

PLACING TRUST:
THE POLITICAL ECOLOGY OF CHICKEN MEAT IN JAPAN

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Abstract

This dissertation explores Japanese chicken meat to examine how the political ecology of food production informs eaters' perceptions and practices. Food systems continue to grow increasingly complex and relations within them increasingly inscrutable. Despite the growing opacity of food networks in advanced capitalist societies, consumers face overwhelming amounts of food options and criteria for evaluating food. To investigate the growing chasm between the upstream conditions of production and downstream consumer practices, I analyze the tension between social anxiety and social trust as a key dynamic reshaping food systems.

Based on two years of ethnographic field research from 2015 to 2017 in Miyazaki prefecture, this dissertation explores a leading region for both industrial broiler chicken and artisan “jidori” chicken production. Today, chicken meat is the leading animal flesh of choice in Japan. Most consumers avoid imported chicken and pay more for domestic chicken, which has higher levels of social trust. Agricultural corporations coordinate clusters of broiler chicken in Miyazaki prefecture, and the region has endured numerous outbreaks of avian influenza. After a series of botched responses to avian influenza outbreaks in 2004, the Japanese state required farm operators to closely monitor their farms and government workers to assist with culling animals during outbreaks. The state portrays avian influenza as a foreign biothreat carried by wild migratory waterfowl that contaminates Japanese territory.

A category of artisan chicken called jidori evokes high levels of social trust, but the national government introduced a jidori standard that favors more industrial brands at the expense of regional brand. Since jidori costs far more than typical chicken meat, consumers are anxious of jidori's authenticity, especially in the wake of several mislabeling scandals. Miyazaki prefecture's jidori, Miyazaki Jitokko, has some of the highest standards and is often served raw

as a representative dish for Miyazaki cuisine. Consumers eat chicken sashimi, which exposes eaters to harmful bacteria such as campylobacter. In analyzing these contradictory trends in contemporary food networks, I emphasize the importance of exploring food initiatives as situated within a unique coming together of place shaped by distinct historical and geographical contexts.

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Prelude

In the *Kojiki*'s *Iwato* legend, the gods turn to the magical power of a rooster's crow to coax the sun god *Ōkami Amaterasu* out of her cave and bring light back into the world.¹ Chickens were a revered companion species throughout Japanese history, used for divining, cockfighting, and to herald the start of the day. They were one of the favorite subjects of the renowned artist Itō Jakuchū (1716-1800) (see Figure 0.1). References from Japanese compendiums in 1697 and 1713 attribute medicinal properties to *ukokkei* (silkie) eggs and even excrement (Yamaguchi 1983, 286-8). Regarding a 1714 Japanese cookbook, historian Rath (2010, 108) writes, "Here, chicken is not only spotlighted but also depicted as representative of all edible fowl and presented alongside fish as a central and ancient ingredient in native foodways." The vanguard of industrial approaches to chicken husbandry in Japan emerged in the 19th century with a group of former-samurai households in Nagoya, Aichi prefecture. All of these examples problematize the widespread perception of chickens as a Western animal, food, or industry.

Today, popular discourses in Japan portray fish and rice as exemplifying "Japanese" food in contrast to the "Western" foods of animal meat and bread (Bestor 2011, Smil and Kobayashi 2012). Meat became "Western" through a convergence of narratives and historical developments. Starting in the Meiji-era (1868-1912), the Japanese state promoted meat consumption as a symbol of physical and military strength (Cwierka 2006). In the 1970s, large corporations organized regionally concentrated industrial chicken meat production by emulating US corporations and using grain and chicken breeds imported from the US. Joint US-Japanese corporate undertakings such as KFC-Japan packaged popular ideas of chicken meat with American capital, cuisine, and culture as chicken meat became cheaper and more accessible, and consumption skyrocketed.

¹ The *Kojiki* is the oldest known Japanese text, foundational for the Shinto religion.

Figure 0. 1 “Rooster crowing at the sun” painting by Itō Jakuchū



(Ōta 2015, 80)

Chapter One. Introduction

On April 18th, 2016, a group of six male tourists from Hokkaido prefecture arrived in Miyazaki City (Yomiuri Shimbun 2016). Eager to experience the local cuisine, they crossed the street from Miyazaki City station to dine at Jitokko-Eki,² a restaurant that serves raw chicken (*sashimi*)³ using Miyazaki Jitokko, Miyazaki prefecture's brand of artisan jidori chicken. The party from Hokkaido ordered dishes such as chicken tartare (chicken breast seared on the outside and raw on the inside) and raw chicken liver. Unfortunately, a foodborne pathogen called campylobacter infected the food at unsafe levels. By the second day of their trip, all six members of the group from Hokkaido fell ill with symptoms such as stomach pain and diarrhea. Their stools revealed the presence of campylobacter, and Miyazaki City hygiene officials closed Jitokko-Eki for two days.

Eight months later, on December 19th, 2016, an industrial chicken operation in Kawaminami, Miyazaki prefecture reported a high number of chicken deaths, setting in motion a detailed response plan. A team from the prefectural livestock hygiene division arrived to collect samples at 12:45 pm. They confirmed the presence of avian influenza within hours. Late that night, hundreds of prefectural workers and Self-Defense Forces converged on the infected farm. At 5 am, workers wearing rubber boots, Tyvek protective suits, masks, caps, gloves, and goggles commenced killing chickens by sealing them in plastic buckets filled with carbon dioxide. The bodies of asphyxiated chickens were put in plastic bags, then buried underground. In all, 1,084 people assisted in the culling of roughly 120,000 chickens. Workers depopulated the infected farm in a mere 36 hours. One week after the Kawaminami outbreak, a story on the front page of

² Jitokko-Eki is a pseudonym. Although the name of the restaurant is publicly listed in newspaper articles, the government removes announcements regarding food poisoning incidents from their website likely as a strategy to reduce the reputational damage restaurants endure from moderate food poisoning incidents.

³ For Japanese-language sources, all translations are my own. I translated all the interviews from Japanese to English and include words parenthetically when they are significant e.g. trust (*anshin*).

Miyazaki's largest newspaper blamed the chicken grower for the outbreak, after an epidemiological research team found a hole 20 cm in diameter in the chicken shed's protective netting (The Miyanichi 2016).

In both events, an unruly microscopic actor disrupts the smooth functioning of capitalist systems of chicken meat provisioning. The state intervenes by exterminating the symptom of unruliness and blaming a private business. In Kawaminami, avian influenza breaks out in an industrial broiler chicken operation, so the government orchestrates the mass killing and interring of all chickens at the infected farm. In Miyazaki City, tourists fall ill because levels of campylobacter overwhelm their immune systems, so the government closes down the restaurant serving raw chicken for two days. While these events have many similarities, they encompass distinct assumptions and responses about food.

The avian influenza outbreak in Miyazaki generated national media coverage and front-page coverage in Miyazaki prefecture. The media portrayed the source of avian influenza as foreign in origin and blamed migratory waterfowl for bringing the disease into Japan. Chicken operations were criticized for having deficient preventative measures when an outbreak occurs. This apportioning of blame overlooks the fact that avian influenza originated from industrial broiler chicken operations that infected migratory waterfowl, and that birds raised in industrial chicken operations with weakened immune systems and dense populations are especially susceptible to avian influenza outbreaks. The state's rapid intervention to cull chickens in the event of an outbreak performs biosecurity and assuages consumers' doubts that industrial chicken is safe. When avian influenza makes the news, eaters worry that avian influenza could infect them either through chicken products or live animals.

In contrast to the extensive media coverage devoted to avian influenza outbreaks, food poisoning incidents from domestic raw chicken garner little if any media coverage. Many eaters mistakenly assume that food sold by restaurants must be safe, while restaurants have an "eat at your own risk" (*jiko sekinin*) policy. Customers at restaurants like Jitokko-Eki trust that traditional Miyazaki cuisine using artisan chicken meat is safe. But even if processors and restaurants meticulously follow hygiene protocols, serving raw chicken has the potential to expose eaters to harmful bacteria such as campylobacter. The danger of eating raw animal meat exploded into the national spotlight in 2011 when raw beef served in a restaurant killed five customers and hospitalized nearly 40 others (Japan Times 2011). No fatalities have been linked

to raw chicken meat in Japan, and food poisoning from eating raw chicken garners little coverage, even when, for instance, over a hundred people fell ill as happened at a “Meat Festival” (*Nikui Fesu*) held simultaneously in Fukuoka and Tokyo in 2016 (Asahi Shimbun 2016). Raw chicken meat sets in motion unpredictable disease ecologies in which living bacteria interact with the flora of eaters’ guts. In most instances, eaters avoid symptoms of food poisoning and then, drawing on embodied experience, assume that raw chicken dishes are safe for themselves and others to eat.

My dissertation responds to the following overarching question: *How does the material and discursive production of chicken meat shape consumer perceptions and practices?*

Developing a deeper understanding of food requires investigation of complex economic, technological, biological, and historical processes. This nuanced appreciation of food systems needs to be reconciled with how eaters actually navigate the often inscrutable relations within contemporary food networks. A crucial contribution of critical food scholars is to make sense of the convoluted chasm separating upstream conditions of production from downstream consumer practices.

Why chickens in Japan?

Today, chicken meat is the leading animal flesh of choice in Japan for both production and consumption (ALIC Multiple Years). Through an analysis of chicken meat in Japan, we can deepen our understanding of how food intersects with capitalism, culture, and natural processes. While advertisements often convey comforting stories of idyllic food origins, the upstream conditions of production contain troubling traces of agrochemicals, whiffs of exploited foreign trainees, and the hiss of a conveyor belt carrying chickens headfirst towards an electric bath. This dissertation dives deep into the intricacies of chicken meat in Japan. Before taking this plunge, I identify the three key contributions of my research.

First, I develop the concept of food in a new dark age. Drawing on Bridle (2018), my use of a new dark age refers to the shift from searching for information that characterized the Enlightenment to the bombardment with too much information that typifies contemporary capitalist societies. Capitalist approaches increasingly condition the logic underpinning chicken and food systems in Japan and around the world. As food systems grow increasingly complex,

opaqueness and unknowability grow along with a widening gap between the production and consumption of food.

Second, I examine the tension between social anxiety and social trust as a key dynamic that is reshaping food in a new dark age. Food producers and retailers employ a range of strategies — such as certifications, branding, and online presences — in an effort to elicit consumer trust. In turn, consumers face social anxiety from the adverse impacts of cheap food. They also recognize that savvy marketers strive to dupe them into paying too much for food. Ideas of social anxiety and social trust enable an exploration of the discursive construction of food that is shaped by both the conditions of production and consumer practices. Upstream, producers and retailers strive to elicit trust and diminish anxiety while eaters mostly rely on intuitive understanding and embodied experience to navigate contemporary foodscapes.

Third, I situate alternative food initiatives within a unique coming together of place that acknowledges Japan's historical and geographical context. I argue that categories such as the local and alternative are often contradictory should be situated within specific places and initiatives. Alternative capitalist food and the agriculture of the middle emerge as increasingly influential categories which seek to bridge the growing chasm between food production and consumption. In this dissertation I explore the challenges and promise facing situated food initiatives in Japan, with implications for understanding food initiatives in other places.

Overview of chicken meat in Japan

After World War II, with the support of American corporations and government policies, Japanese corporations established intensive animal industries and products such as meat, dairy, and eggs, which all became staples in Japanese diets. Along with changes in the cost of food, the diet also transformed. Between 1950 and 2000, consumption skyrocketed in meat (950%), milk and dairy (1,900%), and eggs (700%), while rice and tuber consumption dropped by half (Smil and Kobayashi 2012, 95). In the 1960s and 1970s, chicken meat and eggs split into distinct broiler chicken and layer chicken industries. Concentrated broiler chicken production took hold in Miyazaki, Kagoshima, and Iwate prefectures. By 2005, domestic chicken meat production surpassed pork production, and in 2012 overall chicken meat consumption surpassed pork consumption (ALIC Multiple Years).

The Ministry of Agriculture, Forestry and Fisheries (MAFF) circulates two different measures to represent self-sufficiency: a “calorie base” figure that excludes imported grains from contributing to self-sufficiency calculations, and a “production base” figure that includes animal industries and other foods derived from imported grains. In 2017, Japan had a 38% calorie base self-sufficiency and a 65% production base self-sufficiency (MAFF 2018b). Three-fourths of the grain used for domestic animal industries was imported (MAFF 2018d).

Although imported animal products are cheaper, maintaining domestic production benefits the national economy. Rice remains the most lucrative agricultural commodity today in terms of revenue from sales at 1.7 trillion yen. The next five leading agricultural commodities, all animal products, account for 3.0 trillion yen (MAFF 2018a). They are, in descending order: dairy at 740 billion yen, beef cattle at 720 billion yen, pork at 660 billion yen, layer (egg) chickens at 530 billion yen, and broiler (meat) chickens at 360 billion yen (*ibid.*). Given farm revenue and consumer trends, the future of agricultural production in Japan depends on animal industries, despite the heavy reliance on imported grains.

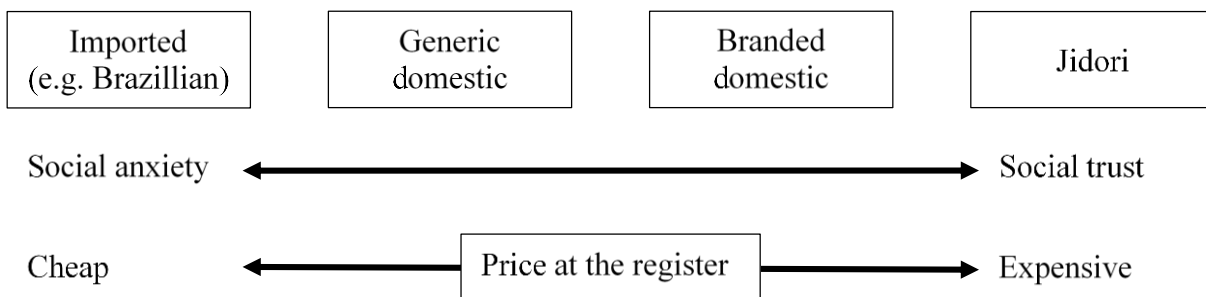
I identify four major categories of chicken meat consumption in Japan: imported, generic domestic, branded domestic, and *jidori*. In successive order, the price at the register for these categories of chicken meat progresses from cheaper to more expensive (see Figure 1.1). Japanese consumer perceptions similarly progress from higher levels of social anxiety to higher levels of social trust. However, the expression of social anxiety and trust changes with each category and through situated practices. For example, a consumer may associate imported chicken meat with food safety scares but have embodied experience with a specific brand sold at a proximal supermarket. On the opposite end of the spectrum, consumers experience social anxiety from *jidori* through the fear that they are paying too much for inauthentic *jidori*. Since risk encompasses both cultural values and the probability of harm (Jasanoff 1999), I do not include risk in Figure 1.1. The actual conditions of food safety occasionally contradict consumer perceptions. For example, freezing chicken meat kills certain harmful bacteria — and all imported chicken meat is frozen — but Japanese consumers prefer “fresh” meat that is chilled and never frozen. As some risks rise others decrease and to address these mutable relations, I analyze disease ecologies, a term that I explain in greater detail in the ensuing section.

Each of the first three categories — imported, generic domestic, and branded domestic — accounts for roughly one third of overall chicken meat consumption and involve similar

methods of industrial chicken broiler production (see Figure 1.1). Branded domestic chicken typically certifies slight alterations to chicken feed and unique branding such as Nippon Ham's "Cherry Blossom Princess" (*sakura-hime*). Jidori, the category of alternative capitalist chicken meat in Japan, only accounts for about 1% of overall chicken meat consumption (see Figure 1.2).⁴ Brands of jidori certify the use of heirloom breeds and set minimum levels for lifespan and stocking density.

The Japanese media reinforces a discourse that portrays foreign food as a food poisoning threat in contrast to the trustworthiness of domestic and local food. Hansen (2014a, 59) describes how Japan's national mass media network *Nippon Hōsō Kyōkai* (NHK) reinforces coded representations of food safety that benefit domestic industries. As a result, Japanese consumers also express far higher levels of trust in domestic food than imported food (NRC 2008).

Figure 1. 1 Main categories of chicken meat in Japan



⁴ Branded chicken also includes spent laying hens and parent stock chicken, and this type of tougher chicken meat had been commonly marketed as jidori before the government's JAS Jidori designation stigmatized such labeling. I discuss issues related to the jidori label in detail in Chapter Six.

Figure 1. 2 Changes in Japanese chicken consumption over time

| | 1965 | 1985 | 1995 | 1999 | 2002 | 2006 | 2011 | 2014 |
|---|---------|-----------|-------------|-------------|-------------|-------------|-------------|------------------------|
| Per capita consumption (kg) ^a | 1.9 | 8.4 | 10.1 | 10.2 | 10.4 | 10.7 | 11.4 | 12.2 |
| Imported (MT) ^a | 10,000 | 112,000 | 568,000 | 640,000 | 669,000 | 610,000 | 721,000 | 730,000 |
| - percent of consumption ^a | 4.0% | 7.6% | 31.2% | 34.6% | 35.2% | 31.0% | 34.3% | 32.7% |
| Domestic (MT) ^a | 240,000 | 1,354,000 | 1,252,000 | 1,211,000 | 1,229,000 | 1,360,000 | 1,378,000 | 1,500,000 |
| - percent of consumption ^a | 96.0% | 92.4% | 68.8% | 65.4% | 64.8% | 69.0% | 65.7% | 67.3% |
| Number of domestic generic chicken ^b | | | 506,249,000 | 405,573,000 | 388,343,000 | 343,199,000 | 351,084,000 | ^d |
| - percent of domestic consumption ^b | | | 82.7% | 70.0% | 65.2% | 54.4% | 54.7% | |
| Number of domestic branded chicken ^b | | | 97,061,000 | 168,702,000 | 201,690,000 | 280,278,000 | 281,230,000 | |
| - percent of domestic consumption ^b | | | 15.9% | 29.1% | 33.9% | 44.4% | 43.8% | |
| Number of jidori ^b | | | 8,533,000 | 5,009,000 | 5,174,000 | 7,194,000 | 9,336,000 | 8,370,000 ^c |
| - percent of domestic consumption ^b | | | 1.4% | 0.9% | 0.9% | 1.1% | 1.5% | |

^a Based on ALIC (Multiple Years).

^b Based on Komai (2012a).

^c Based on MAFF (2015b).

^d Cells are left blank when data is unavailable.

Theoretical framework

I analyze chicken meat in Japan using a political ecology approach to show how social anxiety and social trust reshapes connections between the upstream conditions of production and downstream consumer perceptions and practices. The field of political ecology emerged in the 1980s and emphasized “close examinations of biophysical ecological change” (Walker 2005, 74). While scholars use the term political ecology to describe a broad range of research, this approach typically examines the intersection between political, ecological, and economic forces at multiple scales (Watts 2000). Scholars who employ a political ecology approach often problematize research that portrays ecology as a subject for apolitical scientific research; use mixed methods that combine qualitative and quantitative or document analysis; and embrace normative goals of promoting more just relations (Perreault, Bridge and McCarthy 2015, 7-8). Scholarship informed by a political ecology approach takes up a broad range of issues including urban political ecology (Heynen, Kaika and Swyngedouw 2006), the construction of environmental scientific knowledge (Forsyth 2004), and the biopolitics of animal disease (Hinchliffe et al. 2016). Turner (2016, 418) argues in favor of the “methodological strength of [political ecology’s] place-based tradition for studying social and ecological dynamics in particular geographical and historical contexts.” My application of a political ecology approach to this study draws on a place-based engagement with Japanese chicken meat industries that moves beyond an analysis of the political economy of production to consider the impact of disease ecologies and discursive practices.

I apply a *political economic* analysis through an examination of political power, labor-relations, and strategies to extract capital from chicken meat in Japan. In a series of meticulous books, George Mulgan (2000, 2004, 2006) describes agricultural policy in Japan post-World War II as being shaped by the “iron triangle” of the dominant Liberal Democratic Party (LDP) political party, the Japanese agricultural cooperative (also known as the JA or *Nōkyō*), and policies put forward by MAFF. The Japanese agricultural cooperative organized rural voters to support the LDP party and given the out-sized political power of rural voters, this alliance fortified LDP’s position as Japan’s dominant political party. Despite broad political support for Japanese agriculture, policymakers struggle to balance conflicting goals such as supporting small-scale growers while promoting greater efficiency, protecting domestic agricultural

industries while fostering more international trade, and maintaining an agricultural workforce in the face of restrictive immigration laws. Citing these persistent issues, Prime Minister Abe's office intervened to take a firmer grasp of Japan's agricultural policy, a shift emphasized by a major reform to the Japanese agricultural cooperative in 2015 (MacLachlan and Shimizu 2016, Honma and George Mulgan 2018).

Under this governance regime, expenditures on food and the cost of commodities like chicken meat sharply decreased. The percentage of Japanese household expenditures on food decreased by two-thirds from 66.4% in 1946 to 22.9% in 1995 (Nenji Toukei 2019b). When adjusted for inflation, the price of chicken meat fell six times over, from 872 yen per 100 grams (~\$43/pound) in 1950 to 149 yen per 100 grams in 2000 (~\$7/pound) (Nenji Toukei 2019a). The price plummeted as the Japanese broiler chicken industry adopted more efficient methods and centralized production, a trend that reflected similar developments in other countries such as the US. Japanese corporations sought out low-wage workers with most corporations employing the maximum number of foreign workers permitted under Japanese law. When I toured a broiler chicken slaughterhouse in Miyazaki prefecture, 5% of the workforce were foreign workers on visas acquired through the technical intern training (*ginō jissshū-sei*) program. The broiler chicken industry in Japan has unusually high levels of corporate power and centralization compared to other sectors of Japanese agriculture. However, Japanese agricultural policy for chicken meat remains rife with contradictions that I explore throughout the dissertation.

Alongside the political economy, I use the term *disease ecologies* to draw attention to mutable interactions between human health, farmed animals, and harmful microscopic agents like bacteria and viruses. Corporations continually seek to extract value from nature. Attempts to industrialize and commoditize nature can lead to surprises when corporations fail to anticipate the wild and mutable response of natural processes (Boyd, Prudham and Schurman 2001). The strategy of cramming chickens into battery cages and confined sheds, for example, caused spikes in diseases and ailments harming chickens in industrial operations (Boyd 2001). Most of these maladies, such as Newcastle and Marek's disease, only affect chickens and other birds. Avian influenza, however, originated from industrial chicken operations in the mid-1990s and is currently the leading disease threat to cause a global pandemic affecting humans (Davis 2005, Wallace 2009). Industrial chicken also impacts human health both through food poisoning and antibiotic-resistant bacteria (McKenna 2017).

The third aspect of chicken meat that I examine is *discursive practices*, which refers to the connection between knowledge and power within the truth claims made about chickens, chicken industries, and consumer practices. The Japanese state is a key actor that shapes discursive practices surrounding food and consistently promotes domestic food and cuisine as being healthy, safe, and delicious (Assmann 2017, Rath 2016, Takeda 2008). Despite the emphasis on food safety, Japan has endured numerous food safety incidents (Walravens 2017b). During the triple disaster on March 11th, 2011, the Fukushima Daiichi nuclear power plant released dangerous amounts of radiation that contaminated Japanese food supply chains and led to widespread protests from citizen consumers (Kimura 2016, Morris-Suzuki 2014, Reiher 2016). Government and industry leaders sought to deflect criticism back against those spreading “spurious rumors” (*fūhyō higai*) that undercut confidence in government regulations and harmed food sales. In the aftermath of the disasters, the government launched an “eat and support” (*tabete ōenshiyō*) campaign that encouraged people to eat food products from the affected areas (Takeda 2017). To repair the damage done to the international image of Japanese food, the Japanese government sought and received recognition of Japanese cuisine (*washoku*) by UNESCO as an intangible cultural world heritage in 2013 (Cang 2015, 55). In contrast to the broad support for domestic food, Japanese media devotes extensive coverage to imported food scandals, contributing to perceptions of foreign food as unsafe (Rosenberger 2009, Walravens 2017a). Concepts such as food safety and biosecurity are created through discursive practices in which expert opinions are implemented by the state and amplified by the media.

The tensions between *social anxiety* and *social trust* permeates the political economy, disease ecologies, and discursive practices of chicken meat in Japan. In developing these concepts, I draw on Peter Jackson and colleagues’ use of social anxiety (Jackson, Ward and Russell 2009, Jackson and Everts 2010, Jackson, Watson and Piper 2013, Jackson 2015). Jackson et al. (2013, 27) write, “Referring literally to a constriction of the throat or a sensation of choking, anxiety can be defined as a state of agitation, being troubled in mind and having a sense of uneasiness about a coming event.” They approach anxiety not as an “individual psychological” state but instead “explore the extent to which anxiety also exists as a social (collective) phenomenon” (27). In this formulation, social anxiety over food becomes ingrained “within routines, technologies, and institutions” (25). The most concrete expression of food anxiety occurs in response to food scares that result in products being banned or pulled from the

shelves. These incidents receive extensive media coverage, limit eaters' access, and cause people to worry that food they eat is harmful.

Like with anxiety, psychologies conceive of trust as an individual condition. In using the concept of *social trust*, I shift attention away from trust as an individual psychological state and towards the institutions, technologies, and relations that imbue food with positive expectations. Eaters develop trust over time through a combination of impersonal confidence in institutions and embodied familiarity with people and food products (Kjærnes, Harvey and Warde 2007, Kjærnes 2013). While knowledge of the conditions of production informs trust, people often develop trust in food as a strategy to avoid engagement with the complexity of contemporary food systems (Thorsøe, Christensen and Povlsen 2016). As a result, labelling becomes a prominent mechanism for imbuing food with trustworthiness and shaping the willingness of people to pay more for premium products (Janssen and Hamm 2012, Nuttavuthisit and Thøgersen 2017).

A wide range of scholarship from behavioral economics and the sociology of practice demonstrates that consumers rarely engage in deliberative decision-making for routine purchases such as food (Thaler and Sunstein 2008, Kahneman 2011, Warde 2014). In other words, eaters do not balance social trust and social anxiety through some type of rational calculus like, "IF social trust IS GREATER THAN social anxiety THEN purchase." Instead, they rely on embodied experience and intuitive understanding in making their food choices. Social anxiety and social trust, while useful concepts for discussing different types of foods and eaters' perceptions and practices, cannot resolve contradictions inherent in food systems. Restaurants such as Jitokko-Eki, which serve raw jidori chicken to customers, evoke social trust through the image of jidori and traditional Miyazaki cuisine, yet raw jidori poses a far greater risk of food poisoning than cooked industrial chicken meat. I argue that such contradictions continue to grow along with the complexity of food systems.

My approach in this study has limitations, to be sure. One is that I explore the impacts and contradictions of market-based food systems rather than seek out initiatives that avoid market-based mechanisms to explicitly pursue food justice. Using the language of Gibson-Graham (2008), my project focuses on capitalist and alternative capitalist food as opposed to noncapitalist food relations. Another limitation is that I emphasize the role of human industries, practices, and perceptions. When I write about chickens being killed, my focus drifts from the

chickens to consider how their killing involves and impacts people. Scholars from diverse approaches, including multispecies ethnography, critical animal studies, and anarchism, show that making non-human animals the central emphasis opens crucial insights (Weis 2018, Kirksey and Helmreich 2010, White 2017). These perspectives are not addressed in this study.

Research questions and methods

With the support of the Crown Prince Akihito Scholarship,⁵ I carried out two years of field research from 2015 to 2017 based in Miyazaki prefecture, a leading region for chicken production. I joined Miyazaki University's Department of Culture and Education as a Foreign Researcher under host researcher Professor Nakamura Shūsaku. I developed relationships with industry insiders, beginning with the offices for broiler chicken and jidori in Miyazaki City. Through many conversations with the patient and supportive staff there, I learned how to talk about chicken in Japanese and received introductions to people in the chicken business. Many persons generously shared their time and insights. My project benefited from being a topic largely neglected by researchers and journalists. Industry insiders were often curious to learn more about me. What, they wanted to know, was this Japanese-speaking white guy doing researching chickens in Japan? Even stranger, it seemed, I was doing this as part of a PhD program in geography at the University of Hawai'i at Mānoa. And, surreally, I received an imperial audience with the Emperor and Empress of Japan to report on my research progress in July 2016 as a part of the Crown Prince Akihito Scholarship. Over the two years, I gradually developed access to industrial chicken networks. At the same time I developed relationships with jidori insiders, whose eagerness to engage with my research gave me the opportunity and impetus to create a collaborative YouTube video series on the jidori from Miyazaki prefecture, discussed in more detail below.

Conducting field research in Japan poses numerous challenges for ethnographic field researchers (Bestor, Steinhoff and Lyon-Bestor 2003). As previous researchers on the topic of food commodities in Japan have shown, the positionality of being a foreign researcher presents

⁵ The Crown Prince Akihito Scholarship Foundation is a Hawaii-based community initiated fellowship.

both opportunities and hurdles (Bestor 2004, Love 2007, Hansen 2010). Many were eager to participate in and support my research, but I also encountered hesitance, suspicion, and condescension. The proper introductions are necessary to successfully conduct ethnographic research on many topics in Japan. In my experience, these introductions arise through a combination of serendipity, relationship-building, and integrity. To maintain the integrity of my field research, I followed several rules in addition to having my project approved by the University of Hawai‘i System Internal Review Board. First, I was transparent about the purpose of my research and shared with participants the questions guiding my research and the broader scope of my project. Second, I informed collaborators how I planned to use the data I was collecting — such as audio recordings and photographs — and sought their feedback when appropriate. And third, I avoided eliciting formal introductions unless I deemed them necessary to pursue a specific line of inquiry.

My overarching research question is: *How does the material and discursive production of chicken meat shape consumer perceptions and practices?* Delving into this question, I investigate two working questions.

The first of these — *How did industrial chicken husbandry spread throughout Japan?* — addresses how cheap chicken meat and later artisan chicken became commonplace. As I discuss in Chapter Three, the industrialization of chicken husbandry occurred through a series of piecemeal innovations. Industry and government leaders long sought to promote more industrial approaches, and their favored strategies evolved based on changing circumstances through most of the 20th century. Only under the influence of the US, with low-cost grain imports, productive meat and egg-specific chicken breeds, and corporate strategies for organizing broiler chicken clusters, did cheap chicken take off during the 1970s and 1980s. Even with trade liberalization of grains, Japan’s protectionist policies and consumer preferences preserved the domestic broiler chicken industry despite its higher costs. Families’ small flocks of chickens, historically widespread throughout rural Japan, disappeared in the 1980s and 1990s as consumers gained access to cheap and reliable chicken egg and meat products through supermarkets. To research the rise of industrial chicken, my key sources of data were archival: trade journals, notably *Niwatori no Kenkyū* (*Chicken Research*), as well as chicken manuals and guides. I also relied on government datasets, which revealed historical changes in chicken production. In addition, I interviewed numerous industry experts who observed the changes within the industry firsthand,

particularly the shift starting in 1963-4 when Japan first imported the latest meat and egg-specific varieties.

The second working question — *How does broiler and jidori production help us understand social trust and social anxiety?* — contrasts broiler and jidori enterprises to explore how these two types of chicken meat relate to sentiments, needs, and tensions in consumers' everyday lives. To answer this question, I analyze the political economy, disease ecologies, and discursive practices of broiler chicken and jidori networks.

For broiler chickens, Japanese corporations adopted the strategy of vertical integration from the US and established Miyazaki, Kagoshima, and Iwate prefectures as Japan's core areas for chicken meat production in the 1980s. These areas have lower costs of production for feed, and other favorable characteristics such as low costs of labor and availability of land. The Japanese broiler chicken industry consists of clusters, meaning that most of the land has no broiler chicken production but certain areas have intense industry. To study its impact, I visited industrial grain processing facilities, broiler chicken grower operations, a parent-stock operation, a hatchery, a slaughterhouse, and a biowaste powerplant. I interviewed corporate executives, owners of large broiler chicken operations, and government employees. For the disease ecology of industrial broiler chicken, I analyzed the history of avian influenza outbreaks in Japan and Miyazaki, the prefecture that has been hit the hardest by avian influenza, including an incident while I was in the field in December 2016. I interviewed a worker who participated in the culling of chickens and an MAFF official who explained the state's strategies for preventing outbreaks and for rapid response in the event of an outbreak. To examine discursive practices, I analyzed the portrayal of avian influenza outbreaks and chicken meat in Japan's two major newspapers, the Asahi Shimbun and Yomiuri Shimbun. I also conducted a series of twenty focus groups, discussed below.

For jidori chickens, I drew on archival documents to trace the emergence of unique breeds of chicken in Japan and their designation as Natural Monuments (*Tennen Kinen-butsu*). In the decade prior to the conclusion of WWII, poultry organizations sought to protect heirloom breeds through Natural Monument designation. Beginning in the 1980s, prefectural organizations and businesses independently developed brands of jidori based on Natural Monument breeds. In 1999, MAFF introduced a national standard for jidori called Japanese Agricultural Standard Jidori (henceforth JAS Jidori), with the ostensible goal of clarifying the category of artisan

chicken in Japan. The term jidori, however, has multiple usages, including a specific breed, local chicken, and tough chicken meat (Satō 2011). This centralization of the standard benefited more industrial brands of jidori, especially Tokushima prefecture's Awa-odori, which saw its production more than double. JAS Jidori also enables corporations to introduce in-house brands of JAS Jidori that are not made public and can be confused with more traditional and stringent brands. This confusion occurs within that small sliver of 1% of Japan's chicken meat consumption. To get a grasp of the broader system of jidori in Japan, I interviewed representatives for JAS Jidori and Awa-odori and analyzed representations in the popular media and newspapers.

My fieldwork emphasized Miyazaki prefecture's brand of jidori, Miyazaki Jitokko. I visited the prefectural breeding facility, a parent stock facility, farms, slaughterhouses, and restaurants. I also attended several large meetings and trainings. Miyazaki Jitokko faces many challenges typical of alternative capitalist food. While Miyazaki Jitokko maintains a commitment to high standards in terms of the amount of space per bird and minimum lifespan, they compete in jidori markets against more industrial jidori brands with lower costs of production. Half of Miyazaki Jitokko farmers are independent; the other half are contract growers. The largest contractor is a Tokyo-based corporation called AP Company that launched Tsukada Nojo, a national chain of restaurants using a jidori farm-to-table model. A recent mislabeling scandal, however, marred the restaurant's image and threatens to contribute to overproduction within this niche market. I conducted participant observation at two Tsukada Nojo training events that connect restaurant employees with farmers.

