendering as an “environmentally sound practice responsible for the liberation of 54 billion pounds of edible material resulting from food animal production.” Without rendering, there would be major aesthetic or catastrophic public health problems, and potentially critical issues using other methods of disposal. As Nestle and Nesheim (2010: 86) remark, the amount of carcass and by-product waste generated through intensive animal rearing activities is so extensive it would quickly overwhelm any disposal system.

The economics of the world’s meat industry insist that animal by-products be converted into feed so that the livestock industry can stay economically viable. This can be attributed to the structure of today’s meat industry. As Cassuto (2007: 60) reminds us, “industrial agriculture operates in a regulatory environment that endorses and subsidizes its methods.” A significant legislative contribution exists in agricultural commodity

---

<sup>57</sup> Nutritional will fluctuate due to varying nutritional levels of raw materials used.

subsidy structures, which also prize the (over)production of certain grains such as wheat, corn and soy. According to Winders and Nibert (2004), policies beginning in the 1930s to stabilize food prices had the result of actually making meat production exceptionally profitable in the 1950s and beyond. This is because US agricultural policy came to rely on capitalist imperatives toward expansion by guaranteeing prices supports and production control (Friedmann, 1989). Price support policies guarantee minimum prices for certain designated agricultural commodities, notably, corn, wheat and soybeans. Further, production control initiatives keep crop values steady. Winders and Nibert argue that the purpose of these two initiatives was to reduce the supply of agricultural commodities to avoid a depression in their value, and thus, to raise farm incomes. In their view, the problem is that the supply of agricultural commodities did not decrease. Rather, the opposite is true. Productivity and surplus increased as a result of intensified production, as witnessed by an explosion of all three crop commodities since the 1950s (Pollan, 2007). Winders and Nibert further claim the United States promoted meat production and consumption as a way to manage excess grain, going as far as encouraging, conducting and financing research to make livestock rearing more industrialized and efficient. In so doing, it increased the demand of staple crops, which is very well when grain production is steady. But most importantly, rising numbers of animals have the effect of increasing the amount of material available for rendering.

Profitability within this system is achieved through large corporations' ownership over multiple sectors of the food supply (Nestle, 2002). It is also secured by the ongoing expansion and looping of meat production as well as the integration of rendering facilities. Converting overproduced grains into more expensive meat, with multiple

layers of government support, makes economic sense for corporations. So does taking ownership of rendering. Renderers have their own industry and lobby groups, although most of these are owned by meatpackers. Rendering plants can either be integrated or independent (Martin, 2008: 29). The former operate on-site and in conjunction with animal slaughterhouses or processing facilities and handle materials left over after animals are slaughtered and their carcasses dressed. The latter operate independently of large-scale meat producers and collect raw materials from a variety of off-site sources, including zoos, restaurants, farms, animal shelters, etc.<sup>58</sup> Independent rendering facilities serve an indispensable function and are highly lucrative when scaled. But most commentators recognize significant economic benefit is derived from on-site rendering. Accordingly, rendering facilities in both Canada and the US have rapidly declined from over 725 in 1975 to around 250 by the turn of the 21<sup>st</sup> century (Bisplinghoff, 2006: 25). The significance of independent and integrated rendering plans lies in the eventual destination allowed of the manufactured goods. The materials processed in integrated facilities can be used in a wider range of products and feeds. The substances are legally always within the confines of the slaughter operation, and therefore, deemed 'safe' and 'edible' for human consumption. The products of independent rendering facilities, on the other hand, are considered inedible and banned from the human food supply. Often, these products are used as fertilizer, in 'renewable' energy initiatives, and included in pet or other animal food.

There is value to developing new substances out of waste generated from human meat consumption. However, a unidirectional food or production chain results in

---

<sup>58</sup> The largest independent rendering companies in North America include Darling International, Sacramento Rendering, West Coast Rendering, Baker Commodities Inc., Modesto Tallow, Carolina By-Products, Griffin Industries Inc., Rothsay and Valley Proteins (Martin, 2008: 29).



significant economic and energy losses if there is a tremendous amount of waste material (as there is in converting animals into meat). To pursue animal rearing activities for the purpose of providing humans with food means the production of a great deal of material that is secondary to this undertaking. Turning that waste into consumable items makes raising livestock animals more economically feasible, certainly. However, simply feeding such waste-turned-into-food to humans is not as economically beneficial as feeding it to animals, especially when meat is abundant. Eliminating animal by-product waste from the diet of food animals would require replacement with grain, grass or another food source. This would inevitably mean that grain or vegetable matter is diverted from the human food chain. Moreover, since fat and proteinaceous materials add mass to animals more quickly than these other food sources, the replacement volume of grains would have to be greater. Indeed, the rendering industry recognizes that this cycle is necessary for the intensive and widespread consumption of meat, unabashedly and unironically characterizing this as 'recycling' (Burnham, 1996; 1978).

One of the economic advantages of using fats and protein meals in pet foods is the nutritional value to doing so. Pet food makers harness the potency of the animal and equate these by-products with the complete animal body. The actual nutritional quality of many such pet food ingredients is hotly contested today, which is not surprising considering the highly nutritionalized environment in which they are consumed. This is particularly true with the dried meal products generated through rendering. Not surprisingly, the rendering industry routinely extols the nutritional value of its products. Some veterinarians and nutrition experts even agree, noting that many rendered foods are made from highly nutritious parts of animal bodies containing highly digestible vitamins

and minerals. Nestle and Nesheim (2010: 83) make that assertion, characterizing rendered animal meals as nutritious feeds for both pets and farm animals. Other scholars have challenged rendered products as a reliable ingredient source on the grounds that either some of the products rendered have low nutritional value (such as restaurant waste) or that the very process adulterates the products and strips them of their nutrition (Martin, 2008; Fox, et al., 2009; Billingham, 2001). As I have made clear already, nutrition is a subject that generates great disagreement among experts. The instruments and mechanisms that measure food energy conversion and nutrient absorption are complicated, and at least to some degree, speculative. Bodies' abilities to process foods will vary and change. These problems, as well as many others make the contingency of nutrition salient.

In spite of these caveats, there is a strong and generally widespread belief that dogs and especially cats ought to eat foods derived from animal sources. Most livestock will consume these foods, but often do not need to. While pigs are omnivorous, other animals naturally consume plants. Accordingly, they can thrive from a diet consisting only of plant-based materials, including grasses, soy, corn, hay, wheat, and so on, although most of these products are not natural to their diets.<sup>59</sup> In contrast, cat and dog food seems not to be very palatable to them without the inclusion of animal materials.<sup>60</sup> As will be outlined in the next section, the early pet food industry is characterized by a struggle to create a food consistently desirable for pets. Demand for meat meal by the pet

---

<sup>59</sup> Certainly some foods are superior to others. Pollan (2004) outlines the problems that arise when humans adulterate animals' food to accelerate their growth.

<sup>60</sup> Some argue these foods lacking animal products are patently unhealthy. Vegetarian or vegan food options (I have only seen them for dogs) are becoming more popular, however. This is probably facilitated by developments in both ingredients and palatants, which are compounds added to finished food products to make them pleasant tasting and to encourage consumption.

food industry also drives up its cost (although availability helps keep it somewhat in check). Later, I will outline how that has been the case as the industry has moved toward premiumization. Lastly, the sheer volume of by-product available has allowed for its diversion to pet food. Today it is estimated that pets consume roughly 1/3 of all rendered materials (Nestle and Nesheim, 2010). The link between the rendering industry and the pet food industry is strong, but the former maintains other ties. Of course the rendering industry produces more than just enough products for use in livestock feed and animal food. Thousands of other products are created with animal production derivatives, although as this section hopefully made clear, feed ingredients are now the industry's primary engine. In the second part of this chapter, I explore the shape of the early pet food production industry until the late 1950s. This story emphasizes the relevant companies and technological innovations. It will make clear how the products of rendering became integrated with manufacturing developments. As I will show, the relationship between rendering and pet food production developed somewhat serendipitously, but eventually crystallized and formed into a nutritionalized pet food network.

### *Pet Food's 'Story': The Commercialization of Pet Provisioning*

Pet food has modest beginnings in the 19<sup>th</sup> century. Treats specifically created for dogs, and to a lesser extent, cats were available in the marketplace since at least the early 18<sup>th</sup> century. Pre-packaged pet food took much longer to appear. Early prepared pet food was initially marketed or formulated for dogs. Cats had food marketed to them by the earlier half of the 20<sup>th</sup> century, although formulations lagged further behind. Most

scholars agree that commercial pet food was first introduced in Europe by American electrician, James Spratt. While travelling to London in 1859 to sell lightning conductors, Spratt noticed that left over or spoiled ship's biscuits attracted dogs. The Pet Food Institute (2006) claims Spratt first observed dozens of homeless dogs eating rancid and moldy biscuits by the shipyard's docks. Corbin (2002) maintains the idea of a dog cake was born upon Spratt's discovery that his own dogs were eating them during the long passage to England. However, Nestle and Nesheim (2010: 34-5) point out that the history of Spratt's dog cake relies on his patents than on his actually creating the biscuit. By the 1860s, dog biscuits were already popular and advertised in enthusiast circles (among hunters, in particular). Regardless of which story more accurately reflects Spratt's experience, Spratt spent the next year developing what ultimately became Spratt's Patent Meat Fibrine Dog Cake, with the help of a London baker, Mr. Walker (Corbin, 2002). Believing he could create something better for animals to eat, particularly during long voyages, Spratt developed a dog cake made from wheat meals, vegetables, beetroot and meat product (mostly beef blood). In contrast to the more common hardtack biscuit, these cakes were much softer and included a wider range of ingredients. Spratt's ideas about a more complete food for dogs were not unique in that time. Many well known veterinarians, animal enthusiasts and emerging kennel clubs and humane societies touted various animal dietary formulations that included a range of food groups (Thurston, 1996). The cakes differed in that they were ready-to-eat biscuits that persisted over time. Home-made canine cakes were similar in their constitution, but perished quickly. Baking the ingredients as a mixture, and having consumers add water later, helped the cakes last longer. They also mirrored familiar human foods and drew on

a similar production technologies and grain and vegetable ingredient resources (though likely the cheaper, poorer quality versions). Grier (2006: 367) points out that Spratt's 'eureka' invention coincided with British military experiments to create better battle rations in response to widespread malnutrition and hunger among troops. Among some of the possibilities were similarly composed meat biscuits, signaling and foreshadowing for Grier a connection between ideas about provisioning and conditioning for both people and dogs. Spratt's early financial success can be attributed certainly to English country gentlemen who purchased the food in droves for their sporting dogs (Pet Food Institute, 2006). The thriving dogs helped Spratt tout his patented cakes as a superior way to feed pets. Even in its humble beginnings, a whole range of human and nonhuman actants assemble to make Spratt, much like Pasteur, into a great man and inventor.

Spratt opened a retail shop in London and introduced the dog food cakes to the United States in the 1870s. He died in 1880, but his company flourished posthumously. In 1895, Spratt's opened a sizeable manufacturing plant and store in Newark, New Jersey. Although the businesses thrived, and a few others followed in his footsteps by the end of the nineteenth century, many pet owners continued to either prepare foods for their animals or provide them with regular food leftovers. Some people had difficulty accessing or financially affording biscuits while others were skeptical about feeding them to their animals more than occasionally (Thurston, 1996: 236). Spratt's dog cakes and other marketed pet foods were known, yet still a supplementary food for the majority of pets. Independent entrepreneurs and existing food or feed companies believed pet food production had great business possibilities. A growing population of overwhelmingly urban animal owners, with mounting disposable income, as well as an abundance of raw

ingredients, created ideal circumstances for new pet food companies. The real challenge was creating constant customers. Much as they do today, the early pet food companies were courting customers. Thurston (1996: 235-6) explains a number of marketing approaches designed to address concerns about pet food and turn animal owners into enthusiastic and loyal clients. For instance, companies paid veterinarians for endorsements, touted the benefits of their food in the treatment of ailments and conditions, and maligned regular food as inappropriate for animals. They rooted their assertions in 'health' and 'science,' even though the formulations were based on conjecture and guesswork (Pet Food Institute, 2006). Some companies heralded their own products by denigrating competitors; they claimed their own ingredients were better suited to animals' needs or simply superior in quality. Other companies aligned commercial pet foods with love, care, and devotion for animals. These actions raised the profile of dog food biscuits and increased their sales (Nestle and Nesheim, 2010).

The advertisements represent the beginning of marketing and advertising projects aimed at taking existing clients from competitors, but also gathering new commercial pet food customers altogether. While relatively successful, these were a precursor to what the marketing that would come. The advertisements would only have marginal economic effect for a few reasons. They would largely fail in generating a significantly new customer base because of the war. The campaigns were not sustained or widespread either, in part for the same reason. But the most serious problem lay with the biscuit. Ultimately the dog food biscuit was a difficult sell insofar as it could only be characterized as a grainy, sludgy substance that many pet owners and pets probably found unappetizing. The advertisements were simply insufficient to overcome the poor quality.

Between the beginning of the century and the end of WWI, a slew of new companies had emerged, starting with A.C. Daniels Company of Boston around 1901 and F.H. Bennett Biscuit Co in 1908. A.C. Daniels Company was popular for their medicated dog bread for chronically ill pets while Bennett and Co. introduced Milk-Bone dog biscuits, which were bone-shaped biscuits. These were a truly unique pet food for the market because they were the first products to be sold as a source of nutrition for dogs, although they were only treats. Nutrition in this case was largely a sales device, although the products included whole milk and animal by-products. But they paid no real attention to nutritional completeness. Within a decade, a growing industry still in its infancy changed again as the other method for pet food manufacture, canning, commenced in the late 1910s. This was significantly later than meat canning for human consumption, which began in the 1840s. Grier (2007: 129) claims the delay can be attributed to the high price of making metal cans, a lack of meat sources, and the technical problems surrounding canning meat until well into the 1930s. Corbin (2006: 515-6) adds that the first batches of canned pet food were marketed in 1916 by Kennel Food Supply Company of Fairfield, Connecticut. The Chappel brothers of Rockford, Illinois popularized canned pet food made primarily of horsemeat. In the early part of the twentieth century horsemeat was widely available in the United States. Under the name, Ken-L-Ration, the Chappels were the first large-scale canners who produced for the U.S. national market. By the late 1920s, the Chappels were selling enough of their 'balanced' canned food to feed 500,000 dogs each day (Case et al., 2000). The company, along with its expanded canned and baked dry pet food lines, was acquired by Quaker Oats Company in 1942. Canned pet food would soon overtake its dry predecessor as the pet food of choice.

Unfortunately, the horsemeat that was abundant after WWI became increasingly harder to come by. Demand for canned pet food increased nevertheless, reaching its apex in 1941 (Cowell et al., 2000). This forced dog food companies to use whatever meat or by-product material was cheaply available, but also pushed them quickly into including more grains in their products as well. Companies used meat and by-products from a wide variety of domesticated and wild species, including cattle, swine, salmon and other fish, reindeer, buffalo, and even whales (Grier, 2007: 134)!

Canned pet food was considered a superior product for a few reasons. Canned products had a longer shelf life, and therefore, were adapted easily to the food distribution systems that were growing longer and more complex (Vialles, 1994). Canned foods were rarely found to be moldy or rotten, as was common of biscuits left on store shelves too long. Cans are also relatively cleaner and easier for pet owners to deal with and seemed to appeal better to more dogs. The canned pet food industry threatened the cereal-based industry. But some producers remained committed to its manufacture and experimented with their development. Dry food was still in some demand and a number of pet food companies continued to pursue and improve their production. In 1928, Clarence Gaines, the son of a livestock feed and flour mixing mill operator, created Gaines Dog Meal (Cowell et al., 2000). Manufactured in Sherburne, New York, and originally sold in 50 and 100lb bags, this food differed from the biscuits common of the time. This is because it was the first pet food to be what we might characterized as nutritionally constructed for its inclusion of vitamins. Earlier brands did not actually adulterate the foods to make them more nutritionally complete. Rather, formulators made nutritional claims based on their knowledge and presumptions about animals' nutritional



needs. Gaines' knowledge of the feed industry, as well as the large 'family' of dogs he lived with, helped establish and expand his business. Both the human food and the livestock feed industries helped fuel his business. In addition to adding vitamins to his formulas, he is thought to be the first to conduct feeding trials (albeit rudimentary ones), the first to use small paper bags (for more manageable portions), and to later include meat and grain meals in his recipe. Meat meal will be explained in more detail later in the chapter. Until then, it bears mentioning that it is one of the most common ingredients in many dry pet foods today.

Pet owners were drawn to the convenience of this new product because they could buy a large quantity at one time and little preparation was necessary before feeding. Unlike the biscuits, Gaines' foods had more moisture and the addition of water was not absolutely necessary for palatability (although it certainly helped). From the producers' perspective, these new meal-based dry foods allowed the inclusion of a broader range of grains, which expanded their sourcing options (Corbin, 2002). Gaines held the largest share of the dry food market until 1958. Also in the 1920s, Ralston Purina, a livestock feed company dating back to 1894, added pet food to its product line. After WWI, Ralston Purina began expanding operations throughout all areas of human and animal agricultural production. The intersection between the two industries accounts for Purina's massive and continuous growth, and acted as a model for competitors.<sup>61</sup> Indeed, Ralston Purina has arguably had more influence on the modern pet food industry than any other company and has led the way in research and product innovation. For instance,

---

<sup>61</sup> The company has been profitable every year except one time in the 1930s.

Purina is credited with the extraordinary feat of establishing a place for pet food in the rural market (Thurston, 1996).

Commercial pet food sales soared on the strength of both canned and improved dry foods through the 1920s, although pet food was sold only in specialty feed and animal stores. Pet owners seemed to accept the available commercial pet food options and enjoyed the convenience they afforded. But pet food companies believed there was room to expand. In 1930, Milk-Bone was purchased by the Nabisco Biscuit Company, which sought to introduce its product line to human grocery stores. Case et al. (2000: 144) explain the difficulty faced by Nabisco. They state that because most pet foods were made from food chain waste, including meat by-products, storeowners and customers considered these products unsanitary and felt it was inappropriate to sell them next to foods meant for human consumption. Nabisco, and soon, other pet food companies, persisted. Eventually, grocers relented and it quickly became clear that the convenience and economy of purchasing pet foods at local grocery stores outweighed these other concerns.<sup>62</sup>

The 1930s were a surprisingly lucrative decade for commercial pet food, all things considered. In spite of agricultural declines and high unemployment, pet food sales mainly grew through the decade. Grier (2006) contends that grocery stores normalized pet food products and that more people purchased them simply because they were available and easy. Perhaps the first wave of corporate consolidation can further explain pet food's economic stability. Small 'mom and pop' pet food makers declined in

---

<sup>62</sup> It is not entirely clear why grocery store chains eventually conceded, but it has been suggested that sturdier packaging as well as an agreement to separate animal and human foods played a significant role in permitting pet foods' inclusion. This legacy endures even today – pet foods often share aisle space with cleaning or household supplies instead of other packaged human foods.

number – going out of business or purchased by larger companies with broader economic interests in food and agricultural sectors. Pet food, then, was another place where companies could divert their unusable by-products, offering greater efficiency from multiple holdings. The cereals (oatmeal and corn flakes) left over after human foods were created could be combined with meat and bone meal, pork cracklings, other grain meals and fat, and sold as a dog food (Corbin, 2002: 515). Pet food manufacturing was low risk and high reward; refashioning food waste in a relatively cheap way meant sales were valuable.

Grocery stores housed both dry and canned pet foods, although it is unclear in which proportions. By the time the Second World War began, canned pet food sales accounted for nearly 90% of the pet food market and were valued in the millions. Commentators have attributed this to returning affluence, claiming that some members of the population had enough disposable income to purchase canned pet foods for their domestic pets. Others have suggested that the competitive pricing of pet foods made them likely human food sources, an urban legend that still endures. These canned foods were commonly made by mixing meat or meat by-products with cereals and then cooking and canning the products (Grier, 2008). They were most popularly made with horsemeat through the decade and into the 1940s, even though horse consumption was fading. Most notably, the introduction of canned foods designed for cats helped sales to soar.

World War II changed the pet food industry dramatically. Pet foods were classified as ‘nonessential,’ a categorization that caused hardship for the canned pet food market. Corbin (2002: 515) explains the classification also meant a fundamental change in pet food formulations. He writes: “Government allocations of ingredients were closely

monitored and products with desirable protein quality and quantity were restricted, thus minimizing quantities for animal food manufacturers.” Wet pet food producers attempted to adapt by changing their formulations and reducing their reliance on meat sources. However, inevitable restrictions on metals meant that the tin used for animal food containers was largely unavailable to the dog food canning industry. Many of the small proprietors in the canned pet food industry disappeared. With neither sufficient tin nor adequate animal protein sources, dry foods that could be manufactured using mainly low quality grain and some meat by-products were introduced or reappeared. So were the flavor enhancers, primarily fats and fatty acids, that the pet food industry began exploring around this time. Perhaps as a consequence of this shift, Quaker Oats Company purchased Chappel dog foods. The next year, General Foods bought Gaines. By 1946, dry food dominated the market. The dry food market is believed to have catapulted from constituting 10%-15% of industry sales to 90% within half a decade. Through WWII, most of this food was made using little animal-derived substances (Grier, 2006). Those that were included were outside the ration program, which became progressively more inclusive and difficult to navigate as years passed. However, once the war was over, canned foods again became popular with pet owners. By 1960, canned pet foods regained a significant share of the market, accounting for roughly 60%.

The pet food industry experienced shifts in the post WWII period. Scholars have commented on changes in the relationship between animals and humans stemming from the geographic movement of people from rural to urban and suburban areas. Animals formerly kept for instrumental, agricultural uses were suddenly ‘useless’ and became mere companions. Ironically, Dzani (2003d) claims the coupling of science with

agriculture has been especially beneficial for pets' nutritional needs. The fields of veterinary science and animal medicine thrived following the war as animal research programs at universities and government funding initiatives exploded. Scientists were most interested in improving their understanding of animals' physiological responses to vitamins, minerals, and other supplements, at least in part to cut agricultural costs and maximize yields. In spite of these intentions, the discoveries were used in veterinary practices and animal hospitals everywhere (Fahey, 2003). Animal hospitals in cities were expanding in response to growing medical demand. As they became prolific, small animal practices even started to carry specialty foods and supplements. Cowell et al. (2000: 129) claim veterinarian, Dr. Mark Morris, Sr., first introduced these new types of food. Morris created specialized formulations that he sold out of his Raritan, New Jersey, clinic. His expertise lay in formulating low protein foods to be used in the treatment of kidney disorders, although he also boasted medicinal food formulations for a host of other common ailments. In 1948, Morris signed a manufacturing agreement with Hill's Packing Company to produce Raritan Ration B, later known as Prescription Diet, for sale in veterinary hospitals. Raritan Ration B represented a new category of pet foods designed to aid in the dietary management of animal diseases.

In the same year, Morris established a foundation dedicated to funding animal health research projects in veterinary programs and practices around the world. Three years later, Mark Morris, Sr. and his son, Mark, Jr. would open an animal research facility in the same town where Prescription Diet was produced: Topeka, Kansas. It was structured as a non-profit research institution dedicated to the study of animal diseases as well as a site for innovations in clinical veterinary medicine. The Morris Institute has

been credited with helping to make possible important advances in veterinary treatment, research and medicine. Some of these include the discovery of new diseases, development of vaccines or treatments (notably rabies), anthelmintics, insecticides, drugs, medications, and even greater awareness of nutrition (Corbin, 2000: 515). Outside the Morris-led institutes and a small number of other programs, animal nutrition research focused on improving health for humans or livestock, even if the discoveries made through cat and dog testing inevitably helped these very species. This proved useful as manufacturers were starting to receive complaints about the texture, appearance and digestibility of dry dog food, and some veterinarians were advising clients to avoid them altogether (Grier, 2006). However, pet food makers were beginning to shift their focus to making nutritional cat and dog foods, although as Nestle and Nesheim recognize, most pet food makers were using nutritional claims to tout the relative benefits of their own foods as early as the turn of the century (2010: 37). By the 1940s, detailed talk of vitamins, minerals and other macronutrients was ubiquitous in pet food advertising. But it was only in 1955 that pet food makers first supplemented and advertised the *added* vitamins in pet foods. Puss 'n Boots cat food added thiamin (Vitamin B<sub>1</sub>) to one of its canned food formulas while also publicising the benefits of other vitamins naturally present in the formulations.<sup>63</sup> This use and promotion of synthetic vitamins, as health-creating and in line with those naturally occurring in pet food formulations, was an important step in pet food manufacturing.

As suggested earlier, nutrition was dominating the industry into the 1950s when Purina secretly opened a private, independent laboratory for animal feeding research.

---

<sup>63</sup> Human food-makers, by comparison, began experimenting with vitamin fortification in food as early as the 1920s.

There, they housed hundreds of dogs and employed teams of scientists and researchers in an effort to better understand dog nutrition and experiment with new food manufacturing technologies. This type of initiative was unheard of at the time. Nutrition studies, beginning with Gaines, took one of two shapes: they were either both small and what could pass at the time as scientifically rigorous, or they were done informally and mostly by entrepreneurs, breeders, etc. Even research in Mark Morris's Foundation and Institute related more to health/medicine and the dietary treatment of diseases. Large-scale corporate investment in general food research did not exist, but was obviously becoming increasingly necessary. Originally an offshoot, feed-associated industry, pet food was attracting greater attention among the population. It was transforming from an outlet for human waste to an independent commodity.