Near the conclusion of my research, I created a collaborative YouTube video series on Miyazaki Jitokko featuring three farms and three restaurants. Drawing inspiration from Lassiter's (2005) emphasis on collaborative ethnography, I hoped through these videos to share Miyazaki Jitokko with a broader audience, a goal of transparency put forward by many in the industry. As a PhD researcher, I had unique access to growers and retailers. I have no background, though, in making or editing movies. This project helped jar me out of removed academic approaches and enabled me to experience the vexing challenge of conveying stories about food to eaters who are pressed for time, money, and care.

To connect the political ecology of broiler chicken and jidori with eaters' actual practices, I conducted a series of twenty focus groups on the topic of everyday meals (*shoku-seikatsu*). The

number of participants in a focus group ranged from three to twelve. Overall, I held focus groups with six groups of university students, five groups hosted by government officials, six groups of other preexisting networks, and three cooking groups. These focus groups had large representations of college students, women, and retirees. Following the focus group methods recommended by Bloor et al. (2001), I did not seek to recreate the same questions for each focus group. Time and setting permitting, I distributed surveys to participants that asked demographic questions about their age, gender, education, hometown, and current town. The survey asked respondents to rank how important they consider ten different criteria and which criteria were the easiest to infer from supermarket labeling. When possible, I integrated the surveys into the focus group to evoke further discussion. These focus groups revealed insights into how eaters explain social trust and social anxiety for food in conversation. I discuss them in detail in Chapter Six.

My research provides insights into connections between the political ecology of chicken meat and everyday practices. As food systems grow increasingly complex, the chasm between production and consumption grows, and the commodity itself becomes key material for conveying the upstream conditions to consumers. These market-based relations, though, can obfuscate as much as they reveal, and rarely encompass an explicit commitment to justice. I propose the concept of food in a new dark age to address both the challenges of bridging this chasm and the imperative for doing so.

Dissertation overview

Following this introduction, Chapter Two is a review of literature on industrial chicken production. I develop a political ecology approach focused on how Japan's chicken meat industry has been shaped by the political economy of Japan, disease ecologies of chickens, and discursive practices of consumers. Then I consider everyday practice in the context of increasingly complex food systems.

Chapter Three, which was published in *Japanese Studies* (Schrager 2018b), examines the spread of cheap chicken eggs and meat throughout Japan. It analyzes the industrialization of chicken husbandry beginning with samurai chicken farmers in Nagoya during the Meiji-era. Following the upheaval of World War II, the US facilitated the spread of more industrial methods across the nation. In the 1950s, the US expanded exports of subsidized grains used for chicken feed. In the 1960s, Japan imported the latest US meat and egg-specific breeds. In the

1970s, Japanese conglomerates and corporations emulated the vertical integration structures from the US, which in turn contributed to the rapid industrialization of chicken industries and the rise of chicken broiler clusters in Miyazaki, Kagoshima, and Iwate prefectures. KFC-Japan's cheap fried chicken, which took off during the 1970s and 1980s, exemplified the high hopes for industrial chicken.

Chapter Four offers a case study of broiler chicken clusters in Miyazaki prefecture. I describe different aspects of the industry, including the Shibushi Silo and feed mills, the role of integrators, broiler chicken growers, parent-stock operations, hatcheries, slaughterhouses, and power plants that run on chicken waste. I analyze how these different aspects of the broiler chicken industry fit together and enable Miyazaki prefecture to maintain its status as a leading prefecture in broiler chicken production.

Chapter Five investigates the impact of animal diseases, especially avian influenza, on Miyazaki prefecture, the prefecture hardest hit by animal diseases. After surveying major animal disease outbreaks in Japan, I focus on avian influenza responses in Miyazaki. I consider how government officials enforce biosecurity protocol, how government workers carry out those protocols, and the role of farm owners who face scrutiny if their operation endures an avian influenza outbreak.

Chapter Six explores the creation of the jidori category of artisan chicken meat in Japan. The Natural Monument designation, which underpins many contemporary brands, exemplifies ideas of traditional Japanese chicken and cuisine for many consumers. I delve into the history of the Agency for Cultural Affairs' Natural Monument designation for chickens, which peaked during the decade prior to the conclusion of World War II. A pioneering prefecture for jidori production, Akita prefecture, introduced Hinai-jidori in the 1980s although the brand suffered a mislabeling scandal in 2007. In 1999, the central government introduced a Japanese Agricultural Standard for jidori (JAS Jidori) that benefited more industrial brands like Tokushima prefecture's Awa-odori. I then draw on a series of twenty focus groups to document everyday consumer practices. Participants invoked the importance of price, intuitive understandings, and embodied experience. In general, they preferred domestic chicken meat over imported chicken meat and considered jidori to be delicious but expensive. This chapter analyzes jidori as an example of alternative capitalist food and the agriculture of the middle.

Chapter Seven undertakes a case study of a brand of jidori from Miyazaki prefecture called Miyazaki Jitokko. I examine the origins of the brand, tracing it back to the Natural Monument Jitokko and efforts of Miyazaki prefectural officials. Prefectural livestock research facilities control the Miyazaki Jitokko lineage and deliver parent stock to hatchery operations that produce Miyazaki Jitokko chicks, which in turn are delivered to certified Miyazaki Jitokko farmers. I discuss the pressures facing farmers and the differences between direct-market and contract farmers. The largest contractor of Miyazaki Jitokko chickens is a Tokyo-based corporation that runs a farm-to-table restaurant chain called Tsukada Nojo. After rapid growth, this company now contends with competitors that emulated their model but cut costs, as well as with a ruling in 2018 by the Consumer Affairs Agency that Tsukada Nojo had violated labeling laws. I then turn to three representative chicken dishes from Miyazaki prefecture: chicken nanban, raw chicken, and charbroiled chicken. Each of these dishes raises different issues for restaurants that prepare and sell Miyazaki Jitokko.

Chapter Eight discusses a collaborative ethnography project in which I collaborated with Miyazaki Jitokko farmers and restaurateurs to develop a series of YouTube videos. Through this project, I sought to give something back to people who supported my research and to spread consumer awareness of Miyazaki Jitokko. The videos enable them to share content about Miyazaki Jitokko's farms, restaurants, and brand. These videos enable me, as a researcher, to share a curated glimpse of my fieldwork. This project highlights the unique role of ethnographic researchers and provides an example of how we can create participatory, public representations of the research that reciprocate the support we receive from people in the field.

Chapter Nine, part of which was published in *Geoforum* (Schrager 2018a), develops the idea of food in a new dark age. It builds on Bridle's (2018) concept of a new dark age, in which he argues that technology entangles people in increasingly inscrutable networks that interfere with attempts to act ethically and promote justice. In this concluding chapter, I summarize the tensions between social anxiety and social trust for broiler chicken and jidori. I introduce the conceptual image of *gachapon*, a Japanese vending machine that sells toys and trinkets, as a metaphor for the commodification of food. I conclude by arguing that critical food scholars need to consider not just the growing chasm between upstream production and consumers' everyday practice but also how our normative judgments and activism should recognize food — and the

political opportunities that food engenders — as situated within a unique coming together of place.

Chapter Two. Industrial chicken production: a review of literature⁶

This critical review of industrial chicken production develops the theoretical framework for a political ecology approach to analyze industrial chicken production and everyday food practices. In using a political ecology approach, I draw attention to how the Japanese chicken meat industry has been shaped by the political economy of Japan, disease ecologies of chickens, and discursive practices. I then turn to consider how eaters' everyday practices connect with the upstream conditions of production

Political economy of chicken production

In the case of agriculture, industrialization is complicated by the persistence of nature (Mann and Dickinson 1978, 465). Capital penetrates agriculture through piecemeal innovations that involve changes in aspects of production and end-use (Goodman, Sorj and Wilkinson 1987, 6). For production, industrialization requires a shift from on-farm labor and knowledge intensive inputs to off-farm capital intensive inputs. Farmers become reliant on buying inputs such as synthetic fertilizers, hybrid seeds, and agricultural chemicals. For Japanese chicken farmers, industrialization meant farmers had to invest in inputs such as chicks, feed, medicine, machinery, and structures for housing chickens. Regarding end-use, industrialization brings about a shift from use value, where farmers are mostly self-sufficient for food and market surplus, to exchange value, where farmers specialize in a single commodity that they sell on the market. Instead of diverse farms with various crops and animals, industrialization caused most farmers in Japan to stop raising chickens, with remaining poultry farms growing massive in scale.

In the US, chicken broiler (meat) production increased rapidly beginning in the 1960s for a combination of reasons: advances in the genetics of chicken breeds, improved strategies for managing large flocks of chickens, and new financial arrangements between producers and giant corporations like Tyson Foods (Boyd 2001, 634). Broiler chicken production concentrated in

⁶ I integrated passages into this chapter from two previously published journal articles (Schrager 2018a, 2018b).

regions of the southern US where the costs were lower, and by 1990 chicken surpassed pork to become the most widely eaten meat in the US (Boyd and Watts 1997, 139). Japan's interventionist agricultural policy makers sought to prevent cheaper imported chicken meat from flooding the domestic market (George Mulgan 2006, 1). Chicken broiler production a level of centralization and coordination unusual within Japanese agriculture. In the 1970s, Japanese corporations coordinated the growth of chicken broiler clusters in Miyazaki, Kagoshima, and Iwate prefectures by organizing feed, hatcheries, production, and slaughterhouse facilities (Nagasaka 1993, 42, Gotō 2013, 187). Consumers' food choices are strongly influenced by the availability and price of food products (Andreyeva, Long and Brownell 2010, 216); thus, an increase in the availability of cheap meat contributed to more meat consumption and broader changes in cultural practices around eating meat. Both global and per capita meat consumption are expected to continue to increase with concerning implications (Weis 2013).

Moore (2010, 391) argues that capitalist agriculture may be reaching its ecological limits and arriving at "an *epochal* crisis of capitalism" (emphasis his). If we are hurtling towards such a crisis, then the wide-ranging impacts of intensive animal husbandry are a major culprit. Weis (2013) draws our attention to specific capitalist innovations that facilitate the "meatification" of diets and the immense environmental burdens of intensive animal husbandry. Introducing the concept of the "ecological hoofprint," he analyzes how industrial animal husbandry contributes to greenhouse gas emissions and agricultural land use to produce grains for animal feed. Other adverse impacts of the industrial animal complex include, but are not limited to, poor conditions for workers, cruel treatment of animals, and novel health threats for humans (Fitzgerald 2015, Imhoff 2010). Gunderson (2011) links capitalism with violence against animals, arguing that when massive feedlots treat living, breathing animals as mere commodities, the animals suffer from the structural barbarism of capitalism

In discussions of food in Japan, popular media and even some academic studies emphasize the cultural practices of cuisine as opposed to the political economy of food production (Cwierтка and Chen 2012). In Japanese Studies, scholars must strike a delicate balance, acknowledging the unique sociocultural context of Japan while avoiding essentialization. The Japanese government has long sought to promote traditional Japanese food or *washoku*. Food historian Eric Rath (2016, 27) argues that much of what is now presented as traditional Japanese food only dates from the 1960s. Changes in Japanese dietary habits, such as

increases in meat consumption, processed foods, and dining out, are often lamented as indications of Westernization and the erosion of traditional Japanese foodways (Assmann 2015, 166). While the increased consumption of chicken products in Japan resembles other wealthy capitalist countries, I caution against theories of dietary transition, such as Drewnowski and Popkin (1997), that emphasize how increased wealth changes diets. Instead, I encourage a broader engagement with how government policies and industry innovations influence consumer practices. An excellent example of this approach is anthropologist Paul Hansen's research on Hokkaido's dairy industry (Hansen 2014b). Hansen analyzes how that industry promoted itself as an exotic industry with modern health benefits. He demonstrates how government policies – such as having milk included in school lunches – and innovations like the adoption of industrial milking machinery shaped the trajectory of Hokkaido dairy farms and led to new connections between animals, humans, and machines.

Government policies and innovations in production likewise drove the industrialization of Japan's chicken husbandry. Increased productivity and production led to an influx of affordable chicken products, which in turn spurred increases in consumption. The use of productive breeds, availability of cheap grains, advances in incubator technology, establishment of slaughterhouse facilities, coordination of production by large corporations, and spread of retail infrastructure were all innovations that overcame barriers and enabled industrialization to occur in Japan.

The liveliness of disease ecologies

Writing on how nature becomes a strategy for capital accumulation, Boyd et al. (2001) situate nature as presenting “obstacles, opportunities, and surprises that confront firms.” While agribusinesses sought to promote the production of cheap chicken products, they unwittingly produced the byproduct of more virulent animal diseases. In analyzing chicken meat industries, Boyd (2001, 633) writes, “Intensive confinement, improved nutrition and feeding practices, and the widespread use of antibiotics and other drugs also represented important aspects of a larger technology platform aimed at subordinating avian biology to the dictates of industrial production.” He warns, presciently, that “virtually every effort to further industrialize broiler biology has resulted in the emergence of new risks and vulnerabilities” (633).

Animals like chicken, pigs, and cows are close enough to humans that, with a few mutations, some diseases are a threat to jump the species barrier. Animal diseases that have the

potential to spread to humans are called zoonoses. Cultural anthropologist Lowe (2010) explains avian influenza as a “viral cloud” of “uncertain ontologies.” She describes a 2003 H5N1 avian influenza outbreak in Indonesia: “Contagious viral agents infected a multitude of living beings—domestic poultry, humans, wild birds, and other creatures—at the same time as millions of Indonesian citizens and scores of organizations were scripted into national and international concerns about pandemic preparedness, biosecurity, and sovereignty” (626). For scholars who draw on a multispecies approach or critical animal studies (Kirksey and Helmreich 2010), zoonoses vividly illustrate the permeable species boundary between humans and other animals.

To respond to zoonotic threats such as avian influenza, in 2003 three international agencies launched an international policy framework called One World One Health (Chien 2013, Hinchliffe 2015). This framework has wide appeal through its emphasis on the health connections between countries, animals, humans, and the environment. The ability of zoonotic threats to spread provides a justification for embargoing countries that have certain animal diseases.

By using a political ecology approach to understand the role of disease ecologies in industrial chicken production, I draw attention to the mutable interactions between human health, farmed animals, and harmful microscopic agents like bacteria and viruses. Instead of portraying food as a sterile commodity reducible to its nutrition label, I acknowledge the liveliness of food, farms, and health. Lorimer (2017) does this by contrasting health and ecological management that embraces “probiotic” diversity with “antibiotic” attempts to destroy bad life. Paxson (2008) examines the rise of raw milk in the US and introduces “post-Pasteurian cultures” to describe the growing embrace of beneficial microbes. Looking at infectious diseases, Hinchliffe et al. (2013) critique a borderlines approach to disease management that seeks to wall-out pathological life and wall in at-risk life like broiler chickens. These approaches problematize conventional understandings of disease and illustrate how dominant approaches to disease management and food safety include implicit assumptions about ontology and power.

Eating everyday meals in the shadow of capitalist food systems

Marx’s concept of alienation draws attention to the broader implications of the global transition from use-value to exchange-value and how this fetishization of commodities obscures the relations between people and nature (Pepper 1996, 89). Alienation occurs in several

significant ways in the case of the industrialization of chicken husbandry. With regard to production, on industrial farms tasks such as producing the feed, raising the chickens, and butchering the chickens are carried out in separate places with compartmentalized tasks. With regard to consumption, people face a proliferation of ethical considerations in their everyday decisions about food. Upstream, large producers and retailers seek to exploit premiums from food certification strategies; downstream, people experience conflicting claims on their limited resources of time, money, and care.

Jackson and colleagues evaluate the importance of everyday meals by interrogating the role of social anxiety (Jackson and Everts 2010, Jackson 2015). Two insights from Jackson's (2015) *Anxious Appetites* are key to contextualizing everyday meals in the Global North. First, the industrialization of food production has led to more social anxiety about food. Advances in food technology provide more variety for consumers, but these processes also lengthen supply chains and disrupt "food's seasonality and local provenance" (Jackson 2015: 24). Focusing on frozen chicken, Jackson explores how industrialization of food contributes to consumer anxieties, particularly for raw meat. Second, Jackson evaluates how consumers utilize practical knowledge and embodied skills to navigate anxieties about food. Jackson delves into the "embodied, tacit, and practical knowledge that consumers employ" in their routine trade-offs "between different practical and ethical claims on their attention, such as quality and price, taste and value, convenience and sustainability" (26). Drawing on Schatzki (2002) and Miller (2001), Jackson trains our attention on consumers' practices and explanations, demonstrating how seemingly inconsistent behavior results from conflicting commitments. This approach to everyday meals contextualizes historical and geographic factors that shape the meaning of food in places. Instead of deriving trust from personal relationships with farmers or butchers, trust of industrial food originates from impersonal institutions that certify regulations and labeling (Kjærnes et al. 2007).

In order to examine the significance of everyday meals, social scientists must make key decisions regarding how they situate the people who consume food and the broader impacts that they ascribe to everyday meals. Many social scientists situate people who consume food as either citizens, consumers, or citizen consumers. In agreement with Gibson-Graham's (2006) call for moving beyond capitalist relations, some critical food scholars interpret citizens as people who are committed to progressive and noncapitalist politics. These scholars hold that, in contrast to

citizens, consumers find meaning from buying food products that are better than generic industrial foods; that this leads to contentment that hinders more radical change through citizenship and deepens neoliberal governance. For example, Johnston (2008, 229) warns that Whole Foods Market only provides “superficial attention to citizenship goals” as a strategy to promote consumerism. Morgan (2010, 1860-1) argues that the threat of global climate change necessitates a “new politics of care” and calls for moving beyond the ethical consumer to embrace the ecological citizen. Both Johnston and Morgan see ethical consumption as an insufficient mechanism for fulfilling the obligations of citizenship. In contrast to posing a clear distinction between citizenship and consumption, other social scientists argue that the boundaries between consumer and civic acts are blurring (Schudson 2007). They claim that as these acts meld together, attention to quotidian practice is necessary to analyze the evolving political implications of both consumption and citizenship (Hilton 2009, Soper 2004).

All eaters navigate food networks that grow increasingly complex and difficult to understand. Some social commentators describe alternative food as providing a model for how media companies can reinvigorate their economic model. For example, Foer (2017) invokes the food movement as a positive model in which consumers can agree to pay more for better products. After acknowledging flaws with the food movement, he writes, “Still, in the farmers’ markets and the Whole Foods, there remains something radical — a turn away from the cheap, mass-produced, and heavily marketed” (208). Popular media often invokes alternative capitalist food as a success story, perhaps because alternative capitalist food promotes the idea of betterment and the narrative of reconnecting. Powerful technology corporations are reshaping both food and media in related ways. Amazon’s August 2017 acquisition of Whole Foods for \$13.7 billion underscores the burgeoning connections between Silicon Valley and alternative capitalist food.

In a more encompassing critique of rapid technological change outpacing mass understandings, Bridle (2018) describes how technology entangles people in inscrutable networks that interfere with attempts to act ethically and promote justice. He coins the term “a new dark age” to highlight problems arising from rapid leaps in computing and information technology; we are now suffer from an overabundance of too much information. During the Enlightenment, a central idea was “that more knowledge – more *information* – leads to better decisions” (10). Bridle demonstrates that rapid technological innovation contributes to our

“apparent inability to see clearly what is in front of us, and to act meaningfully, with agency and justice, in the world – and, through acknowledging this darkness, to seek new ways of seeing by another light” (11). The description of the internet as existing on a cloud exemplifies how people struggle to understand new technology with all its complexity and invisible nodes. Unlike the floating ephemerality of clouds, we access the internet through fiber-optic cables connected to data centers where the flow of information is shaped by corporate algorithms.

Even as people gain access to unprecedented information through the internet, the ways in which we access that information — both the infrastructure that powers the internet and the algorithms that shape information accessibility — grow increasingly unknowable. Bridle (2018, 9) writes, “The greatest signifying quality of the network is its lack of single, solid intent.” As networks expand, they enlist countless actors and create new impenetrable relations. Coles (2016) describes how people struggle to grasp “the shocking materialities and temporalities of agri-capitalism” in which a single plant in Brazil transforms 500,000 chickens per day from live animals into packaged commodities. These insights counter the optimistic reading of networks as primarily contributing to greater transparency.

Critical food scholarship has tended to emphasize how alternative food networks provide visibility and clarity about how food is produced without acknowledging how such networks may confuse and conceal. “Fair trade” is a term taken by consumers to indicate that the food was produced ethically. Beginning with Whatmore and Thorne’s (1997) landmark analysis of fair trade coffee as an alternative food network, geographers often connected the ethics of consumer practices to broader food networks. In an ambitious study, Kneafsey et al. (2008) analyze how alternative provisioning systems help to reconnect consumers, producers, and food through an ethic of care. Placing food networks into different categories based on intent proves difficult. Cameron and Wright (2014) persuasively identify three categories of food in Newcastle: capitalist, alternative capitalist, and non-capitalist. These categories derive from Gibson-Graham’s (1997; 2008) research on diverse economies. Scholarship on non-capitalist food explores the importance of care, non-human actors, and feminist-inspired attention to the visceral nature of eating (Hayes-Conroy and Martin 2010, Sarmiento 2017). The diverse category of food that exists outside of capitalist markets encompasses subsistence, small-holder, indigenous, peasant, and informal food economies.

Mirroring non-capitalist food, alternative capitalist food attempts to imbue non-capitalist values within market-based relations. Kirschenmann et al. (2008) emphasize the contributions of alternative-capitalist food using the term the “agriculture of the middle.” A growing number of scholars analyze the role of value in the supply chain to show how the agriculture of the middle provides widespread regional benefits (Ostrom et al. 2017, Hardesty et al. 2014). Other scholars, however, caution that alternative capitalist initiatives such as organic and free trade certification replicate the ills of industrial food due to conventionalization and regulatory capture (Guthman 2004, Jaffee and Howard 2010). Busch (2011) uses the term “standardized differentiation” to describe how the standard for better food is distinguished from generic capitalist food. Antibiotic-free, cage-free, and free-range are all examples of standardized differentiation for chickens. All-natural is perhaps the most blatant attempt to brand industrial food as alternative food, because all-natural is used without reference to any established standard (Abrams, Meyers and Irani 2010).

Large food retailers such as supermarkets reshape both upstream conditions of production and downstream consumer expectations (Dixon 2002). Retailers are well positioned to capitalize on the burgeoning consumer demand for alternative capitalist food. Supermarkets often enforce higher standards, especially regarding the appearance of fresh fruits and vegetables, which in turn change demands on producers and expectations of consumers (Burch and Lawrence 2005, Richards et al. 2013). Freidberg (2017) analyzes how Big Food strives to advertise sustainability, with corporations such as Walmart trying to collect information from farmers to convey sustainability to consumers, and encountering difficulties getting and disseminating such data. Carolan (2018) describes how large supermarkets collect massive amounts of data with the goal of influencing consumer behavior. These initiatives indicate the confusing ethics of contemporary food in which large corporations aggregate data to tout their commitment to sustainability and manipulate consumers into spending more money.

Manichean categories of good or bad food oversimplify complex processes, contexts, and contradictions inherent to market-based efforts to promote more ethical relations through food (Grasseni and Paxson 2014). Further, food can be good or bad for myriad reasons, including upstream labor conditions, animal welfare, and environmental pollution, as well as downstream implications for food safety, palatability, and cultural significance (Beagan et al. 2014). With the increased accessibility of information and food options, persons preparing the food (largely

women) experience societal pressure to invest more time and resources in providing good food for their children or households (Cairns, Johnston and Mackendrick 2013, Mackendrick and Stevens 2016). Cairns and Johnston (2018) emphasize the contradiction that mothers face in feeding their children meat, because mothers want to teach their children about where their food comes from but also to protect them from the harsh realities of animal slaughter. Of all food commodities, meat is especially divisive because it is produced through the killing of sentient animals. Labels certifying animal welfare conditions have helped to raise awareness of animal suffering, but consumers often misinterpret the meaning of those labels, and the labels themselves do not go far enough (Buller and Roe 2014, Miele 2011).

Conclusion

This critical review informs the analysis I will apply in my dissertation to show how chicken broiler and jidori production help us better understand everyday consumer food practices. As the review shows, the connections between the upstream conditions of production and downstream everyday meals are complex. Consumers navigate overwhelming amounts of information while working with limited resources of time, money, and care. With the meatification of their diets, Japanese consumers came to expect cheap chicken meat as a typical commodity. In the next chapter, I turn to the historical development and piecemeal innovations through which cheap chicken meat became common in Japan.

Chapter Three. The internationalization and the industrialization of chicken husbandry in Japan in the 20th century⁷

By the start of the Showa-era (1926-1989), leaders in the Japanese chicken industry sought to promote more industrial approaches. Using the jargon of the time, they encouraged farmers to approach chickens as a primary occupation (*sengyō*) instead of as a side business (*fukugyō*). Agricultural scientist Kosugi Masaya begins a 1926 handbook on chicken husbandry by challenging the notion that chickens are merely a side business (*fukugyō*). Kosugi writes:

We have already moved past the age when we can think of raising chickens as a simple task that is suitable for the elderly, women, and children... Instead of just twenty or fifty chickens, side business farmers are raising two or three hundred chickens and primary occupation farmers are raising over a thousand. These large flock sizes are appropriate because an awareness of scientific and rational approaches is leading to rapid improvement of poultry methods that keep on getting better, and so we have already reached an age that will not tolerate any impediment to progress (Kosugi 1926, 1-2).

Leaders of Japan's nascent chicken industry included agricultural scientists such as Kosugi, government officials, and businessmen. They sought to promote larger and more productive operations but initially struggled to manifest their vision of industrial chicken farms.

The industrialization of chicken husbandry in Japan occurred through a series of piecemeal innovations. By piecemeal innovations, I mean that innovation in the poultry industry occurred through trial and error as industrial approaches gradually spread through the industry. These piecemeal innovations overcame organizational, technical, and biophysical barriers to the penetration of capital, contributing to profound changes in Japanese rural life and the national diet. On the production side, chickens disappeared from the backyards of millions of households and instead concentrated in capital-intensive operations that specialized in either chicken meat or eggs. On the consumption side, the amount of chicken meat and eggs consumed increased many times over and new retailing mechanisms facilitated the spread of cheap chicken products. These

⁷ This chapter was published in *Japanese Studies* (Schrager 2018b). I incorporated the section “The Industrialization of the Global Chicken” that was published in the journal article into Chapter Two. I also made minor edits throughout.

changes meant that in everyday life people encountered chickens more often as food commodities, eggs or chicken meat than as living creatures. This chapter responds to the working question: *How did industrial chicken spread throughout Japan?* I focus here on the Showa-era (1926 – 1989) to fill in this history of the industrialization of chicken husbandry and provide insights into the forces that reshaped social relations and food systems.

Industrialization prior to World War II

Japan's nascent poultry industry first coalesced around Nagoya in Aichi prefecture. In the late Edo-era (1603 – 1868), around a dozen samurai were raising over a hundred chickens each within their family compounds (Iriya 2000). In 1873, the Japanese government abolished the samurai's role in the imperial army (Harootunian 1959, 257). While some former samurai (*shizoku*) smoothly transitioned into business or government positions, others fell into debt and poverty. Several prominent former samurai became chicken farmers and successfully established large chicken operations in Nagoya. One such farmer was Gomi Iwatarō, who raised a thousand chickens and encouraged other former samurai who were struggling to enter the chicken business (Iriya 2000, 66). Nagoya is located favorably between Japan's major urban regions – Kanto and Kansai – and is on the major transportation hub of the Tokaido Road, which became connected by the railroad in 1875. Two years later, former samurai helped found the Aichiken Kaidorigyō Kumiai (Aichi Prefecture Poultry Cooperative), and a hundred former samurai joined (ibid., 68). Aichi became Japan's center for research on chicken husbandry, and the most widely used domestic breed was named the “Nagoya.” Later, the Nagoya was crossed with the Cochin, a breed that was originally from China but was later improved in Great Britain. Called the “Nagoya-Cochin,” this cross is still one of the most famous chicken breeds in Japan. Based on this history, Aichi prefecture was also called the poultry kingdom (*yōkei no ōkoku*) and the chicken industry was also known as a samurai business (*samurai shōbai*).

Outside of Aichi prefecture, there was limited understanding that chickens could be an important agricultural industry. A book from 1904 titled *Tamago ryōri toriniku ryōri nihyakushu oyobi katei yōkei hō* (Two hundred egg and chicken meat recipes and methods for household poultry) illustrates the authors' belief that, to expand the industry, the general populace needed instructions on raising chickens alongside recipes for eating eggs and chicken meat (Murai and Ozaki 1904). The first half of the book features two hundred recipes that are split evenly between

eggs and meat as well as Western and Japanese cooking. The second half gives instructions on topics such as building chicken sheds, hatching chicks, preparing feed, and selecting breeds. This book is indicative of a broader transition to seeing chickens as a source of food as opposed to fulfilling other cultural functions, such as cockfighting and divining.

The first reliable statistics on chicken husbandry in Japan were collected in 1906 as a part of government efforts to promote domestic egg production (Kitamura 1987, 150). According to the 1906 census, Japan had 2.85 million farm households raising chickens with an average flock size of six and a half chickens. Subsequently, the Japanese government collected data on chicken husbandry through the *Nōgyō nenkan* (Annual agricultural statistics) and even reported the exact number of eggs produced and imported (MAFF Multiple Years). These statistics provide a good indication of general trends for the industry regarding the number of farms, average flock size, egg production, and variation by region.

Chicken farming was promoted throughout Japan during the Taisho era (1912 – 1925) as a side or subsidiary business (*fukugyō*). Farms at the time were diverse operations, and farmers typically raised multiple crops such as rice, soybeans, sweet potatoes, and barley. Farmers were encouraged to take up chicken farming as a supplementary source of income. A handbook on side business poultry from 1910 began with the exhortation that chickens can be raised by almost anyone in nearly any environment (Nakamura 1910, 11). In 1917, the government established a program which provided subsidies to regional chicken associations and hatcheries with the goal of facilitating the distribution of more efficient breeds (Hosokawa 1974, 38-9, Kitamura 1987, 151). Industry leaders who sought to promote chickens as “side businesses” also touted the importance of effective practices such as the use of Western breeds that lay more eggs.

With authorities promoting widespread adoption of chicken husbandry, the number of farm households raising chickens and overall productivity increased. The number of farm households raising chickens rose by 25% between 1915 and 1925. Tariffs were lifted on Chinese eggs from 1920 to 1924 because domestic egg production could not meet the demand for eggs. Chinese egg imports peaked in 1921 with nearly 700 million eggs that accounted for 39% of domestic egg consumption (MAFF Multiple Years). In 1925, the tariff on Chinese eggs was reinstated (Saotome 1934, 871) and chicken husbandry became imbued as a symbol for superiority in Sino-Japanese relations.

The Japanese government sought to rectify the trade deficit to China for eggs by implementing an ambitious plan for increasing domestic egg production. In 1925, the government established the *Keiran jikyū zōsan jūkanen keikaku* (The 10-year plan to increase egg self-sufficiency) (Honma 1991, 355). By the time this program went into effect in 1926, Chinese egg imports had already decreased by more than half from their peak in 1921 (Hosokawa 1974, 110). Beginning from this protectionist impetus, the plan laid out three main goals to promote the industry: (1) the establishment of five national chicken breeding facilities across the country, (2) the importation and incorporation of Western chicken breeds to improve egg laying efficiency, and (3) the subsidizing of regional poultry institutions to help disseminate superior breeds (Honma 1991, 355). Each of these government-backed initiatives centered on increasing the availability of high quality breeds to Japanese farmers.

Under the influence of the 10 Year Program from 1926 to 1936, the number of farm households raising chickens decreased by 16%, average flock size increased from 11 chickens to 17 chickens, and annual domestic egg production doubled (MAFF Multiple Years). Broader use of Western breeds such as the White Plymouth Rock contributed to increases in average annual egg productivity (Hosokawa 1974, 58, 108). Although these national statistics indicate general trends, there remained significant geographic variation. For example, in 1935 the average flock size for Aichi prefecture was over fifty chickens while the average flock size for the entire country stood at 17 (Kitamura 1987, 155).

As food historian Katarzyna Cwiertka (2006) demonstrates, animal protein (and especially beef) became a symbol for both physical and military strength in Japan. The menu for enlisted troops included chicken meat and eggs, which helped to spread the popularity of these ingredients (ibid. 74). Protein-rich animal food products were entangled in discourses of rising nationalism that sought to establish Japan as an imperial power on the global stage. The railways furthered the understanding of Japan as a unified nation-state and provided an infrastructure for shipping eggs from rural areas to population centers. Railway terminals and department stores were key retail mechanisms that helped spread the popularity of Western foods (ibid., 50-1).

In addition to the introduction of high quality breeds and adequate feed, other innovations helped grow the industry so that more farmers would consider chickens to be their primary occupation. For example, incubators allow for eggs to hatch under artificial conditions so that chicks can be distributed on a reliable schedule. However, rural areas in Japan lacked stable

electrification grids, and this prevented some hatcheries from using electronic incubators. Hatcheries using a flame heat source found it difficult to control the temperature. Nagatomo Seiichi, who was from Miyazaki and studied at a hatchery in Aichi, created an incubator in 1927 called the Nagatomo Incubator that addressed these issues (Nagatomo 1972). Nagatomo became interested in incubator design and came up with the idea for a non-electric incubator that could automatically regulate temperature. By successfully inserting an ether-based substance into the incubator's lid, he invented a lid that expanded to release steam and lower the temperature when the incubator became too hot (ibid., 42-3).

The Nagatomo Incubator produced favorable results when tested against Western incubators. Agricultural scientist Kosugi Masaya endorsed the Nagatomo Incubator and along with two other agricultural scientists formed a company to market the Nagatomo Incubator that later merged with *Niwatori no Kenkyū* (Chicken Research), a corporation that put out a monthly trade journal in addition to directly marketing poultry products to farmers. At its peak, the Nagatomo Incubator was used at government hatcheries and agricultural universities. It was even exported to Brazil, Argentina, and Indonesia. Due to the design, only one layer of eggs could be hatched at a time, hindering egg capacity. A 1934 pamphlet offered five models ranging in capacity from 120 eggs to 1,200 eggs. In 1935, a factory fire disrupted manufacturing, and production was discontinued during World War II. After the war, the Nagatomo Incubator never recovered its market share. A stable electricity supply lessened the need for non-electric incubators, and commercial hatcheries required more capacity than the Nagatomo Incubator could provide. This incubator is just one example of the many small innovations that enabled chicken husbandry to become a major industry.

Deindustrialization and World War II

In the late 1930s, nationalistic propaganda was ubiquitous in trade journals for animal husbandry such as *Niwatori no Kenkyū* and *Chikusan* (Livestock). For example, in January 1938, Amano Satoshimatsu lauded husbands who bravely went off to join the army and drew a parallel to the courage of wives who stayed behind to run a chicken farm without their husbands (Amano 1938). In August 1939, *Niwatori no Kenkyū* published a picture of poultry industry leaders gathered in front of a warplane that they donated to the military (Niwatori no Kenkyū 1939), a

common show of patriotism at the time (Young 1998, 175). In January 1939, *Chikusan* prominently featured the following haiku:

| | | |
|--------------------------|------------------------------|-------|
| <i>Chikusan no</i> | Because our livestock | 畜産の |
| <i>Zōshoku koso wa</i> | Production needs to increase | 増殖こそは |
| <i>Warera no tsutome</i> | That is our duty | 我等の務め |
| (Chikusan 1939) | | |

As this haiku illustrates, agricultural trade journals portrayed livestock farmers as making an important contribution to the nation.

The goal of increasing chicken productivity during this period of rising nationalism centered on developing a hen that could lay an egg every day of the year. In December 1938, Yamanaka Kiyoshi commemorated the accomplishment of a Barred Plymouth Rock⁸ hen at the Tochigi Prefectural Research Facility that set the new world record of 363 eggs in a year, surpassing the old-world record of 362. Yamanaka writes, “The proud poultry country of Japan is shining bright in East Asia” (Yamanaka 1938b, 60). While these record-breaking hens became a symbol of Japanese industry surpassing the West, increasing the annual number of eggs that a hen laid in a test facility was an insular goal. Other criteria, such as a hen’s efficiency of feed conversion, egg weight, and adaptability to environmental stresses, were more pressing during the hardships of World War II. Japanese researchers, however, remained fixated on the elusive 365-egg hen.

While researchers were focusing on developing an egg-a-day hen, chicken farmers were being encouraged by the Japanese government to join in the colonization of Manchuria and assured that Japan would avoid grain shortages. Hibino Kaneo emerged as a leader in the poultry industry with the unfortunate distinction of being an enthusiast on the wrong side of history. In 1932, Hibino arrived as a poultry farmer in Manchuria and regularly published updates on the status of Manchuria poultry. Some of these reports were infused with nationalist fervor. In December 1938, Hibino writes, “In this new paradise [Manchuria], safety, transportation, and

⁸ Like most commercial breeds in Japan at the time, the Barred Plymouth Rock breed was imported to the country whereupon agricultural scientists sought to increase its productivity further through selective improvement.

great happiness are to be had for those who are willing to work hard to remake this fertile land” (Hibino 1938, 71).

In 1941, *Niwatori no Kenkyū* published a 578-page book by Hibino titled *Manshū shinyōkei hō* (The new Manchuria poultry method) (Hibino 1941). Hibino documented the methods used in northern Manchuria and encouraged their adoption back in Japan. He writes, “From one perspective, what is emerging in Manchuria is a wondrous miracle. It is also a genuine lesson for the development of management in continental Japan” (ibid., 5). Hibino’s enthusiasm for the new Manchuria poultry method was misplaced. Aside from the most obvious reason – the Manchuria colony would soon collapse – large-scale chicken operations were ill-suited to wartime conditions in Japan. Grain supplies were scarce, which made it impractical for farmers to purchase enough feed for a large flock of chickens.

As Japan grew more authoritarian, the government began to intervene in consumer prices in September 1939 and to regulate the distribution of food commodities (Scherer 2002, 108). To receive adequate sustenance, citizens supplemented government rations by frequenting black markets that were technically illegal. In order to participate in the black market, commodities had to be concealed from government officials. Unlike large livestock like cows and pigs, chickens were small and thus easier to conceal. As a result, *yakitori* stalls grew increasingly popular during the war (Tsuchida 2014, 73). By contrast, government intervention in the US during World War II contributed to industrialization, because the government enforced standardization throughout the industry (Gisolfi 2017). Unlike the case in Japan, black markets in the southern US emerged because producers sought to avoid government regulations and did not originate from food shortages (Levenstein 1994, Ch. 6).

Official statistics from the Ministry of Agriculture, Forestry and Fisheries (MAFF) printed in the report *Nōgyō nenkan* (Annual agricultural statistics) demonstrate the significant impact of World War II on chicken husbandry. The number of farm households raising chickens declined from 2.9 million farms in 1936 to 1.9 million farms in 1941. This decline was later offset by a postwar expansion to 4.0 million farms in 1949 (MAFF Multiple Years). These rapid fluctuations indicate that the inter-war strategy of promoting industrialization was untenable during the upheaval of World War II.

Some examples of the tension between internationalization and domestic self-sufficiency can be seen in the publication *Niwatori no Kenkyū*. Although the official government position

was that Japan would secure grain imports, dissenting opinions were voiced in the journal, and a reoccurring topic in articles from 1937 until publication halted in 1944 was how poultry farmers could best navigate wartime difficulties. In November 1937, a large poultry farmer asserted that farmers should produce their own feed to protect against sudden changes in the price of grain (Saito 1937). He observed that by maintaining control over their feed, a farmer could turn a good profit during times of crisis. Researcher Oku Kōshin warned in October 1937 that the issue of self-sufficiency was being overlooked and that a cessation of grain imports would have calamitous consequences (Oku 1937). In May 1938, Yamanaka Kiyoshi questioned Manchuria's productive capacity by drawing on statistics to show that Japan's corn imports were mostly from South American countries like Argentina (Yamanaka 1938a). Japan's food supply and animal-based industries depended on grain imports from its colonies and trading partners.

The chicken industry changed in 1941 following drastic decreases in grain imports (Hosokawa 1974, 45). As feed imports declined, the government intervened in the hatchery business. Akagi Miyoshi operated a chicken hatchery in Miyazaki, and he recounts the impacts of World War II in his autobiography (Akagi 1993). In the early 1940s, Akagi was compelled to sell chicks through a prefectural association and drop his price per chick from 50 *zeni* to 10 *zeni* (100 *zeni* equaled one *yen*). Orders through this prefectural system took a year to process, and most orders were for 30 – 50 chicks with the largest being for 200 chicks. As deprivations during the war deepened, Akagi received a special shipment of Nagoya chickens from Aichi prefecture. His hatchery distributed about 15,000 Nagoya chicks with the goal of boosting household self-sufficiency. Akagi writes, “During the war, our work was all about service and not about making profits” (ibid., 105). Near the end of the war, Akagi joined the militia while his wife and three children fled to the countryside. It was not until 1948 that Akagi was able to reopen his hatchery. He had to receive a special exemption from rolling blackouts so that he could successfully incubate eggs. In the aftermath of the war, Akagi focused on producing hardy chickens, breeds that were a good fit for farmers who were experimenting with new sources of chicken feed.

During World War II, the most effective method of raising chickens was to keep a small flock that could be raised using free or cheap sources of feed. Instead of purchasing chicken feed, farmers were encouraged to raise grass chickens (*kusadori*) on wild plants and grasses (*yasō*). Today, the phrase “grass chickens” could easily be mistaken to indicate free range chickens that have access to outdoor pastures, but the “grass” refers to a method of feed production, not to the

area where chickens were raised. In July 1943, *Niwatori no Kenkyū* published a special issue on “*Yasō shushi no shiryōka*” (Making feed from wild grass seeds). In a feature article, Hatano Tadasu (1943) from MAFF Feed Division advised farmers on how to use wild plants to make feed.⁹ Hatano notes that since there is a food shortage, poultry farmers have an obligation to their country to find a suitable source of feed for chickens. Government officials like Hatano encouraged poultry farmers to seek out new sources of chicken feed so that chickens could provide additional sustenance for citizens amid widespread food shortages.

Buffeted by the memories of wartime deprivations and abetted by the Land Reform, the decade following World War II was characterized by a high level of agricultural self-sufficiency. Thus, grass chickens were the main method of chicken husbandry. *Niwatori no Kenkyū* halted production for several years and was relaunched in 1947. Hatano Tadasu (1947), still of the MAFF Feed Division, wrote the first article of the relaunch and reported that farmers frequently told him that they would raise chickens if only they had some feed. Hibino Kanaeo returned to Japan from Manchuria and eventually became the editor of *Niwatori no Kenkyū*. In the second issue after the relaunch, Hibino laid out his vision for revitalizing Japan’s chicken industries and emphasized the importance of maintaining self-sufficiency (Hibino 1947). Throughout the early 1950s, *Niwatori no Kenkyū* regularly reported on grass chickens. Regional and national conferences disseminated knowledge about efficient grasses and strategies for fermenting grass as silage. In June 1955, Hibino wrote a lengthy special report on a grass chicken method in which 90% of chicken feed was derived from wild plants and grasses (Hibino 1955).

While wartime chicken husbandry was restrained as noted above, by 1950, 75% of farms raised chickens, and the average flock size was ten chickens, the same average flock size as the early 1920s (MAFF Multiple Years). Most rural households and even some city households raised chickens, and the main products were eggs intended to supplement household self-sufficiency. While the grass chicken approach was viable in the decade following the war, it declined as Japan expanded grain imports from the US. By the late 1950s, Japan’s chicken

⁹ Taking the example of Chiba prefecture, Hatano (1947) recommended the following plants, which were often colloquial and spelled using katakana: “*Suzumehie, nobie, minogome, karasunoendō, tabumame, hamaendō*. A few of these grasses have English translations such as *paspalum*, *barnyard grass (echinochloa)*, and *vetch (vicia)*).

industry was again trending towards a reliance on imported grains and efficiencies of scale. *Niwatori no Kenkyū* reported on the poor economic conditions for grass chickens in the late 1950s, and, by the 1960s, references to grass chickens rarely appeared in the journal.

Feed and Breeds from the US

World War II only temporarily reversed the industrialization of the Japanese chicken husbandry. The first major shift occurred when Japan moved to increase grain imports from the US. In 1954, the US Congress adopted the “Food for Peace” Public Law 480 that sought to create export markets for surplus grains and further American geopolitical goals (Goodman and Redclift 1991, 108). Soon after, the Japanese government permitted the rapid expansion of cheap grains from the US (McDonald 2000). In 1955, Japan only imported 10% of concentrated grains (*nōkō shiryō*), a category of grains that includes most crops used for animal feed, such as corn and soybeans (Asami 1974, 217). By 1965, imports of concentrated grains accounted for 54% of domestic consumption as self-sufficiency declined and the reliance on imported grains continued to increase. Imported grains were processed by *shōsha* (large general trading firms). *Shōsha* today, as at that time, are affiliated with large corporate groups such as Mitsui and Mitsubishi, which have historical links to the larger *zaibatsu* corporations that were dissolved under the US-led Occupation. The expansion of grain imports by *shōsha* encouraged a shift from self-sufficient to larger-scale operations.

The next major advances in industrialization were brought about by the arrival of the latest Western breeds. After the war, agricultural scientists were again able to travel and observe chicken production in other countries around the world. For example, Komai Tōru studied abroad at Kansas State University with the support of a Fulbright Fellowship in the early 1950s.¹⁰ In a 1953 *Niwatori no Kenkyū* article, Komai advocated for the development of a chicken broiler industry in Japan. Komai writes, “The poultry industry was considered basically ‘an industry that produces eggs from hens’ and over the past half-century our goal has been to increase egg production, but now along with that we must also focus on increasing meat

¹⁰ From fieldnotes of an in-person interview in October 2016.

production” (Komai 1953, 32). Dual-use chickens remained common in Japan until the early 1960s.

Leaders from the poultry industry who observed the latest Western-style operations were convinced of the advantage of separating meat and egg production. For example, Akagi Miyoshi describes traveling in 1958 with a hatchery group from Miyazaki to see the new Western-style broiler operation in Okayama. He writes:

Separated far from humans in the good environment of the mountains, there were ten large American-style chicken structures. Each chicken structure held 8,000 chickens. The feed was delivered automatically through a modern system. It was just as shocking as when the black boats came at the start of the Meiji-era. We were raising chickens in groups of 50 to 100, and I saw then that we were doing it all wrong. (Akagi 1993, 153-4)

Akagi reflected that not only were the latest US chicken breeds superior, but so too were the management strategies for raising chickens. In an interview I conducted in 2016, an industry insider from Miyazaki recalled the astonishing results when Western breeds arrived in the early 1960s. He said, “The chickens were small, and they laid a lot of huge eggs. The size of the eggs was completely different from the size of eggs of the dual-use chicks we had been using until then... I was also surprised when specialty meat chickens entered in 1964. Basically, it was like when the black boats entered Japan.” The use of the “black boat” analogy, like the one above, is a reference to Commodore Matthew Perry’s fleet of ships and the start of the Meiji Restoration. This analogy indicates the drastic changes that accompanied the introduction of the latest Western breeds.

For those who operated upstream in the hatchery business, the adoption of the latest Western breeds forced Japanese hatcheries to enter into licensing agreements with international agribusinesses. Within the Japanese chicken industry, the latest Western breeds were regularly referred to as foreign chickens (*gaikoku-kei*) while the Western breeds that were in Japan prior to World War II were called domestic chickens (*kokusan-kei*). In an April 2017 interview, Akagi Norimoto, the second generation in his family to be the director of Akagi Shukeijō (Akagi Hatchery), spoke of the decline in the number of hatcheries: “Up until 1963, there were about 16 different hatcheries [in Miyazaki]. But now, most of them have gone out of business.” The Akagi Shukeijō, which is now called Amuse, is the last hatchery in Miyazaki that specializes in egg laying chickens (layers). This example from Miyazaki is indicative of the rapid centralization of chick supply that occurred throughout Japan.

Hatchery businesses centralized as Japanese companies entered into licensing agreements for foreign breeds. One indication of this centralization is that the number of unique hatchery advertisements for breeds of commercial chicks in *Niwatori no Kenkyū* declined by 82% between July 1965 and July 1975.¹¹ The July 1975 issue features a multiple page advertisement for the Shaver 288 laying hen — Shaver was originally a Canadian company that was owned at the time by the US agribusiness Cargill — and lists 29 different Japanese Shaver Association Members. As opposed to exclusively touting the number of eggs that a hen laid in a year, the latest Western layers were marketed based on being small (under 2 kg), laying large eggs (over 60 g), and having efficient feed conversion ratios (around 2.5 kg of feed per 1 kg of egg production).¹²

Large-scale layer operations adopted breeds, machinery, and methods from the US and other Western countries. Battery cages were a key innovation that facilitated the intensification of layer industries. With battery cages, more of a hen's energy was directed towards laying eggs, and this improved feed conversion. Battery cages also reduced space requirements and prevented some diseases because chickens were elevated above the ground. Farmers built large structures to house battery cages and equipped them with systems to dispense feed and water automatically. By the mid-1960s, *Niwatori no Kenkyū* featured large operations such as Takada Daiichi Yōkeijyō, an incorporated layer farm in Hyogo with 20,000 laying hens (Takigawa 1965). Along with this transition, the number of farms raising chickens declined drastically. The number of farm households raising chickens peaked at 4.5 million in 1955 before dropping to fewer than 100,000 by 1990. While the number of overall farms declined in Japan, the rate was far more rapid for farm households raising chickens.¹³ This consolidation of chicken farms follows a pattern similar to how industrialization occurred in other advanced industrial countries.

¹¹ Advertisements were counted and coded by the author. There were 72 unique hatchery advertisements in July 1965 and 13 in July 1975.

¹² Feed conversion is a statistic that measures the ratio between feed and commodity for animal products.

¹³ Between 1955 and 1975, the overall number of farms in Japan declined by 18.0% while the number of farms raising chickens declined by an astonishing 88.7% (MAFF Multiple Years).

With larger layer operations, food processors and retailers could reliably purchase eggs as an interchangeable commodity. Chicken layer farms grew larger and more capital intensive, which in turn contributed to the availability of cheap eggs and increases in consumption. Average per capita consumption of eggs increased from 11.3 kg per year in 1965 to 16.1 kg per year in 1990 (ALIC Multiple Years). Wider availability of eggs lowered the incentives for households to maintain a small flock of chickens. In many conversations with people in Miyazaki, home-raised chickens were recalled as a fond childhood memory of rural life, especially for people in their 30s and older. Most backyard flocks were phased out between 1970 and 2000 although a small number remain. Additionally, the definition of what counts as a chicken farm was changed by MAFF in 1993 to only include farms with over 300 hens, and this was increased to 1,000 hens in 1997 (MAFF Multiple Years). Most of the backyard flocks disappeared while the official statistics ignored flocks with under 1,000 hens, showing the shift in the government's emphasis from self-sufficient to larger industrial layer operations.

Even as overall egg production increased, regional continuity persisted for the layer industry (see Figure 3.1), especially when compared to the drastic changes in the broiler industry (see Figure 3.2). Chicken broilers are more capital-intensive than layers, so they typically form in clusters that are organized with quasi-vertical integration by large firms such as *shōsha*. Vertical integration occurs when a firm coordinates multiple stages of production such as feed refineries, hatcheries, growing facilities, slaughterhouses, processing facilities, or distribution. However, as historian Monica Gisolfi (2017, 40) stresses with regard to the US, the chicken broiler industry is a quasi-vertically integrated industry, because firms typically make growers take on the financial risk of owning chicken broiler sheds and raising chickens. Chicken broilers are produced using an all-in all-out system, which means that baby chicks are delivered to a farmers' structure "all-in" at once. After the chicken broilers are ready to be shipped to the slaughterhouse, they are removed "all-out" from the structure at the same time. Processing entire structures — anywhere from thousands to ten thousand or more chickens — in a day requires a significant investment in both fixed infrastructure and employees. By contrast, layer operations produce eggs daily, and egg processing is less capital and labor intensive than processing live birds into chicken parts.

Figure 3. 1 Number of layers by prefecture (1970 and 1990). (MAFF Census, Multiple Years)

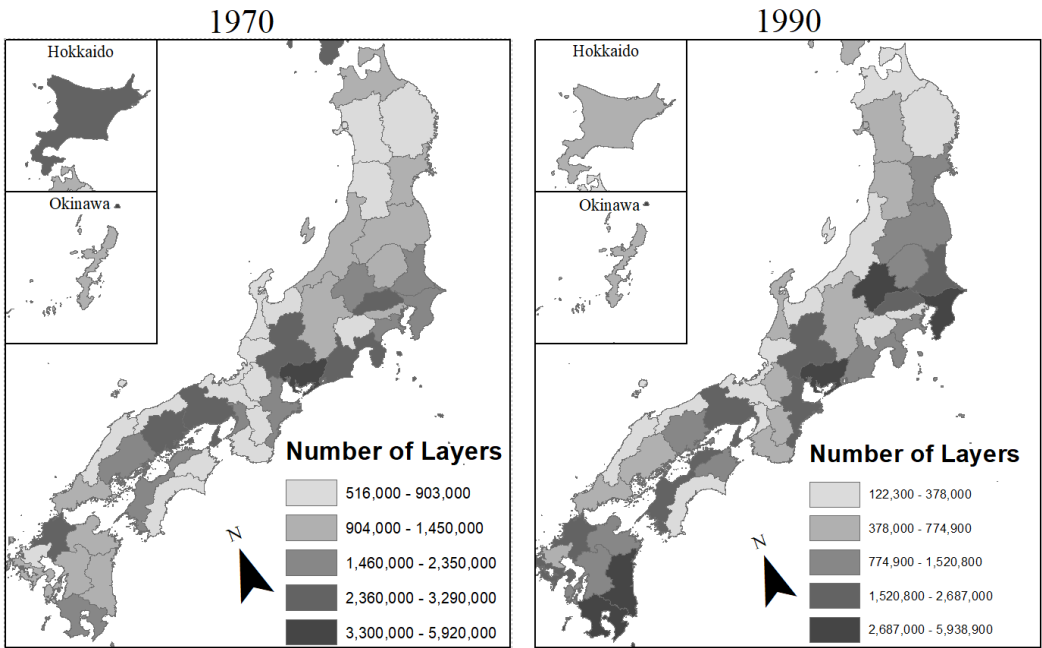
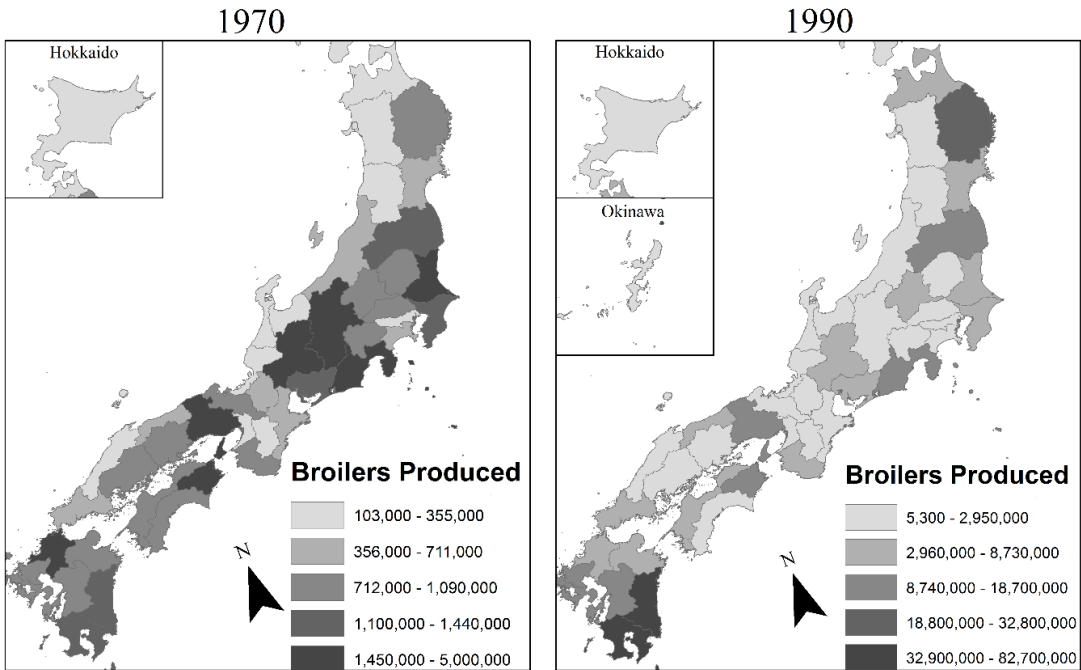


Figure 3. 2 Broiler production by prefecture (1970 and 1990) (MAFF Census, Multiple Years)



Broiler Clusters

Throughout the 1970s, broiler clusters shifted away from the urban fringes and towards the rural periphery (see Figure 3.2) (Nagasaka 1993, Gotō 2013). In the 1970s, Hyogo was the top broiler producing prefecture, but by 1985 the rural prefectures of Miyazaki, Kagoshima, and Iwate outperformed Hyogo, and these three prefectures have since remained the top three prefectures for broiler production (MAFF Census Multiple Years). One of the reasons for their success is that Miyazaki, Kagoshima, and Iwate have lower costs for land, labor, and imported feed. Southern Kyushu's Miyazaki and Kagoshima prefectures also benefited from having accessible ports that kept down the price of feed, which is the largest expense in broiler production. Another factor favoring the relocation from the urban periphery to the rural fringes was that as chicken broiler operations grew larger, they created more pollution from chicken waste and noxious smells. Trade journals like *Niwatori no Kenkyū* frequently discussed the issue of pollution (*kōgai*) in the 1970s. The urban periphery grew untenable for large polluting chicken operations, especially as urban sprawl continued to encroach on the surrounding countryside. Also, advances in refrigerated shipping facilitated the ease with which rural areas could supply the urban core (Nagasaka 1990, 175).

While the overall number of broiler farms plummeted nationwide, the remaining farms grew larger in scale and production skyrocketed.¹⁴ The bodies of the chickens themselves grew more productive as the average weight of chicken broilers increased while they were produced in less time, because growers were using the latest breeds and management techniques (Komai 2012b).¹⁵ These changes caused chicken meat production to increase from 240,000 tons in 1965 to 1.4 million tons in 1987 (ALIC Multiple Years). Integrators also benefited from large slaughterhouses that enabled further processing of chicken carcasses into parts (Komai 2012b,

¹⁴ The number of broiler households decreased by 65% from 1964 to 1984. Over the same time, the average flock size increased from 624 chickens to 19,500 chickens (MAFF Multiple Years).

¹⁵ Between 1965 and 1985, the average weight of chicken broilers in Japan doubled from 1.23 kg to 2.41 kg. Broilers were processed on average after 70 days in 1960, 60 days in 1975, and 55 days in 1990 (Komai 2012).

982). Once large slaughterhouses were established they provided yet another advantage for rural chicken broiler clusters.

Integrators played a central role in deciding where chicken broiler production should be located (Nagasaka 1993, Gotō 2013). In a February 2016 interview, a long-time prefectural employee described how at first integrators would recruit farmers to become growers. To be a grower, farmers who entered the chicken broiler industry had to establish their own companies and sign contracts with integrators that stipulated payment and how growers were to be supplied with chicks, feed, and logistical services. Throughout Miyazaki, Kagoshima, and Iwate, integrators encouraged farmers to enter into contracts with them and become growers in the chicken broiler business.

Mitsubishi and KFC-Japan

One example of *shōsha*-backed integration was Mitsubishi, which used an agricultural integrator called Japan Farms to set up broiler operations in Miyazaki and Chiba in 1968 (Mitsubishi 2010, 148). Mitsubishi also sent an employee to the US to investigate the main consumer uses of broilers. This employee helped strike an agreement between Mitsubishi and KFC that led to the founding of KFC-Japan in 1970 (KFC-Japan 2000, 7). Like McDonalds, which entered Japan in 1971, KFC-Japan embraced its American image and broke Japanese etiquette, which disapproved of eating with one's hands. In 1972, KFC-Japan executive Ōkawara Shinsuke touted the future of Japan's chicken broiler industry and the promise of KFC-Japan in *Niwatori no Kenkyū* (Ōkawara 1972). Instead of seeing the lack of *kusami* (distinctive odor) and soft texture as a weakness, Ōkawara described KFC-Japan's fried chicken as the perfect vessel for promoting broiler meat to Japanese consumers. As Ōkawara asserts, chicken broiler meat is tender and suitable for fried chicken, and so the rising popularity of *karaage* (fried chicken) across Japan coincided with the growth of chicken broiler production and KFC-Japan.

Despite high expectations, the first three KFC-Japan stores were opened and then shuttered within a year due poor to store placement and a failure to adapt the franchise to the Japanese market. After these setbacks, Ōkawara decided to inspire his fellow employees by distributing bright red jumpers that he emblazoned with the aspirational slogan "WE'RE NO.1." "The Red Jumper Story" became the Japanese parallel to the KFC story of Colonel Sanders about how resourcefulness and hard work can overcome adversity (KFC-Japan 2000). In April

1972, the fourth store opened on Tor Road in Kobe and was a smashing success. KFC-Japan began rapidly opening stores, crossing the 100-store mark in 1973 and the 1,000-store milestone in 1992. Even for this period of “miraculous” economic growth, KFC-Japan’s ascent stood out as prodigious (Yamaguchi 1988). KFC’s growth mirrored greater chicken meat consumption, which increased in Japan, per capita, from 1.9 kg in 1965 to 9.4 kg in 1990 (ALIC Multiple Years).

KFC-Japan’s success was facilitated by two savvy marketing strategies: the decision to embrace the image of Colonel Sanders and the launch of a Christmas campaign. Starting with the Tor Road franchise, KFC-Japan began placing statues of Colonel Sanders in front of their entrances. These statues stand outside approximately 80% of KFC-Japan stores (Yoshida 2009). A KFC-Japan Communications Division employee explained in a January 2016 interview, “At the start of the 1970s, people were still asking themselves, ‘What kind of food is fried chicken?’ By putting the statue at the store entrance, it was easy for people to understand that Colonel Sanders makes this kind of food.” Colonel Sanders himself visited Japan three times between 1972 and 1980, events that were covered with much fanfare. According to KFC-Japan’s corporate history, “Before his death, the Colonel often spoke about how Japan remained the most faithful to his chicken. The Colonel was a stickler for quality of ingredients and cleanliness. Of all places, Japan was the most able to follow in his spirit” (KFC-Japan 2000, 34-5). In his lifetime, Colonel Sanders had a fractious relationship with KFC headquarters in the US (Sheraton 1976). With that history in mind, his apparent preference for KFC-Japan, where he was treated with much deference, is understandable.

The second successful marketing decision was to link KFC’s fried chicken with Christmas by launching a KFC Christmas campaign in the mid-1970s. KFC-Japan sought to put forward the misconception that Americans eat chicken on Christmas even though KFC-Japan believed that “it’s really turkey not chicken in America” (KFC-Japan 2000, 33). Despite this deception, the Christmas campaign was so successful that, by the 1980s, KFC could not produce enough fried chicken to meet demand, so they introduced a “party barrel” that included sides, Christmas cake, and a commemorative Christmas plate. *Konbini* (convenience stores) and other retailers copied KFC-Japan by launching special fried chicken offerings on Christmas. KFC-Japan was a prominent corporate actor that not only sold massive amounts of chicken, but also promoted to Japanese consumers the idea of chicken meat as a fun, delicious, and Western food.

Conclusion

Prior to World War II, industry and government leaders sought to promote more industrial approaches to chicken husbandry through the use of more efficient Western breeds. In the decade immediately following the war, an emphasis on self-sufficient diverse farm operations led to deindustrialization as average flock size decreased. Subsequently, three major innovations facilitated the industrialization of Japanese chicken husbandry. First, in the mid-1950s, Japan expanded grain imports from the US, which enabled chicken farmers to purchase feed as an off-farm input. Next, in the early 1960s, Japan imported the latest chicken breeds from the US that specialized in either egg-laying or meat production, and these breeds rapidly spread throughout Japan. Hatcheries had to enter into contracts with international agribusinesses, which contributed to their consolidation. Finally, in the 1970s, Japanese *shōsha* emulated the quasi-vertical integration of broiler production in the US. As a result, Miyazaki, Kagoshima, and Iwate became the leading prefectures for chicken broiler production in Japan. The connections between Mitsubishi, Japan Farms, and KFC-Japan illustrate how *shōsha* implemented new organizational structures that allowed them to profit from the chicken industry in multiple ways.

In this chapter, I drew attention to the piecemeal innovations through which the industrialization of Japanese chicken husbandry took place and how that contributed to changes in dietary practices. Changes in the Japanese diet over the past half-century are often lamented as indications of Westernization (Assmann 2015). This perceived conflict between traditional and Western foods in the Japanese diet overlooks structural changes in agricultural production and provisioning — stark changes within the chicken industries. The changes that have occurred in Japan are similar to many wealthy Western countries, but these changes are not so much an indication of Westernization as of the successes of capitalist strategies for overcoming the barriers to industrialization.

The industrialization of chicken husbandry in Japan was driven by a unique set of dynamics, and additional studies of other contexts and commodities can provide important insights. Over time, backyard chickens became a rarity in rural Japan, and many Japanese began to associate fried chicken from KFC-Japan with Christmas. Instead of interacting with chickens as a living animal or pet, most Japanese today encounter chickens as a commodity, as either eggs or meat. These relationships to chicken are starkly different, but these changes occurred gradually over generations and are indicative of a broader transformation in Japanese society.

Chapter Four. A domestic broiler in (almost) every pot

Introduction

In May 2016, I drove 50 miles from my apartment in Miyazaki City, Miyazaki prefecture to Shibushi, Kagoshima prefecture, the home of the second largest harbor for grain in Japan and by far the largest harbor for grain in Kyushu. As I neared my destination on a rainy day, the view from the road briefly opened to reveal an industrial park for grain (see Figure 4.1). Dwarfed by the surrounding semi-trucks and feed processing plants in my Daihatsu Atrai mini-car (*kei-jidōsha*), I cruised over to Shibushi Silo. Nestled on the Pacific Ocean far from urban centers, few people visit Shibushi (population ~30,000) or recognize it as a key cog in Japan's meat provisioning. Near the border between Kagoshima and Miyazaki prefectures, Shibushi Silo began operating in 1987. This major port for grains keeps down the costs for animal feed and helped Kagoshima and Miyazaki prefectures to become leading producers for beef, pork, and chicken meat.

Figure 4. 1 View from the top of Shibushi Silo of nearby feed processing plants



My previous research centered on corn. As an undergraduate at Grinnell College, a school in Iowa surrounded by corn and soybeans, I conducted independent research on corn farmers and breeders. In Warman's ([1988] 2003) words, the "botanical bastard" of corn combined with capitalism has conquered much of the world. For my master's degree at the University of Hawai'i at Mānoa, I researched the rise of Hawai'i's seed corn industry, the largest agricultural industry in the state (Schrager 2014). In a subsequent paper I co-authored with

Suryanata, we show how Hawai‘i’s seed corn nurseries fit into seed corporations’ broader research strategies (Schrager and Suryanata 2018). The logic of capital accumulation drives the intensification of agriculture. Seed corporations develop higher yielding seeds so that farmers can grow more grain, and most of that grain goes to intensive animal husbandry.