It was clear that many consumers wanted to feed their pets dry food, but only under the right conditions. As mentioned, dry foods are a little more convenient for consumers than moist canned foods. They are easy to handle, usually cheaper, convenient, and less obtrusive than wet foods, which often carry a strong odor. Unfortunately, the cost relative to the quality and palatability of dry pet foods remained a thorny issue for consumers into the 1950s. From the manufacturers' standpoint, foods containing grains are also ideal because canned foods were more expensive to make, had smaller profit margins and were susceptible to supply problems. After the Second World War, horsemeat was becoming scarce and less acceptable as a food ingredient. Access to other meats and by-products was also uncertain as ration programs resurfaced during the Korean War. Grains were in constant supply, inexpensive to purchase, easy to manipulate. For these reasons, Purina was working to create a better, more consistent dry

pet food in the new research facility. Before Purina's development, kibble or biscuit pet foods were produced primarily through baking (Grier, 2007). Industrial baking methods are the same as they are in homes. Ingredients are blended into dough, laid flat on large trays, and then cooked through an oven. After cooling, the sheets of cooked product are cut into the pieces (if they are not already pre-shaped) and packaged.<sup>64</sup> However, a relatively newer and different invention was the model Purina would work with. In 1947, General Foods introduced a hard, dry dog food using pelleting technology. Named the Gaines Krunchon, it would resemble what we might know today as a large kibble. This technology provided a more constant and technological cooking process than baking. Pelleting involves thrusting finely ground mixes, rather than dough, through a machine that uses pressure and heat to cook the substance. The foods are then pushed through multi-hole dies into the form of pellets. Essentially, mixed meals are compressed by heat into small, formed bites. Compared with baking, this production technique for dry food is easier, faster, can be done on a larger scale and tends to produce more consistent results (Case et al., 2000). The food also looks good, which is appealing to pet owners. Theoretically, it would allow consumers to feed dogs a dry formula that was not flaky and did not require added water. Unfortunately, it was inappropriate for the cat and dog food market because the resulting product was still too dry. Pelleting is still popular elsewhere in the animal feed industry, however.

A similar product to the pelleted Gaines Krunchon, an extruded dry pet food, would soon be introduced by Purina in 1957 and revolutionize pet food (Thurston,

---

<sup>64</sup> Baking remains the preferred method of making pet treats even today.



1996).<sup>65</sup> Extrusion has its origins in the materials manufacturing sector from the late 18<sup>th</sup> century, but was adopted as a breakfast cereal production technology earlier in the twentieth century.<sup>66</sup> Its application to the pet food market was an important technological breakthrough that marks the beginning of the modern pet food production era (Pet Food Institute, 2006). Extrusion resembles pelleting insofar as it uses heat and pressure to cook mixes into more consistent dry food bites. However, it works somewhat differently by using higher heat and pressure to involve the food in a process known as starch gelatinization. Starch gelatinization changes the molecular consistency of plant-based foods by allowing water to infiltrate the cell to break down the granular bonds. This allows water to attach to the molecule and expand or puff the food. Pelleting uses a similar process of starch gelatinization, but does so in a different and slower way than extrusion.

Case et al. (2000: 187-8) and Cowell et al. (2000) note that finely ground dry ingredients are mixed together in the extrusion process. These may include plant-based materials such as cereal grain or potato flour, but also meat meals produced through rendering. This blend serves as the base of the product. After it is mixed it is preconditioned with liquids, including fats (also rendering products), untreated meats and water and steam. Preconditioning is a production process that occurs at the base of the extruder, so steam is also part of this step. The preconditioning begins the starch gelatinization process. It only lasts for a brief time, but still has the effect of beginning the cooking phase. The mix then moves into the actual extruder where the cooking is

---

<sup>65</sup> The first pet foods were actually developed in 1954 under the name Purina X-24, but had very limited release.

<sup>66</sup> Today, extrusion is widely used for making breakfast cereals, pastas, crackers, and many other snack foods.

completed. Under further heat and pressure, it is propelled through a cylindrical barrel that is split into different segments. Inside, a large screw (or two) further mix, knead, and proof the food as the ingredients are propelled through the cylinder. The combination of (steam) heat, speed, air, pressure, and friction allows the product to cook and rise continuously. The mix is then pushed into its final shape through a die at the end of the extruder where the kibbles are cut into pieces. The resulting kibbles are spongy and soft. To complete the product, the kibbles are transferred to a dryer where additional moisture is removed. They are then cooled and 'enrobed' with antioxidants, more vitamins and minerals, animal fats, and other flavour enhancers, although these processes were not part of the early pet food extrusion manufacturing. These materials are added after the extrusion process to stabilize the food or because they would interfere with cooking. Antioxidants are required to keep the finished product from spoiling prematurely, but must be added to dry products after the excess water is removed to prevent mold or fungus formation. Vitamins and minerals can degrade under heat and high concentrations of fat will interfere with starch gelatinization. Fat and flavour enhancers also work best as palatants when applied on the outside the finished feed product.

The use of extrusion ensured cereal makers, and not the meat industry, commanded control over dry pet food production as the business became larger and more concentrated. Meat and animal by-products are critical ingredient sources for the pet food industry. But they are feed inputs, certainly in dry foods. Since extrusion requires that a mix contain starches (highly concentrated in cereal foods), companies ensure their

industry's by-products are indispensable to pet food production.<sup>67</sup> As explained, dry pet foods can be made using a variety of manufacturing techniques. But extrusion proved superior to these for a few reasons. Above all, extrusion allowed pet food manufacturers to use more animal-based materials. After the war it became increasingly clear that pet cats and dogs preferred (and probably required) foods containing animal-derived substances to thrive physically (Hussein, 2003a; 2003b). One of the reasons the industry has shunned baking, pelleting or other mixes is because it is more difficult to integrate animal materials into these forms of production. Pet food that is pre-mixed (sometimes by hand) and then baked will yield an inconsistent product with high meat meal concentrations.<sup>68</sup> Pelleting has a longer starch gelatinization period that precedes cooking and including substantial quantities of meat meals would interfere with this process. Other food types, like Gaines's, produced very food of very inconsistent quality and was ultimately not scalable. Both would also create foods that are fairly dry and likely unappealing to some animals. Extrusion, on the other hand, permits the ongoing mixing of proteinaceous meals with grains and other ingredients. The short preconditioning and continuous movement of the product under heat, water and pressure creates well-blended dough. The result is an improved and probably better quality food containing notable amounts of animal-derived ingredients. Indeed, the introduction of extruded pet food meant the consumption of large quantities of meat meals, meat and bone meals, by-product meals, tallow, poultry fat, etc. To get a rough sense of how

---

<sup>67</sup> Extrusion does not absolutely require grain use, although the pet foods are usually more consistent with their use. Because extrusion involves the breakdown of starch (a polysaccharide), other starch sources, including potatoes, will suffice.

<sup>68</sup> Baked products are preferred by some consumers/companies because the products are made at lower temperatures and thought to endure fewer nutrient losses.

much, Bisplinghoff puts cat and dog animal protein utilization at roughly 40% today (2006: 26).

Although extrusion allowed pet food manufacturers to increase their use of animal-derived meals, this was not their primary motivation for using the technology. Extruded pet foods in the 1950s and 1960s contained more animal-derived meal material than their baked or pelleted contemporaries, but still much less than most do today. In other words, they had a heavy carbohydrate loads. The benefit of extrusion was primarily economic. Extrusion was more attractive because it was less costly for a number of reasons. The product was more consistent, which meant less waste. The resulting food pieces are of higher quality – they are light, popped, more palatable to animals than previous dry food formulations, stay together better, look more appealing, last longer, and uniformly mix the full complement of intended vitamins and minerals in most bites (Ockerman and Hansen, 2000: 364-5). For manufacturers, extrusion is also preferable because the continuous action and higher heat of an extruder lends itself to produce cheaper foods as well as larger scale manufacturing. Extruded foods are cheaper because they are less dense – filled with greater air or water concentrations than baked foods. The water content is malleable as well. Extruded foods can be more or less dry depending on an extruder's settings. Perhaps most crucially, extruded pet food can be created more quickly and this production process generates a great deal more output than either baking or pelleting. Extrusion, quite simply, allowed the pet food industry to grow while simultaneously improving the food, at least on its surface. Even though animal-derived ingredients may be thought of as the driving ingredients of the pet food business, cereals and other starch-rich foods are also critical to the business's expansion and development.

Canned wet pet food gained in popularity when ration limits disappeared for good in the 1950s. But a new social climate, as well as the improved, extruded formulation, made dry pet foods much more attractive to consumers than before the war (Grier, 2008). The dry pet food created by Purina ousted Gaines brand as the #1 dry dog food within one year of its release. There were many perceived benefits to these new dry pet foods. They were more economical than wet canned pet foods because they contain a lot less water. Dry pet foods can be left out in a bowl to be eaten at an animal's leisure without spoiling or hardening, which is highly convenient for people. They also stored well because of low moisture content and had a much longer shelf life than their predecessors. The new technology allowed for the production of a consistent product that included both grain mix and meat meals. Equally importantly, dry pet foods fit in well with humans' lifestyles, attitudes and budgets in the postwar period for the reasons elaborated earlier. Olson and Hulser (2003: 140) claim the success of commercially-produced dog food was part of a trend in society toward modern conveniences that would improve the overall standard of living and maximize consumers' free time. Packaged pet food was simply another branch of the mass market for prepared, pre-packaged food in a convenience food era. Thus, dry pet foods turned into the main choice as consumers' desire for these qualities in a pet food grew.

### *Conclusion*

This chapter has traced the emergence of two aspects of modern pet food manufacturing that are indispensable to the industry: rendering and extrusion. I explained the early organization of the industry, pointed to the economic imperative that underlined

the growth of rendering, and explained why the by-product of this industry turned into its key engine. I also explained the shape of the pet food industry prior to the late 1950s to demonstrate how certain economic conditions, scientific developments, and social values shaped the industry. I highlighted why extrusion came to make sense for this industry and how the manufacturing process solidified a connection between rendering and pet food making. I have argued these were necessary developments in the formation of a pet food assemblage. The next chapter picks up on these themes and further examines historical developments in pet food. As I will show, the pet food network continues to develop as regulatory bodies and other organizations become involved in its operation. I point to the way in which nutrition develops as a key actant that configures the pet food network. While present in the industry from the turn of the twentieth century, nutrition in pet food shifts notably and becomes the material and discursive focus of pet food. This required not just the proper technologies, ingredients, resources and companies, but a new way of approaching and translating nutrition.

## **Chapter Six: Nutritionalizing Commercial Pet Food**

The first half of the twentieth century was an important period for pet food production that would shape the dominance of nutrition in the industry. In the previous chapter, I explored some of the most notable innovations responsible for this move. I pointed to the important companies, scientific advances and manufacturing advancements that helped turn pet food into a permanent and lucrative industry. I traced the manner in which some of the principal ingredients, animal fats and proteinaceous animal-derived meals, came to be used in pet food. I showed how these developments contributed to economic growth in the agricultural sector more broadly, and accounted for some of the most important moments in the product's emergence from the middle of the 19<sup>th</sup> century until the 1950s. I also explained how extrusion works and why its use by pet food makers marked the beginning of a secure, economically viable, and scalable era of pet food production that also incorporates significant amounts of cereals and grains. But these were not enough to produce a fully nutrition-driven pet food as we know it today. This chapter picks up from the previous ones to explain how nutrition became integral to the pet food industry. The early industry developments ushered in the transition by making the products desirable, consistent, and marketable. However, it was not until the late part of the 1950s and into the 1960s that pet nutrition was operationalized. As I will demonstrate, at this time the pet food industry began to integrate key principles of nutritionalization into its activities. The full expression of nutritionism was a consequence of three distinct organizations - the Association of American Feed Control Officials (AAFCO), the National Research Council (NRC), and the Pet Food Institute

(PFI), becoming more prominent and working together within the existing pet food industry, throughout the 1960s and 1970s.<sup>69</sup> Ideas about how to provision animals developed in relation to the activities of these groups and ultimately culminated in a full, nutritionist expression of pet food in 1991 when AAFCO incorporated full nutrient profiles into their mandate. Connecting the assurance of a food product's contents with a profile of animals' nutritional needs had the effect of both demanding and controlling the process of formulation. This revolutionized pet food production and marked a unique moment where healthful eating became predictable and actionable. However, it only became so because nutritionalization emerged as the obligatory point of passage in the pet food network. What made nutrition central was the work of many human and nonhuman actants, including not only the actants already operating together and the three aforementioned organizations, but also computers, software, nutrition researchers, nutrition databases, and mathematical formula. These latter enabled nutritionalization in such a way that it came to stand for pet foods while making its materialization invisible.

The process by which pet food came to look as it does is a long one. Much of its course falls in line with similar processes in the human food industry. As with human food, pet food manufacturing is shaped primarily by economic interests that prioritize commodity crop overproduction and the centralization of label ownership in the hands of a few feed/food producers. But as I have already explained and will continue to make clear, the unique oversight of pet food has resulted in a nutritionism exceeding that in human food. The following discussion shall enumerate how each of these three organizations, the Association of American Feed Control Officials, the National Research Council and the Pet Food Institute, – crucial actants in the pet food network – together

---

<sup>69</sup> Again, this is the American NRC.



began to usher in a nutritionist era of pet food manufacturing within the early 1960s. Indeed, each of these organizations are crucial actants in the pet food network. It will provide a historical sketch of each organization to outline how their respective roles in pet food manufacturing changed over time. As the previous chapter stated, certain food products and manufacturing technologies played a key role in shaping pet foods. But so, too, did the stabilization of available ingredients, heightened concern for animals, and more state and scientific investment in nutrition. These turned the industry from one concerned with giving pets food to one concerned with feeding pets; to make feeding commercially-made foods the only viable option in most households. This is a fundamental shift in the organization of the pet food industry that warrants attention.

My analysis in this chapter will begin with AAFCO, the organization most involved in pet food oversight. In spite of industry claims that pet foods are “heavily regulated,” only a small number of government agencies in Canada and the United States oversee this industry (Gillis and Kingston, 2007). Pet food regulation was discussed in Chapter Two and will be considered further. It must be acknowledged that pet food producers are constrained by the legal requirements concerning ingredients and labels, and that pet food is as it is because of its status under the law as an animal feed. Pet food underwent a shift, however, based primarily on its changed relationship with, and expression of, nutrition. Pet food exists in the form that it does not only because of the companies that make it or because of its legal status, but also because of the way these are negotiated in the context of nutrition knowledge regimes, technological innovations, economic incentives and interests, relations with animals, and so on. Thus, pet food is accounted by the feats of a wide range of humans and nonhumans that account for how

the social world shapes and is shaped by assemblages. This analysis elucidates not only the role actants play in making pet foods, but also the way in which pet food is an actor-network constitutive of larger social forces related to animal-human relations or animal food production, for example.

*The Association of American Feed Control Officials, the National Research Council & the Pet Food Institute*

My discussion of the modern era of pet food begins with an examination of the Association of American Feed Control Officials (AAFCO). Pet foods are under the control of AAFCO because they are legally classified as animal feed in both Canada and the United States. Of the three organizations enumerated, AAFCO is the only one associated with government or formal regulation. As I briefly mentioned, it is a voluntary, nonprofit transnational corporation composed of officials of any federal, state, or provincial government agency within North America who are charged with the task of “regulating the production, labeling, distribution, or sale of animal feeds or livestock remedies” (2008: 65). It also provides models and direction for legislation, as well as guidance to pet food makers (Case et al., 2000:146). In terms of its governance, AAFCO’s mandate is simultaneously interpretive and constitutive. Today, AAFCO includes American, Canadian, Costa Rican and Puerto Rican federal government employees, as well as officials from US states, including chemists, biologists, regulators, and so on. The by-laws allow for the participation of non-governmental officials, as AAFCO has advisors, investigators and sometimes members of sub-committees representing a wide range of agricultural organizations, veterinary organizations,

commodity producers, pet food lobbyists, consumer groups, and food companies.

AAFCO does not have direct oversight over pet food, but obtains its authority indirectly through federal, state or provincial laws, particularly as they intersect with both manufacturing, competition, and labeling laws. In other words, AAFCO works with governmental organizations to oversee pet food. This is true in both Canada and the United States, although these nations differ in their respective degrees of regulation. Canada is much more lax in its regulation of pet food, and relies largely on companies' voluntary participation in programs and AAFCO compliance. In the United States, the industry is controlled at the governmental level by the FDA and individual states, and the USDA to a small degree. The degree of oversight by both branches of government is small compared with human food, but has expanded slightly in recent years.

AAFCO was formed in 1909, which makes it a long-standing organization. In its one hundred year history, its powers have remained relatively constant while its responsibilities have expanded. It is this change that has led AAFCO to play a vital role in the modern pet food era. AAFCO was formed in response to mounting concerns about animal feed quality and inconsistency among different state regulations. The meat economy grew considerably around the turn of the twentieth century. The expanding populations of animals bred for human consumption required feed of their own, and a great deal of it. Traditionally, feed for livestock was provided directly by nature in the form of grasses, plants and grains, and supplemented by household and farming leftovers, where available and appropriate. However, farm expansion, the rationalization of livestock rearing, and movement west into less hospitable climates required more use of supplementary feed. The shift toward accelerated fattening as well as arid conditions in

some regions made the year-round and natural sustenance of livestock populations impossible. AAFCO's *Official Publication* (2008: 72-3) explains in its organizational history that this supplementary feed initially came in the form of unadulterated whole grain. As grain provisioning became a lucrative business, the government responded by introducing basic regulatory initiatives to protect against dishonesty. But the protections extended merely to weights and measures, since the quality of whole grains that subsequently would be fed to livestock could be easily assessed by ranchers through the use of basic senses like sight, smell and even taste (AAFCO, 2008: 72).

New and extensive transportation systems that developed throughout the nineteenth century fundamentally altered animal feed provisioning. Agricultural operations continued to swell and move west (Netz, 2004). At the same time, rail transportation routes grew larger and more reliable. Shipping products long distances was a new reality of the nineteenth and early twentieth centuries, which gave farmers access to larger amounts, wider varieties, and therefore, cheaper grains from companies located in the U.S. Northeast or shipped from the Midwest through central transportation hubs (Horowitz, 2006). Shipping whole grain was more expensive or impractical, so grains to be used for feed were ground up. Doing so kept transportation costs down, was spatially efficient, and was feasible for feeding animals.

Unfortunately, grinding up grains made it difficult for consumers to judge their quality, particularly as supplementary quantities grew (AAFCO, 2008: 72). By the end of the WWI, it was clear that feed quality had deteriorated. Two factors account for declining feed quality at this time: the absence of clear (or consistent) guidelines outlining what could or could not be fed to livestock and the push toward profit for feed

companies. Until feed became a commodity, ground and shipped far distances by strangers, its quality was rarely an issue. Farmers must themselves feed animals well because they lose money if their livestock eat poor quality food (Lyman, 1998). Neighbours must not embarrass or alienate themselves from their communities by providing tainted feed. On the other hand, grain sellers located far away do best financially by reducing expenses. To do so, they may engage in behaviours such as converting undesirable grain by-products or other adulterants into animal feed. As long as the finished feed product did not harm animals or eventually the humans that consumed their bodies, polluted feed was difficult to detect. Even reputable firms were thought to be adulterating their products to stay competitive. Anson (1989) claims that almost all feed distributed before WWI included various cheap and inappropriate, but difficult to detect, ingredients - from rancid grains to ingestible wood chips.<sup>70</sup> These constituents lacked nutritional value for animals, at best. At worst, they were toxic and caused or contributed to the death or health woes of livestock. In either case, inferior feeds were costly for ranchers, many of whom were already working in difficult and inhospitable conditions. The fact that many livestock animals became virtually dependent on external feed, as well as unable to vocalize any dissatisfaction with their food source, only meant that feed adulteration worsened well into the first decade of the twentieth century. But even different feed standards presented issues problems.

States' differing feed standards and definitions became problematic because of disparities. The concentration of feed companies in some states was leading to looser feed definitions and lax enforcement. In 1908 government officials held meetings to

---

<sup>70</sup> Nestle (2008: 72-76) claims the feed industry has always used chemicals or treatments on foods to achieve a desired effect as cheaply as possible.

address these issues and set animal feed control priorities for the coming years (AAFCO, 2008). These early meetings provided the foundation for the organization, which still organizes industry standardization. Foremost among the projects taken on by AAFCO were the formulation and distribution of uniform definitions covering all feed ingredients and the establishment of proper labeling requirements (AAFCO, 2008: 72).

Lacking regulatory power, AAFCO's goal is to facilitate dialogue between the various legally-recognized parties. Its mandate is to protect feed buyers and to provide assurances that feedstuffs meet minimal standards. Meeker and Hamilton (2006: 9) assert that the organization accomplishes these goals by defining the composition of all (legally) useable feed ingredients. The early purpose of the organization appeared to focus most, however, on differentiating between acceptable feed ingredients and those inappropriate for use such as non-foods or spoiled foods. In other words, the early AAFCO simply set out to exclude from feed definitions any substances, such as wood chips or sawdust, which would not normally be consumed knowingly or willingly by livestock animals. Advancements in biology, physiology, nutrition and other sciences led to ongoing updates to AAFCO feed definitions as the nutrition of new foodstuffs was explored. This meant the inclusion of nutrient categories, such as protein, fats, and so on, in the *Official Publication*, which eventually received recognition as substances of nutritional importance (Hussein, 2003a). Feeds came to be measured and compared on the basis of their profiles vis-à-vis these nutrients. By the 1920s, most feed laws required such lists on feed sacks. In fact, Nestle and Nesheim (2010: 324) explain that by 1920, forty-two states passed laws requiring feed makers to register their brands and outline the nutritional and ingredient content of their feeds, although not in order by weight. Each of

these laws required the use of a guaranteed analysis statement that articulated the minimum percentages of protein and fat as well as the maximum percentage of fiber. In this combination, these three nutrients were perceived to protect farmers against feed fraud.

Technological breakthroughs in feed development have also been of critical concern for AAFCO in its one hundred year history. New scientific discoveries and developments, coupled with new technological capacities, have led to the creation or discovery of thousands of possible feed ingredients (Dzanis, 2003a). The role of AAFCO is to determine, within the parameters set out in law, whether such ingredients are appropriate feed ingredients – whether they have a biological or physiological purpose and whether they are safe for animal and subsequent human consumption. An AAFCO-approved definition or description is often required of any ingredient before it can be used in pet foods or animal feeds, even if ‘required’ is a loosely administered regulatory description (Hill, 2003b: 85). Making determinations regarding the appropriateness of an ingredient has not been simple and involves the input of a number of individuals and organizations who may possess competing interests.

AAFCO itself does not directly possess enforceable regulatory power but mediates between and advises different parties. The topic of regulation has been addressed, but it is worth highlighting the links between the formal governance of pet foods and AAFCO since there are some connections between the work of this organization and of the relevant governments. As explained, Canada has comparably less stringent regulations surrounding pet food. This is because pet foods are distinguished as an exceptional subset of animal feed. According to Canadian Food Inspection Agency

rules, animal feeds are classified as food substances produced for animal consumption. They fall into two categories: those feeds that enter the human food chain by virtue of being fed to livestock intended for human consumption and those that do not. Pet foods fall into the latter category and are exempt from most of the regulations required of other animal feed.<sup>71</sup> A small percentage of pet foods available on the market used to abide by a now defunct set of voluntary standards outlined by the Canadian Veterinary Medical Association (CVMA) Pet Food Certification Program. Some also adhere to other third-party monitoring, although none of these possess binding or regulatory authority. They would amount to little more than marketing initiatives. At the federal level in the United States, animal feed, including pet foods, are regulated primarily by the Centre for Veterinary Medicine (CVM) branch of the Food and Drug Administration (FDA),<sup>72</sup> but also marginally by the Department of Agriculture (USDA). According to the separation of powers between federal and state agencies, each state in the U.S. also has powers to set out feed safety rules or enforce extant rules, if it desires. Yet Case et al. (2000: 149) observe that most states and the Canadian Veterinary Medical Association voluntarily defer to AAFCO by adopting their recommended feed definitions, policies, procedures, but most importantly, their 'Model Pet Food Regulations.' This means AAFCO inadvertently controls nutrient contents, sets standards relating to substantiation claims, decides how to distinguish ingredients on labels, and so forth. The expression of this control today is in the form of a 'Model Bill' and 'Model Regulations' (AAFCO, 2008: 90-107; 118-182). The organization expressly encourages U.S. states to adopt its

---

<sup>71</sup> This is a regulatory construction but does not seem to reflect the practical reality, proven after the pet food recall crisis, that pet foods are quite regularly fed to livestock, particularly pigs.

<sup>72</sup> In comparison, human foods in the United States are regulated by the FDA's Center for Food Safety and Applied Nutrition.



standards, and has drafted language to do so. States can then enforce the standards outlined by AAFCO. Indeed, the regulatory authority AAFCO possesses is inadvertent. It mandates that manufacturers must comply with an extensive list of ingredient definitions as long as the ingredients meet one of the FDA's approved feed definitions. AAFCO helps to determine whether an ingredient is a feed, but the FDA accepts whether it is generally recognized as safe (GRAS), and therefore, acceptable for use in pet foods.

Although AAFCO's mandate has always been to evaluate feed ingredients and the models that judge them, it has not always been concerned with pet food the way it is today. Case et al. (2000: 146) mention that AAFCO's relationship with pet foods changed in the 1960s when it became more directly and explicitly involved with the pet food industry and introduced the 'Model Pet Food Regulations.' It is rather ironic that pet foods came under the attention of an animal feed body only after they became more widely available and started to resemble human foods more closely, at least in the way they were marketed and sold. It is not expressly stated why AAFCO had little specific interest in pet foods until well after WWII, even though pet food manufacturers seemingly adhered to its feed regulations. There are many possible reasons this may be the case. Perhaps the general trend toward moving pet foods out of feed stores and into supermarkets had the effect of making them more invisible to animal feed regulators. Until the 1930s, commercial pet foods could be purchased only in animal feed stores or directly from producers. Although pet foods' presence in supermarkets became more obvious after the introduction of Milk-Bone in 1931, the relative size of the commercially-prepared pet food industry remained small until the 1950s (Grier, 2008). Few families fed their pet dogs or cats these foods, but each decade saw rising

consumption levels. Pet foods may have also escaped AAFCO's attention for a while simply because the safety of the consumers, dogs and cats, was not a priority. The economic imperative underlying AAFCO had little room for sentimentality toward animals until it was an economic necessity. AAFCO's immediate purpose is to protect the economic interests of animal food producers; to protect animals from adulterated feed in their capacity as economic units and to ensure that feed integrity and consistency are protected. Adulteration of feeds that caused animals or humans to get sick jeopardized the industry. As pet populations grew and they became beloved and cherished individual family members, the economic utility of animals shifted (Shell, 1986). On a large scale, pets were transformed into objects of compassion, and therefore, worthy of attention within the market. The course of their nourishment would become something different than a simple feed designed to minimally sustain them. Instead, it would be an articulation of devotion or care in the form of fulfilling and life-enhancing food.

The economic imperative to feed pets well fuelled a need for consistency that few in the pet food industry contemplated before the 1960s. To be sure, the transformation of pets into (economically) valuable subjects required a reconsideration of their food (Corbin, 2002). The foods, which were financially useful from the standpoint of manufacturers simply because they diverted human food chain waste into a feed ingredient would have to be reassessed somewhat. Nutritional quality would quickly join the imperative toward waste reconfiguration as the driving force of the industry. This is not to say that pet food makers were indifferent to animal health and nutrition before the 1960s. It also not to say they necessarily regard nutrition holistically and in the terms we would recognize today. But there was investment on their part, which was exemplified

by their promotional materials. Grier's (2006) collection of pet food labels reveals that the healthiness and appropriateness of the food was at least a marketing priority, but probably also a genuine articulation of manufacturers' desire to provide good quality, healthy food to pets. The changes that would occur were, therefore, not ideological ones designed to *finally* make 'good' food for pets. Rather, they simply meant that what counts as quality nutrition was starting to change. Mark Morris's work on veterinary nutrition and medicine and similar initiatives discussed previously exemplifies the start of this shift. It was a beginning point in a reorientation of pet food.

Adopting standards for making pet food according to the logic of nutrition would take a great deal of time and involve a number of organizations. Two developments were particularly instrumental in pushing this orientation in the industry: the publication of the earliest '*Nutrient Requirements for Dogs and Cats*' by the Pet Food Subcommittee of the National Research Council (NRC) in 1953 and the creation of the Pet Food Institute. Both pressed AAFCO toward distinct 'Model Regulations for Pet Food and Specialty Pet Food,' and thus, mark a beginning point in a shift toward a nutritionist orientation in pet nutrition and feeding. The creation of a unique section on 'Model Regulations for Pet Food and Specialty Pet Food' in AAFCO's *Official Publication* is not significant on its own. Rather, it is the manifestation of the Model Regulations on pet food packages in the guaranteed analysis statement and the Regulations' effect in circumscribing formulation that has made a modern and nutritionalized pet food era possible. Before explaining how the Regulations fostered unique and advanced forms of nutritionism, the role of the NRC, its Nutrient Requirements, and the Pet Food Institute in building up AAFCO must be outlined.

The National Research Council (2006) is a private, nonprofit institution based in the United States. It, along with four other units, composes the National Academies, a group that investigates and reports on matters of science or art. The NRC is specifically concerned with providing both policymakers and the public with science, technology, and health policy advice based on sound scientific research and evidence. The NRC does not possess any regulatory or legal authority or perform research itself. It only acts as an umbrella organization invested in ensuring the public good by collecting and evaluating research that has been conducted by scientists. The NRC took an interest in animal nutrition research in the 1920s, although this slowed during the depression and ceased during WWII. As can be expected, its initial and principal concern was the health and growth of livestock animals. By the 1950s, the NRC initiated a canine subcommittee tasked with compiling and evaluating nutritional literature dealing with minimal nutrient needs in dogs. The result was the first ever publication of a third-party, science-based summary of pet animals' nutritional requirements in 1953. Smith (1975: 8) explains how this process looked at first: "the nutrient listings were developed by the NRC committee in the same manner that similar lists were developed for farm animals and other laboratory animals. That is, the literature was reviewed for each nutrient for which experimental work had been reported, and best estimates were made for lower limits for nutrient levels." NRC reports are technical enumerations of nutritional needs based on the evaluation of existing research. In its first report, NRC scientists were chiefly interested in identifying essential nutrients and making recommendations for base intake levels of both macro- and micronutrients. In other words, as Nestle and Nesheim (2010: 27) explain, the NRC defined the minimal levels of nutrients required to support

maintenance as well as growth and lactation/reproduction. They also established what would come to be known as recommended allowances, which were the higher of the two amounts. The focus of its first publication was not, then, on the optimal levels required for a pet to remain healthy that we would recognize today.

The first nutrient panel published by the NRC was relatively sparse and inadequate according to today's standard. Moreover, toxicity as a result of micronutrient overconsumption was completely unheard of at this point. Over time this and other gaps or oversights were addressed. Since 1953 the NRC has updated the *Nutrient Requirements for Dogs* in 1962, 1974, 1985 and 2006. There were a number of variations between these documents, most of which centered on updating nutrient information in response to new discoveries within the nutritional sciences. Such changes made the NRC's guidelines most helpful for pet food makers who were interested in making nutritional products with proven scientific support. Indeed, people through the 1960s and beyond were concerned with animals' well being and familiar with the language of dietary nutrients (Grier, 2006). The NRC was in an opportune position to provide pet food makers with scientific research to whet such appetites. As early as 1974, the NRC permitted pet food manufacturers to communicate on their labels that the foods meet or exceed NRC requirements (Anson, 1989: 208). Most of the substantiation research was relatively unconcerned with ascertaining the actual nutritional needs of pet animals (dogs and cats) as ends in themselves. The idea of researching dogs' nutritional needs to make better foods for them was not a popular idea until the later 1960s. Rather, dogs (among other animals) served as animal models for better understanding how nutrients affect mammalian life generally. In other words, the studies used by the NRC

in their 1953 and 1962 reports were initially undertaken largely in pursuit of knowledge for use in either human or livestock nutritional science. In addition, the testing methods for determining such levels would later prove to be problematic for use by pet food manufacturers.

There are two accounts of the problem. Dzanis (2003a) and Nestle and Nesheim (2010) claim that the industry could not continue to use these methods because the custom of scientific research was to perform nutritional research on vitamins and minerals based on what are termed 'pure' concentrations. In pet food manufacturing, pure levels are problematic because nutrients are never wholly available to the body. Pet food manufacturers must correct for the degradation that is associated with cooking, digesting, and the other factors that diminish bioavailability. This means sustained feeding trials, which pay attention to issues of metabolizability, are required to determine appropriate nutrient levels. This type of research simply did not exist in the first half of the twentieth century (Aldrich, 2006: 165-6). Alternatively, it has been said that the NRC's levels were abandoned because their substantiation criteria were too difficult and expensive for pet food makers to meet, particularly in the context of greater regulatory attention being paid to honest and transparent labeling (Martin, 2008). The NRC requires sustained feeding trials for substantiation purposes while AAFCO allows companies to make foods largely without doing so. Feeding experiments are also costly and time-consuming, which means they interfere with getting products to market quickly and affordably.

These circumstances can help to account for the dearth of data for cats. The NRC, in fact, did not publish nutritional research summaries for cats until 1972. These

were part of a larger report on *Nutrient Requirements for Laboratory Animals* (Nestle and Nesheim, 2010: 29). The first distinct report on cat nutrition was produced in 1978, with subsequent reports in 1986 and 2006, when the NRC combined the two publications. The early reports on cats were certainly sparse and required a great deal of updating in subsequent years. As Smith (1975) notes, there was a relatively sizeable body of research using dogs experimentally. The difficulty of housing cats for research purposes meant that relatively less was known about cat nutrition in the pursuit of nutritional information more generally.<sup>73</sup> The preference for using dogs exclusively as research subjects did not subside until prominent problems in cat health were noticed in the 1970s. Until then, there was a presumption that cat and dog nutritional needs were generally very close. The nutritional recommendations for cats were more speculative, based on ethological and physiological science, included assumptions from the canine research, as well as on assumptions about what cats' wild ancestors would have consumed (NRC, 1985). That is not to say there was not cat food in the 1950s or 1960s. The difference between cats and dog foods was really the marketing and packaging; although sold for different populations, the foods were usually identical. The problem of having limited nutritional research experience with cats meant many pet cats started to develop and present health problems as a result of eating food with nutritional deficiencies. This was especially so as the constitution of commercial pet food transformed *and* it came to take up a higher proportion of animals' diets; two points which will be elaborated below. Over time, many micro- and macro-nutritional needs specific to cats have been detected. However, the most well-known example concerned the amino acid, taurine. Taurine can be

---

<sup>73</sup> Unlike cats, dogs are pack and den animals.

synthesized by dogs and humans, but it was discovered and determined to be an essential nutrient for cats in the 1970s (Dzanis, 2003a).

The second notable influence on AAFCO's development of Model Regulations concerns the creation of the Pet Food Institute. The Pet Institute (PFI) is a trade organization that represents the interests of pet food producers. Based in the United States, it is now very large and powerful. Only commercial pet food manufacturers can obtain full membership, although associate memberships are available to major industry suppliers of ingredients, technology, and equipment. The PFI was first formed in 1958 for two general purposes: to encourage more people to purchase commercially-manufactured pet foods for their cats and dogs and raise the profile of pet food producers. According to its website ([www.petfoodinstitute.org](http://www.petfoodinstitute.org)), the Institute "represents 98% of all dog and cat food produced in the United States" and is dedicated to "promoting the overall care and well-being of pets; supporting initiatives to advance the quality of dog and cat food; supporting research in pet nutrition and the important role of pets in our society; informing and educating the public on pet proper feeding and pet care; and representing the pet food industry before Federal and State governments." Grier (2006: 379) characterizes the Pet Food Institute as the lobbying and public information arm of the pet food industry. Thus, the PFI has the task of improving the reputation and relative position of pet food producers. Fox, Hodgkins and Smart (2009: 39) add that the PFI is highly invested in promoting the emotional relationship between animals and humans as a way of bolstering their business interests.

The potential for profit in pet foods was recognized in its infancy by pet food makers and its trade organization, the PFI. One of the reasons the Institute was formed



was to liaise, lobby, and recruit members. But the PFI and its members faced a dilemma: it was increasingly clear the products still had a spotty reputation and too many people were feeding their animals too much regular food. To be sure, the extruded dry pet foods that consumers came to favour were hardly available when the organization was formed (and perhaps made their marketing work easier). As a response, the Pet Food Institute (2006) sought to overhaul the image of a product still looked upon suspiciously by many. This process began in the early 1960s when the Institute embarked on a massive marketing campaign on behalf of its membership to convince pet owners to stop feeding their dogs (and cats) anything other than commercially produced, prepackaged dog food. Advertisements touting the nutritional content or benefit of manufactured pet foods were seen well before this period. But by the 1960s, allusions to special and appropriate formulation were beginning to develop. Thurston (1996: 239) discusses the breadth of the multi-year operation, which cost tens of millions of dollars annually. It included hiring veterinarians as consultants and spokespeople, funding 'research reports' that detailed the benefits of processed dog foods for animals, 'assisting' popular magazines in the preparation of articles on animal care, and advertising widely in magazines, newspapers, and on the radio. The industry also emphasized the human-animal bond by promoting highly romanticized and familialized visions of pet relations. These were shaped by love, devotion, companionship, and responsibility, and helped create a climate where commercial pet foods came to be integrated into the home as a necessary expression of appropriate pet ownership.

There were two differences between the PFI's promotional activities and those which preceded its campaign. This campaign was long-term, sustained, and

international. It was also not just a branding effort where one small company essentially speaks to the overall product, but particularly in comparison with others like it. Rather, its efforts involved new forms of endorsement, including multi-page stories/advertisements in magazines and on television and radio. Experts representing the industry engaged with journalists and talk show hosts about pet foods and their alternatives. The industry funded expert columnists and created 'info ads' that discussed pet needs and the ways commercial foods respond to them. Overall, the initiative represents a case of remaking the product and the consumer.

The promotion of pet foods largely mirrored that of the human foods produced by the same trusted household brands and built on existing advertisements. Commercially manufactured pet foods became a revolutionary current convenience designed specially for pets (Corbin, 2002). They also came to be the only legitimate diet for animals. Table scraps were constructed as dangerous and homemade meals unbalanced, unhealthy, and old fashioned. These were said to pose serious direct and indirect health risks to animals, becoming associated with the onset of acute illness, disease, obesity and other maladies. As the food that had sustained domesticated animal populations for millennia became discursively positioned as inferior, the human stewards who fed them became well-intentioned, but naïve and uninformed, pet owners. This discursive positioning targeted human relations through food and food objects in several ways. Food became the site of contestation over animal health expertise. Both regular foods and the humans who fed them could become intelligible sources of risk or protection for animals. The same was also true for pet foods and the companies that made them. Resonating with classical dualisms that separate nature from culture, scientifically-designed pet foods rendered

regular foods insufficient for animals while making commercial pet foods the only appropriate dietary source for animals. Bren (2001: 30) provides a contemporary illustration of this turn, writing, “Some people think a food that they eat is good for their pets. Not true. Some human foods, in fact, may be dangerous to pets...[Pets] are susceptible to poisoning from a number of human foods...because of their different body chemistry and nutritional requirements.”

The shift toward commercially-manufactured pet foods had the simultaneous effect of establishing the responsabilized model of pet ownership. Humans have lived in close proximity with dogs and cats for millennia. In the west, pet relations akin to what is seen today date to at least the 16<sup>th</sup> century (Grier, 2006). But the notion of pet *ownership* is comparatively recent, and it is my argument that the responsabilized pet owner is even more so. Responsibilized pet owners represent an intensification of animal stewardship that constructs animal care and well-being as attendant qualities of ownership. In addition to a number of other tasks that require a host of involved behaviours designed to bring about the highest form of animal well-being, pet owners are implored to not just feed, but to feed well. This means providing a complete, healthy diet that allows animals to thrive. Commercial pet food, then, was a very meaningful product insofar as it implicated the breadth and depth of science, the love *and* duty of humans for animals, as well as a progressive and affluent household where so-called ‘modern’ middle class women were liberated from the burden of unnecessary and quaint foodwork. These moves began to turn pet food companies into what could be termed an obligatory point of passage in the nutritionalized pet food network. As discussed earlier, an obligatory point of passage is an actant in a network that becomes the legitimate

representative of the network and the body through which new actants must pass before they can be enrolled. But discursive positioning by pet food companies is insufficient on its own to establish the nutritionalized pet food network or their role as the obligatory point of passage. The food companies and their activities are crucial to network-formation. I argue nutrition inevitably displaces them as the central operator of the network. The creation and incorporation of the nutritionist model in pet food, therefore, is not a simple reflection of the needs and wants of capital. Rather, nutrition comes to stand the work of myriad other actants who must be brought in to bear on the network.

According to Case et al., (2000) AAFCO came to be involved with the PFI in the early 1960s. At the same time, it also started to become more engaged with the scientific literature surrounding pet nutrition. AAFCO actually first established a special pet food committee in 1956. But just prior to the 1962 publication of the NRC's *Nutrient Requirements*, the committee issued its first report on pet food labeling in 1961. The early 1960s marks the time in which the three pet food and pet nutrition organizations began working with each other. The Pet Food Institute began to play a role consulting with AAFCO while the NRC's nutritional recommendations held sway. At this time, each organization seemed to have distinct and discernible roles: the NRC identified the nutritional needs of animals based on scientific research reviews, AAFCO defined feeds and encouraged state legislators to make their recommendations law, and the PFI, representing pet food manufacturers, promoted products. Over time the mandate of each organization changed slightly. I argue these are the consequence of each of these actants, with their disparate responsibilities, orientations, and expertise, becoming enrolled in, and subsequently modifying, the commercial pet food network. I argue it is such shifts that

have shaped the pet food industry into one that promotes the nutritionalized commodity that we see today.

AAFCO's role in overseeing production of nutritional products was central to this move, although their direct administration emerged slowly. When pet foods were being manufactured in the 1960s and 1970s, the emphasis was swinging from a focus on reporting content to better integrating nutrition into the reporting mechanisms. However, the work of the Pet Food Institute and its members to encourage consumers to feed commercially-manufactured pet foods created a dilemma: as acceptance of the food increased, so, too, did the need to consider pet foods' nutritional content. Here, then, the problematization of the pet food network materializes. Commercial pet foods were sold long before it was recognized that these products probably should pay attention to animals' nutritional needs. Now serving as the anchor of pets' diets, the Institute and manufacturers wanted to ensure commercial pet foods did not harm animals. Unfortunately, not all products were sufficiently nutritious. Several other nutrient imbalances and deficiencies, as was the case with taurine, were discovered in the 1960s and 1970s (Dzanic, 2003a). Cats and dogs were getting sick, which could tarnish the pet food industry's reputation and cause people to question and stop buying the products.

The issue faced by manufacturers, pets, & the PFI related to consumers actually buying and feeding more pet food, particularly dry foods. Dry, kibble-style pet food sales in the 1960s and 1970s soared. This meant cats and dogs were consuming much greater proportions of cereal than ever before, especially over longer periods of time given their expanded lifespan. Rhodes (1975) suggests this dietary shift caused and also made apparent many nutritional problems. The pet food industry is often looked at as a

meat-based industry. That characterization is a misconception no doubt caused by the millions of dollars in advertising that have over the years stressed the meat content and meat appearance of pet foods. In reality, cereals have played a significant role in making the modern commercial pet food industry what it is today. Grains were used in pet foods before extrusion technologies allowed for more significant inclusions. Leading up to the 1970s, when pet food became firmly established, there was great diversification in the brands of pet foods available to pet owners (Case et al., 2000). Large human food and animal feed companies, including General Foods, Mars, Quaker Oats, Carnation, Lipton, Nabisco and Campbell's Soups, began acquiring these smaller pet food companies in an effort to decrease their operating costs and remake and remarket their human food production waste. Food made by smaller companies was not 'formulated' and was simply fashioned from mostly local industry by-product material and whatever else was cheap. The commodity chain and ingredient panels were relatively short. But consolidation by cereal and food companies lengthened and later globalized both. Rhodes explains how the foods changed within a ten year span, noting that dry products accounted for 35% of industry pound sales in the mid-1960s. By 1975, dry products had grown to 46% of total sales. In 1963, cereal and soy accounted for 43% of the pet food industry's ingredients but counted for over 50% a decade later (1975: 5). In the 1980s and beyond, the pet food industry used non-animal derived materials in greater quantities. In addition to wheat and soy, they added more corn. These cereal-based pet foods are generally much less expensive to produce, tend to be cheaper for human consumers, and appeared to be high quality because of extrusion. But they also created new nutritional troubles for animals.

In the face of potentially undermining their marketing efforts with poor quality foods, pet food makers took greater interest in formulating foods and making them to specifications. This meant thinking about the nutritional content created by placing different grains, meat meals, meats, and other additives into one product. At this time, AAFCO did not directly or indirectly force pet food makers to manufacture to any particular nutritional specifications; it only required honesty on labels and in product promotion. AAFCO first weighed in on nutrition in a meaningful way in 1973, but only for these latter purposes. As Smith (1975: 8) notes, the Pet Food Subcommittee of AAFCO set protocols “to be followed for collecting animal test data to be used to support nutritional advertising claims.” These protocols forced pet food makers to claim the foods were nutritionally complete if certain substantiation mechanisms were followed. Such requirements had the effect of initiating a mountain of cat and dog food testing, which helped to pinpoint the deficiencies and interactions discussed previously. They also made it easier for pet food companies to use grain materials by gaining a better understanding of how these could be balanced with an assortment of nutrient additives. This marked a shift away from food and toward nutrients. It also turned nutrition into a tangible property and realigned the pet food network. Although earlier oriented toward financial considerations, such as inexpensive ingredient acquisition, the pet food network had to adapt to the physiological needs of pets more than those of food producers when pets started to present with nutritional deficiencies as a result of insufficient food consumption. The financial considerations and economic needs of pet food companies were translated to make pet food workable. Networks are not stable or constant. They are dynamic and sustained by constant negotiation between actants. In this case, the issue

of using grains, or any substance, is circumvented by simultaneously providing for companies and animals' bodies. The goal is to make healthy foods that reflect particular nutritional goals. Thus, the ingredients are no longer critical – only their transformation into a specialized final product is.

AAFCO's 1973 protocols circumscribed manufacturers' substantiation methods circuitously for different populations. The question was: how can pet food makers determine whether the foods were 'actually' nutritionally complete? While some may find the premise of nutritional completeness problematic, the industry demands it from its products. The surest way to know how animals will respond to foods, in the animal feed world, is through animal testing. As claimed, pet food testing using both dogs and cats would pick up greatly at this time. Smith (1975: 8-10) details the testing process, noting the techniques as well as the significant amount of data generated. The primary methods for nutritional substantiation are as they are today: feeding trials and laboratory analysis. More precise conditions under which feeding trials were deemed 'successful' would be enumerated in AAFCO's 1985 Regulations. In the meantime, these early trials would ensure dog or cat consumers did not develop sickness as a result of eating the new food. They would also undertake laboratory analysis where the vitamin, mineral, and energy inputs (food) and outputs (urine and feces) were measured. Pet food manufacturers, for the first time, were attempting to understand pet foods' nutrition in terms of intake, digestion, and retention. These differed from most NRC nutritional research initiatives by accounting for cooking and bioavailability (Nestle and Nesheim, 2010: 31). Still, the NRC Guidelines provided a helpful base from which to begin. Most critically, these tests would help form the basis of AAFCO's Nutrient Profiles.



Writers like Martin (2008) and Fox, Hodgkins and Smart (2009) have been rightly suspicious that pet food substantiation tests have always been too dependent on pet food makers. Very little pet food testing has been funded or undertaken truly independently, and this is perhaps even truer of the earlier tests. Of course manufacturers ought not to be accused of conducting such research in order to produce shoddy food, which is at least partly against their economic interest.<sup>74</sup> But they would certainly conduct nutritional tests with at least half an eye toward the bottom line, and the effect of those concerns on pet foods' nutrition cannot be completely ignored. One additional problem that Fox et al. (2009) point out is that pet food testing is not comparative. Researchers only undertake pet food testing of highly processed and cooked foods, which mean that claims regarding healthiness simply evaluate these types of products and not alternatives such as natural or raw food diets. This is significant because testing foods gives consumers a sense of certainty that energy needs, bioavailability, and other complex nutritional matters deduce these are the *best known* options.<sup>75</sup>

The testing of only commercial pet foods circumscribes an especially limited view of healthfulness. This is important because the testing work of pet food makers, operating under the auspices of the PFI, helped to shape AAFCO's soon-to-be Nutrient Profiles. Before the development and acceptance of AAFCO's Nutrient Profiles, the NRC's reports on nutrient requirements for dogs and cats were the recognized authorities for pet food formulation and substantiation of nutritional adequacy claims on the labels of commercial pet foods. Although not without its problems, the NRC's reports assumed a

---

<sup>74</sup> It must be highlighted that it is in their interest to produce high quality food. But that is not to say they must use high quality ingredients. As I said, nutrition transforms ingredients into nutritional foods.

<sup>75</sup> It also suggests that these complex matters can be known precisely, a dubious claim at best.

varied diet of both raw and cooked foods. This model cannot be applied in the pet food industry for the reasons enumerated. Given the inadequacy of the NRC's targets to manufacturers and AAFCO (insofar as AAFCO forced pet food makers to adhere to reporting claims), and because it was becoming clear pet food makers could not adhere to NRC testing as required by labeling laws, by the time the 1985/1986 AAFCO Regulations were released AAFCO was considering its own nutrient profiles. In 1991, it produced them and supplanted the NRC's recommendations. That does not mean the recommendations of the NRC were abandoned completely. In fact, AAFCO's Pet Food Model Regulations in the *Official Publication* acknowledge the NRC's 1978 and 1986 nutrient profiles as the origin point for their own nutrient limits (AAFCO, 2008: 130-139). But the document also acknowledges that a departure from the NRC was necessary for the industry. This is so only because the NRC's research structure was incommensurate with a commodified food industry.

It is worth saying that AAFCO's nutrient profiles were not radically different from the NRC's in their form. What their being represented, which was radical, was a new imperative in the manufacture of pet food. It takes for granted that a largely homogenous diet with significant synthetic vitamin and mineral nutrients is not just known to be healthy, but is known to be healthiest. Unprocessed foods could not be tested in accordance with the rules of AAFCO. Further, nutritional completeness under AAFCO requires the addition of nutrients, specifically vitamins and minerals, 'regular' raw or natural pet foods that are not produced by commercial pet food manufacturers cannot be enrolled in the pet food network. They necessarily miss the obligatory point of

passage of nutrition and sit in contrast to 'legitimate' nutrition espoused by the pet food industry.