The industrial park for grains in Shibushi is a key artery for intensive animal husbandry in southern Kyushu. Here I could see the lifeblood that must continue pumping through the system to keep animals growing, laying eggs, and producing milk. As I detail in the previous chapter, imported grains from the US provided a crucial impetus for the rise of industrial approaches to chicken husbandry and the decline of self-sufficient approaches in Japan. Chickens disappeared from backyards as chicken meat and eggs became ubiquitous and affordable commodities were sold through Japanese supermarkets and eating establishments. Weis (2013) shows how animal industries leave a massive ecological hoofprint. When corporations in Japan import grains, they evaluate the monetary cost of the commodity but not ecological considerations such as land use or greenhouse gas emissions. While grain such as corn and soybeans leaves a clear imprint on the landscapes of Iowa, the impact of intensive animal industries in Japan is felt most keenly in areas where broiler chicken industries operate, in rural locations far from the scrutiny of urban consumers.

Popular descriptions of the chicken industry focus on the places where chickens are raised and killed. This helps consumers think about the life of the animal that becomes chicken meat on their plates. This chapter will analyze how corporate strategies for capital accumulation have structured the broiler chicken industry in Miyazaki prefecture. I begin by discussing the development of the broiler chicken industry in the US and the export of that model to Japan. My analysis focuses on integrators how maximize productivity and profit by orchestrating feed production, chicken growers, chick production, slaughterhouses, and power plants that run on chicken waste.

Comparing the intensification of American and Japanese broiler chicken industries

Like Japan, the initial chicken industry in the US formed around egg production. “Egg money” provided an independent source of income for women, who were typically in charge of managing chicken flocks (Stull and Broadway 2012, 42). Specialized chicken meat production in the United States began with a legendary mistake. In 1923, Cecile Steele, a farmer in the

Delmarva Peninsula (a region that contains land from DELaware, MARYland, and VirginiA), ordered 50 chicks but instead received 500 (Horowitz 2006, 108). Instead of returning the chicks, she decided to raise them for meat. After turning a good profit Steele expanded her operation, and other Delmarva farmers soon emulated her. Chickens from Delmarva were live-shipped to New York City until 1937, when the first broiler chicken slaughterhouse was made from a converted tomato cannery (Constance 2008). Most of the meat produced in the Delmarva peninsula went to New York City, where the Jewish demand for poultry helped to establish a dependable market. Agricultural scientists and local hatcheries developed specialized breeds for either egg-laying or meat-production. Researchers also helped farmers overcome hurdles to industrialization such as vitamin deficiencies resulting from a lack of sunlight and diseases from being raised in close quarters.

In 1944, the US government bought chicken meat in earnest for the military and enforced standardization throughout the industry. Gisolfi (2017, 29) writes, “The USDA set prices for broilers but not for feed and chicks, which encouraged the emergence of a black market.” While the government could compel the Delmarva broiler chicken growers to sell to the government, farmers in southern states such as Arkansas, Georgia, and Alabama could evade regulators. Gisolfi (2017, 40) stresses that the broiler chicken industry is actually a quasi-vertically integrated industry. For true vertical integration, firms would take on the risk of the broiler structures and pay growers a set salary, but with quasi-vertical integration, firms can make growers take on the financial risk of owning broiler sheds through exploitative contracts. One study from the mid-1960s found that growers only “earned returns of 53 cents an hour” for their labor in producing broiler chickens (ibid., 56). Although farmers tried to persist under these difficult conditions, most were forced out of the business. Post-WWII, other countries such as Australia, Italy, and Great Britain adopted the US model for broiler chicken production (Dixon 2002, Tessari and Godley 2014).

As I argue in the preceding chapter, the Japanese industry emulated the US by importing grains in the 1950s, importing chicken and meat-specific breeds in the 1960s, and creating vertically integrated production clusters in the 1970s. As in the US, Japanese corporations shifted production from the urban fringes to the rural periphery. Figure 3.2 visualizes these shifts by showing the move in production towards Kagoshima, Miyazaki, and Iwate prefectures. In 2018, these three prefectures accounted for 55.6% of all broiler chicken production in Japan. Of the

689 million chickens produced, Miyazaki prefecture produced 135 million (19.6%) (MAFF Multiple Years). Vertical integrators played a central role in orchestrating this relocation. The Japanese broiler chicken industry consists primarily of clusters, and it is to the contours of these clusters in Miyazaki that we turn next.

Broiler chicken clusters in Miyazaki prefecture

Integrators

Integrators are the key actors that coordinate broiler chicken clusters. Each integrator reports their capacity for raising chickens at a point in time, and this statistic is a good gauge of the size of the integrator. Broiler chicken operations in Miyazaki prefecture have the capacity to raise 25 million chickens. According to 2016 statistics,¹⁶ the top four integrators are Koyu Shokuchō with the capacity to raise 7.1 million broiler chickens (28% of the capacity in Miyazaki prefecture), Miyazaki Kumiai Chicken Foods with 6.6 million (26%), Ebisu Shyōji with 4.6 million (18%), and White Farm with 3.4 million (14%). Three additional integrators operate in Miyazaki prefecture and account for the remaining 3.7 million (14%) of broiler chicken capacity. The average grower operation for the top four integrators generally has five to seven chicken structures and a capacity to raise between 49,000 and 64,000 broiler chickens at one time.

Koyu Shokuchō is not only the largest broiler chicken integrator in Miyazaki prefecture but also in all of Japan. Founded in 1964, Koyu Shokuchō has 1,106 employees and generates 58.1 billion yen in sales while processing 53.7 million chickens annually (Koyu Shokuchō 2018). The Koyu Shokuchō group also invests in international operations in countries such as Vietnam. The second leading producer, Miyazaki Kumiai Chicken Foods is a part of the Japanese agricultural cooperative (JA), has 821 employees and generates 30.9 billion yen in sales while processing 31 million chickens (Miyazaki Kumiai Chicken Foods 2018).¹⁷ These major

¹⁶ Based on internal industry data that is not publicly available.

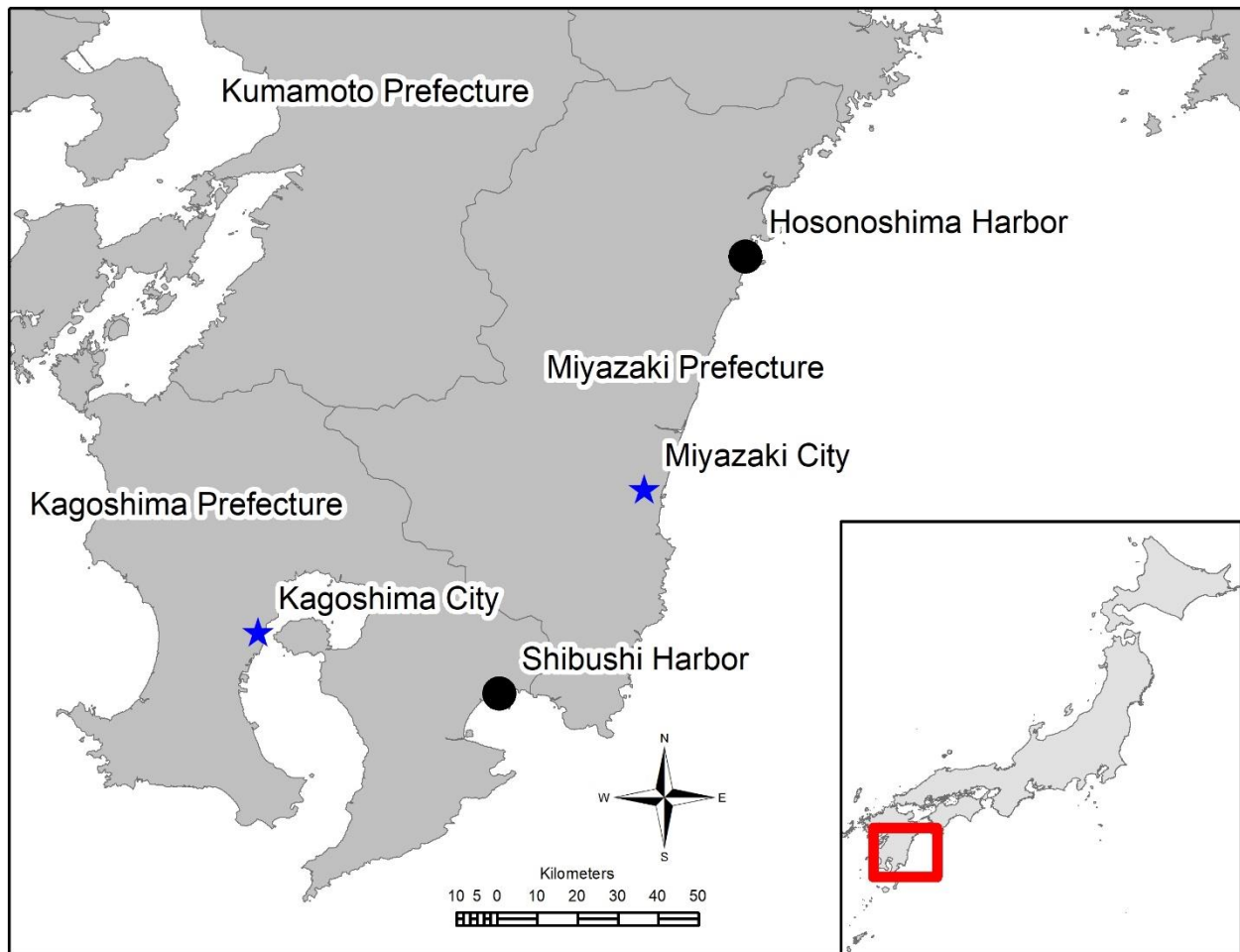
¹⁷ The number of chickens produced is based on internal company data conveyed to the author in 2015.

integrators operate three slaughterhouses each, and their growers are grouped around different slaughterhouses. For Miyazaki Chicken Foods, 90% of its employees work in the three slaughterhouses while the remaining 10% of the work force runs the hatchery, main office, and food processing center. The third largest integrator, Ebisu Shyōji, is a subsidiary of Nosan Corporation, which is itself a subsidiary of Mitsubishi Corporation. The fourth largest integrator, White Farms, is a subsidiary of Nippon Ham, an Osaka-based corporation famous for sponsoring Hokkaido's professional baseball team, the "Nippon-Ham Fighters." These integrators are key actors that orchestrate and profit from the industries described below.

Shibushi Silo and feed mills

In 1985, construction began on a massive grain silo surrounded by grain processing facilities in Shibushi, near the border between Miyazaki and Kagoshima (see Figure 4.2). The grain processing facility was built in Shibushi despite concerns raised by residents and persons in the fishing industry about the impact that the facility would have on the local environment (Asahi Shimbun 1985).

Figure 4. 2 Location of prefectural capitals and major harbors for grain in southern Kyushu



The most sustained criticism of the plan centered on opposition to the American corporation Cargill, then the largest purveyor of grains in the world. Cargill sought to build a processing facility in Shibushi but faced pushback from agribusiness leadership in Japan. The Japanese agricultural cooperative (JA) opposed Cargill's entry into feed processing as a harbinger of further liberalization of Japanese agriculture (Asahi Shimbun 1986). Cargill's plant was eventually approved and began operating in July 1987. Within a decade, however, Cargill, abandoned its goal of establishing grain processing in Japan, selling its plant to a Japanese corporation in December 1996 (Asahi Shimbun 1996). The opposition to Cargill focused not on the entry of grains, a necessary input for intensive animal industries, but on the incursion of global capital. Opposition by JA, a pillar of the "iron triangle" for Japanese agricultural policy, thwarted Cargill's attempt to assert control over the grain markets in Japan as it has done in many other countries.

The Shibushi facility illustrates how Japanese businesses maintain domestic control by joining together in cooperative agreements. The Shibushi facility is an instance where corporations in Japan jointly invested in infrastructure to benefit the broiler chicken industry and industrial meat production in southern Kyushu. The largest grain corporations in Japan — Showa Sangyo, Mitsubishi, Mitsui, and a subsidiary owned by Itochu — now jointly own the Shibushi Silo Corporation, which has the capacity to store 131,600 tons of grain (Shibushi Silo 2019).

By jointly investing, these corporations provided southern Kyushu with a crucial advantage in animal industries. According to 2016 data, feed accounts for 67% of the cost of raising broiler chickens, 67% for layers, 63% for pork, 34% for beef cows, and 46% for dairy cows (MAFF 2018c). In 2014, Japan imported 15.1 million tons of corn, of which two million tons (13.1%) were imported through Shibushi, making it the second largest port for corn in all of Japan (MLIT 2014). Shibushi Silo first sends the unloaded grains through a separator before weighing and transferring them to storage silos. Conveyors connect Shibushi Silo with four major processing facilities, each of which can deliver processed grains directly to semi-trucks. Trucks from Shibushi supply feed to western and southern Miyazaki. For northern Miyazaki, grains are shipped by boat from Shibushi to the feed processing facilities in Hyuga City's Hososhima harbor.

In July 2016, I toured one of the four major grain processing facilities in Shibushi. My hosts explained how the facility transfers the grains directly into trucks for grain (see Figure 4.3). One of the most lasting images of the tour was a large tangle of pipes that my guide pointed to, noting that it looks like an octopus (see Figure 4.4). The flows of organic material like corn and sorghum in those pipes are guided by the logic of capitalism and intensive animal husbandry. These mountains of commodity grains and sorting mechanisms illustrate the degree to which commodity feed is unlinked from its origins.

Figure 4. 3 Grain truck loading up at a feed processing plant



Figure 4. 4 Series of pipes directing the flow of grain in a feed processing plant



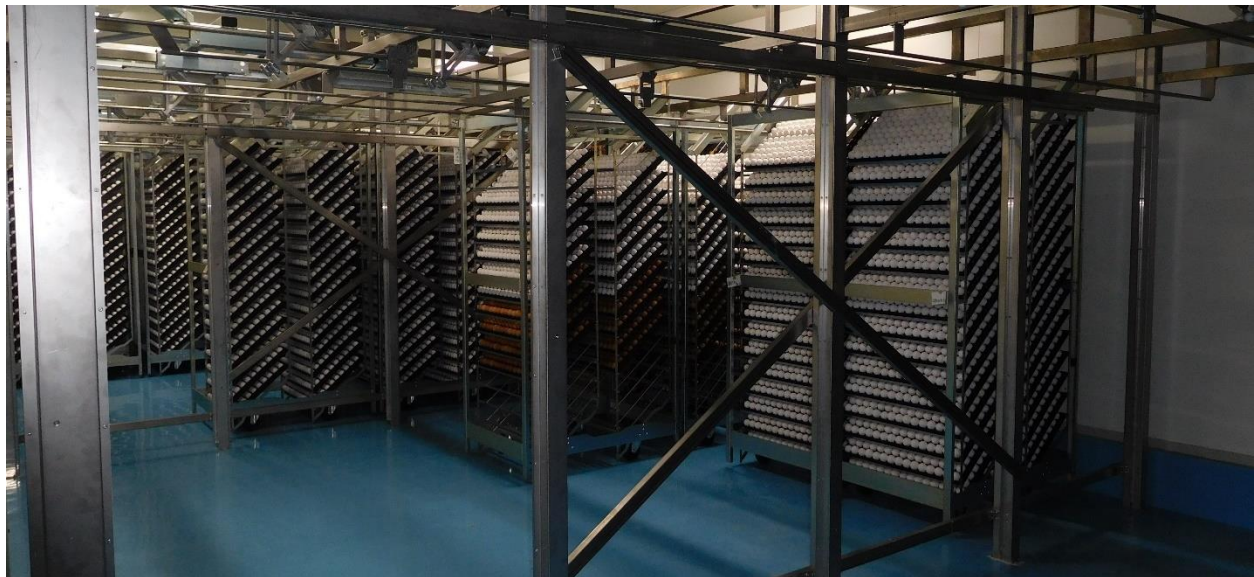
Broiler chicken growers, too, have silos on their farm that link to automatic feed dispensers. Integrators orchestrate the delivery of feed to their growers and the sale of grown chicken at harvest, subtracting these costs from the grower's revenue. Integrators profit at numerous points while orchestrating much of the infrastructure within broiler chicken clusters. In

a routinized and mechanized fashion, massive amounts of feed move throughout southern Kyushu. Beginning with the corn grown in the US and ending with packaged chicken meat sold in Japanese supermarkets, the whole process is impersonal, mechanized, and driven by efficiencies of scale.

Hatcheries and parent-stock farms

I visited Brown Hatchery, a major hatchery in Miyazaki prefecture, in April 2017. This hatchery was for layers rather than broiler chickens, but the principles for industrial chick hatcheries are similar. The hatchery manages the temperature and angle of their eggs. In storage, Brown Hatchery sets the temperature at 10 degrees Celsius (see Figure 4.5), but before moving eggs into an incubator, eggs are warmed up on the main floor of the hatchery to between 16 and 18 degrees Celsius. Incubators are set to 38 degrees Celsius and the eggs are automatically rotated. Eggs hatch in approximately 520 hours or 19.5 days. When my host opened a hatchery room to show me a batch of chickens that just hatched, the room was warm and smelled sweet, evoking memories of French toast served with maple syrup.

Figure 4. 5 Angled eggs in a hatchery's cold storage



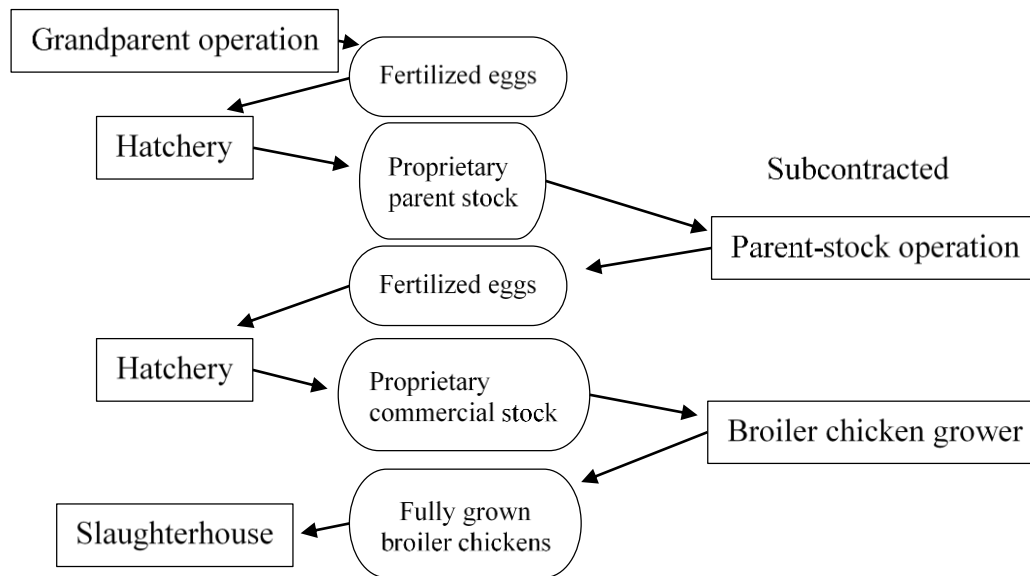
The hatchery moves the just hatched chicks to a conveyor belt where line workers sort the chickens, sending the weak, injured, and male chicks to a “macerator” (*maserētā*). For the breeds used by Brown Hatchery, the feathers distinguish male chicks, so the hatchery does not need chicken sexers. The chicks that workers deem suitable continue down the line as workers

give them vaccines, burn off the tips of their beaks with a laser (a common technique in the industry called debeaking), and then deposit them in plastic crates they will later load into a truck for delivery to growers. Attention to detail, hygiene, and protocol are characteristics that my host cited as necessary for a successful hatchery. Hatcheries follow the directives of the integrator and coordinate with parent stock farms that produce fertile eggs to make sure industrial chicken farms have the chicks they need to maintain production.

After feed, chicks are the next largest cost for growers. Within global markets for broiler chicken genetics, three corporations — EW Group, Tyson, and Griyo Grimaud — control 95% of the market share (Howard 2016, 118). Each domestic integrator enters into contracts with these international corporations to access their proprietary broiler chicken breeds. The precise arrangement varies. Pollock (1999, 415) describes how broiler breeders maintain “Pedigree Purelines,” “Great Grand Parents,” and “Grand Parents” as generations preceding the “Parent Stock” and “End Product Meat Birds.” Corporations and integrators are secretive about how they propagate proprietary broiler chicken breeds. In a hypothetical example, an international corporation maintains control over the great grandparents but enters into a contract to supply an integrator with grandparents. The integrator runs a biosecure grandparent stock operation that supplies chicks to subcontracted parent stock operations. The parent-stock operations then deliver fertilized eggs to the integrator, which incubates the eggs to deliver day-old commercial broiler chickens to growers. Growers raise the chickens for six to seven weeks on average, and the integrator collects the fully-grown broiler chickens and delivers them to the slaughterhouse (see Figure 4.6).

Figure 4. 6 Hypothetical coordination of broiler chicken pedigree by a Japanese integrator

Owned by domestic integrator



In November 2016, I visited a forty-year-old parent stock operation in northern Miyazaki called Oyadori Farm. The operation raises about 10,000 parent stock chickens at a time, 90% of which are hens (see Figure 4.7). Parent stock means that the chickens on Oyadori Farm produce eggs that they deliver to hatcheries. The Oyadori Farm raises chickens for 64 weeks or 450 days followed by two months to clean up their operation and prepare for a new batch. On average, hens begin laying eggs at 150 days.

Figure 4. 7 View of a parent stock operation's chicken structure



On the day I visited, Oyadori Farm produced 5,000 eggs. The farm can produce 8,000 eggs during peak productivity. The integrator pays Oyadori Farm 40 yen per egg, and they aim to keep 33% of that income as profits. If we estimate that the farm generates an average of 6,000 eggs per day over the 300 days, then they would generate 72 million yen in income with about 24 million yen in profits. Factoring in the time before the hens produce eggs and the time needed to prepare for a new batch, Oyadori Farm's profit is roughly 17 million yen (~\$150,000) per year, which covers the salary of four workers. With limited business opportunities in the rural area surrounding Oyadori Farm, this operation provides a steady income for a family run operation.

Unlike broilers, which only live for forty to fifty days, parent stock on Oyadori Farm live nine times as long. When I visit, the birds are 54 weeks old,¹⁸ much older than typical broiler chickens. The Oyadori Hatchery must limit the chicken feed so that the birds do not grow too large. They also place bars over the feeders to prevent the roosters, due to their large crowns, from eating hen-specific feed. Some chickens are henpecked, but in general the chickens are in good condition considering their age and the limited space per bird. Part way through our tour of the operation, a truck from the integrator shows up. The workers at Oyadori Farm move back to their sorting shed and prepare crates of eggs for the truck driver, who is surprised by my presence. He jokes about how heavy the crates of eggs are and pretends to drop one, noting that the crate is worth 8,000 yen (~\$75). One way to visualize how the biology of reproduction ties together the chicken industry is to think that on the day when I visited Oyadori Farm, they produced 5,000 eggs. If 70% of those eggs become broilers that make it to adulthood, these eggs will transform into 3,500 broiler chickens, each weighing over six pounds.

¹⁸ Although I wrote down 54 for the number of weeks in my fieldnotes, I am not certain that this was the exact age of the chickens on the farm when I visited.

Figure 4. 8 Fertilized eggs from the parent stock operation loaded into plastic crates



Chicken growers

During the period of rapid consolidation of the broiler chicken industry, many growers abandoned their operations under significant duress. One long-time employee for the Miyazaki Prefecture Poultry Division recalled:

Growers would come talk with me, and so I would listen to their story and they would show me their records. If things kept going the way they were, they would not be able to continue, because they were in a situation where even after they finished raising the chickens, they couldn't get any money (*yen*). (Fieldnotes, February 2016)

The longtime official continued to explain that people who used the proper techniques (*gijutsu*) could improve their results, but that some failed because they ignored proper techniques.

The general attitude expressed to me by a range of industry insiders was that growers should make a lot of money and that those who are forced out of the industry lack the discipline and attention to detail necessary to succeed. They put a positive interpretation on the current situation, saying that inefficient growers are forced out so that only the most efficient remain.

Aided by investments such as the Shibushi Silo that help to keep costs low, broiler chicken farmers in Miyazaki prefecture have fared better than many in the rest of the country. In several instances I visited the homes of the owners of broiler chicken operations, and their residences seemed noticeably more affluent than neighboring homes. Since broiler chicken operations are concentrated in rural areas, the operator's industry and income stand out in contrast to the modest and sparsely developed countryside. Owners of broiler chicken operations also become employers who hire many local contract, part-time, and full-time employees in their operations.

Oyama, the large owner of a broiler chicken operation, shared with me statistics on his operation. Aside from land, he invests much of his capital in broiler chicken specific infrastructure such as chicken sheds. In the year for which I reviewed his operation's finances, the top expenses were for feed (65.7%) and chicks (18.6%). Secondary expenses included wages for workers (2.0%), antibiotics (2.0%), energy (2.0%), and water (1.3%). The integrator that Oyama contracts with provides reports of the expenses, efficiency, and profitability of each of his chicken houses.

Figure 4. 9 Broiler chicken structure with chickens 1



Figure 4. 10 Broiler chicken structure with chickens 2



Figure 4. 11 Broiler chicken structure with chickens 3



Oyama showed me reports for two different houses, one that had good results and the other with bad results. In the good report, his operation had a 95.4% survival rate while the bad report had a survival rate of 91.4%.¹⁹ As with his overall operation, by far the largest expense was for feed and the next largest expense was for chicks. Integrators also charged Oyama for veterinary expenses and a little over seven yen per bird for catching and eight yen per bird for shipping costs. The contracts between growers and integrators require the integrators to provide, and the growers to pay, for these services. The minutiae of statistics and details from a massive broiler chicken operation can be overwhelming without even getting into details about the money invested in infrastructure or acquired through various loans.

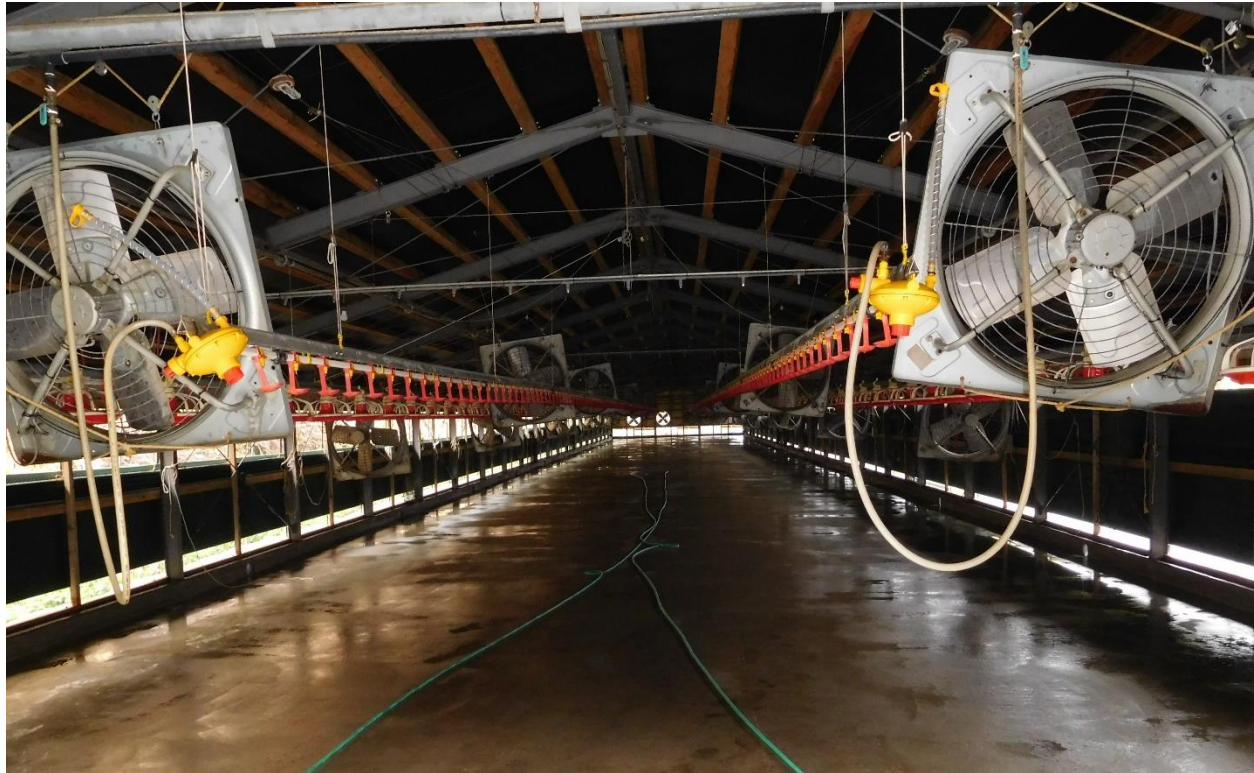
The growers I met were hard-working people who woke up early, worked long hours, and rarely, if ever, took vacations. Although they perform many manual tasks, modern growers must also be savvy managers of their large entities. They must crunch numbers and evaluate a wide range of investment, agronomic, and financial decisions. For a grower who raises a million chickens in a year, savings of a penny a chicken add up. As these operations grow increasingly large, so too does the importance of planning out succession and inheritance.

A typical broiler chicken structure has a width of 9 meters, a length of 69 meters, and houses 10,000 chickens for a density of 16 chickens per square meter. They also need feed silos, feed dispensers, water dispensers, and heaters. When I visited broiler chicken farms, I asked the growers to explain what I should look for as evidence they are doing a good job. Growers often directed me to take in the overall look (*mitame*). The birds should be evenly spaced throughout the entire house and the ground should be dry. Nothing should look off, such as an area of the shed that chickens avoid or a water dispenser that is overflowing. The chickens should be eating, drinking, and moving about. One grower used the word uniformity (*kinitsu*) with great conviction. Growers touted the virtues of catching a problem early, before it gets out of control. The integrators deliver day-old chicks to the growers and then retrieve fully grown broiler

¹⁹ Survival rate indicates the proportion of chicks that reach full weight and are shipped to the slaughterhouse. A common industry practice is for the integrator to give a gift (*omake*) to the grower of three to four percent, so the actual survival rate could actually be lower than the figures calculated here.

chickens after six or seven weeks, leaving growers a week or two to prepare for the next batch of chicks. Several successful growers claimed that they work hardest when the chickens were gone.

Figure 4. 12 Broiler chicken structure being cleaned and prepared for the next batch



In addition to the business and agronomic skills, growers also need interpersonal skills to navigate tensions with their neighbors. I spoke with one grower who had just built a new chicken structure. He described how he went around to the neighboring residents and told them about his project and asked for permission. He also said that he gives payments, using the word *orei*, which means gifts of appreciation. Individual growers living in a community can better manage interpersonal relationships with nearby residents than a remote corporation. For the most part, chicken operations were in rural locations far from nearby residents, which helps to cut down on the nuisance of bad smells and other types of pollution from broiler chicken operations.

Figure 4. 13 Broiler chicken house with feed silo in a remote location



Figure 4. 14 Vegetation where fans blow air out from a broiler chicken house



The Japanese government first reported official statistics on broiler chicken production in 1964, when 21,100 households raised an average of 624 chickens at a time (MAFF Multiple

Years). By 1979, the number of growers was more than halved and the size of the operations increased twenty times over to an average capacity of 12,900 chickens. These trends have continued, with the number of growers thinning as many remaining farms grow massive. According statistics available for 2018, Japan has 2,260 chicken growers with an average capacity of 61,500 chickens. Within the category of broiler chicken farms, there are twice as many small farms (553 operations producing between 3,000 to 99,999 broilers per year) as large farms (272 operations producing 500,000 or more). Small operations account for only 4.31% of overall production, while large operations account for 45.3%. The category of middle-sized farms (producing between 100,000 and 499,999 broiler chickens in a year) accounts for 63.5% of all farms and half of overall production. The distribution of the number of farms continues to shift towards larger operations that account for more of overall production.

As broiler chicken operations become more capital-intensive, the capital barriers to entry prevent an infusion of new operators except for corporate-backed ventures. Existing operators have a greater capacity than potential newcomers to expand their existing operation by building new structures or acquiring structures from others withdrawing from the business. In some cases, integrators have experimented with directly owning and managing growing operations.

Slaughterhouses

In August 2018, I toured a large broiler chicken slaughterhouse in Miyazaki prefecture. They permitted me to bring in my camera, which I gripped in my hand throughout the tour. From the moment I entered the slaughterhouse floor, there was a distinct smell of antiseptics and blood. The floor has a constant din of noise accentuated by the thrum of conveyor belts moving chicken carcasses in various stages through the plant. After living birds are hung on the conveyor belt, 70 minutes later those birds are processed into cellophane packages, cooled, and ready to be shipped in cardboard boxes. It takes 40 minutes to cool down the birds, so the main tasks of killing, defeathering, eviscerating, and cutting into pieces only take 30 minutes.

Our group entered the floor where the chickens were already being processed into pieces (see Figure 4.15). As we worked our way to the area where the live chickens sat in stacks of yellow plastic crates, my guide requested that I not make public any pictures from this part of the slaughterhouse. To reduce the stress for the waiting birds, this area is kept dark and humid. Roughly thirteen workers had the task of picking chickens out of the crates and attaching them

by their feet to the conveyor belt. Workers dexterously yanked out chickens and hooked their legs onto the belt. The flooring in this area has holes in it that become slick with the pumped-in humidity. I was so distracted by the dim lighting, slippery floor, and the movements of the workers that when I first entered the area, I overlooked the conveyor belt that briskly carried chickens to an electric bath. On exiting, I observed how the electric bath made the chickens stiffen and shake. Afterwards, some were limp while others spasmed.

Figure 4. 15 Slaughterhouse workers process chicken meat using knives



The conveyor belt moves the shocked and unconscious chickens further down the line and beyond our vision where the birds are killed, scalded, defeathered, and eviscerated. They come out looking closer to the familiar product sold in the supermarket. A group of workers pull off remaining feathers and viscera such as intestines. The intestines of one bird swung around as a conveyor belt carried the carcass along. Otherwise, the plant appeared hygienic to my untrained eyes. On the main slaughterhouse floor, we walked around in tight quarters. People with carts

full of chicken parts came through. I had to stay alert and at times duck my head (see Figure 4.16). The color of the helmets conveyed different ranks for slaughterhouse workers, (see Figure 4.15) and our small group of three received deferential nods amidst the clamor.