How is it possible to assure that AAFCO's nutrient specifications are followed? How do pet food makers actually make foods in such a way that use the Regulations, yet preclude unprocessed regular foods from doing so? The following section outlines how pet food is made to fit with AAFCO's nutrient specifications. As I will show, AAFCO's takeover of nutrient profiles coupled with its extant control over product reporting necessitated formulation. This represented a new way of manufacturing and married pet animals' nutritional needs to the one of the final measures of nutrition: the guaranteed analysis. Suddenly, the assembling together of regulators, commercial producers, other industry representatives, scientists, manufacturing technologies, the grain and animal food sources, human consumers, and the pets themselves helped translate foods for pets into nutritional pet foods.

### *Making Nutritionalized Pet Food*

In spite of all the coverage and publicity pet food receives, very little has been written about the process by which pet foods are produced. This is particularly the case when one considers pet food manufacture from conception to final product. I have already detailed some of the important innovations in manufacturing pet foods, particularly with respect to dry foods. In Chapter Two, I described some of the main ingredients used in pet food manufacturing. In the previous chapter I further explored the origins of the main animal-based ingredients, rendered meals, and outlined how extrusion was critical in making a nutritionally consistent dry kibble that was good economic value,

attractive to humans, and widely accepted by pet animals. This section extends my analysis to explore the way in which the pet food industry uniquely constructs nutrient categories through multiple translations. Foods are converted into nutrients by formulas, weights and other measurements which change foods – objects of consumption – into numeric calculations and tables. In so doing, nutrition guides the pet food production process by integrating it with nutritional targets and the guaranteed analysis statement. Before such integration, production happened and product constitution and nutrition was reported. Today production begins before ingredients are acquired, combined, mixed, processed and cooked. Pet food assembly begins, instead, with the product's formulation. Whereas in human food manufacturing any food can be fashioned and the nutritional profile evaluated and communicated, pet foods use a different process. In the pet food industry, the desired nutritional constitution is known in advance and the product is assembled accordingly. In other words, pet food manufacturers have a nutrient formula that will be used to generate a set of ingredient inputs for their specifications.

There are several similarities and differences between formulation in human and pet foods. Human food companies use formulations to the extent that they wish to produce nutritionally consistent foods between batches. They may even formulate in advance of production in order to produce a target food. In the latter case, the practices outlined below will likely apply. But there are some reasons that pet food production and human food production follow generally different paths. First, human food companies may make a food product any way they want and simply report the nutritional content (as long as they do so legally). If they choose to manufacture a product that adheres to a certain nutritional profile, as might be the case with a diet product, the manufacturer need

only experiment with their formula to generate the desired product. Moreover, human food products need not include a 'complete and balanced' macronutrient and micronutrient profile that purports to meet a body's overall nutritional needs. If vitamins or minerals are added to produce a nutritional benefit, the company need only report such inclusions. Thus, formulations are significant in human food production. In pet foods, they are essential. They drive the entirety of the production process. Nutritious pet foods cannot be made without formulation. So the proprietary nature of this industry ties economic value directly to nutrition.

The following section will explain how pet food makers can manufacture dry pet food products that are driven by nutrient formulas. Dry foods serve as the exemplar for a few reasons, although most of the principles will apply to wet pet foods, some human foods, and other animal feeds. First, dry food is slightly more difficult to manufacture because it has additional manufacturing steps. Dry foods must also be formulated to meet the complete nutritional levels established by AAFCO while wet foods may be designed as complete or supplementary. Dry foods are considered complete compound feeds, which means they are prepared according to the specific requirements of the target animal. Again, there are some wet foods that are nutritionally balanced, and my description of the formulation process can be extended to those examples. Lastly, dry food is the more popular form of commercial pet food and serves as the anchor of most pets' diets.

Since formulation drives the production process, one would rightly expect that pet food production starts there. As I explained earlier, AAFCO integrated food nutrient profiles into their regulations in 1991. Manufacturers must use a variety of agricultural

and scientific inputs to create products that conform to AAFCO-approved nutrient profiles for cats and dogs. These profiles, which can be found in AAFCO *Official Publication*, are reproduced below. Table 6.1 lists the DM Nutrient Profile for dogs and Table 6.2 lists the DM Nutrient Profiles for cats (AAFCO, 2008: 131-137).

**TABLE 6.1: AAFCO Dog Food Nutrient Profiles Based on Dry Matter**

<b>Nutrients</b>	<b>Units DM Basis</b>	<b>Adult Maintenance Minimum</b>	<b>Growth and Reproduction Minimum</b>	<b>Maximum</b>
<b>Crude Protein</b>	%	18.0	22.0	
Arginine	%	0.51	0.62	
Histidine	%	0.18	0.22	
Isoleucine	%	0.37	0.45	
Leucine	%	0.59	0.72	
Lysine	%	0.63	0.77	
Methionine-cystine	%	0.43	0.53	
Phenylalanine-tyrosine	%	0.73	0.89	
Threonine	%	0.48	0.58	
Tryptophan	%	0.16	0.20	
Valine	%	0.39	0.48	
<b>Crude Fat</b>	%	5.0	8.0	
Linoleic acid	%	1.0	1.0	
<b>Minerals</b>				
Calcium	%	0.6	1.0	2.5
Phosphorus	%	0.5	0.8	1.6
Ca:P ratio		1:1	1:1	2:1
Potassium	%	0.6	0.6	
Sodium	%	0.06	0.3	
Chloride	%	0.09	0.45	
Magnesium	%	0.04	0.04	0.3
Iron	mg/kg	80	80	3000
Copper	mg/kg	7.3	7.3	250
Manganese	mg/kg	5.0	5.0	
Zinc	mg/kg	120	120	1000
Iodine	mg/kg	1.5	1.5	50

Selenium	mg/kg	0.11	0.11	2
<b>Vitamins and Others</b>				
Vitamin A	IU/kg	5000	5000	250000
Vitamin D	IU/kg	500	500	5000
Vitamin E	IU/kg	50	50	1000
Thiamine	mg/kg	1.0	1.0	
Riboflavin	mg/kg	2.2	2.2	
Pantothenic acid	mg/kg	10	10	
Niacin	mg/kg	11.4	11.4	
Pyridoxine	mg/kg	1.0	1.0	
Folic acid	mg/kg	0.18	0.18	
Vitamin B12	mg/kg	0.022	0.022	
Choline	mg/kg	1200	1200	

**TABLE 6.2: AAFCO Cat Food Nutrient Profiles Based on Dry Matter**

<b>Nutrients</b>	<b>Units DM Basis</b>	<b>Adult Maintenance Minimum</b>	<b>Growth and Reproduction Minimum</b>	<b>Maximum</b>
<b>Crude Protein</b>	%	26.0	30.0	
Arginine	%	1.04	1.25	
Histidine	%	0.31	0.31	
Isoleucine	%	0.52	0.52	
Leucine	%	1.25	1.25	
Lysine	%	0.83	1.20	
Methionine-cystine	%	1.10	1.10	
Methionine	%	0.62	0.62	1.5
Phenylalanine-tyrosine	%	0.88	0.88	
Phenylalanine	%	0.42	0.42	
Threonine	%	0.73	0.73	
Tryptophan	%	0.16	0.25	
Valine	%	0.62	0.62	
<b>Crude Fat</b>	%	9.0	9.0	
Linoleic acid	%	0.5	0.5	
Arachidonic acid	%	0.02	0.02	
<b>Minerals</b>				

Calcium	%	0.6	1.0	
Phosphorus	%	0.5	0.8	
Potassium	%	0.6	0.6	
Sodium	%	0.2	0.2	
Chloride	%	0.3	0.3	
Magnesium	%	0.04	0.08	
Iron	mg/kg	80	80	
Copper (extruded)	mg/kg	5	15	
Copper (canned)	mg/kg	5	5	
Manganese	mg/kg	7.5	7.5	
Zinc	mg/kg	75	75	2000
Iodine	mg/kg	0.35	0.35	
Selenium	mg/kg	0.1	0.1	
Vitamins and Others				
Vitamin A	IU/kg	5000	9000	750000
Vitamin D	IU/kg	500	750	10000
Vitamin E	IU/kg	30	30	
Vitamin K	mg/kg	0.1	0.1	
Thiamine	mg/kg	5.0	5.0	
Riboflavin	mg/kg	4.0	4.0	
Pantothenic acid	mg/kg	5.0	5.0	
Niacin	mg/kg	60	60	
Pyridoxine	mg/kg	4.0	4.0	
Folic acid	mg/kg	0.8	0.8	
Biotin	mg/kg	0.07	0.07	
Vitamin B12	mg/kg	0.02	0.02	
Choline	mg/kg	2400	2400	
Taurine (extruded)	%	0.1	0.10	
Taurine (canned)	%	0.2	0.20	

These tables show the maximum or minimum amount of each nutrient that must be contained within a food on a dry matter basis. Although the guaranteed analysis statement reports nutritional composition of whole foods, its listing is decidedly shorter and differs in two ways. First, the guaranteed analysis reports broad nutritional constitution of finished products whereas the AAFCO Nutrient Profiles tables break down the nutrients much further. For example, a guaranteed analysis statement will



report on overall protein while the Profiles outline the minimum requirements in terms of each amino acid. The guaranteed analysis statement also reports the nutritional levels of the finished individual products. The AAFCO Nutrient Profiles mandate the minimum nutrient levels allowable for any 'complete and balanced' dog or cat food on the dry matter basis. In contrast with the finished product, which measures the nutritional value of a food exactly as it is purchased, dry matter refers to the nutritional composition of a product when the moisture is not counted.

These tables each have two sets of minima, as well as maxima, when applicable. The minima correspond with the different populations for whom the food is intended. The 'Adult Minimum Maintenance' column establishes essential nutritional needs for adult canine and feline populations while the 'Growth and Reproduction' column establishes minimum essential nutritional needs for puppies, kittens, or pregnant/lactating bitches and queens. The AAFCO Nutrient Profiles further establish inputs based on four broad nutrient categories: protein, fat, minerals and vitamins. These are some of the main nutrient categories required in guaranteed analysis statements and the main nutritional categories, excluding carbohydrates and water, more generally. In the case of adult food minima, AAFCO requires food to be 18% protein on a dry matter basis for dogs and 26% protein on a dry matter basis for cats. Since proteins are composed of amino acids, AAFCO profiles establish minimum levels for the full complement of essential amino acids. Accordingly, the required amino acids and respective levels differ for cats and dogs; dogs require 10 amino acids in their foods and cats require 12 (methionine and phenylalanine may not be provisioned only in compound form as is the case with dog foods). This is because each species uniquely acquires amino acids by synthesizing them

in the body, obtaining them by diet, or some combination thereof. This is also the reason the required amounts of distinct amino acids enumerated in the nutritional profiles do not add up to the total minimum protein requirement. Cats are seen to require a minimum of 26% protein, with at least 1.04% of the total from Arginine, 1.25% of the total from Leucine, and so on. As long as cats obtain the minimum amounts of each amino acid, the remaining amounts can be any combination. Cats have a few other unique nutrient needs as well, which correspond with their distinctive physiological capabilities. An exogenous taurine source would be the most well recognized of these.

The target nutritional requirements are very precise. Such nutrient specificity especially stands out when contrasted with the nutrients enumerated on the guaranteed analysis statement. The two are, however, related. Manufacturers must make products that conform to AAFCO food profiles, which means they must translate agricultural and human-made food ingredient products into nutrient profiles to meet the targets. What must also be said is they are required to do so in a way that is economically efficient. Regardless of whether the food is a discount brand or a premium product, pet food manufacturers attempt to make food as cost-effectively as their business model allows. Certainly there are many cases when individuals or companies weigh monetary costs more heavily than animals' health and well-being (Nestle, 2009). They may purchase poor quality ingredients or introduce adulterants to maintain the appearance that the food is good and adheres to AAFCO requirements. But even companies genuinely interested in producing high quality and nutritious commercial pet food must be mindful of ingredient prices and input costs. After all, pet food production is a business. The

question, then, is how can pet food makers produce a food that meets such precise nutritional goals in a cost-effective manner?

While the process may differ slightly between manufacturers, generally pet food companies use several tools to meet their nutritional obligations and monetary objectives. The process will involve a great deal of trial and error to identify what ingredients are needed to make a food with as complex a nutrient profile as the one established by AAFCO. This is particularly so when new ‘food families’ are being devised.<sup>76</sup> Making pet food is a practice that begins with formulas. Pet food makers start with a target guaranteed analysis as well as some other general specifications (i.e. that the food will be a chicken formula, contain no corn, no animal by-products, etc.). The target product profile (the starting guaranteed analysis) must include minimum protein, fat, and moisture levels. It also must meet or exceed AAFCO nutrient profile levels because the latter is minimally required in all food. The guaranteed analysis enumerates the nutritional profiles of the finished product including the water content. AAFCO nutrient profiles, however, are based on dry matter levels. The *Official Publication* acknowledges that manufacturers and particularly those substantiating pet foods’ claims have to correct for moisture content to ensure the food falls in line with AAFCO. The organization remarks, “the difference between a value reported on a DM basis vs. an AF [as fed] basis is proportional to the moisture (water) content of the food...this discrepancy makes direct comparison between the food and the table values impossible without first correcting one or the other sets of values, so that both are on an equal DM basis” (2008: 139-40). This is why the moisture amounts are crucial in the initial formulation process. Manufacturers

---

<sup>76</sup> Food families are foods that are approved for sale as AAFCO ‘Complete and Balanced’ foods on the basis that both their ingredient lists and their nutritional profiles are close to food products that have been approved as AAFCO ‘Complete and Balanced’ foods through feeding trials.

must determine the moisture amounts of the finished products, set a target guaranteed analysis profile that includes the water, and then using formulas, deduce that the food on a dry matter basis falls in line with AAFCO's Nutrient Profile levels. In other words, to make nutritional products, manufacturers must first set the final product's nutrient levels. They will then take out the water to ensure that the dry matter hits the targets articulated in the Profiles. In other words, they use only nutrient measures to construct not-yet made foods.

After a pet food manufacturer determines a food's macronutrient composition vis-à-vis moisture levels and some basic food characteristics (what it will be made with), it will then continue with formulation. The next step is to determine how to put together a nutritionally complete food that adheres to the specifications, target guaranteed analysis profile, and minimum AAFCO nutrient profile requirements using a wide range of food inputs. Pet food makers will need to select the appropriate ingredients to make foods. They need to work with foods/ingredients but transform them into numbers to comply with a set of rules put in place because of the economic imperatives associated with feeding animals. So how do pet food companies make a 'turkey and brown rice' kibble with a specific guaranteed analysis at the target cost? How do pet food makers put together a food made, not from numbers, but regular ingredients like turkey, turkey meal, brown rice, flaxseed meal, whitefish, eggs, ground corn, pea fiber, or the thousands of other additives available to meet regulatory standards?<sup>77</sup> How can they know the respective nutritional levels amounts to generate the foods they desire at the intended

---

<sup>77</sup> As witnessed during the 2007 pet food melamine recall, pet food makers sometimes use ingredients not to satisfy nutritional needs, but rather nutritional measurements, of a food. This is a wonderful example of nutritionism working around (and in concert with) food.

costs? In other words, how can a company actually use the target to devise proper ratios of inputs to count the nutrients in their foods?

There are infinite ways to generate a legal formulation, mainly because pet foods demand minimum nutrient levels. Accordingly, thousands of pet food manufacturers can have the same guaranteed analysis and use completely different ingredients to make similar products. Two pet food manufacturers can even have the same guaranteed analysis and use the same ingredients (albeit at different levels) to make different products. Pet food formulation is about the nutritional profiles derived from combining ingredients with each other in overall amounts. Pet food companies use several tools to do this.

The first is the USDA National Nutrient Database for Standard Reference (Agricultural Research Service, 2010). This searchable database provides reports on the full nutrient composition of over 7,500 different foods. It functions to establish verifiable levels for food processors and assures consistency in nutritional reporting. While the inclusion of nutrient content for commodities is to be expected, other foods/food categories are quite surprising. For example, one will find different reports for raw apples with or without the skin, likely to account for differences in fiber. Yet the reports are not so specific as to outline all apple varieties, although they will differentiate among animal breeds within the same species. There are also reports for alcoholic and non-alcoholic beverages, and even popular processed foods like Applebee's French fries or Oscar Meyer hot dogs, for instance. What cannot be found on this site, which is of note to pet food producers, are any ingredients that are not used in human food manufacturing or manufactured for human consumption. This includes rendered meat or fish meals, as

well as less popular grains such as ground corn or wheat germ meal. As might be expected, vitamins and minerals are also not on the list. In these cases, pet food companies and co-packers will derive nutritional information directly from suppliers. The supplier may go to the USDA's list to determine its products' nutritional values or simply test and report themselves. Since most of the ingredients pet food makers use in their products are commodities they purchase, the responsibility for reporting nutritional information falls on the suppliers.

It is not enough to simply possess this extensive nutritional information. Pet food companies must use it to make products that adhere to broader nutritional guidelines. Yet most of the foods produced by pet food companies are made with ten, fifteen, twenty, or more ingredients, in addition to binders, preservatives, minerals and vitamins. How can companies turn such comprehensive nutritional information into products in a timely way? How can they manage such information if they do not add the total nutritional composition *after* the food is made, but instead, use this information to generate final products? They can do so using computerized formulation software programs that can quickly and efficiently process exceptional amounts of nutritional information. Formulation is integral to the livestock feed industry, and has been part of basic operations at least informally for over a century. But since the late 1970s, the animal feed industry has been using computer programs to devise the most nutritionally and economically efficient rations possible.<sup>78</sup> The animal feed industry is lucrative - worth billions of dollars annually. Livestock feed companies are among the largest purchasers

---

<sup>78</sup> Feed management companies date to the late 1960s, but the first feed software program, according to industry websites, appears to have been introduced in 1978-79 by Argi-Data Systems (now Creative Formulation Concepts, LLC).

of corn, soybeans, wheat, barley, sorghum and oats. These programs make it possible to ration the 'best' blend of foods that account for corporate economic interests, expedient growth and animal healthiness. Even the pet food industry was using these programs to deal with the mountains of data generated by their testing explosion in the 1970s (Smith, 1975).

Feed software programs work by allowing manufacturers to turn ingredients into a recipe that will correspond with a desired guaranteed analysis. For example, if a pet food producer wishes to make a premium food composed of chicken and brown rice, but also high in anti-oxidants and fiber, the formulation software can prompt the user to add higher concentrations of proteinaceous ingredients, fewer vegetables, and so on. It will help the user add up the nutritional composition of all ingredients, highlight the deficiencies in the formulation, as well as the places where the formulation is economically wasteful. If a hypothetical guaranteed analysis calls for 32% protein, and a formulation that uses 355g of chicken meal/pound produces 36% protein, the software will point this out so the user can cut the amount of expensive chicken meal to a more 'appropriate' level and suggest a fitting replacement. In other words, these programs allow feed makers to input initial information to generate complex nutritional data that is attentive to cost. This is then translated into ingredient weights that will be used to prepare foods that correspond with AAFCO Nutrient Profiles. Starting with a guaranteed analysis and a few basic ingredients, these programs will suggest supplementary ingredients and other additions that can be added to the base to make the food whole. They will then provide a summary of how much of each ingredient must be added by weight. The formulation process works like a recipe that can constantly be altered and

evolved, but will nonetheless fit within a larger nutritional structure. For this reason, formulations are the key to the pet food industry. And their importance is reflected in the fact that they are closely guarded and proprietary secrets.

When AAFCO combined its newfound control over nutrient standards with its traditional control over both manufacturing standards, it effectively reorganized nutrition. Nutrition did not always look the way it does now and it could have been (and often is) another way. Production did not have to be based on a relatively inflexible nutrient formulation system. This transformation of nutrition is crucial only if pet food companies wish their products to be the sole food source of cats and dogs. Thus, the nutritional information *and* formulation is important precisely for this reason. What happens in the process of the foods being made is twofold: the other actants involved in making pet food disappear from legitimacy and become entrenched within the network while the assemblages that arrange this system and reorganizes nutrition within food disappears. The food, then, becomes *a priori* healthy and appropriate, and pet food companies, in the main but not to the total exclusion of other state, individual, or non-profit actors, the purveyors and assurers of healthy cat and dog food. The interests of the network are realigned and nutrition ‘black boxed’ into a stable system that is disassociated from the processes, laws, and circumstances of their production.

### *Conclusion*

This chapter has outlined how pet food came to be nutritionalized. As I demonstrated, the emergence and changing role of AAFCO, the PFI, and the NRC had the effect of transforming pet foods into nutritionally complete products. I argued that



this could not have happened without all three organizations working together and inevitably seeing their formerly exclusive responsibilities erode. This is particularly true for the role of AAFCO, which, without abandoning its oversight and reporting responsibilities, also included defining animals' nutrient needs in its mandate. It is my contention that the reorientation had the effect of changing and adapting the network in such a way as to become organized around nutrition. I explained how this worked by pointing out the mechanism that allows pet foods to manifest nutritionism in their manufacture: formulation. As I explained, formulation dictates production operations. Pet food makers must use pre-set nutritional criteria to determine how they will make their foods. In other words, the industry rests on the assumption that a regulatory body can identify an animal population's nutritional needs and subsequently produce them systematically and mathematically through use of a range of formulas, charts, graphs, and other technologies. I have called this the quintessential expression of nutritionist eating. The next chapter departs from a discussion of the practical and material dimensions of pet food to consider how people's relationships with animals shape the industry. As I will later explain, this nutritional reality is not the one advertised by the industry. Pet food makers communicate a very different nutritional reality that is based on ideas not just about food, but also about pets and livestock.

## **Chapter Seven: Selling Pet Food**

I explained how the pet food industry has constructed its products. I claim that pet food is a network arranged of human and nonhuman actants and organized around an emergent form of nutrition. This nutrition defines health in terms of macronutrient and micronutrient composition to the point that foods are fashioned in order to meet circumscribed targets. Pet nutrition is taken to be a true and sure quality that can be identified and provided by pet food. The manufacturing process reifies the surety of this system by using multiple calculations and nutrient analysis reporting in manufacturing. The enrolment of many actants occurs through the processes of obtaining ingredients, constructing and making foods. What is not altogether clear is how humans outside the industry participate in this network. In ANT terms, this chapter investigates how animal owners are enrolled and participate in the pet food network. They are not simply passive in its operation, but have interests that are also negotiated. Thus, while a great deal of attention has been paid to the nutritional constitution of pet food products, this chapter explores the way in which nutrition becomes possible as a discursive construct. It explains how ideas about nutrition are important to the development and stabilization of the network. Earlier I claimed advertisements and campaigns by the pet food industry were an integral part of this action. But that description was in the context of the pre-nutritionalized pet food network. Pet foods operate according to a newly emergent logic, and so the participation of humans must be re-evaluated. Here I will argue that pet food packages, and to a lesser extent, pet food companies' websites, shape both the nutritional subjectivity of pets and the character of the foods. In other words, pet food companies

must reassemble the products because the process of nutritionalization largely disentangles food from nutrients. Moreover, the nutritionalized products described earlier are largely incomprehensible to human consumers. This chapter considers how pet foods are made to make sense to humans. It points out that while nutrition is a key operator of the network, its manifestation for human consumers is unique somewhat. Following Mol (2002), I show how nutrition is itself a constantly negotiated network-object, or a 'composite reality.' Nutrition lacks an ontological underpinning, but is the subject of negotiations, articulations and enrollments.

I will claim that, rather than reporting the properties of foods, companies employ a range of contradictory narratives about nutrition. I situate these in terms of a broader understanding of humans' relationships with animals, companion or otherwise. I argue that pet food companies use discourses that simultaneously anthropomorphize and animalize dogs and cats. Although seemingly in conflict, I claim dogs and cats are framed as both family members with unique preferences as well as carnivoristic beings with a natural, evolutionary taste for meat. At the same time the foods are represented at once as holistic or natural and formulated or balanced. I contend that these representations have several consequences. They render the degree of processing within pet food invisible and underplay the inclusion of certain ingredients. But most importantly, they erase the very conditions that make pets' consumption of other animals possible; they simultaneously but inadvertently justify the slaughter of millions of livestock, primarily for human consumption. Pet food companies turn nutritionism, a unique approach to food, into a transhistorical and natural relationship to food. This has the effect of naturalizing circumstances that are contrived entirely by humans and turning

pet food companies into passive bystanders rather than active beneficiaries in the process. The consequence of these moves represents the ongoing entrenchment of the nutritionalized pet food network.

### *Packaging Food and Nutrition*

Pet food companies sell products in many different ways. With the exception of vegetables and fruit, most foods sold in North American retail stores are contained. These packages must have labels that reveal basic information about the product contained therein, including its ingredients, the company manufacturing or distributing the product, and its nutritional composition. Some food companies keep their packaging simple and to the point while others use the packages to promote the commodities and recruit customers. Food companies can be said to package their products both physically and discursively. In an environment where literally thousands of new products appear annually, it is critical for businesses to capture and maintain as many customers as possible. The food business is a somewhat unique industry insofar as foods and their marketing are affected by many factors, such as research findings, production yields, regulatory changes, food scares, recalls, competition, scarcity, etc. Innovations in nutrition generate a revolving door of new or newly designed products intended to augment health in myriad ways. Product research and testing is very profitable and plays directly into a market where food fads and crazes dominate. In the food business, dietary or health miracles appear all the time. Food companies constantly vie for business by creating or capitalizing on these trends.

An array of scholarly, popular, and industry literature has explored how consumer decisions are made. Purchasing motivations are varied and multifaceted. They represent a mixture of individual taste (both reasoned and spontaneous), normative eating pressure, and larger production circumstances. As Hamilton (2008: 16-17) explains, “a supermarket consumer’s choice of what to eat is articulated through a vast chain of individuals and organizations woven together by technological networks...continually shaped and reshaped by business and political decisions and by shifting cultural patterns of diets, agrarian ideology, environmental concern, and scientific knowledge.” Dixon, Sindall and Banwell (2004) add that buyers are influenced by others’ direct or perceived recommendations, including those of scientific organizations, friends or colleagues, non-profit organizations, or even ‘independent’ grocers. For corporations, the goal is to understand and mobilize these factors to win customers, and certainly advertising and marketing play an important role in recruitment. Advertising affirms, reinforces and transforms cultural beliefs and values (Retzinger, 2008: 150). It allows companies to configure their brands and products. As Williamson (1978) puts it, advertising shifts focus from the properties and constitution of an object toward what that object means for humans. For Cato (1985), purchasing decisions are “triggered by the cumulative impressions formed by advertising, promotion and prior use of the product” (28). Yet he further adds that package design is of the upmost importance since it represents the final chance to speak to or recruit clients; to reinforce a brand’s long-term personality.

Package design is a lucrative business and companies spend a great deal of energy designing containers to make their products stand out from the competition. They must, if they are to make their products seem unique and worth consumers’ money. Food

packages at once hold, advertise, provide information about, albeit selectively, and market foods. Products' packages are also designed to make lasting impressions about the companies they represent. Elliott (2008b) reminds us, "they continue to advertise and represent long after the sale – a cereal box communicates equally well on the kitchen table as on the supermarket shelf. 'Shelved' representations therefore continually negotiate within consumers' quotidian lives. And as mass media messages proliferate – more television channels, more magazines, more newspapers, more advertising – packaging, ironically, becomes more important..."(182). Cato calls packaging the "discourse most firmly wrapped around consumer products" (1985: 29). This is perhaps best revealed when products are designed for unique populations. In these instances, package advertising is particularly essential to consumer recruitment and retention initiatives. For example, as governments discourage companies from advertising highly processed or unhealthy foods directly to children, food producers come to rely even more heavily on their packages to draw both the interest of children and acceptance of their parents. On-container marketing not only 'calls out' to children, but continues to recruit them as loyal consumers by peddling toys, engaging in product pairings, prompting consumers to play games, visit websites, enroll in contests, and so forth.

Pet food companies must use unique strategies because the foods will not invest human purchasers in a direct sensory relationship with the foods. Pets are also unable to verbalize their preference or dissatisfaction with their foods beyond rejecting them altogether. Pet food companies, then, must generate and retain interest by other appeals. People's motivations for purchasing certain pet foods are complicated. Many likely solicit recommendations from breeders, veterinarians, store clerks, friends or salespeople.

They may listen to the marketing and sales pitches carefully orchestrated by pet food companies, which Wortinger (2008) claims have a significant impact on people's ideas of pet nutrition. Consumers may also rely on their own knowledge, research and expertise. But undoubtedly pet food packages also play a significant part in shaping individuals' decisions. This is not to diminish the importance of outside media advertising or website management in this task. Clearly both promote and enhance a product's visibility. Indeed, my analysis will explain how websites complement package design by reconfiguring pet food companies as professional pet experts. But my primary interest is in how packages form narratives of animal nutrition; how these food packages construct pets' nutritional 'realities' (Elliott, 2008b).

### *Methodological Considerations*

My dissertation analyzes pet food packages to create a profile of the pet food products available on the market in English Canada. Pet foods are sold in many different places. Between January 2010 and March 2010, and again between December 2010 and January 2011, I reviewed pet food packages in twelve different locations across the city of Ottawa. Six site visits were to pet food and pet product specialty stores representing national and local businesses. The other six visits were evenly split between three national supermarkets and three multinational 'big box' department stores. The purpose of my visits was to review a significant sample of pet food packages available at retailers in one major Canadian city: Ottawa. I selected these stores because they represent a wide cross-section of places where individuals commonly shop for pet foods *and* must select from among several options. I excluded from my sample any locations, including small

grocers, variety stores, and even veterinary offices that did not carry a reasonably large selection of pet foods. A large selection was defined according to the following criteria: the store must carry both dog and cat foods, with dry kibble options from at least three different labels and canned foods options from at least three different labels, but also with no less than two different flavour formulations in each label of the latter.

I excluded from my location sample any retailers where individuals' purchases would be too limited. The purpose is to understand the marketing of pet foods, and so this at least presumes some competition between pet food labels. This is also one of many reasons I excluded the foods sold in veterinary offices from my analysis. I recognize that veterinary foods are very important to the industry and are arguably its purest expression of nutritionism because the foods are meant to treat and manage health issues through diet. However, the foods sold in veterinary offices do not uniquely enroll humans into the pet food network. Many offices also lack sufficient space to display the foods they have for sale, so the marketing is related less to packaging and more to the recommendations of the veterinarian. Often veterinary offices sell only one or two brands of food. Even for those veterinarians who do sell a wider assortment, nearly all are designed to aid in the dietary maintenance of particular conditions or illnesses. For this reason, individuals would not select the foods from among many options, but would buy the one that fits their animal's particular ailment.<sup>79</sup> Finally, the 'look' of these bags is well represented by their retail store parallel, which will be discussed. Where relevant and stated, my comments will apply to the veterinary-level foods.

---

<sup>79</sup> It bears emphasizing that these foods are represented as therapeutic but do not include any drugs or non-food substances. They are merely foods that are being *promoted* as medical treatment, rather than the medical treatment turned into a food object. Nevertheless, because I lack veterinary or medical training, and because certain ailments necessitate dietary restrictions, I do not feel it would be appropriate to comment on these foods when there are other parallel examples on the market.



From each location I included at least one food in my sample. I chose both dry and wet foods as well as dog and cat foods. I did not choose the foods randomly because stores of the same type commonly carry many of the same foods. I wanted my food sample to include as many brands and lines as possible, and used this as the defining criteria for my selections. To make sure my sample represented a wide array of pet foods, I chose foods from different price-points and with different degrees of complexity or simplicity in their packaging. I made sure to select foods that are owned by each of the five largest pet food companies. I divided this category further by selecting foods that have been long owned by the company as well as those that are newer acquisitions. I also selected several independent or private brands. With these considerations, I sampled 41 cat and dog food packages. I limited my sample to 41 packages because I began to identify repeating themes and I was sufficiently satisfied that my choices reflected noteworthy industry trends. I also found that there was a great deal of congruity between the foods made for cats and dogs by the same companies. Table 7 reflects the division by species and by food type.

**TABLE 7: Pet Food Package Sample**

	Cat	Dog
Dry Foods	14	11
Wet Foods	8	8

I reviewed 22 cat food packages and 19 dog food packages. Of the 22 cat foods, 14 were dry kibbles and 8 were wet foods. Of the dog foods, 11 were kibble and 8 were canned foods. The marginal difference in the sample size for species is a reflection of food congruity and the order of my sampling. I reviewed more cat foods than dog foods at the beginning of my study and found many of the lines crossed into the dog market. I also included slightly fewer canned foods in my sample for much the same reason, but also because these labels are a fraction of the size and communicate less information. Upon selecting a food for inclusion in my sample, I copied down the package's details as precisely as possible for the first twenty selections. This included all pictures, diagrams, tables, and text (except detailed ingredient listing). For the next twenty selections I recorded all pictures, diagrams, and tables, but limited my text replication to anything that was boldly displayed or was a unique expression of the food's distinctiveness. In the case of all kibbles, I also noted the number of ingredients used. There were never fewer than 25.

After completing my sampling, I reviewed my notes to identify common marketing themes. I decided to cluster the claims according to whether they transmitted information about the company, the food, or animals. These represent the three central promotional concerns on the packages. I assumed that pet food marketing works by implicitly addressing the reasons consumers ought to purchase these products instead of others. A company needs to make clear why its products, compared with competitors', are best suited for animals. This necessitates an articulation of the company's identity, including its expertise and values, as well as a vision of the pet and the food. There were salient messages being communicated for each. However, one of the challenges of

separating messages in such a way is they are often premised on each other. This point will become clearer below.

I then began to identify examples within each of the categories, although broader tendencies within the industry were certainly shaping the construction of each. As I said, I began to see patterns appear after roughly 20 foods. Some of these were ones I anticipated in advance of my research and were based on trends that were represented as salient by analysts, industry insiders, or in industry publications. Hodgkins, Fox and Smart (2009: 1-2) identify a number of inclinations in the pet food market, including diet foods, organic, holistic or natural foods, foods designed to treat health conditions or address special pet needs just as joints, coats, teeth, etc., 'functional foods,' foods specific to different animal breeds, and so on. They claim that these marketing and sales strategies are carefully orchestrated and have a significant impact on how people understand good (animal) nutrition. Some of the other trends I identified stemmed from my observations and knowledge of the history of the pet food industry.

Before I explain how pet food packages represent companies, their products, and the animals who will consume them, a significant point must be made. The Canadian pet food industry is not homogeneous. Although my sample included foods from all market-levels, there is definitive market segmentation. As might be expected, the foods sold in pet product retailers tend to differ from those sold in both grocers and department stores, which are about equivalent. There is some overlap between the foods that are sold in these two markets, but only with a few lines from the multinational brands. With the exception of one department store, in the six non-pet product stores sampled, I found only inexpensive private label brands and food lines by multinational corporations. This

makes sense given foods in this latter category came to dominate pet foods by entering the mass market. Each of these retailers also sold a few lines from a couple of the foods (i.e. a cheaper version and a higher-end version). In the grocers and department stores, the high-end national brand foods would represent the highest end pet food products they sell. But in the pet food retailers, these would hit the low-to-middle of the market at their highest point. For this reason, these spaces and the costs of the foods for consumers who frequent them will differ. My arguments certainly represent the marketing of pet foods in specialty pet retailers, but are less representative of the foods one would find in grocers or some department stores. The industry in general is heading toward (or more likely, has arrived at) premiumization and super-premiumization. One sees examples of this in the recent introduction of such higher end (looking) foods in non-specialty stores. But grocers and big box stores have not abandoned their core products or market, and continue to sell inexpensive national and discount private labels brands. This is significant because it shows that the pet food network is not consistent and the discourses of nutrition may be contradictory or disjointed.

This is not to say that the national labels are underrepresented in the highest end of the market. Although they have historically done well as a result of hitting the mass consumer market, particularly in the discount and mid-range levels of the industry, recent diversification initiatives involving ongoing label acquisition have helped them remain economically secure and lucrative. The companies have introduced, where appropriate, their own high end lines or have simply bought up smaller premium brands. Large pet food corporations are, thus, represented well across all markets. Smaller companies thrive in the premium niche market.

### *Packaging Commercial Pet Food Realities*

This section considers how pet food labels communicate nutrition through representations of their companies, their products, and the animal consumers they serve. These divisions are salient, if not entirely tidy. Although the messages are heterogeneous, I will identify important recurring themes within the industry. I will show that their marketing paints a picture of the products that diverges from the industry's operations and works to reify nutritionalization in the network. This is because the very notion of nutrition changes and responds to the needs of the human actants in the pet food network. Pet food packages enroll human consumers by mobilizing nutrition – by making this object multiple. This will become clearer in the examples below.

#### Pet Food Manufacturers

I will begin my analysis of the representation of nutrition in pet food by discussing those who make pet food: the companies. It is worth pointing out that my study focuses primarily on the foods' packages. Since pet food packages routinely prompt pet owners to visit their websites for food, feeding, or any other information, some notes about the websites should be included as well. This is especially important when considering the companies' attempts to develop their corporate profiles. They will utilize a few signals to signal expertise on their products' packages, but most is found and elaborated elsewhere.

A preliminary point that warrants discussion is which companies count as knowable pet food companies according to pet food packages. The pet food industry is

dominated by what has been only be described as ‘ghost’ pet food producers, ‘co-packers’ which actually manufacture a great deal of pet foods. The trouble with co-packing is that the companies that own the pet food brand relinquish control over production. This is problematic when one considers how the brand holders are representing and marketing themselves and their businesses. By hiring third parties to produce their foods, pet food companies surrender involvement in everything, including ingredient sourcing. According to the subcontracting model, profit is driven by manufacturing efficiency. It may take the form of avoiding production bottlenecks, producing more closely to specifications (i.e. paying attention to proper weights), minimizing waste, and so forth. But it can also take the form of sourcing more inexpensively since ingredient purchasing is where a good sum of profits lie. When companies make their own foods, they can better ensure the quality of the ingredients by sourcing only from reputed sources and/or instituting stringent guidelines and auditing systems for their suppliers. While such measures will help to avoid problems, knowing the source of one’s food’s ingredients will also help should any problems arise. In an industry that literally uses hundreds of possible ingredients to make its commodities, identifying the source of contamination is hard. Co-packing makes it even more difficult. The overall security of the food, then, relies on the integrity of the companies, producers, suppliers, and other production partners involved in the process. Even with an extensive auditing system, the additional distance added to an already long production chain can make this nearly impossible.

In the context of corporate identity-formation, producing the food can be important because pet food companies routinely frame themselves as pet food authorities.

Asserting the company has control over manufacturing is particularly critical in the post-recall era. As Natura pet food company, which produces six high-end pet foods, explains on its website ([www.naturapet.com](http://www.naturapet.com)), “developing healthier recipes wasn’t enough for Natura. We went one step further. To ensure each and every bite of our kibble is the safest on the market, we took manufacturing into our own hands.” Likewise, Purina Company also features both its production facility and its ‘farm’ prominently on its website. Individuals are invited to book tours or even reserve space for special events. Like these companies, others regularly make assertions on their packages that they “know exactly” what is in the foods (with the implication being that the ingredients are high quality). Indeed, the food packages often connect directly with a model of pet food expertise. This is probably best represented by the Hill’s company, which is known for having its origins in veterinary foods. Hill’s is now a subsidiary of Colgate-Palmolive Corporation, and maker of popular food brands, ‘Science Diet’ and ‘Prescription Diet.’ These are marketed as exclusively high-end foods and are available only in specialty pet stores and veterinary offices, respectively. Hill’s calls itself a leader in manufacturing food specifically designed for different life stages and health issues.

In total, Hill’s manufactures nearly one hundred dry kibble and wet formulations for both species under the ‘Science Diet’ brand. They manufacture about the same number under the Prescription Diet brand. Aside from the few adult formulations, the rest are designed to aid in the dietary maintenance of different physical conditions. They have formulations for oral care, hairball control, sensitive stomachs, weight control, both hairball *and* weight control, and so on. They also have versions of each for different breeds of dogs and cats and sizes of dogs.

The kibble and the soft food containers of Science Diet are comparatively quite simple. With the exception of the 'Nature's Best' line of Science Diet, the bags are white in colour. The company's brand name and logo are conveniently superimposed over a seal that reads 'veterinarian recommended,' both of which are featured prominently on the top half. Below the seal the bags explain the specific age group and formulation, and is colour-coded to further highlight the distinction. The brand's overall motto, 'superior and clinically proven nutrition for lifelong health,' is bolded and highlighted. The bags are punctuated with an additional 'seal' that claims that Science Diet is the #1 choice of veterinarians worldwide. At the bottom of the bag consumers will also find six small animals with circles over parts of their bodies and appendages or organs blown up, almost magnified, within these circles. Beside are captions that presumably describe the consequence of some added benefit. For instance, the original older cat formula claims to promote a 'strong immune system,' 'healthy skin and radiant coat' and 'healthy bones and lean muscle mass,' to name a few qualities. The reductive imagery and text in their totality match the tropes of science obviously espoused by the company. The prominence of 'science' in the name and the sterile-looking bags conjure up images of white-coated scientists working in laboratories to unlock secrets of animal nutrition.

The expertise encompassed by the veterinarian or clinician is routinely extended beyond pet food research. Pet food producers position themselves as more than just food experts, but as *pet* specialists. Their packages tend to contain information that is mostly relevant to food and feeding, but their websites have much more than advice on food and diet. Instead, companies direct visitors in all areas of pet-keeping, including pet adoption, care, health and behaviour. Some of that expertise is summoned by their



associations with recognized third-party organizations, like animal shelters or veterinary associations. Much more rests on their inclusion of a wide range of pet narratives.

The Hill's website ([www.hillspet.ca](http://www.hillspet.ca)) is simple and allows visitors to peruse the products, see their associations, a company history, what's new with the company or find retail locations. Again, the scientific expert becomes prominent as we learn that this company was founded and advanced by veterinarians who were most interested in 'treating health through proven nutrition.' The company claims a partnership with the Canadian Veterinary Medical Association and involvement in animal shelter nutrition programs, although further details of these are not elaborated. The Iams website ([www.iam.com](http://www.iam.com)) is similarly constructed to point visitors toward one of hundreds of pet-related articles that address topics ranging from nutrition, health and animal behaviour to special needs, stories about pets, and 'technical bulletins, which solely address food and ingredient issues.'<sup>80</sup> Lastly, Nutro proudly displays its relationship with the 'Waltham Centre for Pet Nutrition' in the form of a dog/cat symbol on some of its packages. The company explains on its website ([www.thenutrocompany.com](http://www.thenutrocompany.com)): "The Waltham Centre for Pet Nutrition is a group of scientists and pet lovers who have been making advances in pet nutrition – and sharing their advances with The Nutro Company." Further investigation into the Waltham Centre reveals research is only conducted for pet food and animal feed labels, including Nutro, owned by Mars. This contradicts the suggestion that independent scientists *share* cutting edge nutrition research findings with Nutro, which is then innocently implemented.

---

<sup>80</sup> Dog articles can be found here: <http://www.iam.com/dog-article/PetArticles.aspx>. Cat articles can be found here: <http://www.iam.com/cat-article/PetArticles.aspx>.

Perhaps no company exemplifies the expertise model as much as Purina. As one of the world's largest pet food manufacturers, Purina features an assortment of pet experts to inform the public on all matters cat or dog. The Canadian Purina website ([www.purina.ca](http://www.purina.ca)) has six tabs dedicated to dog and cat care, the company history, products, advice or assistance. Each tab is further broken down into simpler subjects where visitors can find detailed information to address their concerns or questions. The range of material offered by *Purina* is comprehensive and touches on topics from training, behaviour, medical or cosmetic interventions, to finding breeders, shelters or veterinarians, getting (Purina) pet insurance, visiting sponsored community events, and beyond. The American website ([www.purina.com](http://www.purina.com)) has a different layout and aesthetic, but offers even more information. Visitors can find out about community programs, obtain information about breeds, and even sign up to listen to animal advice podcasts. Their motto is apt: 'Your pet. Our passion.' Although said from the perspective of the company, information is provided by veterinarians, breeders, nutritionists, behaviourists, and other pet 'experts' who are mobilized to instill confidence.

In each of these examples, different associations with individuals and groups transform pet food companies into caring partners in pet development. This occurs in spite of the conditions of the foods' manufacturing or the employment of veterinarians, nutritionists, or others. It is further solidified by corporate responsibility narratives, which highlight pet food companies as leaders in the pet industry and civic-minded community partners. They produce food, as well as treats, toys, and medicines. They partner with established and professional organizations, including humane and rescue groups, animal medicine experts, kennel clubs and breed fanciers' groups. Dixon, Sindall

and Banwell (2004: 124) explain that this strategy is integral to legitimizing food claims. Third-party endorsements from respectable nutrition organizations offer a great deal of credibility, especially in a food environment steeped in nutritionism. In these instances the premises of nutritionism are quite apparent. So are those of creating responsibilized pet owners who can turn to pet authorities. Outlining how scientists study foods and their constituent components makes clear that they uncover the 'truth' about foods, nutrients and the needs of the body, and subsequently advise pet food makers, which use these facts to make their products. In these narratives, pet food makers are mere witnesses to nutritional (as well as behavioural) knowledge acquisition. As the Eukanuba site ([www.eukanuba.com](http://www.eukanuba.com)) puts it 'nature and nutrition have reached an understanding.' But their proximity to these experts makes them informed authorities themselves. Pet food companies explain how the ingredients are healthful for animals. These products are said to augment physiological function even though the very consumption of them is not a product of nature, but one of pet food/feed corporations generating ingredients for economic gain. Such positioning complements the way their foods are represented. Drawing on the work of Donna Haraway, Mullin (2007) argues that pet food companies engage powerful 'origin stories' to legitimate consumer choices. She continues:

In a context in which there is great emphasis on individual choice, choice informed by expert authorities and assessments of risk, domestication stories offer the promise of assessment based not, or not only, on corporate sponsored research in laboratories but on knowledge seemingly less shaped by corporate interests. If, among consumers, the science of the laboratory has lost some of the authority it wielded a decade ago, the science of the field...has gained appeal (Mullin, 2007: 278).

As Mullin makes clear, the mobilization of 'independent' knowledge is important for pet food companies. They may be the best arbiters of foods' healthiness and

appropriateness. But this is true only as long as the companies adhere to principles that extend beyond themselves, as is the case with nutritionism. This manifests in both the hyper-symbolized representation of the foods and the pets who eat them.

### Pet Foods

What, exactly, do pet food companies say about their foods? Perhaps the best response is to ask what they do not say. Any appeal that might sell foods has long been made by pet food companies. A quick perusal of pet food products will reveal claims that their foods are natural, holistic, human-grade, high quality, #1, approved by pets, approved by vets, healthful, gourmet, clinically proven, nutritious, delicious, just like nature intended, breeders' choice, wholesome, gentle, and so forth. In short, pet foods are all a human customer and an animal consumer could ever hope for. According to Linda Bren (2001: 26), most of these terms have no standard definition or regulatory meaning. They often do not represent a valid description of the product or ingredients. Within the pet food industry, these terms characterize market segments or subsets. For consumers, they represent a pet food's characteristics.

But by far the most prominent trope in pet foods relates to nature. If the origin story of pets is in their co-evolution with humans, then the origin story for their foods is nature. Nature motifs take a number of different forms on pet food packages. They also intersect with the construction of pet animals as natural beings, which will be outlined in the next section. Hyperbolic nature is ubiquitous, but not universal, in pet food. As with human food, variation and contradiction on pet food packages abound. Many of the

foods discussed have elaborate (and expensive) pet food packages. Many combine several food themes. There are also plain packages that market their products as simple, inexpensive, and yet, perfectly fine food. Even these pet foods will claim to be wholesome, packed full of vitamins, minerals and nutrients. They are legally required to list ingredients and provide a guaranteed analysis, but often companies choose to highlight one or more nutrient or its quality, regardless of the ingredients used. For instance, a product may claim to be high in protein even if the protein source is soy or corn-based. The more expensive pet foods, however, marshal more detailed language of whole food on their containers and even on their websites. Most packages fall somewhere between these two extremes. But nature is beginning to expand, in some ways, into all but the cheapest and most simple pet foods on the market.

While foods must comply with the numeric language of nutrition, (most) packages tell a different story. The nutritional paradigm constructs health on the basis of measuring nutrient units within foods. At the same time, discourses of nutritionism erase the slight shift from food to nutrients, couch nutrients in the language of health and wholeness, and subsequently represent the foods as natural. One might describe these as oppositional qualities. As I will further explain this is integral in a nutrient-driven foodscape. The packages show seemingly conflicting qualities. I argue that discourses of nutritionism and those of nature do not clash because nature becomes the lens through which the foods and their nutrition become knowable. As with human food, being natural is privileged in the world of pet food. Nature is seen as a guide to how we should live and what we should eat, even if this characterization is problematic. But there is also recognition that the advances and discoveries of modern society should not be forsaken.

Even with human food, added vitamins and minerals enhance a product in the nutritionist model. So while science and nature are framed as oppositional categories, they more readily act as a combined force where science is used to harness nature. This is demonstrated by pet food corporations' tendency to unite the 'disparate' qualities of both. Many pet foods show that neither on its own is as good as they are together. Consumers end up with pet foods that are human-made reflections of what was intended in nature.

The most obvious example of the tendency to combine science and nature rests with the 'Nature's Best' line in the Science Diet brand. Here, the Science Diet motif is bolstered. Rather than using a sterile white bag, the logo now appears over a golden bag which, upon closer inspection, is actually a wheat field. A cat or dog (depending on the intended consumer) is pictured alongside cuts of meat and whole fruits or vegetables. The bag claims the product offers the first real glimpse of an "actually proven," natural diet. Among other things, we also learn the food possesses antioxidants to "maintain cellular health because they fight free radicals." Their website (<http://www.hillspet.com/natures-best.html>) purports to "advance life through science and technology." Another brand, Natura, suggest on its bag that its own mandate is to "integrate nutrition with medicine." Here again, nature and science are framed as complimentary forces. While nature is heralded and the foods strongly signal their natural elements, science plays an equally important role in pet food. Both scripts are further designed to reject that which is unsubstantiated by the proper authorities and establish health and nutrition as the territory of the few.