Figure 4. 16 Slaughterhouse workers and chicken carcasses on the slaughterhouse floor



After the tour, an executive at the slaughterhouse explained that they sourced 5% of its employees from the Philippines, the maximum proportion allowed using Japan's technical intern training (*ginō jisshū-sei*) program. The practice of using this program to access foreign workers is widespread in Japan. Hansen (2010) describes encountering Chinese workers in Hokkaido's dairy industry who suffered numerous hardships through this program. Given how slaughterhouse workforces have long been associated with recent immigrants, poverty, and harsh work conditions (Striffler 2005, Pachirat 2011, Stull and Broadway 2012, Stuesse 2016), I was unsurprised to learn that industrial slaughterhouses in Japan take advantage of the foreign worker training program. While these programs raise many issues that warrant further research, I did not

pursue them in this study. The workers on the slaughterhouse floor were also predominately female. There was a stark class and gender divide between the management conducting the tour and the workers. Given my relationship with upper management, I deemed that asking for an introduction to speak with slaughterhouse floor workers would trigger problematic power dynamics that could create problems for the workers, my research contacts, and my continued research access.

In 1977, less than half of Japan's domestic broiler chicken meat was cut-up and processed, meaning that most of it was sold whole as either New York-dressed (with head, feet and viscera intact) or with organs removed (Komai 2012a). By 1985 more than two thirds of the chicken meat was processed, and by 1999 more than 90% was processed. Instead of frequenting specialty meat shops, consumers increasingly bought broiler chicken meat through supermarkets and restaurants. Since processing chicken meat is labor intensive and takes up valuable floor space, purveyors of chicken meat gravitated towards processed meat over whole chickens. Large slaughterhouses required major capital investments and laborers willing to accept demanding and dangerous slaughterhouse work. The slaughterhouses are the largest investment in infrastructure and labor made by integrators. Given the scarcity of jobs in parts of rural Miyazaki, integrators can recruit from the local labor pool but also take advantage of international labor markets. For Miyazaki Chicken Foods, one of the largest integrators in Miyazaki prefecture, 90% of its employees work in their slaughterhouses, with most of them carrying out tasks on the slaughterhouse floor.

The leading integrators in Miyazaki prefecture — Koyu Shokuchō and Miyazaki Kumiai Chicken Foods — each have three slaughterhouses. Ebisu Shōji has two, and the remaining integrators each have one. The smallest capacity broiler chicken slaughterhouse in Miyazaki prefecture is 25,000 birds in a day, while the largest process well over 50,000 birds. Chicken catchers enter sheds at night when chickens are the most docile. They pick up chickens and place them in plastic crates for shipping to the slaughterhouse. One integrator charged a grower seven yen (~7 cents) per chicken as the price of catching. Precarious workers take on this type of demanding job with low wages and challenging hours. In areas with chicken clusters, delivery trucks filled with chicken crates take the same roads as other commuters. Once, I spotted a truck headed to the slaughterhouse and took pictures, which seemed to unsettle the driver as the truck sped away (see Figure 4.17).

Figure 4. 17 Truck filled with broiler chickens in plastic crates at a rest area



Chicken waste power plants

After integrators collect grown broiler chickens and deliver them to the slaughterhouse, growers must clean their soiled structure before they receive the next batch of new chicks in around ten days. In Miyazaki's broiler chicken clusters, most growers can subcontract the cleaning to companies that transport the chicken waste to special biomass power plants, of which Miyazaki prefecture has two. These power plants help to dispose of chicken waste, and they receive significant government subsidies. Both facilities emphasize their role in promoting environmental sustainability. Given the high costs of operation and modest amounts of energy produced by these power plants, I argue that they are better understood as part of the infrastructure supporting the regional advantages of the broiler chicken industry — advantages that include convenient disposal of chicken waste.

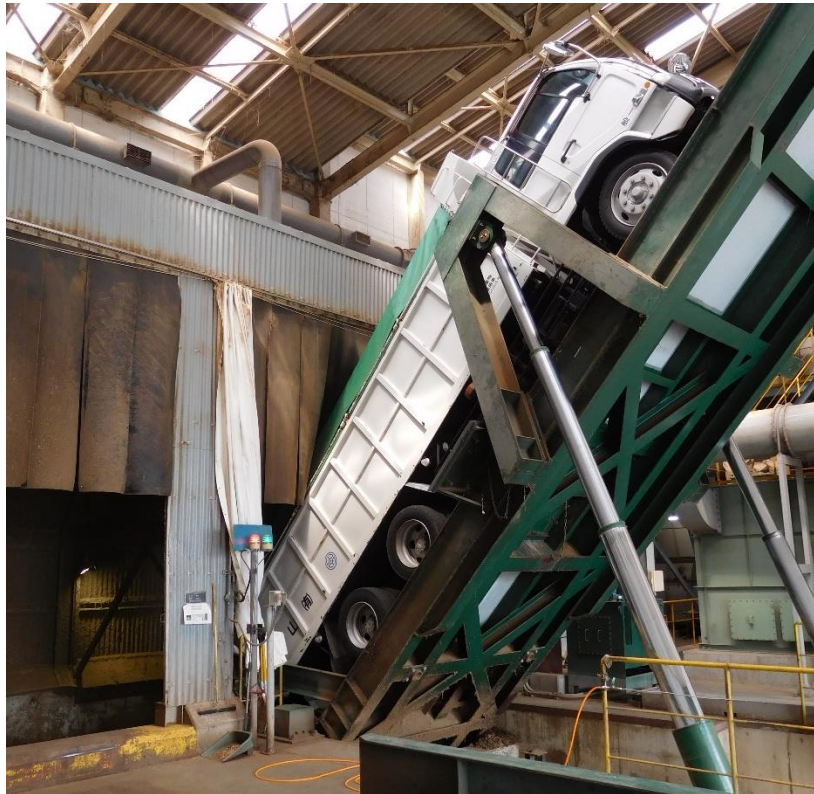
In 2002, Nangoku Kosan — a corporation specializing in livestock support industries, transport, and food — built the first of these power plants in Miyakonojō. Officially called the Chicken Waste Boiler Power Facility (*Keifun hatsuden boirā shisetsu*), the initial building cost 2.25 billion yen (~\$21 million) and received 1.07 billion yen (~\$10 million) from national subsidies and 356 million yen (~\$3.4 million) from prefectural subsidies (Biomass 2009b). In 2009, the plant generated 10,000 Megawatt hours of energy, with the facility itself consuming 6,200 Megawatt hours of energy and most of the remaining energy going to power Nangoku Kosan's feed processing operations (Biomass 2009b). In 2009, Nangoku Kosan won a special award from the “Stop Global Warming ‘One village one product’ National competition” (Yomiuri Shimbun 2009). If the plant generates an average of 3,800 Megawatt hours of energy per year, then it generates the amount of energy consumed by approximately 500 Japanese citizens (CIA 2018).²⁰

The second power plant began operating in 2005 in Kawaminami based on a cooperative arrangement reached by several broiler chicken integrators and Kyushu Electric Company. Officially called Miyazaki Biomass Recycle, I toured the power plant in May 2016. Trucks full of chicken waste pulled up to the plant to deposit their cargo (see Figure 4.18). The plant then moves the waste into a storage silo from which it is conveyed to a boiler to create steam that powers a turbine and generates energy. The power plant began operating in 2005 and has a control room staffed with Kyushu Electric Company employees that monitor it. Costing more than twice as much as Nangoku Kosan's facility, the plant required five billion yen (~\$46 million) to construct, of which 1.2 billion yen (~\$11 million) came from national subsidies and 150 million yen (~\$1.4 million) from prefectural subsidies. The plant processes 132,000 tons of broiler chicken waste per year, which produces around 77,000 Megawatt hours of energy, about 13% to 15% of which the power plant consumes (Biomass 2009a). I estimate that the plant

²⁰ Calculated based on a per capita average of 7,479 Kilowatt hours determined by the World Factbook Data, Japan's population in 2018 was 126,168,156 people, and in 2016, Japan's energy consumption was 943.7 million kilowatt hours of energy.

generates the amount of energy consumed by approximately 8,750 Japanese citizens (CIA 2018).²¹

Figure 4. 18 A truck being tipped back to unload chicken waste



Both chicken-waste power plants help to deal with a major problem, disposing of chicken waste, and both portray their operations as promoting sustainability. A minute-long television commercial about Miyazaki Biomass Recycle released in 2015 by Kyushu Electric Company highlighted its contributions to sustainability. The commercial features a granddaughter named Manami visiting her grandmother's poultry farm. It is part of a Kyushu Electric Company campaign that roughly translates as "brightening our future, forever" (*zutto saki made, akarukushitai*). The commercial contains the following voiceover:

²¹ Generated using the same estimate for per capita consumption, 7,479 Kilowatt hours, as Nongoku Kosan, and assuming that Miyazaki Biomass Recycle consumes 15% of the energy produced through in its operation so that 65,540 Gigawatt hours are sold to Kyushu Electric Company.

Manami: My chicken farmer grandma told me something that surprised me. Chickens make energy?

Grandma: That's right. We take the chicken waste to the power plant and make energy. In addition, the leftover ash becomes fertilizer.

Manami: That's great. Chickens are helping us live with nature.

Narrator: We are making energy from Kyushu-based stable (*antei*) and renewable sources.

Manami: Wouldn't it be nice have more power plants like this? (Kyushu Denryoku 2015)

Made several years after the triple disaster in Fukushima, the reference to stable (*antei*) energy draws an implicit contrast between biomass and nuclear energy. This commercial depicts the biomass plant by drawing on the rhetoric of sustainability and cooperation. These power plants provide a technological fix that solves the problem of chicken waste while generating modest environmental benefits.

Conclusion

The current trends in the industry seem likely to continue, with the number of growers declining as remaining growers increase in size. Uncertainties persist. The trajectory of the industry could be altered by an integrator abandoning the industry, avian influenza outbreaks, spikes in grain prices, or trade liberalization. The Japanese state plays a central role in creating the political economic circumstances in which Miyazaki's broiler chicken industry can thrive. International trade policy protects domestic broiler chicken industries from being flooded by cheap imported chicken meat. Within Japan, the state recognizes and even promotes the consolidation of the industry into concentrated productive regions. Miyazaki benefits from Shibushi Silo and power plants that run on chicken waste. Cooperation between agricultural corporations and the state enabled this infrastructure to be built. With geographic rent advantages, broiler chicken industries gravitated to concentrated areas in Miyazaki, Kagoshima, and Iwate prefectures. In these regions, integrators orchestrate the intense flow of feed, chickens, and workers that the industry requires to produce cheap chicken meat for Japanese consumers. Miyazaki's broiler chicken clusters are in regions struggling with issues such as depopulation and a lack of economic opportunities. Many view Miyazaki prefecture's chicken broiler industry as providing important economic vitality to the region. While the industry provides jobs, most are grim and demanding jobs on the slaughterhouse floor.

Chapter Five. Preventing and extinguishing avian influenza outbreaks in Miyazaki prefecture

An industrial chicken operation in Miyazaki prefecture's Kawaminami reported a high number of chicken deaths on December 19th, 2016. This report set in motion a detailed response plan. A team from the prefectural livestock hygiene division arrived on the farm to collect samples at 12:45 pm. By 3:20 pm, they confirmed avian influenza. At 11:50 pm, scientists determined that the virus was a highly pathogenic avian influenza (HPAI) H5N1 subtype. By 2:30 am on December 20th, hundreds of prefectural workers and Self-Defense Forces converged on the infected farm. At 5 am, they began killing and interring chickens. In all, 1,084 people assisted in the culling of roughly 120,000 chickens. The farm went from infected to depopulated in a mere 36 hours. Plans such as the one the Japanese government orchestrated in Kawaminami, Miyazaki are common not just in Japan but around the world.

Epidemic diseases among animals are termed epizootic. Some, such as avian influenza, can infect humans, and states approach these animal diseases using a biosecurity discourse that justifies the state's use of violence to exterminate pathological life. In Japan, the government struggled with initial responses to avian influenza outbreaks in 2004. Subsequently, it adopted a model that emphasized prevention and a swift response to outbreaks. The state developed the following protocol: coordinating biosecurity experts to confirm any suspected outbreak; enlisting workers and Self-Defense Forces to kill infected chickens once an outbreak is confirmed; and sterilizing contaminated farms. Government officials audit farms after an outbreak and announce any areas where biosecurity measures were lacking.

Japan's food system faces many threats, including hoof and mouth disease, contamination from radiation, and contamination by harmful bacteria such as campylobacter. New epizootic threats such as avian influenza have emerged with the intensification of animal husbandry. This chapter surveys major animal disease outbreaks in Japan, focusing on avian influenza outbreaks in Miyazaki prefecture, the prefecture hardest hit by epizootic animal diseases. I consider how government officials enforce biosecurity protocol, how government workers carry out those protocols, and the impact on farm owners who face scrutiny if their operation endures an avian influenza outbreak.

Major food safety scares in Japan

As an island archipelago, the Japanese state regarded itself impervious to novel animal diseases. That was shattered in September 2001 when government officials confirmed a case of bovine spongiform encephalopathy (BSE), also known as mad cow disease, in Chiba prefecture (Tanaka 2008). Following the BSE disclosure, the government was criticized for failing to prevent the outbreak and slow response times that exacerbated the threat (Kadohira et al. 2011, Walravens 2017b). Widespread criticism — often expressed through negative media coverage and consumer boycotts of affected products — caused the state to recognize that BSE threatened citizen-consumers' confidence in its ability to ensure food safety. This pattern was repeated in several subsequent food safety incidents.

In 2004, Japan endured its first case of highly pathogenic avian influenza in 79 years. The state was criticized for having a sluggish response as it struggled to cull chickens at the infected farm and recall eggs that had entered the food supply chain (Yomiuri Shimbun, 2004). Since then, Japan has been hit by avian influenza outbreaks on an almost annual basis. To assuage food safety concerns, Japan expanded biosecurity measures beyond prevention to encompass a comprehensive rapid response (Miyazaki Prefecture 2015). The state also introduced the Food Safety Commission in 2003 and the Consumer Affairs Agency in 2009 (Walravens 2017b).

The Fukushima Daiichi nuclear power plant disaster of March 11, 2011 released dangerous amounts of radiation that contaminated Japanese food supply chains and battered consumers' confidence in the adequacy of government protection of food (Kimura 2016, Morris-Suzuki 2014, Reiher 2016). Government and industry leaders sought to deflect criticism, saying that critics were spreading “spurious rumors” (*fūhyō higai*) that undercut confidence in government regulations and harmed food sales. On its face, the term “spurious rumors” chastises those who interfere with “accurate” food risk communication and implicitly suggests that loyal citizens should trust the state's food safety assurances. In typical Japanese families, women are responsible for buying and preparing food (Holthus & Tanaka, 2013). As Kimura (2016) shows, the charge of spurious rumors is gendered, dismissing legitimate concerns over food safety as a nuisance created by irrational women. To blunt these charges, activists, most of whom were women, wrapped themselves in the expertise of science by using citizen science to monitor for radiation and explain the results of their findings (Kimura, 2016; Reiher, 2016; Sternsdorff-Cisterna, 2015). For each of these threats to food safety described above — the BSE outbreak in

2001, avian influenza outbreaks beginning in 2004, and food contaminated by radiation after 3/11 — consumer criticism caused Japanese officials to recognize the seriousness of these incidents.

The Japanese state portrays its territory as biosecure and biothreats as originating in foreign origins. States increasingly invoke a model for containing and neutralizing pathological life that draws clear distinctions between biosecure and unruly spaces (Hinchliffe et al., 2013; Mather & Marshall, 2011). Given the mutable exchanges through which animal diseases spread, borderlines problematically oversimplify epidemiological processes and effective biosecurity responses (Hinchliffe et al., 2013).

These oversimplifications gloss over mutable connections and the centrality of banal nationalism to biosecurity discourses. Billig (1995) develops the concept of banal nationalism to explain how nationalism is produced through everyday life in wealthy capitalist states. He also cautions that many social scientists overlook banal nationalism and in so doing naturalize “theories of nationalism” (Billig 1995, 17). Biosecurity discourses enable for states and social scientists to naturalize xenophobic nationalism by drawing on the seemingly nonpolitical biosecurity science. While states pursue the illusory goal of creating biosecure territory, their interventions perform and reinforce the idea of the state as a benevolent force protecting its vulnerable populace from foreign biothreats. By portraying foreign life and microbes as menacing the homeland, biosecurity extends the reach of banal nationalism.

Managing the threat of avian influenza in Japan

Symptoms of avian influenza in chickens include nasal discharge, green diarrhea, swelling around the head, and, finally, mass mortality. When it infects a farm, governments typically intervene in the name of biosecurity to coordinate the killing of infected birds and sterilize the farm. Excellent scholarship by Davis (2005) and Wallace (2009) detail the history of avian influenza and government responses. The liberalization of China’s economy contributed to increases in intensive animal husbandry and the density of chicken, duck, and human populations living by ponds festering with avian influenza. Japan contributed to the intensification of production in Guangdong, where the recent strains of HPAI first emerged in the mid-1990s. In 1990, Guangdong exported 540,000 tons of chicken meat to Japan, leading all Chinese regions (Gotō 2013, 108). Davis (2005, 63) writes, “The industrialization of south China, perhaps, had

altered crucial parameters in the already very complex ecological system, exponentially expanding the surface area of contact between avian and nonavian influenzas.”

Japan’s first avian influenza outbreak in Yamaguchi prefecture shattered any illusions of Japanese imperviousness to HPAI. An official checked on the irregular conditions at Yamaguchi prefecture’s Win Win Farm on December 30th, 2003, but only confirmed on January 12th that the operation was infected with avian influenza. The government’s sluggish response drew withering criticism because it heightened the threat of contagion (Yomiuri Shimbun 2004a). Distress was compounded as the government belatedly sought to recall 22 tons of eggs from the food system. The government also lacked experience with the mass culling of chickens. The six farm workers in charge on January 12th only culled 754 chickens. The following day nine livestock sanitation employees joined the farm workers, and together they culled 5,403 chickens. At that rate, officials forecasted that they would complete the culling in three to four days (Asahi Shimbun 2004c). Facing nationwide criticism for a lackadaisical response, 38 workers rushed to complete the culling of the remaining 15,000 chickens on January 14th.

The government issued an HPAI response manual just a few months earlier, in September 2003, but the outbreak revealed pressing questions that remained unanswered. Who was responsible for culling infected chickens? In what ways, if any, would the state compensate farmers for their losses? Following the manual’s guidelines, the government implemented a “movement restriction zone with a radius of 30km” (MAFF 2003, 13). Affecting 30 chicken operations, the manual prohibited farms from moving chickens or eggs, but it did not establish a system for compensating chicken operations for their losses. The Governor of Yamaguchi prefecture beseeched the central government to aid the stricken chicken operations.

Following the Win Win Farm outbreak, the government heightened its scrutiny of imported chicken meat. By the end of January, Japan embargoed poultry products from China, Vietnam, Thailand, and Indonesia, all countries enduring avian influenza outbreaks. These embargoes caused Brazil’s share of the Japanese chicken meat import market to jump from 30.9% to 88.5% (ALIC Multiple Years).

On February 14th, 2004, government officials confirmed a second outbreak in Oita Prefecture at a small hobby farm with 13 bantam chickens and one duck (MAFF 2004). The outbreak in Oita drew attention to the ecological and geographical factors that linked these outbreaks. (Yomiuri Shimbun 2004b). Veterinarian scientists concluded that migratory

waterfowl were the likely vector that brought the same strain from South Korea and later to Yamaguchi and Oita prefectures. Experts further warned against raising waterfowl alongside domesticated poultry such as chickens.

On February 27th, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) announced a third — what would become Japan’s most infamous — avian influenza outbreak at Funai Farm in Kyoto prefecture. Funai farm is a large layer (egg) operation operated by the Hyogo prefecture-based Asada Nosan Company. Over the previous ten days, hen mortality at Funai Farm had increased at a disturbing rate: 101 on the 18th, 2,123 on the 23rd, and 10,000 on the 27th (Asahi Shimbun 2004d). While thousands of chickens were dying per day, Asada Nosan leadership hustled chickens off to slaughterhouses, shipping 10,000 chickens to Hyogo Prefecture and 5,600 to Aichi Prefecture (Japan Times 2004). Some of those chickens had HPAI, so they infected other chickens and contaminated the slaughterhouses. An anonymous whistleblower tipped off Kyoto prefecture officials to the conditions at Funai Farm, and MAFF announced the suspected outbreak. Besides sending infected chickens at the slaughterhouses, the farm had shipped one million eggs to seventeen different prefectures, eggs that the state now struggled to recall.

On March 3rd, government officials announced a suspected outbreak 4 km away from Funai Farm at an operation with 15,000 chicken broilers (ibid.). At this point, Kyoto prefecture called for and received assistance from Self-Defense Forces. The following day, MAFF and the Kyoto prefectural government announced plans to file a criminal lawsuit against Asada Nosan. MAFF accused Asada Nosan of failing to “promptly notify the prefectural government of abnormalities” (Yomiuri Shimbun 2004c). The Japan Poultry Association revoked the chairperson of Asada Nosan, Asada Hijimu’s, position as vice chairman and board member of its organization. At a news conference, Asada Hijimu said, “I have placed a burden (*meiwaku*) on so many. To all the country’s consumers, I give a most sincere apology” (Asahi Shimbun 2004b). Several days later, Asada Hajimu (67) and his wife Chisako (64) committed suicide by hanging themselves from a tree near their home. They show the tragic consequences of the ire directed at farm operators, especially if they shirk biosecurity protocols.

Before a consensus coalesced against Asada Nosan, an article in the Asahi Shimbun reasoned that Asada Nosan had pursued the legitimate option of forgoing government compensation and independently managing the outbreak (Asahi Shimbun 2004a). Government

officials continued to attest to the safety of meat and eggs from avian influenza infected chickens. For example, several days after the Asadas committed suicide, scientists sought to assuage citizen concerns by counseling that heating chicken meat to 75 degrees Celsius for one minute destroys the avian influenza virus (Yomiuri Shimbun 2004d). Regardless of whether Asada Nosan flouted the protocols or was scapegoated, the lesson for chicken operators was clear: to avoid the fate of Asada Nosan they must earnestly monitor their flocks and quickly report any possible avian influenza outbreaks.

This earnestness to prevent an outbreak may have precipitated one. Between June and December 2005, Ibaraki Prefecture, a leading prefecture in egg production, endured a low pathogenicity avian influenza (LPAI) outbreak of H5N2 and H7 subtypes. Unlike the highly pathogenic H5N1 outbreaks, which cause mass mortality in chickens and can spread to and kill humans, LPAI is harder to detect, causes fewer deaths among chickens, and its transmissibility to humans remains uncertain. The outbreak affected 41 industrial chicken operations, and in response workers culled 5.8 million chickens. From the start, Ibaraki officials treated the LPAI outbreak differently from the HPAI outbreaks by adopting a narrower movement restriction radius of only 5 km (Asahi Shimbun 2005).

Several aspects of this outbreak underline the mutability of disease situations. First, the question of whether these strains of LPAI can infect humans is unclear. Serological tests of antibodies from poultry workers in Ibaraki prefecture revealed higher levels of H5N2 neutralizing antibodies than the Japanese population (Yamazaki et al. 2009, Ogata et al. 2008). Although no workers reported influenza-like symptoms, the distinction between “infection” and “exposure” is dynamic, changing with virus mutations and host responses. Experts also questioned several peculiar aspects of the outbreak. The strain found in Ibaraki most resembles a strain documented in Central America, but no migratory birds connect Ibaraki with Central America (Yomiuri Shimbun 2005). Although never confirmed, some experts hypothesized that a botched vaccine caused the outbreak (*ibid.*). Instead of immunizing chickens, a botched vaccine could have infected them with a weaker strain of the avian influenza virus. If that was the case, then industry insiders’ fear of an outbreak led to vaccinations that may have precipitated the outbreak — a grim but plausible explanation.

Biosecurity responses in Miyazaki

Embodying biosecurity measures

Miyazaki endured its first avian influenza outbreak when officials confirmed H5N1 at three farms in January 2007. Prefectural workers culled roughly 150,000 chickens at these farms. Several years later, Miyazaki suffered through an outbreak of Foot and Mouth Disease (FMD) from April until August 2010. MAFF officials in Miyazaki strove to contain FMD, which infects cloven-hoofed animals such as cows and pigs. Government workers assisted by Self-Defense Forces culled over 200,000 animals at 292 farms. The culled animals accounted for 22% of Miyazaki prefecture's cows and 24% of pigs (Asahi Shimbun 2010). Including indirect costs, officials estimated that the FMD outbreak caused 235 billion yen in economic losses (~\$2 billion). Prefectural officials applied lessons from responding to HPAI outbreaks to FMD. In 2011, avian influenza again struck Miyazaki's chicken industry, even worse than in 2007. Officials confirmed HPAI at 13 different farms between January 22nd and March 5th. To contain the outbreak, roughly 30,000 workers culled over one million chickens (MAFF 2011). In the course of these events, Miyazaki prefecture gained a hard-won reputation for effective responses to epizootic outbreaks.

During an interview in December 2017, an official in Miyazaki prefecture's livestock department explained the prefecture's approach to biosecurity measures to me. As Suzuki said, "Miyazaki prefecture has abundant experience [with epizootic outbreaks] when compared to other prefectures. That's how we were able to create such a detailed manual. We made it based on actual experience. Many other prefectures use our manual as a model when creating their own." Miyazaki prefecture's manuals for HPAI and FMD – at 270 and 296 pages respectively – are important documents that enshrine the state's biosecurity measures within meticulous step-by-step procedures for government agencies and workers (Miyazaki Prefecture 2015). Suzuki said, "The foundation is prevention. In the unfortunate event that there is an outbreak, we want to extinguish it swiftly. With situations like last year [in 2016], it could be said Miyazaki prefecture is not the best at preventing outbreaks. However, we are the fastest at controlling outbreaks." The prefecture's biosecurity strategies are twofold: prevention and rapid intervention if an outbreak occurs.

Suzuki explained that the government approaches HPAI and FMD using similar biosecurity strategies adapted to the different viruses, animals, and industries. Comparing the viruses, FMD is harder to eradicate and has a longer gestation period. As a result, FMD poses a greater threat of contagion, and confirming containment takes more time. Following an FMD outbreak, government workers converge on the infected farm to cull the animals. Implementation of movement restriction zones and other biosecurity measures depends on the severity of the outbreak. For severe outbreaks, officials and even volunteers erect stations for disinfecting cars and apply lime on the ground in high-risk areas. Methods for culling and interring animals at infected farms vary based on the animal. Chickens are typically killed by putting them in a plastic container filled with CO₂. Pigs and cows are killed using drugs or electricity (Miyazaki Prefecture 2016, 58). While chickens are buried on the farm's premises, workers move pigs and cows to a designated location for interring. The flow chart for the FMD manual highlights with the word "Important" (*juyō*) the step when workers "explain burial plans to nearby residents" (ibid., 162). Despite the differences in animals and diseases, the grim outcomes sought by the state are similar: workers cull the animals, bury them, and disinfect the farm.²²

For prefectural and municipal workers, an outbreak confirmation marks the start of an intense period of work, almost as if they were enlisted to go to war. In April 2017, I interviewed a municipal worker named Ōyodo, who assisted with both the outbreak in Kawaminami on December 21st, 2016 (described in the introduction) and in Kijyōchō on January 26th, 2017. During the Kawaminami outbreak, he worked for 13 hours culling chickens. Worker teams divided into different tasks such as catching the chickens and putting them in plastic containers, filling the containers with CO₂, carrying the containers across the chicken shed, and putting the dead chickens into plastic bags. Ōyodo's task was carrying the sealed plastic containers of chickens across the chicken shed. The chickens would die after 10 to 20 seconds while he was lugging the container. He described the chicken's death throes as being like "the screams from hell." Asked if he got depressed, Ōyodo replied, "At first, but in the middle of working, you lose the sense that there is a living thing. Something like your eyes get cloudy. You lose your

²² Burying is not permitted in some cases due to issues such as a shallow water table. The alternative to burying is burning.

peripheral vision, and then you get used to it, to the sounds of the cries, too.” He added, “After Kawaminami, it was difficult (*tsurakatta*) for me to look at chicken meat. But now I can eat it. For a number of days, I had no appetite for chicken meat after killing so many.” In response to the outbreak in Kijyōchō, Ōyodo did not cull chickens but instead assisted with readying supplies. He worked 26 hours straight.

Miyazaki prefecture’s avian influenza manual includes detailed diagrams that organize the space workers inhabit at infected farms (Miyazaki Prefecture 2015). Upon arriving, workers proceed to a tent that is divided between a “Changing Room” and a “Break Room.” First, they remove their shoes, then they pick up a bag for their shoes, a bag for their clothes, a Tyvek protective suit, a mask, a cap, gloves, goggles, and other items such as tape. Workers then enter the Break Room. The manual recommends that workers split into two groups that trade off in hour-long shifts between working and recovering. Government workers and Self-Defense Forces work in separate teams. Between the break room and the farm is an area for checking protective gear. A 17-step process explains how workers should put on their protective gear, including taping over openings where the rubber boots and gloves connect with the Tyvek suit. Upon leaving the infected farm and before returning to the rest area, workers pass through an area for disinfecting, changing, and leaving rubber boots. In the rest area, workers can remove the Tyvek suit and other protective equipment. When workers entirely remove their protective equipment, they are supposed to follow a 23-step process. Seven of these steps are to disinfect your hands, repeatedly.

Raising chickens and hazarding disaster

The impacts of animal disease outbreaks are far-reaching and experienced by many as a disaster. In a study on FMD and other animal disease outbreaks, Convery et al. (2008) analyze how animal disease outbreaks become traumatic experiences, with those impacted exhibiting symptoms typical of people who survive more conventional disasters such as floods. Convery et al. (2008, 89) observe that people affected by a 2001 FMD outbreak in the UK “reported feelings of shock, depression, including thoughts of suicide; loss of concentration and interest and recurrent thoughts and flashbacks.” In this section, I consider how the state positions people who raise chickens as bearing not just personal responsibility for their flock but also obligations to nearby poultry operations and by extension the regional economy.

Miyazaki prefecture faces a higher risk of HPAI outbreaks than other regions of Japan due to a history of previous outbreaks and greater numbers of migratory birds. Adjusting biosecurity to this higher-risk environment, government officials require chicken operations to install expensive protective nets or fences to keep out wild birds. After outbreaks occurred at farms that followed seemingly flawless protocols, government officials sought to control for other potential vectors such as small animals and humans. Miyazaki livestock department officials strive to enter all of the nearly 1,000 animal farms in the prefecture to ensure that they are biosecure. Suzuki said, “We try to enter all of [the animal farms] and give concrete advice. If there are insufficient areas, we keep returning to farms until they fix those areas.” The prefectural government distributes flyers to poultry farmers with the following instructions: place a warning sign outside of the farm that bars outsiders from entering; change rubber boots when entering a chicken structure; use nets or fences with openings of less than 2 cm to keep out wild birds; apply lime around chicken structures; keep a register of people who enter the farm; and report if the farm experiences conditions associated with avian influenza such as a high numbers of deaths.

When an avian influenza outbreak occurs, officials implement the steps laid out in the prefectural manual. At farms where the outbreak occurs, the prefectural and national government takes charge of culling and cleaning the infected farms. After an HPAI outbreak, government officials inspect the infected farm for weaknesses through which HPAI may have entered. These inspections reinforce a narrative of culpability for the outbreak, assigning blame to either the farm operator or uncontrollable natural forces. One week after the Kawaminami outbreak, a story on the front page of Miyazaki’s largest newspaper carried the following headline: “Damaged net in chicken structure of outbreak: the results of MAFF’s epidemiologic investigation” (Miyazaki 2016). MAFF officials found a hole in the protective netting of 20 cm in diameter, large enough for a wild bird or small animal to enter the chicken shed where the disease broke out. An epidemiological official said, “While we cannot state definitively that the disease entered through this hole, it is a fact that there was a hole and so proper measures were not in place” (ibid).

With 11 structures for housing chickens on the Kawaminami operation, I estimate that the circumference of these structures that required protective netting or fencing was a minimum of

1.7 km and likely more.²³ Ensuring the absence of holes in this much netting requires onerous monitoring. While accepting some responsibility, the prefectural livestock disease prevention division deflected much of the blame for the outbreak onto the Kawaminami operation in their statement: “Until now, we have visited all farms and imparted guidance. Farm operators responded appropriately, but we sincerely face this oversight. Disease prevention was not complete. We strive to spread the understanding that farmers must protect their own farms and will continue to promote transparency.” At the prodding of prefectural officials, farm operators install costly fencing and netting. For example, following the 2011 outbreak in Miyazaki, one farmer who endured an HPAI outbreak replaced all his protective netting at a cost of two million yen (~\$18,000) per structure (Asahi Shimbun 2011).

Following an outbreak confirmation, the prefecture creates two movement restriction regions. The first and stricter “movement restriction” region is a circle with a 3 km radius around the infected farm that remains in place until 23 days after the outbreak.²⁴ Farms in the “movement restriction” region are not permitted to ship chickens outside of this region for meat processing. Officials instruct broiler operations to maintain their flock until the restrictions are lifted, but this proves difficult because of issues with chickens suffering leg injuries from becoming too large, excessive chicken excreta, and poor air quality. With permission, farms can ship eggs for eating, fertilized eggs, or chicks outside of the “movement restriction” region. The second and laxer “export restriction” region is a circle with a 10 km radius around the infected farm that is kept in place for two weeks after the outbreak is confirmed. The state permits farms in the “export restriction” region to ship chickens and eggs to processing centers within the same region, but requires farms to get permission to ship these commodities outside of the “export restriction” region. Exactly how the state compensates farmers for their losses and determines the “conditions under which movement is possible” remains opaque. It seems to vary case by case.

²³ I estimated the perimeter using the standard chicken shed size of a different Miyazaki chicken corporation that houses 10,000 chickens in a 69 m by 9 m structure. The structures on the Kawaminami operations were likely larger since the structures housed an average of over 13,000 chickens.

²⁴ The manual counts the day the outbreak is confirmed as day one, and lifts the “movement restriction” on day 24.