The depiction of unprocessed whole foods occurs frequently on pet food packages. As agricultural products, it should be expected that pet foods are represented

as having some connection with nature. Many of their ingredients are grown or raised. Of course, the conditions under which this takes place have long been industrialized and mechanized. Many of the ingredients, however, are not primary agricultural products. As I explained, the diets of cats and dogs are full of synthetic derivatives, processing surpluses, or other secondary materials. The justification for this is nutritional need. Yet pet food bags hardly represent this part of the foods. Common names like 'By Nature,' 'Nature Organics,' 'Nature's Best,' 'California Farms,' or 'Harmony Naturals' summon up visions of pure foods directly from the land or sea. At the same time, cuts of meat, whole vegetables and fruits are displayed prominently and designed to conjure visions of foods produced directly by bucolic farms instead of in laboratories and beakers. The marketing imagery of many pet foods is nothing short of agricultural pornography, which include snapshots of naked agrarian splendor that titillate while suppressing questions or concerns about the food's quality or ingredients. For instance, 'Meow Mix' brand cat food by Del Monte corporation now offers a 'Wholesome Goodness' formulation in its popular line, which also displays fresh foods on its cover and the claim that it is fashioned with fresh vegetables (emphasis on package). Similarly, Iams has a 'Healthy Naturals' line that contains "prebiotics to protect and support your pet's defenses," with "no artificial colours, flavours or preservatives just wholesome chicken, leafy greens, fruits and vegetables." On the package of Del Monte's brand's 'Farm Stand Selects,' consumers learn about the "benefits of fiber and phytonutrients, lean protein, vitamins, minerals and antioxidants" found in its foods, all of which, of course, it is suggested are bestowed primarily through whole foods.

Countless other pet food packages offer variations of these assurances in their pictures and narratives; the foods are fresh, natural, or high quality, ‘meat’ is a central ingredient, certain foods are excluded, there are no fillers or preservatives, and so on. One reason they do this is to help consumers understand the foods they are purchasing for their pets. Pictures allow people to connect pet food in terms of basic ‘staple ingredients’. Consumers can situate chicken, spinach, blueberries, or fish nutritionally. Yet companies will make such claims even if the product is not made exclusively of raw agricultural ingredients, but also includes food-like substances, pseudo-foods, chemically-derived additives or perhaps adulterants. As suggested by Johnson and Bauman (2010), pet foods deal in a language of authenticity where these compound creations represent the real or the natural. What is pictured, then, exposes a great deal about what is prized and what is not in pet foods. So does what is unpictured or unsaid. For instance, ingredient lists routinely show that the meat to which many companies refer is in the form of meal or by-product meal. These foods are not fresh, but rendered products that are cooked down. Even when meat is in the food and listed as the first ingredient, it is not necessarily the *main* ingredient. For package labeling purposes, ingredients must be listed in order by weight prior to processing.<sup>81</sup> Because raw meats and meat cuts naturally contain a great deal of water, it is easy to use a small amount of meat in a food to make it appear meat based. For example, a producer may formulate a food using 10 pounds of chicken and 9 pounds of corn. Since extrusion literally evaporates water, roughly one to two pounds will be left over after the food is extruded compared with a much small reduction in the corn. The result is a food that actually contains much more corn than chicken. The same

---

<sup>81</sup> For the purposes of nutritional assessment in the guaranteed analysis, pet foods must reflect the nutrient composition of the food on an as fed basis *after* the water is removed.



premise holds for wheat or even chicken meal. Raw meat becomes much less important to any formulation even though it appears to be central and valued in the food. The high value of meat will be elaborated further in the next section, but meat in pet foods represents the highest and quintessential form of natural eating.

Additionally, every commercial pet food contains at least a dozen ‘vitamin or mineral additives,’ which likely possess nutritional benefit. The products also contain preservatives, binders and other ingredients to keep the foods together, enhance freshness and prevent putrefaction. In other words, added chemical compounds of vitamins and minerals allow the foods to be made in the first place, yet are mostly invisible in the marketing. When they are represented, they are health-advancing additions, rather than necessary for the legal sale of the product. In other words, vitamins and minerals seemingly become necessary for pets’ health, at least according to the ‘experts.’ Again, pet food manufacturers are framed as authorities to whom consumers ought to defer. Finally, some of the most utilized ingredients, corn or soy, are also the least likely to be depicted. Although many people may recognize soy, corn is certainly easily identifiable. In my sample, corn was mentioned only a handful of times and was never depicted pictorially, even on the foods in which it serves as one or more ingredient.

Representations of nature expand beyond just the presentation of whole, fresh ingredients. Rather, the bucolic farm and other depictions speak to ‘from scratch’ goodness. Some pet food packages picture foods on a plate and/or represent the foods as whole meals or even cuisine. ‘By Nature’ brand food sells dog and cat food exclusively in either green or neutral beige (only with the organic lines) containers. Centred in the middle of the bag are three adjacent pictures: one of a vegetable on the left, one of a meat

on the right, and one of either an animal, or an animal and a human, in between the previous two. The product designed for active dogs pictures carrots and a whole, moist-looking and covered in herbs, cooked chicken while another, halved sweet potatoes and grilled, frenched cut pork loin on a bed of greens. Merrick cat and dog food demonstrates that pet food is composed of more than just simple food commodities. The company offers dogs and cats 'cuisine' or complete 'meals.' Consumers can choose a brand that offers turkey, rice and spinach formulations, for example. Or, they can choose Merrick, and allow pets to feast on 'Thanksgiving Day Dinner, 'Grammy's Pot Pie,' 'New England (lobster!) boil,' 'California Sushi Roll,' a 'Mediterranean Banquet' or any other number of gourmet meal selections. This is significant because, as Bell and Valentine (1997:59) argue, "part of the manufacturer's intention behind producing processed meals, which are easily cooked or heated, is to produce 'home' and 'family.'" In this case, pet foods conjure up images of whole, proper foods and turn mushy canned contents into recognizable food or favorite meals. They offer the familiarity of food humans without any of the risk of feeding them threatening table scraps.

Pet food makers regularly remind humans that feeding anything other than commercially-produced pet foods will cause any number of problems, all the while offering the appropriate nutritional remedies. Orijen cautions to 'nourish as nature intended.' Purina says: "table scraps will not provide the balanced diet that dogs require, and are not an appropriate treat," "raw meats may contain parasites – and cooked meats can be too high in fat," and "consistently adding human food to a nutritionally balanced commercial pet food diet may upset your cat's nutrient balance. It may also create behaviour problems." The idea that the very foods companies use as ingredients can

cause nutritional imbalances, infections, infestations, or other vague problems when not fed by the companies is a powerful message. It is also a responsabilizing one that is difficult to refute.

Pet foods make a wide range of claims about their products in a manner designed to attract customers. Although they are not untrue, most are at least exaggerations bordering on misrepresentation. To suggest that commercial pet foods are natural according to any common notion of the term is illogical. Yet these types of claims are widely made by both pet and human food manufacturers. Certain ingredients, including those that are processed - animal 'by-products' or chemically-stripped grains – do not figure well into the story of pet food, even though they are nearly universally used. These ingredients are incommensurate with the appearance of offered by the business. Rhodes (1975) has called the pet food industry a cereal-based industry that sells itself as a meat one. Smith (1975) suggests pet food companies have been complacent in the denigration of cereal use in pet food by refusing to acknowledge or properly defend this practice. Hiding their presence has fuelled criticisms by those who believe the consumption of high levels of carbohydrates is inappropriate and unsuitable for dogs and cats (Martin, 2008; Martin, 2001; Fox et al., 2009; Billingshurst, 2001). At issue in these debates are visions about what counts as appropriate foods. These ideas are inextricably bound to ideas about, and constructions of, all sorts of animals.

#### Pets (and other animals)

Pet foods are in the business of selling ideas about their products and the consumers who purchase them. They market notions about themselves, their business

and about the foods they make. But invested in each of these are subtle and palpable ideas about pets' natures, needs, wants, and connections with humans and other animals. The representations of pets and their relationships with other animals is essential to the marketing of pet foods. As I will show, pet food companies mobilize complex and contradictory notions of animalness and petness to sell their products. Pet food bags both anthropomorphize and animalize pets. It is my argument that this operates to naturalise the conditions of production and to exonerate humans and human food producers from responsibility in creating these conditions. It is also to cover the construction of pet foods as such.

The obvious way pet food companies do this is by turning their products discursively into 'natural' unprocessed foods as explicated above. Doing so has implications for the way in which animals are pictured, but pet food companies also represent their products as natural in the sense that they are simple and homemade fare. This representation is equally important, particularly when one considers larger marketing strategies and representations of pets. It is very important that pet food companies give the impression that pets are individual family members with their own tastes or desires. As discussed, pet food companies during the 1960s undertook a multi-year advertising campaign valued in the tens of millions. It was designed to attract and retain customers by touting the advantages of commercially-prepared pet foods compared with their 'table scrap' counterparts. But equally, it was designed to invest humans in ideas about their feelings and responsibilities toward animals. This marketing approach was the first of many that would invest people in both affective and responsibilized relationships with pets. In their depictions, dogs and cats have needs and wants just like

our own. The anthropomorphization of pets played a strong role in such narratives. Pets were routinely contrasted with other animals and given human-like qualities and values. Pets come to want love, affection, attention, and so on from their human companions. They have psyches, which must be nurtured and attended to.

Pet food packages and websites depict affective and anthropomorphic animals. The packages and websites often show humans holding, embracing or stroking animals. Their faces may be touching or one may bestow a 'kiss' or lick upon the other. For example, Blue Buffalo's Spa Select adult formulation cat food depicts an ethereal cartoon version of a cat and a woman engrossing a heart, both with serene smiles on their faces. Halo pet foods show a caricatured woman feeding both a cat and a dog from her palm. There is a distinct tranquility in the picture. The Purina website ([www.purina.com](http://www.purina.com)) calls pet cats or dogs people's confidants, sidekicks, biggest fans, or reason for getting up every morning. Many acknowledge that cats and dogs have their own 'personalities,' and therefore, they need a food to suit their unique tastes. Pet foods simply provide their favoured selections – their favorite meals to be consumed from, for instance, crystal dishes as cats have of 'Fancy Feast' for the last twenty years.

As close as cats and dogs are to humans, they are actually not quite so. They have traits, feelings and tastes like ours, but pet food companies also regularly, and sometimes concomitantly, show that pets have an innate taste for something else a little less tame. While naturalness is widely acknowledged to be a characteristic in the marketing of the pet foods themselves, the naturalness of the animals being fed is underexamined. Here, the animalness of pets is not played down, but hypersymbolized. Feeding the hunger is then a signature of the foods.

The representations of animalized cats and dogs show, above all, a strong preference for meat. Eating meat is socially privileged to the point of being naturalized and normalized for humans. Consumption of it bestows a pre-cultural strength upon its consumers while supposed hunger for it transcends its availability. This omnivorousness in humans is only a shadow of the carnivorousness bestowed on certain animals, including cats and dogs. The carnivorous connection of cats and dogs to remote ancestors is regularly highlighted in pet foods. In a play on religious era symbolism and entry into the modern era, the 'Before Grain' line of pet foods simply scrawls the letters 'B.G.' against a cream or black backdrop. For this line in the Merrick family brand, grains represent the adulteration characteristic of modernity while the meat is exactly what the animal needs. Grains are the result of culture; of humans. Proctor & Gamble also produces a hypersymbolized food to feed animals' natures. The New Zealand Venison and Potato formulation of its 'Naturally Wild' line uses a picturesque field backdrop to signal constitution. We see a picture of the 'prey,' which are two deer walking in a wooded clearing while a stoic hound in the bottom half of the bag looks on. We learn that the food is "premium dog food inspired by the wilderness," and "excludes meat-by-products and corn."

The 'Naturally Wild' section of the Eukanuba website (<http://www.eukanuba.com/en-US/naturally-wild.jspx>) further advances these discourses. Visitors learn that 'deep inside, dogs know what they want.' Consumers are then transported through the actual eye of the dog to a natural wooded area with a river and two (distinctive) mountain ranges. In the sky the following message appears: 'introducing the dog food Mother Nature would make.' The deer (as well as salmon and

turkey representing the 'prey' from two other formulations) are pictured and we are invited to learn more about these 'ingredients.' Doing so tells a short story about how Eukanuba was inspired to create each of these foods. We learn turkey is used as a "tribute to dogs' nutritional heritage," that "the turkeys of the Great Plains are always moving. Because of this, and their healthy diet, dogs had thrived on lean turkey for countless centuries." Venison is considered a quality ingredient because "the gorgeous yet rugged landscape of New Zealand yields fit and healthy wildlife that dogs lived off of for millennia." Finally, "the food chain of ages past" inspired a salmon-based formulation. Eukanuba claims "the arduous journey salmon make to their spawning ground results in a lean source of protein that nourished dogs for thousands of years." In each case, we are further reminded that dogs love these foods; that it is "in their nature." Luckily we also reminded that "Eukanuba knows what dogs need."

'Taste of the Wild' brand pet food builds on the motifs of carnivores hunting. It is an independent label that subcontracts its production to private label pet food makers. There are several dog and cat formulations, each of which depicts some ancestral connection between domestic cats and dogs and other animals. The 'High Prairie Canine Formula' dog food package shows snarling coyotes on the 'Great Plains' stalking bison while ironically proclaiming itself a 'grain free' diet. On the 'Wetlands Canine Formula' package, wolves chase fleeing ducks on the shore of a mountain lake. The 'Pacific Stream Canine Formula' bag depicts a pack of wolves encircling a grizzly bear deep in the mountain woods in seeming competition for nature's resources. For cats, the 'Rocky Mountain Feline Formula' shows a cougar on a cliff ledge stalking a deer frolicking by a waterfall while the 'Canyon River Feline Formula' depicts a mountain lion on a river's

edge catching fish. In this product line, the wolves, coyotes and big cats do not merely get prey, but violently kill them while humans become innocent witnesses to a ferocious and brutal nature.

Many other companies represent pets as never truly tame and draw on their undomesticated ancestry-relations. Blue Buffalo calls its Wilderness line a “natural, evolutionary diet.” These constructions are evident even in less expensive brands. Meow Mix’s ‘Wholesome Goodness’ cat food packages explain that “cats are naturally drawn to the food their bodies need.” Overall these companies suggest that their foods are not actually made by humans, but assembled from nature for animals. The Orijen pet food brand, which is produced by Champion Pet Foods, urges customers to feed carnivorous cats and dogs from the grasslands as nature intended. It even touts its foods as “biologically appropriate real-food kibble” or ‘BARK.’ Their website ([www.orian.ca/](http://www.orian.ca/)) continues: “Our concept is simple: mirror the balance and variety of foods that dogs and cats would consume in their natural environment and for which they have evolved.” Orijen is making direct connections between its foods and the biologically appropriate raw food (BARF) approach to animal feeding that is becoming increasingly popular among pet owners and even starting to enter the pet food market more seriously. The BARF diet, which is antithetical to traditional commercial pet foods, has been used sporadically by veterinarians and breeders for the last few decades. Beginning in the early 1990s it started to become more popular with the publication of books on the subject and the expansion of holistic veterinary practices. Interest in such alternative pet diets were fuelled further by the 2007 pet food recall when questions about industry practices came to the fore.



It is a diet premised on the notion that domestic breeds of cats and dogs remain very biologically similar to their canine and feline ancestors and have not evolved to eat considerable amounts of grain or carbohydrate-rich materials. The belief is that cooked foods, including animal products, are stripped of nutrients required by dogs and cats, and that grains are completely inappropriate foods for their bodies. Dr. Billinghurst, who is perhaps the most widely cited proponent of the BARF diet, recommends that animals consume as closely as possible to their 'wild' and ancestral relatives. This means the diets of cats and dogs should consist primarily of raw meaty bones and raw vegetables, with some occasional organ and fatty acid or vitamin-mineral mix supplementation (2001).<sup>82</sup>

What both the BARF diet and the pet food bags discussed reveal is a deep contradiction in our experience with animals and a fabricated history of how our relationships with them have developed. Both function by trading on visions of nature and ancestry for credibility. The BARF diet intends to highlight the conditions that make commercial pet food. The latter uses the same imagery to erase its being and instead replaces itself and its reality with a hyperbolic nature. But in both cases, pets become members of a species with primal, instinctual needs. These are not just the need to eat meat, but the need to stalk and kill prey. Indeed, the reality of how their nutritional needs are met today is rendered completely undetectable. The supposed turkeys of the Great Plains that are always moving have very little to do with the fowl raised in intensive

---

<sup>82</sup> Of course, proponents of raw eating among humans have similar ideas about the consequences of cooking and heating. It is more common for raw food consumers to eat vegan, vegetarian, or limit their meat consumption to sashimi. But there are individuals who will adhere to the raw Paleolithic diet. What is most interesting is this is one of the few instances where ancient ancestry is invoked as a rationale for human diet. This is, of course, a common trope in pet foods.

factory farming conditions, which rarely permit them to move. The jumping fish from fresh lakes and rivers are more likely raised in environmentally destructive landlocked aquaculture tanks rife with high levels of diseases such as lice, parasites, bacteria and fungi, as well as the purported treatments of antibiotics, growth hormones etc. The CAFO operations that make meat and its by-products so widely available come to be replaced with an almost cartoonish nature that simply reifies the consumption hierarchy and turns farmed animals into wild, free range prey. That animals are drawn to these foods and/or eat them is just evidence that they are natural.

It must be granted that human food is sold as natural and that people are urged to eat more ‘naturally,’ whatever that means. However, the naturalness of pet foods uniquely rests in the construction of animals as hunters or scavengers with a primitive taste for meat and other animals. Even if humans need to eat meat, they do so under conditions of their own choosing. Food companies tout their products as natural, healthy, or biologically appropriate. But no food company actively markets its foods as satisfying a primitive hunger. They do not associate their products with eating more closely to our Neolithic, cave-dwelling ancestors. In pet foods, dogs and cats are actively turned to carnivores that simply cannot help themselves. Here again, pet foods simply provide to these creatures exactly what they supposedly need. It does not matter that dogs are opportunistic omnivores that regularly eat all manner of objects. It does not matter that cats and dogs split from these ‘ancestors’ tens of thousands of years ago, or that there are no circumstances in nature under which a 10 pound cat or 30 pound dog can stalk and kill a 200 pound deer. It also does not matter that invoking ideas of evolution collapses thousands of years of animal domestication under an array of global circumstances into a

short window while completely neglecting human's intensive and extensive animal breeding of dogs and cats as well as virtually all species of livestock. Indeed, the bodies and lifestyles of modern dogs and cats bear no similarity whatever to their wild ancestors or relatives. These animals are sheltered in heated and cooled homes and do not have to forage or compete for food and water. Representations of commercial pet foods as naturally satiating our semi-wild pet animals simply instantiates a baseless origin story that naturalises existing relations between different animals. It erases both the conditions of human food production as well as the history of domestication, and turns humans into innocent witnesses.

These constructions can be explained by a need to experience the animal other.

Grier claims:

Pet keeping in America today is marked by a deep, and I suggest unprecedented, tension between the apparent desire of American pet owners to experience animalness – the wholeness and otherness of animals – through contact with pets and an equally apparent trend toward increasing control of our pets' lives, including their behaviour, their biology, and their routines, precisely because we want to bind them closely to us. Because so many owners seem to desire so much closeness, ambivalence about the animalness of our pets may be more acute today. Some pet owners work hard to celebrate the 'animal.' A careful perusal of pet store shelves makes apparent that some pet owners are adherents of 'natural' approaches to their pets. Natural foods and natural training techniques channel the normal behaviours of animals (2006: 418).

Animalized pet foods help us to celebrate the animalness of pets that is often lost or repressed in modern pet-keeping practices. We can see in our companions more than the projection of human feelings and attributes. Perhaps these foods impress upon people the need to feed animals in a way that respects their biology; that being a cherished member of the family means meals ought to suit their special tastes. Pet cats and dogs do need to

be recognized as distinctive species in their own right. But the hypersymbolized representations on pet food packages far exceed the lives they would lead with or without humans. These are fantastic depictions of realities that have never existed for dogs or cats. They are crucial for the operation of the pet food network, however, because they trade on appropriate notions of what animals should eat and obfuscate other objects they (likely) should not. Representations such as those outlined of all parties helps to stabilize the network by concealing the degree to which pets' diets are nutritionalized. They make the material process possible by effacing it discursively. Again, this helps to draw in, legitimize, and sustain the extant pet food network.

### *Conclusion*

In this chapter I have analyzed pet food packages to show how the industry creates nutritional realities. While I made ties with the packaging of human foods, particularly in terms of constructing natural foods, I also demonstrated the ways in which pet foods uniquely draw on the animalness of pets to legitimize but erase their business practices. I argued this is also bolstered by their positioning as larger pet authorities. I believe constructing pets as nutritional subjects in these ways has implications. Above all, they permit the realities of pet food production, which center on intensive agricultural and animal production and the fabrication of highly processed foods, to continue without critique. As pet food makers implore individuals to avoid dangerous table scraps, they simultaneously make it possible for animals to 'naturally' eat in a 'healthy' way. Just as there appears to be an unlimited and diverse number of brands, the diet of pets appears to

be a widely varied. In fact, as I have illuminated in this analysis of several pet food brands, neither claim of pet food makers is true.

## **Chapter Eight: Conclusion**

This dissertation has explored the conditions that made it possible for pets to eat the way they do. Specifically, my project outlined how pet animals have come to consume commercial pet foods exclusively; how they can eat the same food for the duration of their lives and seemingly thrive physiologically. I considered the alliances that had to be made and the interests that had to be negotiated to allow pet foods to come together this way. My analysis of this phenomenon was informed by the epistemological insights of actor-network theory. ANT holds a symmetrical view of society that maintains objects and knowledge are not created by individual actors who possess agency. Rather, the social world is made up of assemblages of human and nonhuman actants. In ANT, assemblages and actants are intertwined concepts that provide an ontological leveling of the objects and scales of our investigation, respectively. Both concepts hold that social explanations should move away from drawing on distinctions or dualisms of subjects and objects, society and nature, institutions or individuals, humans or nonhumans, etc. because these ignore heterogeneities in the world. Explanations that attribute responsibility for social circumstances to humans ignore the degree to which nonhumans are mobilized and used in human activities. ANT claims that the salient point, often missed, is that people do not act, but rather, that action is the result of networks being formed and mobilizing a large array of entities in pursuit of certain interests. The job of social scientists is to consider how networks are built and sustained. It is to consider how actants, with their myriad interests, are enrolled in a collective through processes of negotiation or translation. The role of social scientists is to tell

stories about how social life becomes as it is. ANT provides the tools for thinking about and understanding how certain things or objects come to be the way they are.

I argued that the materialization of contemporary pet food was the result of the mobilization of many human and nonhuman actants into a stable and cohesive network organized around nutrition. This occurred over a significant period of time and was the consequence of the network changing and adapting as new actants became enrolled. In its early years, pet foods were largely responsive to the desire of food companies to displace waste and generate nominal sums of money from these products. As pet food became a more stable product – as it invested in ideas about humans’ responsibility to pets’ nutritional needs, as the technologies came to be developed and available, as appropriate research emerged, and so on – nutrition became the principle concern and also changed in its definition. Whereas nutrition is traditionally and typically geared toward eating a variety of foods, in 1991 the pet food industry turned nutrition into a target that was both predictable and actionable. Nutrition, in this case, could literally be known, measured, produced. This was the result a wide array of actants, including corporate bodies, companies, entrepreneurs, legislators, farmers, research subjects, consumers, animals, packages, websites, trade groups, formulas, tables, and so on, forming a workable system in which nutrition could be identified, measured, and provided. As I show, the principal interest, ‘proper’ nutrition as provided by certain macronutrient and micronutrient requirements, was generated by a constantly changing and adapting network.

I claim that the nutritionalized pet food network attended to the needs of animals, humans, and capital. The height of nutritionism can be found in the way in which the

concept comes to reworked as the authority to define and act on nutrition shifts way from the scientific body of the NRC and becomes relocated in AAFCO. At this time cats' and dogs' nutritional needs are not just identified, they are combined with manufacturing. In fact, their nutritional needs reorganize the production process so that ingredient actants can be combined with formulas and formulation schemes to produce physiologically-satisfying and satiating food products. This was increasingly necessary because companies favoured dry, grain-based foods and insisted that pets could only safely consume commercially-prepared pet foods. As the material nutritionalization of the industry has expanded, however, its discursive construction has followed a different path. Nutritionism reduces foods to nutrients. Yet the packages evoke other ideas to enroll human pet owners into the network. Many of these draw on naturalized ideas about food and the reaffirmation of dualisms between culture and nature where pet animals are classified in shifting ways around this border. Thus, my argument points out that nutrition, even as the centre of a network, is not stable or constant. It shifts, moves, and takes on different meanings within the network. Actants experience and organize around it in the way most relevant to them. I claim this is integral to the network's ongoing endurance. Nutritionism within pet food is operational because it behaves materially, discursively, and ideologically in mutually constitutive and reinforcing ways.

### *Implications of a Nutritionalized Pet Food Industry*

The majority of this dissertation has focused on explaining the way in which nutritionism has taken shape in the pet food industry, with relatively little discussion concerning the broader implications. My analysis has been rather chilly toward



nutritionalized food and eating. In fact, I think there are serious consequences to shaping the food industry in this way. This is not to say that there are no advantages to be derived from a greater focus on the nutritional integrity of diet. Often the first step toward advancing a population's health and longevity is making sufficient calories available. Increasing the availability of calories often increases the diversity of nutrients available to be consumed. At the same time, attention to nutrition by state officials, researchers, nutrition experts, and individuals often improves population health. Today's pet foods are readily available, convenient, consistent, and produced with an attention to fulfilling biological need. They provide pets with regular access to more food, and perhaps even more nutritious food than at any other time. This constant supply of energy as well as other nutrients likely help pets live longer and healthier lives today. But this does not mean the current circumstances are the best way to construct the pet food industry. While more food is certainly an improvement over scarcity, it certainly does not mean the foods available are nutritionally exceptional.