In prefectures such as Miyazaki that have suffered through numerous HPAI outbreaks, farm operators strive to prevent outbreaks and understand what would happen to their operation if it were to fall within a restricted region. Since an outbreak creates a burden on the surrounding farms, farmers experience not just a personal hardship but also the guilt of placing burdens on others. If the government announces, as it did for the Kawaminami outbreak, that the farm operator's biosecurity measures were insufficient, then the grower bears additional blame.

Before leaving Miyazaki prefecture, I gave a presentation on my findings to leaders of the chicken industry in August 2017. In it, I described the position of Convery et al. (2008), who argue that animal disease outbreaks should be treated like a disaster. After the presentation, I discussed this point further with a venerable farm operator. While he praised me for recognizing the traumatic impact of HPAI outbreaks, he countered that farm operators would become less vigilant if they thought of outbreaks as inevitable natural disasters like earthquakes or volcanic eruptions. Just as farm operators are unable to lessen their vigilance, so, too, are they ensconced in new burdens of responsibility on the frontlines of biosecurity prevention and surveillance.

Conclusion

Industrial chicken operations are susceptible to avian influenza outbreaks because these operations house dense populations of chickens with stressed immune systems. Epidemiologists believe that the latest strains of avian influenza originated from southern China in the mid-1990s, whence a significant amount of exports headed for the Japan market. These connections underline how the global political economy of broiler chicken meat production and trade shaped the emergence of new avian influenza strains. In turn, these novel influenzas infected wild migratory waterfowl and spread across the globe.

The Japanese state and media portray avian influenza as a foreign disease carried by wild birds that cause outbreaks in poultry operations with inattentive managers. These characterizations of avian influenza deflect blame from the structural ways in which industrial poultry production provides the conditions for avian influenza to proliferate. The Japanese poultry industry is not alone in facing these issues. Industrial chicken husbandry grows around the world along with the likelihood of a global pandemic. Given these conditions, the Japanese state and Miyazaki prefectural officials implement a series of protocols intended to protect industrial animal husbandry and foster biosecurity. They emphasize prevention and then rapid

intervention if an outbreak occurs. By extinguishing the threat, the Japanese state performs biosecurity and asserts its competence as a sovereign power protecting its citizenry.

Chapter Six. How to authenticate *jidori*? Challenges of creating a new category of artisan chicken meat in Japan

Introduction

The Japanese word *jidori* combines the characters for place (*ji* 地) and chicken (*dori* 鶏) to signify “place chicken.” Except for specialists, most Japanese have only a functional grasp of the word. *Jidori* is riddled with meanings; it can refer to artisan chicken meat, tough chicken meat, wild chickens, local chicken breeds, and a specific breed of heirloom chicken (Satō 2011). In 1999, the Japanese government introduced a Japanese Agricultural Standard (JAS) for *jidori* (henceforth, JAS *Jidori*) to clarify the category of artisan chicken meat. Typical consumers in Japan today perceive *jidori* as expensive and highly palatable chicken to eat. But they know little of the history or standards behind *jidori* brands. Foods such as *jidori* reveal the discordant interplay between the political ecology of production, strategies for certifying and retailing food commodities, and consumer practices and perceptions.

Market-based exchanges of food have long been shaped by issues of commodity fetishism. Harvey (1990) argues for lifting the veil on commodity fetishism in order to reveal geographical relations. For industrial chicken production, the cloaked geographical relations encompass the suffering of animals, the exploitation of precarious workers, and environmental pollution. In contrast to Harvey’s stance against commodity fetishism, Jackson (1999) and Castree (2001) call for empirical investigations of the impacts of situated commodity fetishes. In a new dark age, consumers face increased pressure to act ethically through their food consumption practices, but encounter an over-abundance of information despite the persistence of inscrutable relations. The growing chasm between the production of food commodities and everyday consumer practice poses a major challenge to theorizing alternative capitalist food networks. In this chapter, I use the concept of authentication to highlight a key process through which upstream retailers commoditize better products that are then interpreted as better by downstream consumers.

Authentication and alternative capitalist commodities

Scholars from a variety of fields recognize that most consumers make food choices based on intuitive cognition and not deliberative calculations (Kahneman 2011, Thaler and Sunstein 2008). Warde (2014, 2016) develops sociological theories of practice to explain consumption and eating. He writes, “[D]espite their coherent critique of dominant accounts of action in the social sciences, theories of practice face an uphill struggle to provide an alternative conception of action which is not premised upon individual choice and decision, but rather upon habit and routine in conditions of distraction” (Warde 2014, 292). In this chapter, I develop the idea of authentication to explain how food commodities become a key medium for translating between the upstream conditions of production and consumer practices.²⁵

The idea of authenticity can be traced to the Greek admonition to “know oneself.” Berman (1970) analyzes how Enlightenment thinkers used authenticity to extol the virtues of individuality and self-realization, even though societal constraints prevented people from its pure pursuit. Berman (1970, 319) writes, “If the rulers were shrewd, they could control their subjects more totally than ever through a rule of veils, masks, disguises that could captivate men’s [sic] minds while infusing them with the illusion that they were free.” The concept of authenticity illustrates the challenge of understanding truth and freedom within complex governance structures.

My use of authenticity draws attention not to the ability of people to transcend society but rather to the assertion of consistency between tangible objects and intangible claims about commodities (Cavanaugh and Shankar 2014). Authentication refers to the process through which retailers authenticate commodities as being genuine objects while downstream consumers authenticate commodities primarily through intuitive understandings and embodied experiences. For alternative capitalist food, authentication describes the process through which upstream retailers and downstream consumers authenticate that they are exchanging genuine and better

²⁵ The idea of authenticity for food most commonly appears with reference to exoticized ideas of authenticity in which ethnic food provides authentic experiences for people disenchanted by modern life. Although authentication could be applied to ethnicity and cuisine, the use of authentication in this chapter emphasizes the dialogic process through which commodities are certified as better by retailers and experienced as better by consumers.

than generic commodities. While authentication is most visible at the point of purchase, it conditions practices within broader networks. Within their circulation, foodstuffs must be formulated as commodities at the point of sale, but they both acquire and lose commodity status as they move through different commodity phases (Agha 2011, 27).

Consumers typically make their decisions based upon habit and routine and rarely through deliberative choice and decision (Warde 2014, 2016). They develop trust in food over time through a combination of impersonal confidence in institutions and embodied familiarity with people and food products (Kjaernes 2013). Instead of having a fixed idea of good food, consumers authenticate the goodness of food using variable criteria such as palatability, nutritional content, cultural significance, and local origins (Beagan et al. 2014). Given the opacity of upstream production, taste becomes a central way that consumers authenticate better food (Evans and Miele 2012, Carolan 2012). Terroir is a key concept — originally used for French wine — that connects the place of production with unique taste profiles (Barham 2003, Trubek 2008). The role of place and factors that impact taste are different for meat than for wine. Animal breed, lifespan, stress, feed, and exercise all impact how meat tastes. Since taste preference is subjective and shaped by expectations, consumers may initially perceive artisan meat to be less palatable than industrial meat. Weiss (2016), for example, analyzes how experts teach consumers to discern the “funky” taste of pasture raised heirloom pigs in North Carolina and interpret this taste in a positive light. In the context of Japan, consumers often invoke taste as their primary way to authenticate the benefits of jidori.

Jidori and Japanese foodscapes

Japan’s agriculture of the middle has roots in both the redistribution of land during US occupation (McDonald 1997) and environmental protests against pollution that accompanied rapid economic growth (Avenell 2012). Agriculture of the middle recognizes the contribution of alternative-capitalist food and its role in creating value in the supply chain and providing regional benefits (Kirschenmann et al. 2008). In the 1970s, leaders in Japanese organic agriculture drew on progressive rhetoric that linked alternative food with resisting capitalist relations (Moen 1997). Rosenberger (2017) finds that Japanese organic farmers today emphasize the benefits of alternative lifestyles, independent livelihoods, and connectivity with local communities.

The Japanese government has long promoted local food initiatives throughout Japan as part of a cohesive national strategy. In the 1980s, the Japanese government moved to promote “local cuisine” which had positive associations with heirloom ingredients and local dishes (Rath 2016). In the 1990s, food activists started food education (*shokuiku*) campaigns to promote healthy eating. Later, food education became enshrined as national policy in the Basic Law for *Shokuiku* in 2005 (Takeda 2008, 14). The *shokuiku* campaign enabled the Japanese government to promote not just healthy food but also a broader agenda of support for rural economies and local food products. Kimura (2011) analyzes how the campaign reinforces traditional gender roles and glosses over structural inequality. The *shokuiku* initiative coincided with increases in place-based branding and certifications such as geographical indications. Sekine and Bonanno (2017) analyze the branding of *Hatcho Miso* from Aichi Prefecture and observe that geographical indications intensified the conflict over proprietary naming rights and the impact of global competition.

The most explicit effort to authenticate Japanese food is the adoption of traceability by private companies at the urging of the national government (Hall 2010). Traceability can enable a supermarket shopper to scan the barcode of an apple to learn “where it was grown, when it was picked, what chemicals were used in the orchard, the route the apple took to the supermarket, and even a photograph of the farmer(s) who grew it” (Hall 2010, 827). Upstream, retailers authenticate these apples through traceability by collecting production data that they link with food products. Survey data show, however, that many Japanese consumers are unaware of traceability, while those who are aware feel reassured that it exists without actually accessing the information (Jin and Zhou 2014). Even if they did, consumers would struggle to make sense of specialized information such as the timing and type of various agrochemical applications.

The hyper-visibility of heirloom food and traceability mechanisms overwhelms consumers with too much information and also distracts them from less reassuring subterranean nodes. The largest subterranean node concealed within Japanese food networks is Japan’s reliance on genetically modified (GM) food and grains. Due to strong citizen consumer protests against GM food, Japanese farmers do not commercially produce GM crops (Moore 2013). Still, Japan annually imports roughly eleven million metric tons of corn, three million metric tons of soybeans, and two million metric tons of canola (GAIN 2017, NARO 2018). Most of these imported grains are GM and come from the US. Despite this reliance on imported GM grains, the

Japanese government developed a labeling system that conceals the presence of GM food by only requiring the labeling of raw unprocessed GM grains with an unobtrusive double-helix mark (GAIN 2012). GM grains are processed into ubiquitous ingredients found in unlabeled food like ice-cream, chocolate, jelly, potato chips, and rice crackers (ibid.). In addition to processed food, imported GM grain also accounts for 73% of the feed used in Japanese animal industries (NARO 2018). In highlighting the role of GM grains, my interest lies not in their contested safety but in how the Japanese state responded to citizen consumer objections to GM grains by concealing their presence. Even for those who expend great effort to understand contemporary food networks, subterranean nodes are hopelessly inscrutable.

Beginning in the 1980s, corporate agribusinesses established centers for industrial chicken meat production in Kagoshima, Miyazaki, and Iwate prefectures. Since the 1990s, these three prefectures have accounted for roughly half of domestic production. Jidori provides an opportunity for other prefectures to enter the chicken meat industry through an agriculture of the middle approach that promotes local ingredients, cuisines, and food systems. Japan's jidori system most resembles France's "Label Rouge," which was first introduced in the 1950s and by 2000 accounted for 130 million chickens and half of French chicken meat consumption (Stevenson and Born 2007). Stevenson and Born look to Label Rouge as providing an important model for revitalizing the agriculture of the middle for poultry in the US. Unlike in France, where Label Rouge is widely accessible, jidori only accounts for roughly 1% of Japanese chicken meat consumption and is largely limited to upscale and specialty retailers. The following section analyzes the development of jidori chicken as a standard for artisan heirloom chicken meat in Japan, drawing on interviews with industry experts and archival research conducted between 2015 and 2017.

Creating and certifying jidori networks

Natural Monument origins

Chickens are a companion species with ancient roots in Japan. The oldest excavated chicken remains are 2,000 to 2,500 years old (Saitō 1985, 105). The Japanese name for this ancient breed is "jidori." It is a close relative of the wild fowl from which scientists believe chickens were domesticated (ibid.). Before chickens became a major food source and economic

industry, people throughout what is modern-day Japanese territory used chickens as a source of medicine and for cultural functions such as divining and cockfighting.

A set phrase, “The Big Three Jidori” (*San-dai Jidori*), indicates three well-known breeds of Japanese chickens: the Nagoya from Aichi prefecture, the Hinai-dori from Akita prefecture, and the Satsuma-dori from Kagoshima prefecture. When the chicken industry began to develop, however, its leaders considered native Japanese breeds to be inferior to Western breeds. Chicken handbooks encouraged farmers to adopt more productive Western breeds as early as 1910 (Nakamura 1910). Many hatcheries replaced Japanese breeds such as the Nagoya with Western breeds like the White Plymouth Rock in the 1930s and 1940s (Hosokawa 1974, 108).

In 1911, the Japanese government adopted the German term *Naturdenkmal* or “Natural Monument” (*Tennen Kinenbutsu*),²⁶ which the Agency for Cultural Affairs used as a conservation designation (Katō et al. 1995). In 1923, *onagadori* became the first chicken breed designated as a Natural Monument. With tail-feathers that grow indefinitely long (some to over ten meters), the *onagadori* is an ornamental breed that is housed in a wooden box resembling a cupboard. This wooden box prevents the *onagadori* from moving and damaging its tail-feathers. In 1951, the *onagadori* became the only chicken to be elevated to the status of “Special (*tokubetsu*) Natural Monument.”

During wartime hardships, poultry organizations sought to protect heirloom breeds through Natural Monument designation. Fifteen out of a total of seventeen Natural Monument chicken breeds received designation between 1936 and 1943, including the *jidori* breed in 1941 (Katō et al. 1995). While there is little dispute over the significance of breeds such as *shamo* (gamecocks), *chabo* (bantams), and *ukokkei* (silkie), others were less obvious choices for designation.²⁷ The goal of designation was primarily preservation. Most hobbyists raise heirloom chickens based on non-capitalist bonds with chickens and neighboring chicken enthusiasts. Since

²⁶ While I translate *Tennen Kinenbutsu* as “Natural Monument,” the word is also translated into English as “Natural Treasure.”

²⁷ Official paperwork on Natural Monument designation is either destroyed or in inaccessible archives at the Agency for Cultural Affairs.

the last chicken was designated a Natural Monument, the designation has gained a mystique of exemplifying traditional Japanese chickens. It now underpins most jidori brands.

The rise and fall of “the world’s most expensive chicken meat”

Hinai is the historical word for a region that is now a part of Akita prefecture. In 1897, a famous breed of chicken that was simply called “jidori” was renamed Hinai-dori (Koyama 1979, 69). In 1942, the Agency for Cultural Affairs bestowed the Natural Monument label on Hinai-dori. Within Akita cuisine, Hinai-dori was a key ingredient for *kiritampo*, a soup dish made from chicken broth and served with skewers of pounded rice. Beginning in the mid-1970s, a group of farmers in Akita sought to produce Hinai-dori on an industrial scale. They struggled because of issues with transportation and inconsistent quality of meat (Nagasaka 2004). In the 1980s, a new group of farmers banded together in concert with the prefectural government and the north Akita Japanese agricultural cooperative (JA). Instead of using the Natural Monument Hinai-dori, this coalition developed a new commercial breed made by crossing Hinai-dori with the Rhode Island Red, a hardy breed from the US. Prefectural officials named this hybrid Hinai-*jidori* to emphasize its lineage while differentiating it from the Natural Monument Hinai-dori.

Although a broad coalition backed Hinai-jidori, some Hinai-dori purists objected. For example, a newspaper article from 1990 titled “Dangers for Hinai-dori” claimed that these industrial approaches compromised the true essence of Hinai-dori (Asahi Shimbun 1990). The author describes fake Hinai-dori as selectively improved chickens raised in cages and asserts that fake Hinai-dori will lead to the loss of *kiritampo*’s “real flavor.” While the new Hinai-jidori brand used an improved breed, neither permitted the use of cages.

Despite the objections of Hinai-dori purists, government and industry leaders backed Hinai-jidori and it grew famous throughout Japan. Hinai-jidori chicken production boomed throughout the mid-2000s, tripling from 260,000 chickens in 2000 to 780,000 in 2008 (Chikusan Shinkō-ka 2017). Sold in department stores for over 600 yen per 100 grams (roughly \$30 per pound), Hinai-jidori garnered renown as “the world’s most expensive chicken meat” (Fukumoto 2006, 7). Beyond department stores, Hinai-jidori was sold in upscale Japanese bars (*izakaya*) and restaurants. In addition to north Akita JA, two other for-profit companies had begun certifying and selling Hinai-jidori.

In October 2007, government auditors determined that one of these companies, Hinai-dori Shokuhin²⁸ (Hinai-dori Foods), was mislabeling spent laying hens as Hinai-jidori, a scandal that became a major news story and severely tarnished the Hinai-jidori brand. Hinai-dori Shokuhin is based in Ōdate City, a region with historical ties to Hinai-dori, and Hinai-dori Shokuhin adopted the famous chicken as its company name. This company sold a popular chicken jerky called “Hinai-jidori” through the national discount chain Max-Value, and some questioned its authenticity (Asahi Shimbun 2007c). According to Hinai-dori Shokuhin employees, the company determined that spent laying hens were more palatable for jerky than either Hinai-jidori or broilers, because spent laying hens have a lower moisture content. Since Hinai-dori Shokuhin sold the mislabeled chicken meat as jerky, consumers found it difficult to taste the difference between old spent laying hens and Hinai-jidori, an observation that the Asahi Shimbun (2007a) confirmed with a taste survey of its Akita prefecture newsroom.

Within a week of the story becoming national news, industry and government leaders introduced a new system for certifying Hinai-jidori. In addition to specifying the breed, the new standard set the minimum lifespan of 100 days for roosters, 150 days for hens, and specified a maximum stocking density of five birds per square meter (Asahi Shimbun 2007b). In the realm of alternative capitalist commodities, consumer skepticism of the authenticity of a commodity poses a grave threat to the niche market. Since 2007, when 141 farmers produced 757,000 Hinai-jidori, production declined by roughly a third in 2016, to 106 farmers who produced 510,000 Hinai-jidori (Chikusan Shinkō-ka 2017).

JAS Jidori and conventionalization

By the late 1980s, Japanese media covered the “boom” of consumer interest in jidori. Experts disagreed over the definition and name for this category of better chicken. Eventually, industry leaders coalesced around the term jidori, though its meaning remained unclear. Between 1995 and 1999 annual jidori production dropped from 8.5 million to 5.0 million chickens (Komai 2012a). Over that same period, the number of branded chickens increased by 73% from 97

²⁸ The name of this company changed multiple times. At one point it was called ‘Akita Broiler’ which was later changed to ‘Hinai-dori’. To avoid confusion, I call the company *Hinai-dori Shokuhin*, which was the name of the certifying organization in Japan Chicken (2018).

million to 168 million (ibid.). Branded chicken is a category of chicken meat with unique branding based primarily on alterations to feed. Many consumers did not understand the difference between branded chicken and jidori.

Seizing on the need for clarity, the Ministry of Agriculture, Forestry and Fisheries (MAFF) introduced a Japanese Agricultural Standard for Jidori (JAS Jidori) in 1999, which required that chickens be at least half native heirloom breeds, be raised on level ground (outside of cages) after 28 days, have a minimum lifespan of 80 days, and have a maximum stocking density of ten chickens per square meter. JAS Jidori defines a native heirloom breed as “any breed established within the country prior to the Meiji era (1868) that is included on the appended list of [38] chicken breeds” (MAFF 2015a). Some of these native heirloom breeds, such as the “Kyushu Rhode Island Red,” are Western breeds that arrived in Japan prior to 1868. An Asahi Shimbun (1999) article explains the unclear difference between JAS Jidori, jidori, and non-jidori: “Even without certification from JAS, the name jidori can still be used. JAS Jidori certifies the fulfillment of JAS Jidori specifications but does not differentiate between jidori and non-jidori.” The word jidori was already in wide usage, with numerous commercial and colloquial meanings (Satō 2011). Although MAFF ostensibly introduced JAS Jidori to provide clarity, by coopting the word “jidori” MAFF ensured long-lasting confusion over the meaning of jidori and its relation to the standard for artisan chicken in Japan.

Brands such as Hinai-jidori resisted being certified by JAS Jidori, because it had far lower levels for minimum lifespan and stocking density. During the Hinai-dori Shokuhin mislabeling scandal, media outlets seized on the violation of JAS Jidori even though Hinai-jidori pointedly resisted JAS Jidori certification. Following the Hinai-jidori controversy, a Miyazaki company called MK Corporation ceased selling “Miyazaki Jidori.” This precautionary move still attracted criticism, because “Miyazaki Jidori” did not meet JAS Jidori standards. Defending MK Corporation, then-governor of Miyazaki Higashikokubaru Hideo said, “On the one hand, there is the JAS Jidori law, but our tradition in this region is to call chickens raised this way jidori” (Asahi Shimbun 2007d). Within a decade, JAS Jidori expanded from being a self-contained category to one that co-opted both the standard for artisan chicken meat and commercial use of the word jidori. Retailers that persisted in using the word jidori without meeting JAS Jidori risked being accused of misleading consumers.

A few industrial brands of jidori benefited the most from the introduction of JAS Jidori certification, especially Tokushima prefecture's Awa-odori. The historical name of Tokushima prefecture is *Awa*, and Tokushima is famous for a dance called Awa-odori (Awa-dance). Beginning in the late 1980s, Tokushima prefecture launched a brand of jidori that is a homonym of Awa-odori, keeping the traditional place name *Awa* but replacing the character for dance (*odori* 踊) with tail (*o* 尾) and chicken (*dori* 鶏). Awa-odori is a hybrid of the Natural Monument Shamo (gamecock) and the White Plymouth Rock, a productive breed originally from the US. Both breeds are robust and neither are particularly unique to Tokushima prefecture.

JAS considers itself the “scheme owner” of Awa-odori, a relationship that JAS has with only Awa-odori and a minor brand from Ibaraki prefecture (Fieldnotes, July 2017). Although other brands of artisan chicken can be certified as JAS Jidori, only Awa-odori and the Ibaraki brand have permission to use the JAS mark. Other brands such as Hinai-jidori are unable to use it. Following the introduction of JAS Jidori in 1999, production of Awa-odori more than doubled, from 740,000 chickens in 1999 to 1,800,000 in 2002, and has since hovered around two million chickens (Sato 2013). As with broiler chicken, corporate integrators coordinate Awa-odori production and distribution. Awa-odori are raised in industrial chicken sheds without access to outdoor pastures. An Awa-odori official explained in an interview that one reason for the success of the Awa-odori brand is that it has a good price point (Fieldnotes, April 2016). Although more expensive than generic industrial chicken, Awa-odori is cheaper than other jidori brands. The introduction of JAS Jidori and its cozy relationship with Awa-odori highlights familiar problems of conventionalization and regulatory capture that hound alternative capitalist food.

These concerns heightened after a 2015 revision to JAS Jidori reduced the minimum lifespan for JAS Jidori from 80 to 75 days. When making this decision, JAS officials only consulted with brands of which they were the scheme owners (Fieldnotes, July 2017). Public relations material provides further insights into the reasoning behind the revision: “In recent years, productive new birds and management techniques continue to improve, and so a number of jidori are getting remarkably bigger than before” (FAMIC 2016). The report adds, “According

to scientific data, jidori's *umami*²⁹ content and meat texture remain appropriate (*tekitō*) when the period for rearing is above 75 days" (ibid.). Instead of recognizing the benefits of slow-growing breeds, this explanation portrays faster-growing jidori as an indicator of progress.

In another sign of the conventionalization of jidori, JAS permits corporations to certify in-house brands of JAS Jidori. However, the standards underpinning these in-house corporate brands and production numbers are not publicly available. Previously, all major chicken brands disclosed production numbers and standards through Japanese Chicken's national compendium on branded and jidori chicken (Japan Chicken 2018). According to the latest statistics available in the compendium, of the 8.7 million jidori produced, JAS Jidori certified 42% (ibid.).³⁰ The average annual production of the JAS Jidori-certified brands in the Japanese Chicken compendium is 280,000, about three times more than the average for non-certified jidori brands. It should be noted that these statistics only count JAS Jidori brands that self-report.

In one troubling case, a major food business corporation called Monteroza certified the *Satsuma Yamauchi-jidori* brand as JAS Jidori in 2014. This brand is easily confused with *Satsuma-jidori*, a more stringent jidori brand from Kagoshima prefecture established in 2000 but not certified by JAS. In this scenario, the official seal of JAS Jidori favors the newer, more industrial, and corporate-backed brand while undercutting a brand with stronger place-based and traditional claims.

Everyday practices of consuming chicken

This section draws on a series of 20 focus groups with Japanese consumers on everyday practices of eating in the Tokyo metropolitan area and Miyazaki prefecture. The number of participants in the focus groups ranged from three to twelve. Instead of cash payments, the typical enticement for focus group participants in Japan, I sought participants willing to volunteer their time, and gave culturally appropriate reciprocity through small souvenirs

²⁹ *Umami* is a Japanese word for savory. In writing on food, umami is often not translated and considered the fifth taste.

³⁰ Calculated by the author using self-reported production statistics from Japan Chicken (2018).

(*omiyage*). To solicit participants, I contacted relevant groups and distributed a flier. In all, I held focus groups with six groups of university students, five groups hosted by government officials, six groups of other preexisting networks, and three cooking groups. Based on the topic and availability of participants, college students, women, and retirees were over-represented. I announced that the focus group was over after between 45 minutes to an hour. A few groups continued their discussion longer.

Following the focus group methods recommended by Bloor et al. (2001), I did not use the same questions with each focus group. Rather, I sought to facilitate a natural flow of conversation where participants would discuss food in a way that resembles everyday talk. I started each focus group using a question posed by Evans and Miele (2012): “What did you eat yesterday?” This question encourages participants to think about their own practices. Next, I inquired about where people get their food, and followed up by asking for store names or for further details if they grow or receive food. I also passed around photographs of raw and processed chicken meat that I took in supermarkets. After distributing these pictures I would ask, “Which ones would you normally buy?” Then I would ask “Which ones would you never buy?” These exchanges created a way for participants to discuss how they navigate complex food systems. I avoided bringing up questions about food scares, because topics such as avian influenza stilted conversation, forcing participants to shift gears from talking about their everyday practices to trying to recall historical and food safety facts.

Time and setting permitting, I distributed surveys to group participants. I integrated the surveys into the focus group to evoke further discussion. This survey data is, of course, not a representative sample of the Japanese population, but it provides useful insights into consumer practice. As the issues of network connections and visibility grew pronounced, I modified the survey to ask participants to rank on a scale of 1 to 5 the importance they attach to different criteria related to chicken meat.

Figure 6. 1 Survey data from focus groups on importance and ease of inference of different criteria for chicken meat

| | Importance (1 to 5) ^a (n=76) | Ease of inference ^b (n=56) |
|--------------------------------------|--|--|
| Food safety/peace of mind | 4.46 | 23.2% |
| Domestic vs. imported | 4.39 | 57.1% |
| Freshness | 4.35 | 42.9% |
| Price | 4.28 | 57.1% |
| Cut of the chicken | 3.95 | 41.1% |
| Global warming | 3.83 | 3.6% |
| Region within Japan | 3.79 | 30.4% |
| Animal welfare (see discussion p.x) | 3.55 | 7.1% |
| Condition of the processing facility | 3.32 | 0% |
| Farmer income | 2.86 | 0% |

^a The survey asked respondents to rate the importance of different criteria for chicken meat on a scale of 1 (unimportant) to 5 (very important). This column reports the mean importance attributed to the criteria by survey respondents.

^b The survey asked respondents to note the three criteria that were the easiest to infer from supermarket labeling. This column reports the percentage of respondents who reported a criteria as easy to infer.

The top-three criteria in terms of importance attributed by participants all relate to the divide between domestic and imported chicken, with domestic chicken regarded as safer and fresher than imported chicken. Consumers rated food safety and peace of mind (*anzen to anshin*), a common set-phrase in Japanese, to be the most important consideration. Government and industry leaders in Japan use this term to indicate both the importance of being free from anxiety and the necessity of scientific risk analysis (Yamaguchi 2014). This term evokes social trust, referring to both a feeling of confidence and impersonal institutional practices that reduce food safety risks. Much of the confidence in chicken meat comes from impersonal confidence in Japanese corporations and the Japanese state's ability to regulate food safety. The importance attributed to the domestic vs. imported criterion shows that not only do people recognize the difference between these two categories, but they attach much importance to the distinction. Eaters also attributed high levels of importance and ease of inference to "Freshness" (*shinsen*-

do). In response to my inquiries about how they assess freshness, most eaters explained that they either evaluated how the chicken looked through the translucent plastic or the sell-by-date on the product labeling. Since all imported chicken meat is frozen and shipped long distances, many consumers assume domestic chicken meat to be inherently fresher than imported chicken meat.

Price was a very important criterion, and easy to infer. For chicken meat, price suggests a tension between the cheaper, less trusted imported meat and more expensive, more trusted domestic meat. On average, university students ranked price as the most important criterion, in line with how people navigate food systems based on their limited resources. Among my survey participants, university students prioritize the importance of lower price over the higher levels of social trust associated with domestic chicken meat.

In general, the average importance correlates to the ease of inference from supermarket labels, yet several gaps emerge. Perhaps the biggest indicators of chicken meat safety are slaughterhouse and storage conditions, but these facilities are a subterranean node, invisible on the labels and not weighted as highly important by consumers. While consumers expressed concern over global warming, few associated chicken meat with greenhouse gas emissions. During one focus group with six mostly retired women, a participant stated that she is very concerned about global warming. Based on the criteria section of the survey, she asked if there was a connection between chicken meat and global warming, and if so, should she stop eating chicken meat (Focus group 6, December 2016).

Her question highlights my positionality as both a foreigner and an expert. In my identity as a foreigner, participants were comfortable explaining their practices and teaching me about Japan, but as an expert, participants sometimes looked to me for answers. This became pronounced when I distributed the pictures of chicken meat products and brands. Few participants could explain the differences between the many brands of chicken or differentiate between jidori and non-jidori chicken. Several university students expressed confidence that they could look up the meaning of different chicken brands using their smartphones, although they had never bothered to before. Even if they did, the information they could access would be difficult for them to understand. For example, the distinguishing characteristic of Nippon Ham's "Cherry Blossom Princess" (*sakura-hime*) brand is the use of a proprietary feed with three times as much vitamin E as typical chicken feed. (Japan Chicken, 2018). The appealing "Cherry Blossom Princess" labeling evokes social trust using a brand character and touting that it is from

Miyazaki prefecture (see Figure 6.2). As opposed to generic domestic chicken meat, branded domestic chicken meat demonstrates slightly more transparency regarding the methods used in production and the corporate integrators responsible for the product.

Figure 6. 2 Example of “Cherry Blossom Princess” picture distributed to focus groups



“Whenever possible, domestically produced”

In their everyday practices, Japanese consumers continually face the choice between more expensive domestic food and cheaper imported food. Regarding imported foods, eaters consistently described Chinese food products as the most untrustworthy during both informal conversations and formal interview settings. The following exchange between three previously acquainted mothers during a focus group in Miyazaki City illustrates how citizen consumers discuss the link between food safety and provenance. Machiko and Nanami are in their early thirties with a high school education; Yoshie is in her early forties with a university education:³¹

³¹ All names are pseudonyms.

Machiko: To put it bluntly, my approach is “no Chinese” (*nō chainizu*). I absolutely don’t want food from China.
 Yoshie: You find where the food is actually produced [on the labeling].
 Machiko: For food products, China and Korea are totally...
 Nanami: Scary! It’s a little, I don’t know.
 Yoshie: But it is cheap.
 Machiko: Australia, food from there is still okay. Brazilian chicken, too.
 Nanami: It’s half price (*hangaku*), isn’t it?
 Yoshie: Whenever possible, domestically produced (*kokusan*), Japanese.
 Nanami: If you can do that. (Fieldnotes, December 2016)

Although these mothers prefer domestic food, they must factor in economic considerations. The older and higher educated Yoshie says that she buys food produced in Japan whenever possible. In contrast, Nanami’s qualification that you should buy domestic food “if you can” indicates that although she prefers domestic chicken meat, she cannot always afford it over the “half-price” imported option. Citizen consumers willingly pay more for domestic food, and this provides a clear boon for domestic industries. Machiko’s perception of food safety mirrors Japan’s security interests where Japan’s ties remain cold with China and South Korea in contrast to warmer relations with Australia and Brazil. Citizen consumers project geopolitical relations onto food safety as acts of consumption become intertwined with political acts of citizenship.

On eating delicious but expensive jidori

In the focus group surveys, I asked participants whether they knew either the name or the meaning of JAS Jidori. Of 80 survey respondents, 47 (58.8%) knew neither the name nor the meaning, 26 (32.5%) knew the name but not the meaning, and 7 (8.8%) knew both the name and the meaning. Given that numerous participants had expertise in agriculture and food provisioning, the proportion that knew the name and meaning of JAS Jidori is likely higher than would be found in the general population. When I distributed the pictures of chicken meat, participants typically decried the two pictures of jidori as too expensive. In general, they associated premium meat with beef and brands such as “Kobe Beef.” In contrast, they consistently described their image of chicken as being cheap and healthy.

This survey data and participant responses provide insights into the (dis)connections between upstream conditions of production and eaters’ everyday practices. Similar to what Evans and Miele (2012; 306) found for French, there was no direct translation into Japanese for “animal welfare” because of the limited recognition of the concept. In the survey, I rotated the

Japanese pronunciation of the English words animal welfare (*animaru-uerufea*), with chicken protection (*aigo*), chicken health conditions (*kenkō jitai*), and chicken building conditions (*keisha no jyōkyō*). Participants consistently inquired what I meant by animal welfare. One of the clearest benefits of jidori is animal welfare, but absent this concept, consumers perceive benefits mostly in terms of palatability and place-based associations.