The origins and logic of nutritionism fit best with a profit-driven food model. Unfortunately, this model does not always attend to nutrition well. Subsidy programs affect food availability and distribution. These have also created significant nutritional gaps among both the fortunate and underprivileged. Too much food energy or improperly balanced foods can create health and dietary problems over time. There is a serious crisis of over/under-nutrition in most Western nations in the sense that people are consuming food that is dense in energy, but not in other nutrients (Patel, 2007). So far, pet foods have reflected this tendency, especially in the least expensive pet food lines. The quantification of food is neither an assurance that pet foods are balanced and

healthful nor a necessary reflection of their appropriateness. Whereas the guaranteed analysis may provide some guidance about the healthfulness of a food, the link between the two is ultimately marginal.

The focus on nutrients as the basis for a healthy food can create the benefits addressed above. But much more realistically, and as the 2007 pet food recall revealed, when nutrients become the definitive focus of healthy consumption, problems can still occur. Nutritionism as the primary organizing principle in pet food begs the question of which mechanisms and methods will be used to count nutrients. I have outlined how the counting works in the pet food industry – how pet food manufacturers think about foods' nutrients and make products that adhere to those specifications. At best, manufacturers actually make foods that fall in line with the requirements. Much more likely, and because the verifications systems are poorly matched with their object as well as a push to keep costs low, they do not. The pet food industry claims its products meet the highest nutritional standards known. It counters that the recall was the result of fraud and that adulteration has no bearing on the structure of the larger industry. The ubiquity of the fraud, the disparity in ingredients across the industry, and ongoing questions that surround some other commonly included ingredients, do not support this claim. Nestle and Nesheim (2010: 307-9) agree and offer several pieces of advice to the industry. They warn companies to be truthful in spirit and letter in their advertising, become much more transparent about ingredient sources, quality, and testing methods, to be more cognizant of food safety, including pathogens and toxins, and to support reviewable and financially-independent research. Their feeling is the industry operates secretively, which confuses customers and creates skepticism about the quality of their products.

Nutritionalization as seen in the pet food industry is among its most radical expressions. Human food does not yet display this tendency to the degree that individuals are advised to consume essentially one of many identical whole, but processed meals, to meet their full dietary needs. This type of diet is the science fiction of the 1950s and 1960s where foods came in pill form. Yet some corporations are expressing increasing interest in taking food in this direction. The food industry has actively pursued expressions of commodified nutritional adulteration, in spite of the larger consequences. Several examples include the green revolution, biotechnology and bioengineering, and now the recent and rapidly expanding field of nutrigenomics. This field concerns itself with the relationship between food, nutrients and genes. As with pet foods, it operates according to the presumption that we can know, predict, and feed to optimum nutrient levels – a belief social scientists should view hesitantly. Such assumptions focus on individual health and remove social and environmental factors from discussions about nutrition. Reducing nutrition to figures and measures is simply a poor way of approaching health. We largely know this. As was obvious in the pet food industry, people recognize that *foods* must constitute the centerpiece of diet and nutrition. Eating for nutrients simply begets a range of problems, not the least of which concerns how consumption becomes translated into a recognizable vocabulary. Nutritionism fosters hypersymbolized and cartoonish representations of nutrition that are removed from the realities of consumption.

#### *Directions for Future Research*

The scholarship on pet food is still in its infancy and much more research on the industry is needed. By far the most common type of work related to the field concerns popular commentary on human-pet relationships, animal care and animal health, while notable gaps in both the scientific and social scientific scholarship on pet foods remain. These former works are of importance to animal caregivers, practitioners, or to the industry itself. They might even provide important avenues for social scientific researchers, as will be discussed momentarily. But what is really necessary is more academic work on pet food, particularly the type that will situate it within social structures. Pet food offers a number of rich insights into social institutions and dynamics, including food systems, commodity chains, health, nutrition, bodies, laws, animal-human relations, and so on. While this project has attempted to showcase some of these linkages, much remains to be done. What follows represents some potential projects that would make great additions to pet food research.

This dissertation has provided an historical overview of the pet food industry with a particular focus on the major companies, events, and ingredients that have influenced its formation. My analysis has drawn heavily on the pet food historical scholarship that exists. Because most sources are secondary, there is a great deal of room for more primary historical work on pet food or the pet food industry. Some excellent projects could center on writing about the involvement of major grain/feed producers in pet food manufacturing. Rich histories about the life and work of some of the more influential figures in pet food production, Clarence Gaines or Mark Morris, for instance, or smaller and now defunct facilities or labels and their food chains, would also make significant contributions to the terrain. There is room for researchers to dig deeper into these areas.

But the most significant challenge, as stated, is the availability of the appropriate primary documentation. Many records simply do not exist. When they do, access to them is limited by the pet food corporations which possess them.<sup>83</sup> More archival research would likely uncover some fruitful results, but social scientists may struggle to obtain or access these other rich texts.

Additional research projects could connect directly with the industry to uncover, in greater depth, the way pet food producers view their clients (dogs or cats), ingredients or products. How does the pet food industry understand pets? How does it shape petness? How have these phenomena changed over time? Such a project might center on tracking and tracing how the industry has oriented itself with humans' relationship to dogs and cats to understand how their treatment has changed over time. There are two strong data sources for this endeavour: print advertisements and the Petfood Institute's half-century old trade publication, *Petfood Industry*. Since 1959 the Institute has six to twelve times annually published a magazine highlighting issues, operations, companies, products, legislation, and so on. A detailed review of these documents would allow researchers to track the industry's role in, or response to, any number of different social, legal or economic problems. This project could trace the subtle ways views of nutrition, animals, legal oversight, and so on have shifted within the industry over time. Such questions could also be addressed by researching the pet food industry's advertisements. As either a stand alone project or one that augments a study that includes industry trade periodicals, researchers could select advertisements over time, again, to consider subtle shifts in the treatment of pets and attitudes toward pet food. A study into the

---

<sup>83</sup> For example, an informant told me that diaries belonging to Clarence Gaines were unearthed in the office adjacent to an old feed mill purchased by Nestlé-Purina. My attempts to confirm their existence or review them at all, have been completely ignored.

advertisements launched during the industry's rebuilding and rebranding phase of the 1960s would be especially fruitful.

Nestle and Nesheim (2010) claim that one of the greatest research needs for pet food research is independently-funded and non-proprietary scientific research on nutrition. Sources of such information are growing in number, but the vast amount still remains tied to the major commercial labels. In principle, more independent and more robust scientific research could cause little harm. But this project has problematised the science-based model of food and nutrition that characterizes nutritionism and governs the pet food industry as being insufficient and too reductive to provide definitive answers on the healthfulness of pet foods. Food and nutrition operate in the industry as though they are independent of the social and economic conditions that make them possible. I would add that any scientific research into pet nutrition needs to start with new approaches that are removed from biases. These will have to look not just for nutrients, but measures of overall health. Studies ought to be conducted over long periods of time, in non-invasive ways. They need to include different alternatives to commercially-prepared diets. Scientists should be prepared to question the basic assumptions of their research approach in the first place.

Lastly, pet food companies and pet owners seem to have the same interest in having pets exist as human dependents. The relationship between humans and animals can be profound and incredibly rewarding for both parties. It is one that will probably not disappear any time soon. But as human populations grow, environmental problems worsen, and resources become increasingly scarce, both the industry and the people who live with pets will have to more seriously examine the sustainability of pets. Making the

production facilities less resource-intensive is one step that companies seem to be taking. But serious questions are being asked about the environmental impact of ingredients used in pet food. As either a by-product or co-product, the pet food industry bears some responsibility in exacerbating environmental problems related to animal agriculture and aquaculture. It is most pronounced in aquaculture since fish and fish oils are added to cat foods in exceptional levels. Moreover, the contention that these foods are not being taken away from the human food chain may not be so clear cut or hold over time. The foods, as they are presently fashioned, would be undesirable to consume. But global hunger is far too common to dismiss these refurbished calories hastily as inedible. Some of the ingredients found in pet foods have high nutritional utility and excluding them from the human food chain simply because they can fetch better prices when used in pet food from affluent pet owners may not be ecologically or socially tenable.<sup>84</sup> It may soon be the case that pets' environmental and social 'paw' print, so to speak, cannot be naturalized and covered by clichés about recycling or glossed over with assertions of inedibility. But no doubt any of these developments will be taken by the industry in stride.

As this project has shown, this now taken-for-granted industry is a resilient one. But as long as pets are the friends, family and companions of people, there will be contestation over their food. Pet foods offer surprisingly interesting and rich possibilities for interrogations about human social life and circumstances. As the number of pets grows worldwide, and the globalization of the pet food industry continues, these will only become more obvious. The task facing social scientists is to unpack the relations that make this product so central to the lives of humans & the pets that live with them.

---

<sup>84</sup> I am most certainly not suggesting poor people ought to eat pet food. Rather, I am simply asking questions about why some ingredients are in the pet food chain. They may include ingredients with 'gross' factor (for some people), but could equally include meat cuts, grains and fresh vegetables or fruit.

## References

- Aberle, Elton, John Forrest, David Gerrard and Edward Mills. 2001. *Principles of Meat Science*, 4<sup>th</sup> Edition. Dubuque, IA: Kendall Hunt Publishing Company.
- Ackerman, Stephen and Judith Levine Willis. 1991. 'Pet Cuisine.' *FDA Consumer* 25.2: 28-32.
- Adams, Carol. 2000. *The Sexual Politics of Meat: A Feminist-Vegetarian Critical Theory*. New York: Continuum.
- Agricultural Research Service, United States Department of Agriculture. 2010. *USDA National Nutrient Database for Standard Reference, Release 23*. Nutrient Data Laboratory Home Page: <http://www.ars.usda.gov/ba/bhnrc/ndl>
- Albritton, Robert. 2009. *Let Them Eat Junk: How Capitalism Creates Hunger and Obesity*. New York: Pluto Press.
- Aldrich, Greg. 2006. 'Rendered Products in Pet Food.' In *Essential Rendering: All About the Animal By-Products Industry*. David Meeker, ed. Arlington, VA: National Renderers Association, pp. 159-177.
- Aldrich, Greg. 2003. 'Ingredients with Regulatory Issues. In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 157-162.
- Andersen, Robin. 2000. 'Selling 'Mother Earth': Advertising and the Myth of the Natural.' In *Reclaiming the Environmental Debate: The Politics of Health in a Toxic Culture*. Richard Hofrichter, ed. Cambridge, MA: The MIT Press, pp. 201-217.
- Anson, Suzan. 1989. *Bone Appetit!: Gourmet Cooking for your Dog*. New York: New Chapter Press.
- Appadurai, Arjun. 1986. 'Introduction: Commodities and the Politics of Value. In *The Social Life of Things: Commodities in Cultural Perspective*. Arjun Appadurai, ed. Cambridge: Cambridge University Press, pp. 1-63.
- Armstrong, Philip. 2007. 'Farming Images: Animal Rights and Agribusiness in the Field of Vision.' In *Knowing Animals*. Lawrence Simmons and Philip Armstrong, eds. Lieden & Boston: Brill, pp. 105-128.
- Association of American Feed Control Officials. 2008. *2008 Official Publication*. Oxford, In: Association of American Feed Control Officials, Inc.
- Beardsworth, Alan and Teresa Keil. 1997. *Sociology on the Menu: An Invitation to the Study of Food and Society*. London and New York: Routledge.



Becker, Geoffrey. 2004. *CRS Report for Congress: Animal Rendering: Economics and Policy*. Washington, D.C.: The Library of Congress.

Belasco, Warren. 2008. *Food: The Key Concepts*. Oxford: Berg Publishers.

Belasco, Warren. 2006. *Meals to Come: A History of the Future of Food*. Berkeley: University of California Press.

Bell, David and Gill Valentine. 1997. *Consuming Geographies: We are Where We Eat*. London: Routledge.

Bentley, Amy. 2002. 'Inventing Baby Food: Gerber and the Discourse of Infancy in the United States.' In *Food Nations: Selling Taste in Consumer Culture*. Warren Belasco and Philip Scranton, eds. New York: Routledge, pp. 92-112.

Berschneider, Helen. 2002. 'Alternative Diets.' *Clinical Techniques in Small Animal Practice* 17.1: 1-5.

Billinghurst, Ian. 2001. *The BARF Diet: Raw Feeding for Dogs and Cats Using Evolutionary Principles*. Australia: Ian Billinghurst, DVM.

Bisplinghoff, Fred. 2006. 'A History of North American Rendering.' In *Essential Rendering: All About the Animal By-Products Industry*. David Meeker, ed. Arlington, VA: National Renderers Association, pp. 17-28.

Blay-Palmer, Alison. 2008. *Food Fears: From Industrial to Sustainable Food Systems*. Burlington, VT: Ashgate.

Boothe, Dawn. 2004. 'Balancing Fact and Fiction of Novel Ingredients: Definitions, Regulations and Evaluation.' *The Veterinary Clinics Small Animal Practice* 34: 7-38.

Bourdieu, Pierre. 1984. *Distinction: A Social Critique of the Judgment of Taste*. Trans. Richard Nice. Cambridge, MA: Harvard University Press.

Bowker, Geoffrey and Susan Leigh Star. 1999. *Sorting Things Out: Classification and its Consequences*. Cambridge, MA: MIT Press.

Bowler, Ian. 1985. 'Some Consequences of the Industrialization of Agriculture in the European Community. In *The Industrialization of the Countryside*. Michael Healey and Brian Ilbery, eds. Norwich, UK: Geo Books, pp. 75-98.

Bren, Linda. 2001. 'Pet Food: The Lowdown on Labels.' *FDA Consumer* 35.3: 26-31.

Brown, Cathy, Kyu-Shik Jeong, Robert Poppenga, Birgit Puschner, Doris Miller, Angela Ellis, Kyung-Il Kang, Steffen Sum, Alexis Cistola and Scott Brown. 2007. 'Outbreaks of

Renal Failure Associated with Malamine and Cyanuric Acid in Dogs and Cats in 2004 and 2007. *Journal of Veterinary Diagnostic Investigation* 19.5: 525-531.

Brownell, Kelly and Kathy Battle Horgen. 2004. *Food Fight: The Inside Story of the Food Industry, the Obesity Crisis and What We Can Do About It*. Chicago: Contemporary Books.

Burnham, Frank. 1996. 'The Rendering Industry: A Historical Perspective.' In *The Original Recyclers*. Franco, Don A and Winfield Swanson eds. Merrifield, VA: Animal Protein Producers Industry, The Fats and Proteins Research Foundation, and The National Renderers Association, pp. 1-15.

Burnham, Frank. 1978. *Rendering: The Invisible Industry*. Fallbrook, CA: Aero Publishers.

Cannon, Geoffrey. 2005. 'The Rise and Fall of Dietetics and of Nutrition Science, 4000-BCE-2000CE.' *Public Health Nutrition* 8.6A: 701-705.

Callon, Michel. 1999. 'Actor-Network Theory: The Market Test.' In John Law and John Hassard, eds. *Actor Network Theory and After*. Oxford: Blackwell Publishing, pp. 181-195.

Callon, Michel. 1986. 'Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fisherman of St. Brieuc Bay.' In *Power, Action and Belief: A New Sociology of Knowledge*. London: Routledge, pp. 196-233.

Callon, M. and J. Law (1982). "On Interests and their Transformation: Enrolment and Counter-Enrolment." *Social Studies of Science* 12: 615-625.

Caparella, Tina. 2009. 'Rendering is One Solution to Environmental Sustainability.' *Render: The National Magazine of Rendering* 38.2(April): 8-9

Case, Linda. 2005. *The Dog: Its Behavior, Nutrition and Health*, 2<sup>nd</sup> Edition. Ames, IO: Blackwell Publishing.

Case, Linda. 2003. *The Cat: Its Behavior, Nutrition and Health*. Ames, IO: Iowa State Press.

Case, Linda, Daniel Carey, Diane Hirakawa and Leighann Daristotle. 2000. *Canine and Feline Nutrition: A Resource for Companion Animal Professionals*, 2<sup>nd</sup> Edition. St. Louis: Mosby.

Cassuto, David. 2007. 'Bred Meat: The Cultural Foundation of the Factory Farm.' *Law and Contemporary Problems* 70: 59-87.

Caswell and Padberg. 1992. 'Toward a More Comprehensive Theory of Food Labels.' *American Journal of Agricultural Economics* 74: 460-468.

Cato, Mac. 1985. 'Give that Product...Personality! Selling by Design' *Canadian Packaging* 35.4: 28-30.

Combelles, Eric. 2004, August 13. 'The Premiumisation of Private Label in Pet food. *Euromonitor International*. London, U.K. Available: [http://www.euromonitor.com/The\\_premiumisation\\_of\\_private\\_label\\_in\\_pet\\_food](http://www.euromonitor.com/The_premiumisation_of_private_label_in_pet_food) (accessed July 18, 2009).

Cook, Nancy. 2008. 'How Pet Food is Made.' 145<sup>th</sup> *American Veterinary Medical Association Annual Convention*. New Orleans, LA: July 19-22. (Style?)

Corbin, Jim. 2002. 'The History of Petfood.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 514-516.

Cowell, Christopher, Neil Stout, Mark Brinkmann, Edward Moser and Stephen Crane. 2000. 'Making Commercial Pet Foods.' In *Small Animal Clinical Nutrition*, 3<sup>rd</sup> Edition. Michael Hand, Craig Thatcher, Rebecca Remillard and Philip Roudebush, eds. Topeka, KS: Mark Morris Institute, pp. 127-146.

Crandell, Kathleen. 2001. 'Defining and Dealing With Nutraceuticals in the US.' *Feed Mix* 9.6: 30-1.

Crotty, Patricia. 1995. *Good Nutrition?: Fact and Fashion in Dietary Advice*. Melbourne: Allen and Unwin.

Crotty, Patricia. 1993. 'The Value of Qualitative Research in Nutrition.' *Health Sociology Review* 3.1: 109-118.

Davis, Karen. 2009. *Prisoned Chickens, Poisoned Eggs: An Inside Look at the Modern Poultry Industry*, 2<sup>nd</sup> Edition. Summertown, TN: Book Publishing Company.

Day, Jared. 2008. 'Butchers, Tanners and Tallow Chandlers: The Geography of Slaughtering in Early-Nineteenth-Century New York City.' In *Meat, Modernity, and the Rise of the Slaughterhouse*. Durham, NH: University of New Hampshire Press, pp. 178-197.

De Silva, Sena and Giovanni Turchini. 2008. 'Towards Understanding the Impacts of the Pet Food Industry on World Fish and Seafood Supplies.' *Journal of Agricultural and Environmental Ethics* 21: 459-467.

Dickinson, Dan. 2003. 'Petfoods and Multi-Wall Packaging.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 406-412.

- Dixon, Jane. 2009. 'From the Imperial to the Empty Calorie: How Nutrition Relations Underpin Food Regime Transitions.' *Agriculture and Human Values* 26: 321-333.
- Dixon, Jane. 2003. 'Authority, Power and Value in Contemporary Industrial Food Systems.' *International Journal of Sociology of Agriculture and Food* 11.1: 31-39.
- Dixon Jane and Cathy Banwell. 2004. 'Re-embedding Trust: Unraveling the Construction of Modern Diets.' *Critical Public Health* 14.2: 117-131.
- Dixon, Jane, Colin Sindall and Cathy Banwell. 2004. 'Exploring the Intersectoral Partnerships Guiding Australia's Dietary Advice.' *Health Promotion International* 19.1: 5-13.
- Dolwick, Jim. 2009. "'The Social' and Beyond: Introducing Actor-Network Theory.' *Journal of Maritime Archaeology* 4.1: 21-49.
- Douglas, Mary. 1999. 'Deciphering a Meal.' In *Implicit Meanings: Selected Essays in Anthropology*, 2<sup>nd</sup> Ed. Mary Douglas, ed. London: Routledge, pp. 231-251.
- Dzanis, David. 2008a. 'Understanding Regulations Affecting Pet Foods.' *Topics in Companion Animal Medicine* 23.3: 117-120.
- Dzanis, David. 2008b. 'Anatomy of a Recall.' *Topics in Companion Animal Medicine* 23.3: 133-136.
- Dzanis, David. 2003a. 'Ensuring Nutritional Adequacy.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 62-67.
- Dzanis, David. 2003b. 'Petfood Types: Quality Assessment and Feeding Management.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 68-73.
- Dzanis, David. 2003c. 'Novel Ingredients: Safety and Utility.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 135-140.
- Dzanis, David. 2003d. 'Substantiating Nutritional Adequacy.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 163-169.
- Dzanis, David. 1994. 'Understanding Pet Food Labels.' *FDA Consumer* 28.8: 10-15.
- Earle, K.E. 1990. 'Feeding For Health.' *Journal of Small Animal Practice* 31: 477-481.

- Ebel, G. and A. Spielman. 1998. 'Emerging Infections: Origins, Ecology, Costs and Prevention.' *Parasitology Today* 14.4: 134-135.
- Eder, Klaus. 1996. *The Social Construction of Nature: A Sociology of Ecological Enlightenment*. London: Sage Publications.
- Elias, Norbert. 1978. *The Civilizing Process*. Trans Edmund Jephcott. New York: Urizen Books.
- Elliott, Charlene. 2008a. 'Taste Rules! Food Marketing, Food Law, and Childhood Obesity in Canada.' *Cuizine: A Journal of Canadian Food Cultures* 1.1. Available: <http://cuizine.mcgill.ca>.
- Elliott, Charlene. 2008b. 'Consuming the Other: Packaged Representations of Foreignness in *President's Choice*.' In *Edible Ideologies: Representing Food and Marketing*. Kathleen LeBesco and Peter Naccarato, eds. New York: State University of New York Press, pp. 179-197.
- Elliot, Charlene. 2008c. 'Marketing Fun Foods: A Profile and Analysis of Supermarket Food Messages Targeted at Children.' *Canadian Public Policy* 34.2: 259-273.
- Elliott, Charlene. 2007. 'Big Persons, Small Voices: On Governance, Obesity, and the Narrative of the Failed Citizen.' *Journal of Canadian Studies* 41.3: 124-149.
- Etkin, Nina. 2006. *Edible Medicines: An Ethnopharmacology of Food*. Tucson: University of Arizona Press.
- Fahey, George. 2003. 'Research Needs in Companion Animal Nutrition.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 57-61.
- Ferrie, Suzie. 2010. 'Invasion of the Body Snatchers: Food, Feeding, and Power in Hospitals.' *Cultural Studies ↔ Critical Methodologies* 10.6: 437-444.
- Fiddes, Nick. 1991. *Meat: A Natural Symbol*. London and New York: Routledge.
- Fine, Ben. 2005. 'From Actor-Network Theory to Political Economy.' *Capitalism Nature Socialism* 16.4: 91-108.
- Fischler, Claude. 1980. 'Food Habits, Social Change and the Nature/Culture Dilemma.' *Social Science Information* 19.6: 937-953.
- Fitzgerald, Amy. 2009. 'It's a Horrible Coincidence': Corporate Responsibility and the 2007 Pet Food Recall.' *Critical Criminology* 17.3: 195-215.

- Fox, Michael W., Elizabeth Hodgkins and Marion Smart. 2009. *Not Fit For a Dog!: The Truth About Manufactured Dog and Cat Food*. Fresno, CA: Quill Driver Books.
- Fox, Rebekah. 2006. 'Animal Behaviours, Post-human Lives: Everyday Negotiations of the Animal-Human Divided in Pet-keeping.' *Social and Cultural Geography* 7.4: 525-536.
- Franco, Don. 2006. 'The Rendering Industry's Role in Feed and Food Safety.' In *Essential Rendering: All About the Animal By-Products Industry*. David Meeker, ed. Arlington, VA: National Renderers Association, pp. 53-70.
- Franco, Don and Gary Pearl. 2000. 'Rendering Food Waste.' In *Food Waste to Animal Feed*. Michael Westendorf, ed. Ames, IO: Iowa State University Press, pp. 241-248.
- Freidberg, Susanne. 2009. *Fresh: A Perishable History*. Cambridge, MA: The Belknap Press of Harvard University Press.
- Friedmann, Harriet (1982). 'The Political Economy of Food: The Rise and Fall of the Postwar International Food Order.' *The American Journal of Sociology* 88 (Supplement; Marxist Inquiries: Studies of Labor, Class, and States): S248-S286.
- Gareau, Brian. 2005. 'We Have Never Been Human: Agential Nature, ANT, and Marxist Political Ecology.' *Capitalism Nature Socialism* 16.4: 127-140.
- Gilbert, Jess and Carolyn Howe. 1991. 'Beyond 'State and Society': Theories of the State and New Deal Agricultural Policies' *American Sociological Review* 56: 204-220.
- Gillis, Charlie and Anne Kingston. 2007, April 30. 'The Great Pet Food Scandal: How One Supplier Caused a Huge Crisis, and why it's Just the Tip of the Iceberg.' *Maclean's Magazine*.
- Grier, Katherine. 2008. 'Provisioning Man's Best Friend: The Early Years of the American Pet Food Industry, 1870-1982.' In *Food Chains: From Farmyard to Shopping Cart*. W. Belasco and Roger Horowitz, eds. Philadelphia: University of Pennsylvania Press, pp. 126-141.
- Grier, Katherine. 2006. *Pets in America: A History*. Orlando, FL: Harcourt Books.
- Gruber, G.S. 1975. 'The Exciting History of the Petfood Industry.' *Petfood Industry* 17.1:
- Guthman, Julie. 2007. 'Commentary on teaching food: Why I am fed up with Michael Pollan et al.' *Agriculture and Human Values* 24: 261-264.
- Hamilton, Shane. 2008. 'Analyzing Commodity Chains: Linkages or Restraints?' In *Food Chains: From Farmyard to Shopping Cart*. W. Belasco and R Horowitz, eds. Philadelphia: University of Pennsylvania Press, pp. 17-25.

Hamilton, Shane. 2008. 'Analyzing Commodity Chains: Linkages or Restraints?' In *Food Chains: From Farmyard to Shopping Cart*. W. Belasco and R Horowitz, eds. Philadelphia: University of Pennsylvania Press, pp. 17-25.

Hamilton, C.R., David Kirstein and Richard Breitmeyer. 2006. 'The Rendering Industry's Biosecurity Contribution to Public Health and Animal Health.' In *Essential Rendering: All About the Animal By-Products Industry*. David Meeker, ed. Arlington, VA: National Renderers Association, pp.71-93.

Harris, Marvin. 1985. *Good to Eat: Riddles of Food and Culture*. New York: Simon and Shuster.

Herrick, Clare. 2009. 'Shifting Blame/Selling Health: Corporate Social Responsibility in the Age of Obesity.' *Sociology of Health and Illness* 31.1: 51-65.

Hervera, M., M. D. Baucells, C. Torre, A. Buj and C. Castrillo. 2008. 'Prediction of Digestible Energy Value of Extruded Dog Food: Comparison of Methods.' *Journal of Animal Physiology and Animal Nutrition* 92: 253-259.

Hill, Dale. 2003a. 'Purchasing Quality Ingredients: A Large Company's Prospective.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 82-84.

Hill, Dale. 2003b. 'Specialty Ingredients: Considerations and Use. In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 85-100.

Hirshberg, Gary. 2009. 'Organics-Healthy Food, and So Much More.' In *Food, Inc.: How Industrial Food is Making us Sicker, Fatter and Poorer – And What You Can Do About It*. Karl Weber, ed. New York: Public Affairs, pp. 47-59.

Hischke, Herbert. 1975. 'Canned Pet Foods – Past to Present.' *Cereal Foods World* 20.1: 12-15.

Hoestenback, Roger. 2003. 'Regulatory Considerations for Petfood Packaging.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 458-467.

Holbrook, Morris. 2008. 'Pets and People: Companions in Commerce?' *Journal of Business Research* 61.5: 546-552.

Holbrook, Morris and Arch Woodside. 2008. 'Animal Companions, Consumption Experiences, and the Marketing of Pets: Transcending Boundaries in the Animal-Human Distinction. *Journal of Business Research* 61.5: 377-381.

- Horowitz, Roger. 2006. *Putting Meat on the American Table: Taste, Technology, Transformation*. Baltimore: John Hopkins University Press.
- Hussein, Hussein. 2003a. 'Basic Nutrient Requirements for Healthy Adult Dogs.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 2-13.
- Hussein, Hussein. 2003b. 'Basic Nutrient Requirements for Health Adult Cats.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 14-28.
- Imhoff, Daniel. 2010. 'Myths of the CAFO.' In *The CAFO Reader: The Tragedy of Industrial Animal Factories*. Daniel Imhoff, ed. Los Angeles: University of California Press.
- Johns Hopkins Center for a Livable Future. 2007. *Feed for Food-Producing Animals: A Resource on Ingredients, the Industry, and Regulation*. Baltimore: Bloomberg School of Public Health.
- Johnson, Lindgren. 2005. "'Slaughtering" Equality?: Rendering the Animal and E-racing the Human in the *Slaughterhouse Cases*.' *Food and History* 3.2: 219-239.
- Johnston, Josée. 2008. 'The Citizen-Consumer Hybrid: Ideological Tensions and the Case of Whole Foods Market.' *Theory and Society* 37: 229-270.
- Johnston, Josée and Shyon Baumann. 2010. *Foodies: Democracy and Distinction in the Gourmet Foodscape*. New York: Routledge.
- Kane, Ed and Tim Phillips. 2003. 'Ingredients and Perception.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 170-174.
- Katcher, A., H. Segal, and A. Beck. 1983. 'Contemplation of an Aquarium for the Reduction of Anxiety.' In *The Pet Connection*. R.K. Anderson, B. Hart, and L. Hart, eds. Minneapolis: University of Minnesota Press, pp. 171-178.
- Kallfelz, Francis. 2003. 'Optimum vs. Minimum/Adequate Nutrition: Reality or Redundancy?' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 49-56.
- Kilbourne, Jean. 1999. *Deadly Persuasion: Why Women and Girls must Fight the Addictive Power of Advertising*. New York: The Free Press.
- Kingslover, Barbara. 2007. *Animal, Vegetable, Miracle: A Year of Food Life*. New York: HarperCollins Publishers.



Klein, Richard. 2010. 'What Is Health and How Do You Get It?' In *Against Health: How Health became the New Morality*. Jonathan Metzl and Anna Kirkland, eds. New York: New York University Press, pp. 15-25.

Kopytoff, Igor. 1986. 'The Cultural Biography of Things: Commoditization as Process.' In *The Social Life of Things: Commodities in Cultural Perspective*. Arjun Appadurai, ed. Cambridge: Cambridge University Press, pp. 64-91.

Krestel-Rickert, Deena and Julie Kisic. 2003. 'Nutraceuticals in Petfood.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 129-134.

Kronenberg, Jakub and Ralph Winkler. 2009. 'Wasted Waste: An Evolutionary Perspective on Industrial By-Products.' *Ecological Economics* 68: 3026-3033.

Kvamme, Jennifer. 2003. 'What is Palatability?' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 176-177.

Lang, Tim and Michael Heasman. 2004. *Food Wars: The Global Battle for Mouths, Minds, and Markets*. London: Earthscan.

Laflamme, Dorothy. 2008. 'Introduction: Controversies in Small Animal Nutrition: Pet Food Safety.' *Topics in Companion Animal Medicine* 23.3: 116.

Latour, Bruno. 2005. *Reassembling the Social: An Introduction to Actor-Network Theory*. Oxford: Oxford University Press.

Latour, Bruno. 1999. *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge, MA: Harvard University Press.

Latour, Bruno. 1993. *We Have Never Been Modern*. Trans. Catherine Porter. Cambridge, MA: Harvard University Press.

Latour, Bruno. 1992. 'Where are the Missing Masses? The Sociology of a Few Mundane Artifacts' In *Shaping Technology/Building Society: Studies in Sociotechnical Change*. Wiebe Bijker and John Law, eds. Cambridge, :MIT Press, pp. 225-258.

Latour, Bruno. 1988. *The Pasteurization of France*. Trans. Alaln Sheridan and John Law. Cambridge, MA: Harvard University Press.

Law, John. 1999. 'After ANT: Complexity, Naming and Typology. In *Actor Network Theory and After*. John Law and John Hassard, eds. Oxford: Blackwell Publishing, pp. 1-14.

Law, John. 1992. 'Notes on the Theory of the Actor-Network: Ordering, Strategy and Heterogeneity.' *Systems Practice* 5: 379-393.

- Law, John. 1991. 'Introduction: Monsters, Machines and Sociotechnical relations' In *A Sociology of Monsters: Essays on Power, Technology and Domination*. John Law, ed. New York: Routledge, pp. 1-23.
- Law, John and Kevin Hetherington. 2000. 'Materialities, Spatialities, Globalities.' In *Knowledge, Space, Economy*. John Bryson, Peter Daniels, Nick Henry and Jane Pollard, eds. London, Routledge, pp. 34-49.
- Levenstein, Harvey. 2003. *Paradox of Plenty: A Social History of Eating in Modern America*, Revised Edition. Berkeley: University of California Press.
- Levenstein, Harvey. 1988. *Revolution at the Table: The Transformation of the American Diet*. New York: Oxford University Press.
- Levi-Strauss, Claude. 1965. 'The Culinary Triangle.' *Partisan Review* 33: 586-95.
- Linthicum, Lee. 2007, September 6. 'Going Upmarket: Premiumisation Driving UK Pet Care Industry.' *Euromonitor International*. London, U.K. Available: [http://www.euromonitor.com/Going\\_upmarket\\_Premiumisation\\_driving\\_UK\\_pet\\_care\\_industry](http://www.euromonitor.com/Going_upmarket_Premiumisation_driving_UK_pet_care_industry) (accessed July 19, 2009).
- Liu, Deng-Cheng. n.d. *Better Utilization of By-Products From the Meat Industry*. Available: <http://www.agnet.org/library/article/cb515.html> (accessed June 23, 2009): 1-15.
- Lockie, Stewart. 2002. "'The Invisible Mouth': Mobilizing 'the Consumer' in Food Production-Consumption Networks." *Sociologia Ruralis* 42.4: 278-294.
- Lonsdale, Tom. 2001. *Raw Meaty Bones: Promote Health*. Australia: Rivetco P/L.
- Lowe, John. 2003. 'Nutrition and Lifestage.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 29-48.
- Lupton, Deborah. 1996. *Food, the Body and the Self*. London: Sage Publications.
- Lyman, Howard with Glen Merzer. 1998. *Mad Cowboy: Plain Truth from the Cattle Rancher Who Won't Eat Meat*. New York: Touchstone.
- MacDonald, M. L., Q.R. Rogers and J. G. Morris. 1984. 'Nutrition of the Domestic Cat, A Mammalian Carnivore.' *Annual Review of Nutrition* 4: 521-562.
- MacLachlan, Ian. 2001. *Kill and Chill: Restructuring Canada's Beef Commodity Chain*. Toronto: University of Toronto Press.

- Marchello, John and Elaine Marchello. 2005. 'Contributions to Society: Slaughter By-Products.' In *Encyclopedia of Animal Science*. Wilson Pond and Alan Bell, eds. New York: Marcel Dekker, pp. 258-260.
- Martin, Ann. 2008. *Food Pets Die For: Shocking Facts About Pet Food*, 3<sup>rd</sup> Edition. Troutdale, OR: NewSage Press.
- Martin, Ann. 2001. *Protect Your Pet: More Shocking Facts*. Troutdale, OR: NewSage Press.
- McClintock, Anne. 1995. *Imperial Leather: Race, Gender and Sexuality in the Colonial Contest*. London: Routledge.
- McGovern, Victoria. 2000. 'Recycling Poultry Feathers: More Bang for the Cluck.' *Environmental Health Perspectives* 1108.8: A366-A369.
- McIntosh, Wm. Alex. 1996. *Sociologies of Food and Nutrition*. New York: Plum Press.
- Meeker, David and C.R. Hamilton. 2006. 'An Overview of the Rendering Industry.' In *Essential Rendering: All About the Animal By-Products Industry*. David Meeker, ed. Arlington, VA: National Renderers Association, pp. 1-16.
- Miller, E. Phillip and James Cullor. 2000. 'Food Safety.' In *Small Animal Clinical Nutrition*, 3<sup>rd</sup> Edition. Michael Hand, Craig Thatcher, Rebecca Remillard and Philip Roudebush, eds. Topeka, KS: Mark Morris Institute, pp.183-198.
- Miller, Jeff and Jonathan Deutsch. 2009. *Food Studies: An Introduction to Research Methods*. Oxford: Berg.
- Mol, Annemarie. 2002. *The Body Multiple: Ontology in Medical Practice*. Durham: Duke University Press.
- Mol, Annemarie. 1999. 'Ontological Politics: A Word and Some Questions.' In *Actor Network Theory and After*. John Law and John Hassard, eds. Oxford: Blackwell, pp. 74-89.
- Mol, Annemarie and Jessica Mesman. 1996. 'Neonatal Food and the Politics of Theory: Some Questions of Method.' *Social Studies of Science* 26.2: 419-444.
- Mudry, Jessica. 2010. 'Counting on Dinner: Discourses of Science and the Refiguration of Food in USDA Nutrition Guides.' *Environmental Communication* 4.3: 338-354.
- Mudry, Jessica. 2009. *Measured Meals: Nutrition in America*. Albany, NY: SUNY Press.

- Mullin, Molly. 2007. 'Feeding the Animals.' In *Where the Wild Things Are Now: Domestication Reconsidered*. Rebecca Cassidy and Molly Mullin, eds. Oxford: Berg, pp. 277-303.
- Murray, Sean, Avinash Patil, George Fahey, Jr., Neal Merchen and Denzil Hughes. 1998. 'Raw and Rendered Animal By-Products as Ingredients In Dog Diets.' *Journal of Nutrition* 128.12: 2812S-2815S.
- Nast, Heidi. 2006 'Critical Pet Studies?' *Antipode* 38.5: 894-906.
- National Renderers Association Inc. 2008. *Pocket Information Manual: A Buyer's Guide to Rendered Products*. Alexandria, VA: National Renderers Association.
- National Research Council. 2006. *Nutrient Requirements of Dogs and Cats*. Washington, D.C.: The National Academies Press.
- Netz, Reviel. 2004. *Barbed Wire: An Ecology of Modernity*. Middletown, CT: Wesleyan University Press.
- Nestle, Marion. 2008. *Pet Food Politics: The Chihuahua in the Coalmine*. Berkeley: University of California Press.
- Nestle, Marion. 2006. *What To Eat: An Aisle-By-Aisle Guide to Savvy Food Choices and Good Eating*. New York: North Point Press.
- Nestle, Marion. 2003. *Safe Food: Bacteria, Biotechnology and Bioterrorism*. Berkeley: University of California Press.
- Nestle, Marion. 2002. *Food Politics: How the Food Industry Influences Nutrition and Health*. Berkeley: University of California Press.
- Nestle, Marion and Malden Nesheim. 2010. *Feed Your Pet Right: The Authoritative Guide to Feeding Your Dog and Cat*. New York: Free Press.
- No author. 2004. 'Formulation Software: A Buying Guide.' *Aqua Feeds: Formulation and Beyond* 1.3: 9-10.
- Ockerman, Herbert and Conly Hansen. 2000. *Animal By-Product Processing and Utilization*. Boca Raton, Fl: CRC Press.
- Olson, Roberta and Kathleen Hulser. 2003. 'Petropolis: A Social History of Urban Companion Animals.' *Visual Studies* 18.2: 133-143.
- Palthur, M. Prasad, S.S. Sajala Palthur and Suresh Kumar Chitta. 2010. 'Nutraceuticals: A Conceptual Definition.' *International Journal of Pharmacy and Pharmaceutical Sciences* 2.3: 19-27.

Patel, Raj. 2007. *Stuffed and Starved: Markets, Power and the Hidden Battle for the World Food System*. Toronto: Harper Collins.

Paulman, Kate. 2008. 'See Spot Eat, See Spot Die: The Pet Food Recall of 2007.' *Animal Law* 15.1: 113-139.

Pet Food Institute. 2006. *History of Pet Food*. Available: <http://www.petfoodinstitute.org/Index.cfm?Page=History> (accessed October 19, 2009).

Philpott, Tom. 2007. 'Flesh and Bone: Toward a Whole-beast Meat-eating Ethos.' *Gastronomica* 7.2: 106-109.

Pollan, Michael. 2010. *Food Rules: An Eater's Manual*. New York: Penguin.

Pollan, Michael. 2008. *In Defense of Food: An Eater's Manifesto*. New York: Penguin Press.

Pollan, Michael. 2006. *The Omnivore's Dilemma: A Natural History of Four Meals*. London: Penguin Books.

Prokop, William. 1996. 'The Rendering Industry – a Commitment to Public Service.' In *The Original Recyclers*. Franco, Don A and Winfield Swanson eds. Merrifield, VA: Animal Protein Producers Industry, The Fats and Proteins Research Foundation, and The National Renderers Association, pp. 15-21.

Rampton, Sheldon and John Stauber. 2000. 'Silencing Spring: Corporate Propaganda and the Takeover of the Environmental Movement. In *Reclaiming the Environmental Debate: The Politics of Health in a Toxic Culture*. Richard Hofrichter, ed. Cambridge, MA: The MIT Press, pp. 157-173.

Rankins, Darrell. 2002. 'The Importance of By-Products to the US Beef Industry.' *Veterinary Clinics of North America: Food Animal Practice* 18: 207-211.

Remillard, Rebecca. 2008. 'Homemade Diets: Attributes, Pitfalls, and a Call for Action.' *Topics in Companion Animal Medicine* 23.3: 137-142.

Retzinger, Jean. 2008. 'The Embodied Rhetoric of "Health" from Farm Fields to Salad Bowls.' In *Edible Ideologies: Representing Food and Marketing*. Kathleen LeBesco and Peter Naccarato, eds. New York: State University of New York Press, pp. 149-178.

Rhodes, Hedric. 1975. 'Overview of United States Pet Food Industry.' *Cereal Foods World* 20.1: 5-7.

Roe, Emma. 2006. 'Things Becoming Food and the Embodied, Material Practices of an Organic Food Consumer.' *Sociologia Ruralis* 45.2: 104-121.

Ross, Eric. 1980. 'Patterns of Diet and Forces of Production: An Economic and Ecological History of the Ascendancy of Beef in the United States Diet.' In *Beyond the Myths of Culture: Essays in Cultural Materialism*. Eric Ross, ed. New York: Academic Press, pp. 181-225.

Roth, Aleda, Andy Tsay, Madeleine Pullman and John Gray. 2008. 'Unraveling the Food Supply Chain: Strategic Insights from China and the 2007 Recalls.' *Journal of Supply Chain Management* 44.1: 22-39.

Roudebush, Philip, Dzanis, David, Jacques Debraekeleer and R. Glenn Brown. 2000. 'Pet Food Labels.' In *Small Animal Clinical Nutrition*, 3<sup>rd</sup> Edition. Michael Hand, Craig Thatcher, Rebecca Remillard and Philip Roudebush, eds. Topeka, KS: Mark Morris Institute, pp. 147-161.

Rovner, Sophie. 2008, May 12. 'Anatomy of a Pet Food Recall: Investigators Deployed an Array of Analytical Tools While Probing a Wave of Pet Food Deaths in 2007.' *Chemical and Engineering News* 86.18: 41-43.

Rudy, Alan. 2005. 'On ANT and Relational Materialisms.' *Capitalism Nature Socialism* 16.4: 109-125.

Rudy, Alan and Brian Gareau. 2005. 'Actor-Network Theory, Marxist Economics, and Marxist Political Ecology.' *Capitalism Nature Socialism* 16.4: 85-90.

Saldanha, Arun. 2003. 'Actor-Network Theory & Critical Sociology.' *Critical Sociology* 29.3: 419-432.

Sapkota, Amy, Lisa Lefferts, Shawn McKenzie and Polly Walker. 2007. 'What Do We Feed to Food-Production Animals? A Review of Animal Feed Ingredients and Their Potential Impacts on Human Health.' *Environmental Health Perspectives* 115.5: 663-670.

Schlosser, Eric. 2001. *Fast Food Nation: The Dark Side of the All-American Meal*. Boston: Houghton-Mifflin.

Scrinis, Gyorgy. 2008a. 'Functional foods or functionally marketed foods? A critique of, and alternatives to, the category of 'functional foods'.' *Public Health Nutrition* 11.5: 541-545.

Scrinis, Gyorgy. 2008b. 'On the Ideology of Nutritionism.' *Gastronomica* 8.1: 39-48.

Scrinis, Gyorgy. 2002. 'Sorry, Marge.' *Meanjin* 61.4: 108-116.

Serpell, James. 1989. 'Humans, Animals and the Limits of Friendship'. In *The Dialectics of Friendship*. Roy Porter and Sylvana Tomaselli, eds. London & New York: Routledge, pp. 111-129.

- Shell, Marc. 1986. 'The Family Pet'. *Representations* 15: 121-153.
- Shukin, Nicole. 2009. *Animal Capital: Rendering Life in Biopolitical Times*.
- Smith, Andrew. 2009. *Eating History: Turning Points in the Making of American Cuisine*. New York: Columbia University Press.
- Smith, Mick. 2002. 'The 'Ethical' Space of the Abattoir: On the (In)human(e) Slaughter of Other Animals'. *Human Ecology Review* 9.2: 49-58.
- Smith, R.E. 1975. 'Nutritional Overview of the Pet Food Industry.' *Cereal Foods World* 20.1: 8-11.
- Sobal, Jeffery. 1995. 'The Medicalization and Demedicalization of Obesity.' In *Eating Agendas: Food and Nutrition as Social Problems*. Donna Maurer and Jeffery Sobal, eds. New York: Aldine de Gruyter, pp. 67-90.
- Stacey, Michelle. 1995. *Consumed. Why Americans Love, Hate and Fear Food*. New York: Simon and Schuster.
- Steinfeld, Henning, Pierre Gerber, Tom Wassenaar, Vincent Castel, Mauricio Rosales and Cees de Haan. 2006. *Livestock's Long Shadow: Environmental Issues and Options*. Rome: Food and Agriculture Organization of the United Nations.
- Stephens, Keri and Patty Malone. 2009. 'If the Organizations Won't Give Us Information...: The Use of Multiple New Media for Crisis Technical Translation and Dialogue.' *Journal of Public Relations Research* 21.2: 229-239.
- Stull, Donald and Michael Boradway. 2004. *Slaughterhouse Blues: The Meat and Poultry Industry in North America*. Belmont, CA: Thompson & Wadsworth.
- Tarasuk, Valerie. 2008. 'Healthy New Foods, Healthy Population?: Regulation, Marketing and a Critical Gap in Food Studies. *Food, Culture and Society* 11.3: 275-280.
- Taylor, Jessica. 2011. 'Riding Out the Storm: The Top 10 Petfood Manufacturers Continue to Feel the Effects of the Global Economic Meltdown.' *Petfood Industry* 53.1: 24-32.
- Thompson, Angele. 2008. 'Ingredients: Where Pet Food Starts.' *Topics in Companion Animal Medicine* 23.3: 127-132.
- Thurston, Mary Elizabeth. 1996. *The Lost History of the Canine Race: Our 15,000 Year Love Affair with Dogs*. Kansas City: Andrews and McMeel.

Tran, Quang, Wouter Hendriks and Antonius van der Poel. 2008. 'Effects of Extrusion Processing on Nutrients in Dry Pet Food. *Journal of the Science of Food and Agriculture* 88: 1487-93.

Tuan, Yi-Fu. 1984. *Dominance and Affection: The Making of Pets*. New Haven: Yale University Press.

Vale, Robert and Brenda Vale. 2009. *Time to Eat the Dog: The Real Guide to Sustainable Living*. London: Thames and Hudson.

Valverde, Mariana. 2008. *The Age of Light, Soap and Water: Moral Reform in English Canada, 1885-1925*. Toronto: University of Toronto Press.

Vialles, Noelie. 1994. *Animal to Edible*. Trans. J.A. Underwood. Paris: Cambridge University Press.

Walker, Paul. 2000. 'Food Residuals: Waste Product, By-Product or Coproduct. In *Food Waste to Animal Feed*. Michael Westendorf, ed. Ames, IO: Iowa State University Press, pp. 17-30.

Watson, Fransheneka. 2008. 'Raising the Damage Award for the Loss of a Beloved Pet via the Creation of a New Category: Pets as a 'Non-Functional Dependent'. *Thurgood Marshall Law Review* 33: 315-328.

Westerman-Cicio, Mary. 2002. 'Healthy Pets: Web Sites to Help You Make Wise Health Care Decisions for Your Pet.' *Health Care on the Internet* 6.3: 33-42.

Willard, Tom. 2003a. 'Choosing and Sourcing the Best Ingredients.' In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 76-81.

Willard, Tom. 2003b. 'Formulation Techniques and Other Considerations. In *Petfood Technology*. Jennifer Kvamme and Timothy Phillips, eds. Mount Morris, IL: Watt Publishing, pp. 141-143.

Williamson, Judith. 1978. *Decoding Advertisements: Ideology and Meaning in Advertising*. London: Marion Boyars.

Winders, Bill and David Nibert. 2004. 'Consuming the Surplus: Expanding 'Meat' Consumption and Animal Oppression.' *International Journal of Sociology and Social Policy* 24.9: 76-95.

Winson, Anthony. 2004. 'Bringing political economy into the debate on the obesity epidemic.' *Agriculture and Human Values* 21: 299-312.



Woodgate, Stephen. 2006. 'What Would a World Without Rendering Look Like?' In *Essential Rendering: All About the Animal By-Products Industry*. David Meeker, ed. Arlington, VA: National Renderers Association, pp. 277-294.

Woodgate, Stephen and Johan van der Veen. 2004. 'The Role of Fat Processing and Rendering in the European Union Animal Production Industry. *Biotechnology, Agronomy, Society and Environment* 8.4: 283-294.

Woon, Emily. 2011. 'Private Label Performance in Global Markets.' *Petfood Industry* 53.2: 30-34.

Wortinger, Ann. 2008. 'Educating Clients about Commercial Diets' Value Post Pet Food Recall.' *Veterinary Technician* 29.9 (September).

Wright, D. Wynne. 2004. 'The Irrationality of Rational Hogs.' *Great Plains Sociologist* 16.1: 95-109.

Wrye, Jen. 2009. 'Beyond Pets: Exploring Relationship Perspectives of Petness.' *Canadian Journal of Sociology* 34.4: 1033:1063.

Zicker, Steven. 2008. 'Evaluating Pet Foods: How Confident Are You When You Recommend a Commercial Pet Food?' *Topics in Companion Animal Medicine* 23.3: 121-126.