I brought the jidori from Miyazaki prefecture, *Miyazaki Jitokko*, to a focus group with four 20-year-old students at the University of Miyazaki, three female and one male (Focus group 2, November 2016). When I revealed the *Miyazaki Jitokko*, one of the female students exclaimed, “This is so premium! I need to take a picture.” Upon eating *Miyazaki Jitokko*, students commented that it was more tender than they expected. One female student said, “Soft. Wow! This is so soft. I thought it would be super tough.” Although the students lauded its tastiness, this was far from a neutral setting for taste-testing, because students likely felt obligated to express gratitude for receiving a free meal of expensive chicken meat. When looking at the wrapper of a small package of charbroiled chicken that cost 600 yen (~\$5.50), one student commented that they would not normally eat chicken this expensive. When I asked the students to explain the difference between *Miyazaki Jitokko* and “normal” chicken, no one knew the answer to this question. A female student reflected, “When you get chicken nanban³², you have no idea what kind of chicken that is. I’ve never thought about that before.” In this setting, jidori raised questions for participants about how upstream conditions affect the taste of both jidori and industrial chicken.

Common descriptors of palatable chicken meat in Japan are words like juicy (*jūshī*), tender (*yawarakai*), and lack of a distinctive odor (*kusami ga nai*), which corresponds to the taste profile of broilers. By contrast, common descriptors of jidori, such as suppleness (*hagotae*; direct translation: tooth response), full-bodied (*koku*), and flavorful fat (*abura no umami*), evoke more complex flavors. A food scientist once lamented to me that in blind taste tests, consumers often prefer broiler meat over jidori (Fieldnotes, March 2017). Some jidori organizations collect scientific data such as omega-3 fatty acid levels to authenticate that the taste of jidori is

³² Chicken nanban is a famous Miyazaki dish in which fried chicken is served with a sweet tartar sauce.

objectively superior. Based on taste alone, consumers would struggle to authenticate that jidori is better than generic industrial chicken meat. But when coupled with the narrative of jidori and its higher cost, consumers can authenticate jidori's benefits.

After a cooking class in a community kitchen in Miyazaki City, I had a lively discussion with five women, mostly in their sixties, in which they discussed when people would eat jidori meat. One participant explained, "With branding approved by Miyazaki prefecture like *Miyazaki Jitokko*, it is value-added and, of course, expensive. But if you want to make normal chicken like for a sports festival (*undō-kai*) then you get the cheap kind, because you need to make a lot" (Focus group 3, December 2016). Here, the participant distinguishes between the expensive brand of jidori and normal chicken, making clear the class differences.

When I inquired what settings are appropriate for *Miyazaki Jitokko*, these women initially derided it. They made comments such as "Jidori is expensive," "I don't really use it," and "I think typical households don't eat it." Since Miyazaki Jitokko costs roughly five times as much as the cheapest option, the initial rejection helped to ease class tensions within the group. Then several participants touted the favorable palatability of Miyazaki Jitokko. One noted that "the texture (*hagotae*) is totally different." Another commented, "When we used coals to charbroil jidori and normal chicken meat at home, the flavor was completely different. If you bite into it, you understand right away." In this side-by-side comparison, consumers can authenticate the difference in taste between jidori and broiler chicken meat. Unlike in a blind taste test, consumers can link the taste of jidori with its positive narrative.

Discussion and conclusion

This case study of jidori reveals the importance of authentication for critical food scholars when analyzing the impact of alternative capitalist food on upstream production and downstream consumer practice. While alternative food has the potential to imbue capitalist food with more intangible ethical relations, capitalist pressures force these networks through the bottleneck of commodity authentication. Rather than portraying alternative food as facilitating a cohesive network intent on instilling market relations with non-capitalist values, this case study urges a broader recognition of the possibilities, limitations, and contradictions of attempts to imbue markets with non-capitalist values.

In the 1980s, north Akita JA used the Natural Monument Hinai-jidori breed to create a commercial hybrid they called Hinai-jidori. This new brand provided a mechanism for chicken farmers, prefectural officials, and retailers to collaborate on producing and selling jidori. As Hinai-jidori became famous throughout Japan, other companies in Akita prefecture began to certify and market Hinai-jidori. In 2007, authorities caught Hinai-dori Shokuhin selling spent laying hens mislabeled as “Hinai-jidori Jerky.” This mislabeling scandal threatened a basic tenet of alternative capitalist food, the tenet of authenticity.

The iron triangle of Japanese agriculture, however, reveals rifts between the goals of the JA and MAFF. Against the interest of many JA backed brands of jidori such as Hinai-jidori, MAFF introduced JAS Jidori with the stated goal of creating greater transparency in 1999. Within a decade, only chicken that met or exceeded JAS Jidori standards could use the word jidori without facing charges of malfeasance. The Japanese media cited JAS Jidori as defining jidori even when discussing brands like Hinai-jidori that resisted JAS Jidori certification. JAS Jidori also permitted brands to gain certification without sharing with the public basic information on JAS Jidori brand names, standards, and production statistics. JAS Jidori also enacted a revision to its standard in 2015 through an opaque process that reduced the minimum lifespan from 80 to 75 days. The goals pushed by MAFF of promoting corporate-backed approaches and productivity clashes with the goal of JA offices that seek to promote regional brands and the agriculture of the middle.

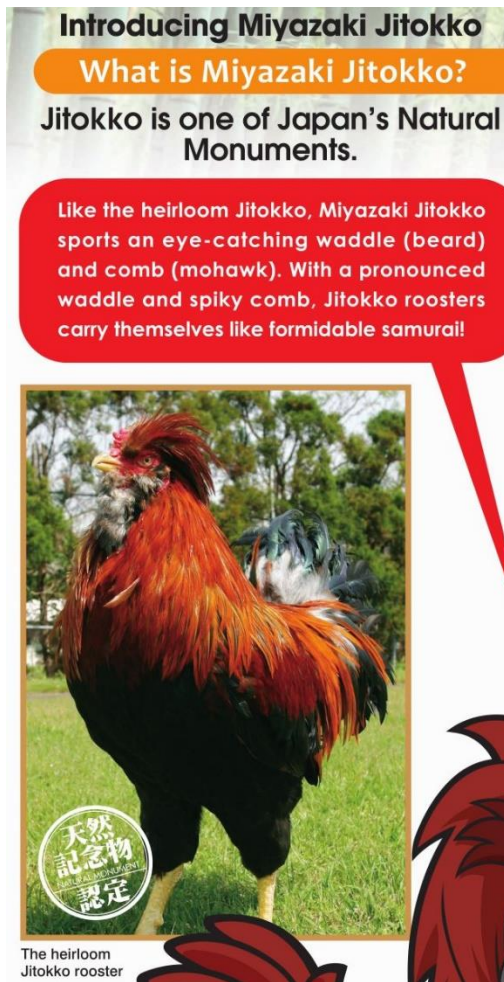
Both the Hinai-dori Shokuhin scandal and the JAS Jidori revision illustrate the challenge of authenticating jidori in the face of malfeasance and conventionalization. Upstream actors authenticate chicken meat through certification and labeling, but consumers struggle to differentiate between jidori and non-jidori chicken or between brands of jidori. With widespread social anxiety about imported meat, especially from China, many Japanese consumers seek out domestic chicken. Unlike domestic broiler chicken meat, most people rarely encounter jidori, given its expense, and only after eating jidori are they able to gain embodied experiences of jidori’s taste. Authentication draws attention to how upstream and downstream actors navigate capitalist relations and the central role that the commodity takes in representing and translating claims about alternative capitalist food. Most consumers remain unaware of branding developments such as JAS Jidori and continue to rely on cost, intuitive understandings, and embodied experiences of taste. Although these criteria can be manipulated, they can also be

resourceful ways to navigate food in a new dark age teeming with too much information and unknowable nodes.

Alternative capitalist food creates opportunities that extend beyond immediate market relations and strengthen the agriculture of the middle. For jidori farmers, processors, and retailers, jidori brands are a means for maintaining agricultural production while promoting regional cuisine, cultural practices, and distinct food systems. While many consumers perceive jidori as expensive and tasty chicken meat, jidori also creates an opportunity for consumers to learn more about the conditions of chicken production such as the lineage of chicken breeds, how long chickens live, and how much space chickens have. This visibility may also prompt some consumers to learn about the differences between jidori and industrial chicken. If alternative capitalist food networks are to facilitate progress towards non-capitalist goals, the success of these initiatives will be determined through the broader impacts of these networks. Many of these impacts, such as animal welfare benefits, community connection, and transparency, are difficult to quantify but remain significant contributions.

Chapter Seven. “A delicacy fit for royalty”: Making a better brand but facing the bottom line

Figure 7. 1 Miyazaki Jitokko pamphlet



What are Jitokko's roots?

Originally raised at the base of Mt Kirishima, Jitokko are a formidable breed of chickens with short legs and a pronounced waddle. Historically, Miyazaki farmers presented the heirloom variety of Jitokko to their lords as a sign of respect. The “Jito” in “Jitokko” means lord of the manor because Jitokko were prized as a delicacy fit for royalty. In 1943, Jitokko was designated as one of Japan's Natural Treasures.

Beginning from this original Jitokko, Miyazaki Prefecture developed a unique variety of chicken meat to share this complex and rich flavor with the world. Preserving Miyazaki's historic taste, we are proud to present “Miyazaki Jitokko.”

(Miyazaki Jitokko 2017)

Introduction

The preceding Figure 7.1 and text are from an English language pamphlet that portrays Miyazaki Jitokko as exemplifying deep historical ties between Miyazaki prefecture, the Jitokko chicken breed, and the Miyazaki Jitokko brand. I created this version from the Japanese one for the Miyazaki Jitokko business cooperative. Having covered the development of jidori in the previous chapter, this chapter is a case study of Miyazaki Jitokko, a jidori brand with some of the most stringent and, consequently, high costs of production. Proponents of the Miyazaki Jitokko brand struggle to differentiate it from other jidori brands and industrial chicken meat.

Miyazaki Jitokko growers are split in half between those growers who directly process and market themselves and contract growers who deliver live chickens to a company that handles processing, distribution, and marketing. The most famous such company is Tsukada Nojo, a corporate chain restaurant that emphasizes a farm-to-table philosophy and has 91 branches throughout the country that feature Miyazaki Jitokko. For chicken cuisine in Miyazaki prefecture, the three most iconic dishes are chicken nanban (fried chicken topped with a sweet tartar sauce), chicken charbroiled over coals (*sumibiyaki*), and raw chicken, called chicken *tataki* when seared and chicken *sashimi* when completely raw. Each of these dishes raises different issues for Miyazaki Jitokko. This chapter begins with an analysis of the history of Miyazaki Jitokko and then examines the conditions of production, the Tsukada Nojo chain, and the impacts of different culinary practices.

The origins and ephemera of Jitokko

As I discussed in the previous chapter, most brands of jidori trace their breed lineages back to Natural Monument breeds, most of which were certified in the decade before the end of WWII. Japanese chicken preservation societies (*hozon-kai*) sought Natural Monument status from the Agency of Cultural Affairs for heirloom breeds to justify preserving these chickens during wartime hardships. In a summary of Japanese chickens for *Niwatori no Kenkyū* (*Chicken Research*), Oana describes Jitokko at the time of its designation as a Natural Monument:

This breed is from Kagoshima prefecture and Miyazaki prefecture and was wonderfully preserved as a middle-sized chicken with short legs.

We are yet unfamiliar with this breed's origins. This breed has a single comb or triple comb. Its weight for roosters is around 700 monme (~2.6 kg) and hens around 500 monme (~1.9 kg). Feather colors include black-breasted red, silver-grey, barred, and black. However, finding a Jitokko of one color is exceedingly rare. Egg weight is 14 or 15 monme (~54 g) with an average of 150 eggs per year. The meat is exceptionally delicious. (Oana 1943b)

The reasoning behind the Agency for Cultural Affairs' decision to designate Jitokko as a Natural Monument in 1943 is unknown.

At the time, Jitokko was far from a household name for chicken aficionados. Woodblock prints by artists such as Kōno Bairei (1844-1895) depicted specific chicken breeds such as gamecocks (*shamo*), bantams (*chabo*), silkies (*ukokkei*), and *onagadori* (sometimes called a Yokohama in English). Perhaps it was through some quirk of chicken preservationist

connections and the breed's charisma that Jitokko received Natural Monument designation over other short-legged chickens like Kumamoto prefecture's Jisuri, Kochi prefecture's Miya-jidori, and Okinawa prefecture's Chān. In fact, the picture attributed to Jitokko in *Niwatori no Kenkyū* (see Figure 7.2) is actually a mislabeled picture of a different short-legged breed called "Jisuri."³³ Many Japanese books on chicken husbandry throughout the 20th century have descriptions of major Japanese breeds but omit Jitokko entirely.

Figure 7. 2 Photograph of Jisuri mislabeled as Jitokko in *Niwatori no Kenkyū* (1943)



The text across the top: Jitokko - Kyushu livestock, a chicken breed with short legs
The text along the left: newly designated as a Natural Monument

A history of Kagoshima poultry reports that Jitokko was also known as “*issun*” in reference to a small area and “*jikkui*” to mean that it was short (Kagoshima Yōkei Kyōkai 1985, 42). The breed Jitokko emerged out of informal networks connecting chicken hobbyists in the rural region around the border between Miyazaki and Kagoshima prefectures, specifically Kirishima and Miyakonojō. While Jitokko gained formal recognition as a significant breed through Natural Monument designation, it remained the province of hobbyists until the mid-

³³ The same picture as Figure 8.2 is labeled in Oana (1943b) and Oana (1951) as “Jisuri.”

1980s. In order to show how the appearance of Jitokko changed after prefectural authorities assumed control over the breed, I will introduce a series of pictures of Jitokko. These pictures, especially the early ones, are of poor quality, but taken together these ephemera portray a breed that changed markedly under the stewardship of the prefectural government.

The earliest picture of Jitokko that I found appears in Oana's book *History of Japanese Chicken* (Oana 1943a, 104, see Figure 7.3). A preface to the book describes Oana as "a lover of Japanese chickens and a leading expert in the field" (Oana 1943a, 2). Both Jitokkos have short legs. The rooster on the left has a hackle of white feathers and high-arching tail feathers and sickle. The hen on the right is almost a solid color with some lighter stripes on the neck hackle. The second oldest picture of Jitokko I obtained is from a later edition of Oana's (1951) book on Japanese chicken history (see Figure 7.4). A description under this picture states "raised by the author" (*choshu shiiku*). Although poorly reproduced, we can make out a similar silhouette of a rooster on the left half of the picture with a white upper body and high-arching tailfeathers. The third black-and-white picture comes from an article in *Niwatori no Kenkyū* on industrial strategies for raising Jitokko as layers (Nejime 1955). The picture accompanying this article shows two short-legged chickens identified as Jitokko with a rooster, probably, on the left and a stooped hen on the right (see Figure 7.5). While these pictures fail to provide a clear image of Jitokko, they illustrate both its outline and obscurity.

Figure 7. 3 Photograph of Jitokko from 1943 book on Japanese poultry (Oana 1943a)

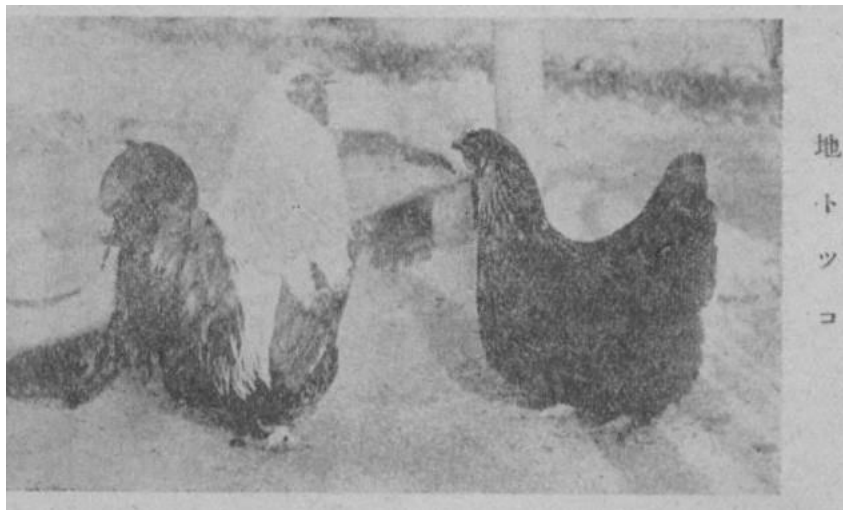


Figure 7. 4 Photograph of Jitokko from 1951 (Oana 1951)



Figure 7. 5 Photograph of Jitokko from 1955 (Nejime 1955)



A 1979 compendium of Japanese chickens includes two strikingly different Jitokko exemplars. (see Figure 7.6). Most distinct from the other images of Jitokko is the all-white Jitokko with a single comb and, still, the characteristic short legs (Koyama 1979, 47). The

Jitokko on the right —what the book describes as “black-breasted red with a walnut comb and a beard” —resembles the modern-day image associated with the Jitokko used for Miyazaki Jitokko (ibid., 47). In 1979, hobbyists still embraced a diversity of appearances within the Jitokko breed. A compendium by the preservation society of Japanese chickens (*Zenkoku Nihon Niwatori Hozon-kai*) shows a “black-breasted red variety” of the “bearded Jitokko” (*hige-jitokko*) with feathers around the comb, a beard, waddle, and the rooster’s tailfeathers extending back and down (see Figure 7.7). The book explains that there are different types of Jitokko, such as the “bearded Jitokko” (*hige-jitokko*) pictured below and the gamecock Jitokko (*shamo-jitokko*) (Zenkoku Nihon Niwatori Hozon-kai 2004, 58).

Figure 7. 6 Different pictures of the Natural Monument Jitokko (Koyama 1979, 47)



Figure 7. 7 Picture of Jitokko from (Zenkoku Nihon Niwatori Hozon-kai 2004, 57, 58)



Introducing the Miyazaki Jitokko brand

The prefecture's agricultural scientists in Miyazaki's livestock research began researching Jitokko in 1985. Their methods and criteria for selective improvement differed significantly from how Jitokko hobbyists initially developed and maintained the Jitokko breed. Prefectural researchers sought economic opportunities for the prefecture by establishing Jitokko as a foundation for Miyazaki prefecture's brand of jidori. A longtime prefectural employee explained the impetus for beginning research on Miyazaki Jitokko to me in an interview:

Miyazaki already had Miyazaki Beef. And there was Nagayama Pork. Then we had to make something for chicken to avoid missing out on the country-wide jidori boom, so we started conducting research at the Miyazaki livestock research facility. (Fieldnotes, February 2016)

The livestock scientists working for the prefectural government distinguish between the original breed of Jitokko — which they describe as having short legs, a beard, and feathers around its crown — and the research facility's improved breed, which has a larger body and normal-sized legs. The prefecture began selectively improving in Jitokko in 1985, and by 1987 introduced a commercial breed called “Miyazaki Jidori.”

A trailblazing grower by the name of Osugi, who experienced the early years of Miyazaki Jidori, explained during an interview in October 2015 the challenges he encountered when he tried to get customers to eat his Miyazaki Jidori:

At the beginning, I would tell customers, “This jidori is delicious so eat a bunch.” But Miyazaki has a long history of charbroiling the thigh meat from spent layers over coals. That was the normal way to do it. Tender was considered not delicious (*oishikunai*). And so, I would try to get them to eat my delicious jidori and fry it up. They would go, “Isn't this broiler?” I'd say, “No it's not. This is completely different from broiler.” They'd say, “Jidori is something way tougher.” However, I am happy that people have gradually come to understand my jidori. Back then, to be honest, only one out of ten people would try my chicken. (Fieldnotes, October 2015)

At the time of jidori's introduction in the 1980s and 1990s, the two main categories of chicken meat in Japan were soft meat from broiler chickens and tough meat from spent laying hens. Before the broiler chickens altered popular understandings of chicken meat in the 1970s, tender chicken meat from three to five-month-old spring chickens, called young chickens (*wakadori*) in Japanese, was an expensive delicacy (Matsumoto 1990). Miyazaki Jidori and other brands of jidori represented the introduction of a category of expensive chicken meat, reminiscent of the historical category of “young chickens,” that was tougher than broiler chickens but softer than

“spent” chickens. Before the category of jidori became widely recognized, retailers struggled to introduce this new category of chicken meat to the Japanese public.

To help meet these and other challenges, Miyazaki Jidori industry leaders founded the Council for Promoting Miyazaki Jidori (*Miyazaki jidori fukyū sokushin kyōgi-kai*) in 1996. One of the most pressing challenges for the council was the impending introduction of JAS Jidori (Yomiuri Shimbun 1998). The new standard threatened the legitimacy of Miyazaki Jidori, because it was less than half “native,” comprising $\frac{1}{4}$ Jitokko and $\frac{3}{4}$ White Plymouth Rock.³⁴ In 1998, Miyazaki officials changed the makeup of Miyazaki Jidori by introducing the Kyushu Rhode Island Red. The resulting composition of the commercial breed was $\frac{3}{4}$ native³⁵ with $\frac{1}{4}$ Jitokko, $\frac{1}{2}$ Kyushu Rhode Island Red, and $\frac{1}{4}$ non-native White Plymouth Rock.

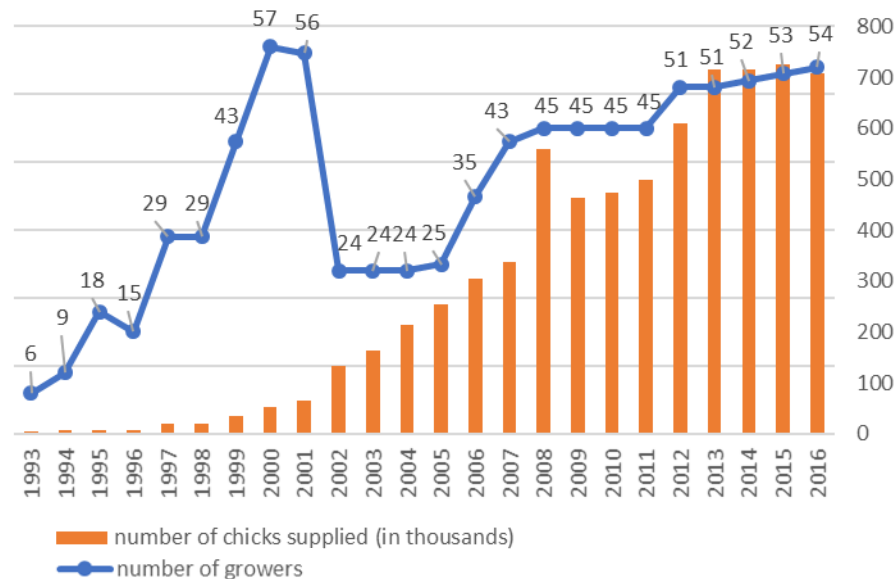
The Japanese central government introduced JAS Jidori in 1999. In 2004, Miyazaki Jidori changed its name to Miyazaki Jitokko and received JAS Jidori certification. Until 2001, growers received an average of 1,200 Miyazaki Jidori per year (see Figure 7.8). The number of small farms decreased after officials set minimum levels for production per farm, although officials allow room for negotiation. For example, one certified farm still produces only 1,200 Miyazaki Jitokko per year. The total number of chicks delivered to growers has continually increased, growing from 5,000 in 1993 to 52,000 in 2000, 559,000 in 2008, and 707,000 in 2016 (Miyazaki prefecture 2018). These increases in the number of Miyazaki Jitokko chicks indicate the broader growth of the brand. Following the scandal over mislabeled Hinai-jidori in 2007, industry leaders launched the Miyazaki Jitokko business cooperative in 2008. The cooperative emphasizes that certified hatcheries deliver Miyazaki Jitokko chicks to certified growers who in turn supply

³⁴ In the rest of the chapter I avoid putting native in scare quotes, but the term remains problematic. The Japanese term for native species and breeds is *zairaishu*.

³⁵ The exact percentage of native-ness attributed to Miyazaki Jitokko remains ambiguous. As I discuss in Chapter Seven, there is a stigma against eating chickens that are 100% Natural Monument. Much of the material created to promote Miyazaki Jitokko touts it as 50% native. The two likeliest explanations for this figure are that they underestimate the native-ness of Miyazaki Jitokko so that it corresponds to the JAS Jidori minimum levels, or that they consider Kyushu Rhode Island Red to be 50% native.

certified restaurants. These chains of certification help to ensure that consumers only encounter genuine Miyazaki Jitokko.

Figure 7. 8 Changes in Miyazaki Jidori/Jitokko Growers and Chicks (1993-2016)



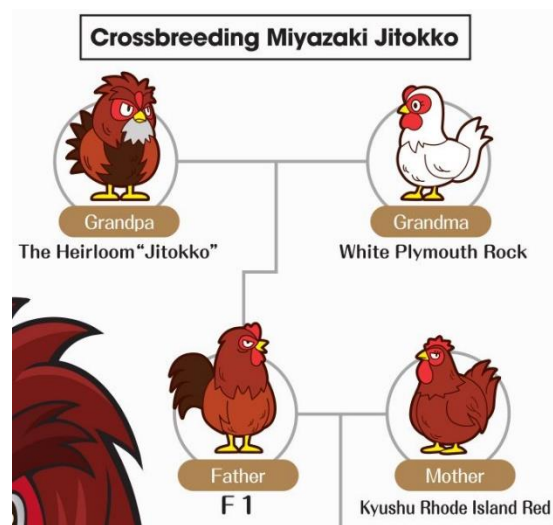
(Created by author based on Miyazaki prefecture 2018)

Prefectural research facilities and parent stock farms

Agricultural scientists at the prefectural livestock research facility in Kawaminami introduced a commercial breed of jidori for Miyazaki prefecture in 1987. They sought to improve Jitokko by not propagating chickens with defects such as weak legs, and by selecting for favorable characteristics such as appearance and size. The research facility also carried out taste tests of different chicken combinations to guide their selection process (Okuyama 2005). The prefectural research facility creates Miyazaki Jitokko through a specified combination of breeds and sexes (see Figure 7.9). Unlike broiler chicken clusters, where international corporations supply integrators with broiler chicken stock, Miyazaki Jitokko entails fewer obligations and thus enables greater grower independence. The prefectural research facility has no obligations to international broiler stock corporations or feed processing mills. The contract between the prefecture and Miyazaki Jitokko growers stipulates that the growers will adhere to the standards for Miyazaki Jitokko and raise Miyazaki Jitokko chicks. Otherwise, growers are free to raise and sell Miyazaki Jitokko as they see fit.

The prefectural research facility maintains the grandparent breed stock and crosses an improved Jitokko rooster with a White Plymouth Rock to produce an F1 hybrid. They deliver the F1 hybrid roosters and Kyushu Rhode Island Red hens as parent stock to five operations across Miyazaki prefecture that operate both parent stock farms and hatcheries for Miyazaki Jitokko. These operations collect fertilized eggs from the parent stock that they incubate. The hatcheries distribute the resulting day-old chicks as Miyazaki Jitokko, which they only distribute to certified Miyazaki Jitokko growers.

Figure 7. 9 Diagram of breeds combined to create Miyazaki Jitokko



I toured Miyazaki prefecture’s livestock research facility at Kawaminami in March 2016. The chicken science division of the research facility has 13 employees that raise between 3,500 and 4,200 chickens, which are Jitokko, Miyazaki Jitokko, Kyushu Rhode Island Red, White Plymouth Rock, and Satsuma-dori. Given the pictures of Jitokko that I found in documents, I was surprised to find that prefectural breeders have altered the characteristics of Jitokko to stress a circular crest of feathers around the head that obstructs its vision (see Figure 7.10). This work on establishing a singular look for the breed — a requirement for the prefectural brand — contrasts with the diverse types of chickens considered Jitokko and raised by hobbyists. The handiwork of selective improvement conducted by agricultural scientists is apparent in the long legs, large body, and frock of feathers obstructing the vision of the improved Jitokko (see Figures 7.1, 7.10, and 7.11).

Figure 7. 10 Crown of improved Jitokko in Miyazaki's prefectural breeding facility



Figure 7. 11 Improved Jitokko in elevated wire cages



In June 2017, I visited one of the five combination parent stock and hatchery operations for Miyazaki Jitokko in Nichinan. To access the hatchery, you must pass through a theme park replete with reproductions of Moai statues from Easter Island. A section of the one-lane road fell off the cliff during the last typhoon and was being repaired by workers, so we left our vehicle behind to walk on foot past the damaged section before getting into a small truck (*kei-tora*) to drive the final leg to the hatchery. The remote location helps to reduce the risk of diseases (see Figure 7.12).

Figure 7. 12 Nichinan breeder and hatchery operation for Miyazaki Jitokko



The operation has two chicken structures and a staff of four employees. Two dogs lived on the operation to ward off wild animals such as weasels and wild boar. When I visited, they were cleaning one of the chicken structures. The other housed 1,700 Kyushu Rhode Island Hens and 200 F1 roosters for a ratio of 8.5 hens per rooster. Daily tasks include feeding the chickens by hand once-a-day, collecting eggs, and cleaning the eggs. When I first entered the chicken structure, the Kyushu Rhode Island Red hens rushed over, curious to greet me, while the F1 roosters hung back (see Figure 7.13). The chickens seemed in excellent condition, with a full complement of feathers and lots of vocalization.

Figure 7. 13 Breeder farm with lighter colored F1 roosters and Kyushu Rhode Island Red Hens



The operation also has a hatchery where eggs are stored and incubated. They post egg delivery schedules on a prominent office calendar. Since it takes 21 days for eggs to incubate, they must diligently schedule ahead to make sure that farmers get their chicks on time. They give chicks vaccines for diseases such as Marek's disease before delivering them to farmers. During typhoon season, the hatchery and its incubator can lose power due to strong winds, rain, and the remote location. If the incubator loses power for too long, then the eggs will not hatch, which means no chicks for the commercial growers. To prevent this major disruption from occurring, the director of the operation receives a notification if the power goes out and drives through treacherous conditions to the hatchery so he can turn on the generator to power the incubator. The director of the operation stressed that these chickens and their eggs are the intellectual property of Miyazaki prefecture. In contrast, broiler chickens are the intellectual property of international broiler stock corporations that enter into contracts with domestic broiler chicken integrators.

Miyazaki Jitokko growers

In 2017, when I attended the general meeting of the Miyazaki Jitokko business cooperative, there were 54 certified grower operations. The main requirements for these operations are that they raise Miyazaki Jitokko, have a maximum stocking density of two birds per square meter, and raise roosters for a minimum of 120 days and hens for a minimum of 150 days. Miyazaki Jitokko's standards for stocking density are five times greater than JAS Jidori and eight times greater than typical broiler chickens. Miyazaki Jitokko's minimum lifespan is 80% longer than JAS Jidori and nearly three times as long as typical broiler chickens.³⁶ According to internal statistics from the Miyazaki Jitokko business cooperative, between 2013 and 2015 growers averaged a 73.6% survival rate. The growers I spoke with reported having survival rates as high as 95%, 90% and 85%. My interactions skewed towards more successful growers, and I also sensed that they sought to share their best results with me.

A typical Miyazaki Jitokko grower brings in a batch of 1,000 chicks per month and raises chickens in at least six different enclosures that enable growers to determine when chickens are old enough to be processed (see Figure 7.14). Due to concerns over avian influenza, Miyazaki Jitokko growers must install costly netting to keep wild birds out of their chickens' enclosures. I use the word enclosure, because most growers have an outdoor area and a sheltered area (see Figure 7.15). The sheltered area protects the chickens from the elements and contains automatic water dispensers and feed holders. A few growers have automatic feed dispensers, but most deposit the feed manually, moving it from a silo into a wheelbarrow and then scooping it from the wheelbarrow into the feeders. Filling the chicken feeders is one of growers' most labor-intensive tasks. Grower operations usually have at least two dedicated staff. Growers lament that they can seldom take a day off and cannot take extended vacations.

³⁶ The standards for JAS Jidori are a maximum stocking density of ten birds per square meter and a minimum lifespan of 75 days. For a typical broiler chicken operation, chickens have a stocking density of 16 chickens per square meter and live for 48 days. I calculated the difference in lifespan based on a 135-day minimum lifespan for Miyazaki Jitokko determined by averaging the minimum lifespan of Miyazaki Jitokko roosters and hens.

Figure 7. 14 Diagram of Miyazaki Jitokko grower operation

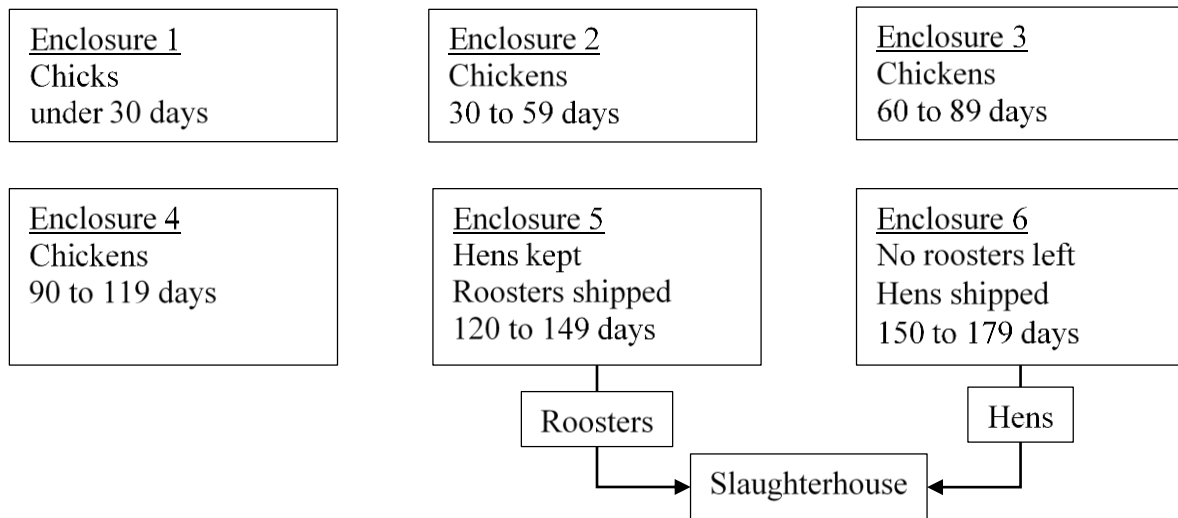


Figure 7. 15 Miyazaki Jitokko chickens with shelter and netting in the background



Miyazaki Jitokko growers strive to minimize the stress that their chickens experience. Chickens often peck each other when stressed, and cannibalism — a word for when chickens kill each other — is a leading cause of mortality. Debeaking reduces the damage inflicted when the birds peck each other but can itself become another source of stress. Since chickens become territorial over the sheltered area, weaker chickens often stick to the outdoor area. Since the water dispensers and feeders are in the structure, the weak chickens grow weaker and often die from cannibalism. Oshioka-san, who I feature in the collaborative ethnography project on YouTube, built a roof over all his enclosures and reported a noticeable improvement in production results (see Figure 7.16). Several other growers have similarly built roofs over their enclosures and done away with outdoor areas that can lead to territorial defensiveness and become a source of disease.

Figure 7. 16 Miyazaki Jitokko chickens with a roof over entire enclosure



Chickens are weakest when they arrive as day-old chicks from hatcheries. One agricultural scientist from the prefectural livestock research facility gave a presentation on caring for chicks to a group of young Miyazaki Jitokko growers. One slide declared in huge bold letters: “THE BATTLE IS DECIDED IN THE FIRST WEEK!” (*Nyūbina-go 1-shūkan ga shōbu!*). Growers have different strategies for raising chicks. Some have chick-specific structures that help them insulate the birds from outside weather. The downside is that they have to be transported from one enclosure to another, which causes stress. Other growers set up temporary enclosed areas within a structure that they gradually expand as the chickens grow larger. This strategy reduces the stress of moving the chicks but makes it more difficult to maintain ideal temperature and humidity conditions.

Growers receive feed from networks based out of Shibushi that also supply large broiler chicken operations. The grower’s manual divides the feed between the first period of three weeks, the middle period from four to fourteen weeks, and the finishing period from fifteen weeks onwards. The manual describes the finishing feed as being antibiotic-free (Miyazaki Jitokko 2013, 5). Similar to industrial chicken, Miyazaki Jitokko receive standardized antibiotic doses in their feed. Regulations require that growers cease giving antibiotics to their chickens eight days prior to shipping (*ibid.*, 17).³⁷ Miyazaki Jitokko have an average feed to meat conversion ratio of 4.16, which means that Miyazaki Jitokko put on 1 kg of weight for every 4.16 kg of feed they consume. A large broiler chicken company in Miyazaki prefecture’s feed conversion ratio is 1.87, less than half that of Miyazaki Jitokko. Unlike broiler chickens, Miyazaki Jitokko live longer and have both the build and the room to move. While chickens benefit from better welfare conditions, this method of production still requires the use of industrial feed and antibiotics.

The rainy season and summer are the most challenging times of year for growers. During the rainy season, the ground of the enclosure can become sopping wet and muddy, conditions that amplify the spread of diseases. During summer, Miyazaki Jitokko are at risk of dying from overheating. Having large shelters, fans, and other cooling mechanisms such as sprinklers can

³⁷ The Miyazaki Jitokko manual and the bags of feed did not provide further information on the type of antibiotics included in feed used during the first period and middle period.

prevent deaths from overheating. When I asked one grower how he was coping with the hot summer weather, he told me a sad anecdote (Fieldnotes, July 2017). He explained that while he does not have a sprinkler system, when the weather becomes dangerously hot he will run to the enclosure carrying a hose to spray water and cool his chickens. Once the birds overheat, there is little hope for saving them. He then described running over to a chicken enclosure in the stifling heat and spraying water from a hose but being too late. The biggest chickens overheat first and were already dying. When larger chickens die a grower incurs a larger loss, because larger chickens have consumed the most feed.

One longtime and successful Miyazaki Jitokko grower named Mori emphasized the importance of observing chicken behavior and thinking about what causes them to act the way they do. He neither debeaks his chickens nor moves them to different enclosures. For a while he did debeak, but he decided that the chickens looked pitiful (*kawaisō*), so he stopped debeaking. Mori described sitting for hours and watching how one alpha male rooster would run around picking fights with chicken after chicken. One strategy he developed to reduce the stress for his chickens is to put feed in lengthy feeders he built from bamboo. This helps the weaker chickens get access to food and avoid becoming targets of larger chickens. As Miyazaki Jitokko insiders explain it, anyone can work in a slaughterhouse, but to be a successful grower requires an ability to pay attention to how chickens act and to catch problems early, before they afflict the whole flock.

When I asked what message longtime grower Mori would want to convey to consumers, he replied that he wanted consumers to understand why Miyazaki Jitokko is so expensive. At a subsequent gathering in June 2018 with two other industry insiders, he quipped, “People say, ‘[Miyazaki Jitokko] is definitely delicious and expensive. You must be making a bunch of money!’” An insider chimed in, “That doesn’t mean we are making any money!” Mori and the other leaders stated their goal of ensuring that Miyazaki Jitokko growers maintain profits of at least 500 yen per bird. Using these calculations, a grower operation that receives 1,000 Miyazaki Jitokko per month with a 73.6% survival rate would make 368,000 yen per month (~\$3,400). A 95% survival rate would generate 475,000 yen per month (~\$4,400). Miyazaki Jitokko growers produce chicken meat that costs far more than generic industrial chicken meat. Since most growers and workers on these operations are in the working and middle class, they are producing a luxury good they would rarely, if ever, eat were it not for their profession.

Direct marketing

Half of Miyazaki Jitokko growers direct market. The other half are contract growers that deliver fully grown Miyazaki Jitokko to companies that handle processing, distribution, and marketing. Among grower operations that direct market, a handful own a restaurant or direct marketing store; the majority sell their meat throughout Japan to *izakaya* (Japanese-style bars) and restaurants specializing in chicken meat, such as *yakitori* (chicken parts on skewers) restaurants. Many of these restaurants are in Fukuoka, Tokyo, and the Kansai area. Growers who direct market strive to cultivate new customers while maintaining their existing relationships. Weekly orders peak to meet the weekend demand; seasonal orders peak around New Year's and Golden Week. Growers deliver chicken meat directly to nearby restaurants and send the rest by refrigerated shipping services. To process the chicken meat, direct marketing operations typically have one or two dedicated slaughterhouse workers. The main tasks are killing and bloodletting the chickens, defeathering, processing into pieces, packaging, and shipping. Many of these small slaughterhouse and processing operations hire family members.

A younger grower named Ōshima, who direct markets, invited me to visit his farm on several occasions. Once he allowed me to take part in his daily tasks (Fieldnotes, August 2017). He explained that one of the challenging parts of his job is the long hours of each day he must commit to work even if he is not working hard the whole time. Chickens respond to the sun, so they are active longer during the summer, when he must be at the farm early to feed them and then wait until the sun goes down to catch the ones to process the next morning. On the day I tag along, we go over to the enclosure where chickens are between 120 and 150 days (Enclosure 5 in Figure 7.14) to catch roosters. He stalks around in the dim light looking for larger and tranquil roosters, sometimes feeling their bulk. When he finds one, he yanks it by the legs and then holds it upside down.

Use the correct technique and the birds will spread their wings out and go limp. He gives me a bird to carry. I gingerly carry it towards the plastic crates in the back of his small truck (*kei-tora*). Carrying two birds in each hand, Ōshima zooms past me and flips the chickens into the plastic crate. I try to coax my bird in, a strategy that backfires. Ōshima indulges me to experience carrying a few more chickens, and then we move on to collect hens from the sixth enclosure. He snags hens, hands them to me, and then passes by with his hands full of chickens. Once in the

plastic cages, the birds appear complacent. Ōshima, his sister, and mother will process the chickens the first thing the next morning.

To my knowledge, all Miyazaki Jitokko are slaughtered by hand with sharp knives used to sever the bird's carotid artery in the neck. Aside from scalding and defeathering, workers eviscerate and process Miyazaki Jitokko by hand. Broiler chicken slaughterhouses use conveyor belts that automatically carry chickens through electric bathes for stunning, scalding to loosen the feathers, defeathering to remove the feathers, and eviscerating to remove the internal organs. Hand-slaughtering is slower and reduces the chance that a still-conscious bird will continue to the next stages.

Besides tending, catching, slaughtering, and processing Miyazaki Jitokko, growers who direct market must also manage the marketing and retailing of their chicken. This entails more work and yet another skill set. Direct marketing gives growers control over distribution. Once they have established relationships with retailers, they can expand through word of mouth and expend less effort on marketing. As marketers they face challenges with retailers coming and going, especially during economic downturns.

Tsukada Nojo and the travails of the corporate farm-to-table

Contract growers deliver live chickens to companies that kill, process, market, and distribute Miyazaki Jitokko. The largest of these organizations is AP Company, a corporation that created a nationwide chain called Tsukada Nojo, which began by specializing exclusively in Miyazaki Jitokko. AP Company established a company called Jitokko Land in 2005 to manage the production, processing, and distribution of Miyazaki Jitokko. According to a Jitokko Land report commemorating its 10th year anniversary, Jitokko Land contracted with 22 (41.5%) of the 53 Miyazaki Jitokko growers. Two other organizations in this business are the Hyūga agricultural cooperative (JA), which contracts with five growers, and a food company called “Idea” that operates chain *izakaya* and contracts with three growers. Contract growers that deliver to these organizations focus on maximizing the efficiency of their production.

Contract growers benefit from processing their chickens as soon as they reach the minimum age requirement set by the Miyazaki Jitokko standard. A contract grower like Ōshima removes roosters from Enclosure 5 and hens from Enclosure 6 over the course of a month (see Figure 7.14). In contrast, contract farmers can deliver all their 120-day-old roosters and 150-day-

old hens to the slaughterhouse on the same day. Jitokko Land's slaughterhouses also enforce strict standards and will only buy A-grade chickens. Jitokko Land gives a B-grade to chickens they deem to be too small or otherwise deficient. They process these chickens and then return them to the grower. Farmers must either eat B-grade chickens themselves — which can be too much Miyazaki Jitokko for any one family — or give them away as gifts, or sell them through informal networks. While contract growers benefit from delivering their chickens as soon as possible, they lose the ability to allow smaller chickens time to grow larger or to match the qualities of their chicken with the needs of different retailers.

The biggest concern for contract growers is their dependence on a lone company to make effective business decisions. The trajectory of Tsukada Nojo, which rapidly expanded but has recently contracted, highlights the promises and perils of relying on large corporations. Yoneyama Hisashi founded AP Company, Tsukada Nojo's parent corporation, in 2001 and is still its CEO and driving force. After working in real estate and then running a darts bar in Tokyo, Yoneyama opened a jidori-themed *izakaya* in 2004, the same year Miyazaki Jitokko gained JAS Jidori certification. Yoneyama decided to jump-start his jidori-restaurant model by establishing direct connections with Miyazaki Jitokko growers. He reasoned that by cutting out the middleman, he could deliver a delicious 7,000 yen (~\$66) meal to customers for half the price at 3,500 yen (~\$32) (Yoneyama 2012, 62). Yoneyama struggled to connect with Miyazaki Jitokko growers and industry leaders; eventually, he garnered their trust in Nichinan, and entered into a contract. AP Company's corporate magazine describes this as a crowning achievement for Miyazaki Jitokko leaders in Nichinan: "they were finally able to make a contract with a large Tokyo corporation! In Nichinan, the contract was signed, and everyone was happy" (Miwa 2016, 16). In 2005, Yoneyama founded Jitokko Land in order to organize Miyazaki Jitokko production, processing, and shipping for AP Company.

Yoneyama sought to expand Miyazaki Jitokko production to meet the demands he envisioned for his corporate farm-to-table chain restaurant, so he tried his hand at chicken farming. Instead of purchasing the chicken housing for 12 million yen (~\$105,000), he and his colleagues decided that they would build it themselves for one fourth the cost at three million yen (~\$27,000). In 2006, they completed a slaughterhouse and began operating Yoneyama's farm. This farm was in a district (*chi-ku*) called Tsukada. Yoneyama decided to name his new Miyazaki Jitokko-themed restaurant chain Tsukada Nojo, combining the name of the district

with the Japanese word for farm (*nōjō*). This farm remained under corporate control and operation, but when I visited the site in August 2017 it had been abandoned for years (see Figure 7.17).

Figure 7. 17 Abandoned Miyazaki Jitokko farm in Tsukada that Yoneyama helped build



After establishing a successful cluster for Miyazaki Jitokko production in Nichinan, AP Company built a second cluster in Saito with greater capacity than Nichinan in 2013. AP Company also moved beyond Miyazaki by opening Kagoshima and Hokkaido variations of Tsukada Nojo, serving jidori and cuisine unique to those prefectures. The number of Tsukada Nojo increased from 111 in 2014 to a peak of 155 in September 2016, before declining to 149 in March 2018.

The number of Tsukada Nojo franchises is declining because it expanded too quickly and now faces competition from other corporate chain restaurants that emulate the strengths of Tsukada Nojo but cut costs. A report in a business newspaper called *Toyo Keizai* criticizes AP Company for building restaurants faster than they could train management (Tokiwa 2017). According to the report, more than half of Tsukada Nojo restaurants lack sufficient managerial staff, which can lead to fundamental breakdowns such as slow service.

Although Tsukada Nojo was the first national chain to specialize in jidori, other more experienced corporations quickly copied this model. The largest of these chains is Yamauchi Nojo, which had 217 jidori franchises across Japan in 2017 (Monetroza 2017). A major Japanese food corporation called Monteroza that operates over 2,000 food businesses throughout Japan established Yamauchi Nojo in 2012 using a Kagoshima prefecture theme. Yamauchi developed a corporate brand of chicken called Satsuma Yamauchi Jidori, set to JAS Jidori minimum levels, that received JAS Jidori certification in 2014. Like Tsukada Nojo, the Yamauchi Nojo menu features pictures of smiling farmers, beautiful farms, and regional cuisine (Yamauchi Farm 2017). Unlike Tsukada Nojo, Yamauchi Nojo does not have work retreats for employees to learn about the conditions of production. While both franchises use similar farm-to-table rhetoric, Yamauchi Nojo and its parent company Monteroza hold fast to the bottom line of profitability.

These setbacks for Tsukada Nojo dimmed AP Company's enthusiasm for the prospects of its corporate farm-to-table franchise. In an interview, CEO Yoneyama said, "We are clinging too much to our experience of success. It feels as if the Tsukada Nojo boom has passed" (Tokiwa 2017). While AP Company can realign its corporate goals, the people and regions that invested in Miyazaki Jitokko infrastructure have far less flexibility to adjust. If the AP Company's use of Miyazaki Jitokko continues to decrease, it could undermine the economic viability of growers who contract with Jitokko Land and create a glut of Miyazaki Jitokko that threatens the broader Miyazaki Jitokko market.

Training retreats and sixth industry visions

Training retreats (*kenshū*), where employees who work in Tsukada Nojo restaurants travel to learn about the origins of the chicken meat they serve in the restaurant, are a key mechanism for AP Company to instill unity and passion in their workforce. I attended two of these employee trainings — one at Nichinan, Miyazaki prefecture, in September 2016; the other at Kirishima, Kagoshima prefecture, in October 2016. The activities at both trainings were similar. Employees spoke with farmers, had a party at a company restaurant, and toured a farm, slaughterhouse, processing facility, and storage facility.

The mission of the AP Company is "In pursuit of what Japanese food should be." It portrays itself as an exemplar of the "sixth industry" model (*roku jisangyō*) (Yoneyama 2012). Sixth industry is a buzzword in Japan that refers to cooperation between the first industry of

primary resource extraction; the second industry of manufacturing, processing, and shipping; and the third industry of retail and service. This numerical categorization of industries derives from mid-20th century economic theory (c.f. Wolfe 1955). For Tsukada Nojo, the first industry consists of the farmers that produce the chickens; the second industry consists of slaughterhouses, processing, storage, and shipping operations; and the third industry is the restaurant franchises. AP Company touts this holistic approach to food for inspiring greater passion, motivation, and ingenuity from their employees.

When restaurant employees interviewed growers who attended the retreat, higher-level employees sat at a different table playing pop music, which contributed to an informal atmosphere and conversations full of candor. After a farmer explained some of the challenges of raising Miyazaki Jitokko, an employee asked, “Do you ever think about quitting?” The grower replied, “I can’t say I’ve never thought about it.” He then quickly turned the tables on the employees by asking if they intended to always work for Tsukada Nojo.

In both Nichinan and Kirishima, AP Company hosted a party for both employees and farmers at the company restaurant. Early the next morning, the training group visited a slaughterhouse where a few of them tried their hands at slaughtering chickens. In Nichinan, a slaughterhouse employee enthusiastically explained the process. He gestured to the blood and feathers on his arms. “This is what it looks like. We kill the chickens. Cut them up.” The Tsukada Nojo employees who tried to kill chickens wore white protective suits (see Figure 7.18). As we moved through the facility in Nichinan, I thought that the event helped restaurant employees recognize the labor and contributions of slaughterhouse employees. As we exited the slaughterhouse, I glanced around the corner and saw a worker furtively smoking a cigarette next to a reeking stack of plastic crates filled with dead chickens.³⁸ Just then, someone chastised the smoker to get back to work. The harsh words reminded me of the difficult conditions borne by slaughterhouse workers.

³⁸ The slaughterhouse must wait for an official disposal service to remove the chickens that die prior to slaughter.

Figure 7. 18 Tsukada Nojo employees assisting a slaughterhouse employee



During the Kirishima training, I tried my hand at killing chickens. Having stated my intention to participate, I, along with three other Tsukada Nojo employees, changed into a white ibex suits, white rubber boots, and cloth gloves. The slaughterhouse uses upturned cones into which workers place the chickens headfirst. They kill the chickens using a razor blade to make two incisions on each side of the throat inside of the bird's mouth. Done correctly, the incisions sever the carotid artery, causing blood to spurt from the mouth and a quick death.

The slaughterhouse employee demonstrated for me on a couple of chickens. Unlike the professional, I struggled. First, you need to force the chicken's mouth open to make the incisions. The proper technique consists of a swift jerk and twist with the left hand. I tried to ease the chicken's mouth open, which only succeeded in agitating the bird. Worse was my inability to sever the carotid artery. While the jugular vein is visible, the carotid artery lies within the neck muscle (Humane Slaughter Association 2015). I have no experience working with a razor blade or cutting into a live animal. I hesitated to exert too much pressure on the blade because my unprotected left hand was directly behind its neck. I tried to make the proper incisions and then sought the worker's approval. He would grimly shake his head, then finish the job, then ask if I wanted to try again. After about four chickens, he asked if I wanted to try another row. I declined. Later, when our group gathered for a debrief, the slaughterhouse employee asked me

how it was. I replied, “I couldn’t do it well. Of course, it’s difficult.” He responded that he now has two years of experience, but at first he was often scolded. Shoddy slaughter technique is not just an animal welfare issue; it lowers the quality of the resulting meat.

Figure 7. 19 Slaughterhouse employee (foreground) instructing author (in white) how to kill a chicken



I have mixed feelings about how the company provides restaurant workers with the opportunity to experience killing chickens. The emphasis on firsthand killing results from a laudable aim of instilling reverence for the life that is taken to make chicken meat. Yoneyama writes,

For the part-time staff, we always show them a DVD that tells the story of how jidori are produced, shipped, slaughtered, and processed. The staff often turn their eyes away from the scene when chickens are killed. No matter what they are feeling, I believe that recognizing this sacrifice of life helps to instill a feeling of gratitude. That is why with a feeling of respect, I want people to eat every last delicious morsel. This is not the kind of thing that you can convey in a manual. (Yoneyama 2014, 8)

From his explanation, I agree with encouraging part-time employees to watch the DVD and taking groups on training retreats to visit the slaughterhouse. For people like myself, however, with no background relevant to killing animals, the attempt to experience the slaughtering of a chicken will probably inflict greater suffering on the chicken. The outcome conflicts with the goal of cherishing the life that is being sacrificed. On the other hand, inflicting violence on a chicken is an act all too distant from most eaters. Once the idea and opportunity of killing a chicken takes hold, something almost primal carries you toward the act from which, knife in hand and chicken waiting, there is no turning back.

Miyazaki Jitokko cuisine

Three chicken dishes from Miyazaki prefecture stand out as representative: chicken nanban, raw chicken, and charbroiled chicken. Each dish raises a different set of issues for restaurants that prepare and sell Miyazaki Jitokko.

Chicken nanban

The nanban from chicken nanban means barbarian: it refers to non-Japanese, especially of Iberian origins.³⁹ One of the earliest known Japanese cookbooks from the 17th century is the Nanban Cookbook (*Ryōrisho*), which called for the use of eggs and chicken meat even though both ingredients were still stigmatized within Japanese high society (Rath 2010). Chicken nanban's origins trace to post-WWII Miyazaki prefecture, when a restaurant in Nobeoka City created a dish consisting of fried chicken topped with a sweet tartar sauce. Two competing restaurants, "Ogura" and "Nao-chan," claim to have invented chicken nanban.

The issue for using Miyazaki Jitokko to prepare this staple of Miyazaki prefecture's cuisine is that broiler chicken's soft texture and neutral flavor is arguably better suited for chicken nanban. Since people from Miyazaki usually eat chicken nanban prepared with broiler chicken, some consumers find the taste and texture of preparing it using Miyazaki Jitokko to be less palatable. Some Miyazaki Jitokko insiders shared with me their preference for the taste of

³⁹ Nanban is a derogatory but antiquated-sounding word. Also of note, nanban art (*gijyutsu*) refers to a school or artwork in Japan influenced by foreign art.

broiler chickens over Miyazaki Jitokko for both fried chicken and chicken nanban. These insiders maintained that Miyazaki Jitokko should be prepared in a way that accentuates its unique taste profile.

Most jidori restaurants serve broiler chicken meat alongside jidori. The type of meat used for different menu items can be difficult to figure out even after carefully reading the menu. A common industry practice for restaurants that serve both jidori and broiler chicken is to include the jidori name in item titles or descriptions on the menu. Absent the jidori name, customers are expected to assume that the restaurant prepares the item using broiler meat. These minute distinctions over labeling became newsworthy on May 22nd, 2018, when the Consumer Affairs Agency announced that Tsukada Nojo violated food labeling laws by mislabeling items such as chicken nanban. The statement was damaging for AP Company and their Tsukada Nojo franchises. The Consumer Affairs Agency's reasoning was that Tsukada Nojo wrote *jidori hitosuji* on the cover of its menu. This phrase has no direct translation into English, but roughly means "true to jidori." The menu also explains the standards underpinning Miyazaki Jitokko. Following industry practices, the menu does not state when menu items are not made from jidori. Given my understanding of the accepted practices for jidori restaurants, the ruling surprised me.

Figure 7. 20 Chicken nanban served at Tsukada Nojo



Yamauchi Nojo, for example, uses almost the exact same labeling on their menu. The cover of the menu states that it is a Jidori specialty restaurant, and the inside explains the jidori standard. Dishes such as fried chicken, which are not labeled as containing jidori, are made from broiler chicken.

I spoke over the telephone with a representative of the Consumer Affairs Agency, who concurred with my observation that the industry standard is to assume that absent the jidori's name, the restaurant prepares an item using cheap industrial chicken. He said,

There are probably many menus where the name is not written explicitly. When the name is not written, no matter what you use, it is not, as you say, a clear-cut lie. In Tsukada Nojo's case, when we took into account the entire menu provided by the company, the message came across very strongly that they were using chickens branded with the name Jitokko, so we decided that this was a deceptive company practice.⁴⁰ (Fieldnotes, June 2018)

According to the Consumer Affairs Agency official, they only instigate an investigation when a consumer, whose identity remains anonymous, files an official complaint. There was no indication that the agency compared the practices of Tsukada Nojo to the rest of the industry, including other chains like Yamauchi Nojo. A far more equitable action by the agency would have been to notify Tsukada Nojo and all other jidori chain restaurants that they must clearly label what type of chicken meat they use for different menu items.

The ruling led to a second round of negative publicity for Tsukada Nojo when the Consumer Affairs Agency announced a fine of nearly one million yen (~\$90,000) on March 1st, 2019. Popular media described the incident as though Tsukada Nojo had intentionally misled consumers (Asahi Shimbun 2019). The grounds are weak for singling out one company based on an anonymous consumer complaint when other companies, as far as I can tell, are doing the same

⁴⁰ In reaching their conclusion about what constitutes a deceptive act, the representative explained that they relied on the Japanese translation of the US Federal Trade Commission Act, Section 5 of which declares:

- “An act or practice is deceptive where
- a representation, omission, or practice misleads or is likely to mislead the consumer;
 - a consumer's interpretation of the representation, omission, or practice is considered reasonable under the circumstances; and
 - the misleading representation, omission, or practice is material.”

thing. This decision, while motivated by a concern for consumer transparency, effectively sanctions Tsukada Nojo for taking too much pride in their commitment to promoting Miyazaki Jitokko.

Raw Chicken

Raw chicken is a popular delicacy in southern Kyushu's Miyazaki and Kagoshima prefectures. An apocryphal story holds that people living in the mountains were too far from the ocean to get fish sashimi, so they ate chicken as sashimi instead. The two most common ways of serving raw chicken are seared tartare (*tataki*) or sashimi (raw). Another, less common way to serve it is marinated in a soy (*shōyu*) or soy citrus (*ponzu*) sauce. Specialty *izakayas* serve chicken sashimi not just from thigh and breast meat but also from the organs, such as gizzards, stomach, heart, and liver. Of all the organs, liver is the most likely to cause food poisoning. Liver is also the most sought-after by customers. The Japanese government banned retailers from selling raw beef liver in 2012 after five people died from eating raw ground beef (*yukke*) served at a *yakiniku* (Korean-style barbeque) restaurant in 2011 (Japan Times 2011). In 2015, the government banned raw pork liver, too (Nagata 2015). Raw food fanatics bemoan the banning of raw beef liver and seek out chicken liver as a consolation (Taniguchi 2013).⁴¹

Similar to what DeSoucey (2016) describes with *foie gras*, I encountered several situations when eating raw chicken helped to establish my credentials among industry insiders. By eating raw chicken, I proved myself as a unique foreigner who eats and enjoys raw chicken. I often took people who visited me in Miyazaki to eat raw Miyazaki Jitokko, because it is a memorable experience and highly palatable, especially when paired with soy sauce, ponzu sauce, or sesame oil and salt. I became more conservative, however, as I learned of the health risks posed by raw chicken.

The first time I ate raw chicken in Miyazaki, I felt both like I was breaking a taboo and that raw chicken was somehow magically safe in Japan. Once I became attuned to the possibility of raw chicken, I noticed that it was all around me, and not all of it was from pristine *jidori*. The supermarket down the block from my house sold partially raw chicken *tataki* for between 200 to

⁴¹ Raw horse (*basashi*) liver also remains legal.

300 yen (~\$2 to \$3). I ate raw chicken assuming it was safe until I met with a professor at Miyazaki University who explained that people often get sick from eating raw chicken, especially raw liver. The professor kept saying a word I did not understand, so I asked him to write it in my notebook. He wrote in all capital letters CAMPYLOBACTER.

Figure 7. 21 Chicken *tataki* sold at the supermarket near my apartment



Left: The sign above the Chicken *tataki* reads: We are committed to Miyazaki's local food systems (literally: locally consumption of local products) (*Watashitachi wa Miyazaki no chisan-chishō ni kodawarimasu*)

Figure 7. 22 Chicken *tataki* and chicken *sashimi* made from broiler chicken



Figure 7. 23 Chicken sashimi with liver (left) and heart (right) made from Miyazaki Jitokko



In 2003, campylobacter surpassed salmonella to become the leading cause of food poisoning in Japan (Misawa 2013). While salmonella food poisoning plummeted, Japan endures over 300 incidents of food poisoning originating from campylobacter per year. Due to a spate of

food poisoning incidents from raw chicken in the mid-2000s, Miyazaki prefecture introduced a guide for raw chicken meat in 2007 (Miyazaki Prefecture 2007). The guide sets temperatures for meat storage and instructions for keeping the internal organs separate from the rest of the meat.

I spoke with officials in charge of food hygiene related to raw chicken for offices in both Miyazaki City and Miyazaki prefecture. The officials explained that the government's position is that chicken meat should always be thoroughly cooked. For those who persist with raw chicken meat, however, the guide helps reduce food poisoning incidents. The prefecture also requested that restaurants remove raw chicken from course meals where children, elderly, and other at-risk populations might be pressured into eating raw chicken against their better judgment. Inspectors visit small-scale chicken slaughterhouses and give recommendations to farmers on how they can improve their operation. Miyazaki Jitokko growers described regular visits from these officials.

While raw chicken remains an uncommon dish, Japanese consumers regularly eat raw chicken eggs, which are supposed to be safe. Iconic Japanese dishes call for the use of raw egg, such as raw egg on rice (*tamago kake-gohan*) and in *sukiyaki*, a dish in which boiled meat and vegetables are dipped in a sauce with a raw egg base before eating. In 2011, a 74-year-old woman from Nobeoka City, Miyazaki prefecture died a week after falling ill from eating a raw egg infected with salmonella (Yomiuri Shimbun 2011). The woman's family pursued litigation, and in 2014 a judge ruled in their favor, ordering the "Nobeoka Poultry Farming Association" (*Nobeoka Yōkei Jigyō Kumiai*) to pay 45 million yen (~\$420,000) to the family for failing to sanitize their facilities properly and prevent salmonella (Asahi Shimbun 2014).

Unlike the accepted practice of eating raw eggs, organizations deflect responsibility for raw chicken at multiple stages. Prefectural food safety organizations caution against eating raw chicken, but they also introduced a safety guide for raw chicken and conduct safety inspections of small slaughterhouses. The Miyazaki Jitokko business cooperative does not endorse serving raw Miyazaki Jitokko. Growers request that restaurants not serve their chicken raw, establishing plausible deniability. These layers of denying responsibility mean that, while much of the onus falls on the restaurant, still more, arguably, falls on individual eaters. While restaurants can be shut down for several days and suffer reputational and economic damage, eaters are putting their bodies on the line and exposing themselves to a small but real risk of which many are unaware. When people eat raw chicken, they typically avoid food poisoning and then, drawing on embodied experience, assume that other raw chicken dishes are safe for themselves and others to

eat. If customers suffer adverse health consequences, the “eat at your own risk” (*jiko-sekinin*) mantra applies.

In the literature of critical food studies, raw milk is the commodity that most resembles raw chicken. In the mid-1910s, local governments in the US required pasteurization, a process named after French biologist Louis Pasteur, in which milk is heated to kill harmful bacteria. DuPuis (2002) shows that while pasteurization reduced the risk of food poisoning from milk, it also contributed to the industrialization and consolidation of the US milk industry. Enticott (2003) examines the practice of consuming unpasteurized milk in an English village and analyzes the tension between discourses of risk analysis, the quality turn, and “situated identities and moralities.” He finds rural identity to be a central motivator for imbibing unpasteurized milk, because it provides connection within rural culture and communities. Paxson (2008) coins the term post-Pasteurian to describe the broader recognition within medical science and the food business that not all microbes are bad. She describes how artisan cheese-makers propose a different health paradigm for evaluating the value and safety of living food.

In using the phrase disease ecology to describe food poisoning, I draw attention to the liveliness of food. The living bacteria in meat interacts with our bodies, which host a dizzying ecology of billions of bacteria. Advances in microbiological research provide insights into the complexity of these interactions. A growing subfield of medical research examines the microbiome — the word for the bacteria that humans host — and some raise alarm that contemporary microbiomes suffer from the loss of microbial diversity, which contributes to a multitude of modern health ailments (Blaser 2015). While I never encountered claims that raw chicken meat provides any benefits to the microbiome, attentiveness to the microbiome helps us to better understand the dynamic and relational processes through which food poisoning from campylobacter occurs.

Charbroiled chicken

Unlike chicken nanban, which does not accentuate Miyazaki Jitokko’s flavor profile, and raw chicken, which poses a food safety risk, industry leaders embrace charbroiled chicken without reservations as a dish that is representative of Miyazaki cuisine and brings out the deliciousness of Miyazaki Jitokko. The dish is prepared by charbroiling thigh and/or breast meat over coals, and is usually seasoned with salt and pepper and accompanied by a citrus pepper

(*yuzu koshō*) condiment. The only drawback to charbroiled chicken is that it requires the use of coals, which requires a special grilling area and ventilation. The coals also cause the chicken meat to take on a greyish hue. On the positive side, the simplicity of the dish allows customers to appreciate the texture and flavor of Miyazaki Jitokko (see Figure 8.24). Given the popularity of this dish, Miyazaki Jitokko *izakaya* often sell out of thigh and breast meat while struggling to sell the other parts of the chicken such as the wing and organs.

Figure 7. 24 Charbroiled Miyazaki Jitokko with both thigh and breast meat



Conclusion

The Jitokko breed originated from the mountainous region near the border of Miyazaki and Kagoshima prefecture to become an important brand for Miyazaki prefecture and cuisine. The prefectural research facility improved and accentuated features of the bearded Jitokko, which then provided the basis for Miyazaki prefecture's brand of jidori. Growers face many challenges because of Miyazaki Jitokko's strict standards. AP Company accelerated the growth of Miyazaki Jitokko in 2005 when it entered into a partnership with the brand through Jitokko Land and the restaurant chain Tsukada Nojo.

The contradictory goals of different state actors hinder the viability of Miyazaki Jitokko. While the state promotes the idea of regional food and cuisine, the actual policy of MAFF and the Consumer Affairs Agency shows a disregard for the structural challenges facing a brand like Miyazaki Jitokko. MAFF's decision to reduce the minimum lifespan for JAS Jidori in 2015 places Miyazaki Jitokko at a disadvantage against more industrial brands that are able to further

cut their prices in comparison to Miyazaki Jitokko. The Consumer Affairs Agency decided to sanction Tsukada Nojo even though the restaurant chain was using widespread industry practices. Both of these decisions were reached through bureaucratic processes sheltered from public scrutiny by offices that claim to be acting in the public interest.

The recent contraction of Miyazaki-themed Tsukada Nojo restaurants could be an indicator of overexpansion that causes uncertainty in the Miyazaki Jitokko market. Two of the representative chicken dishes within Miyazaki cuisine each raise different issues for the use of Miyazaki Jitokko. Chicken nanban fails to accentuate Miyazaki Jitokko's unique taste profile and raw chicken increases the risk of food poisoning. Charbroiled chicken is the dish from Miyazaki cuisine that best accentuates the flavor profile of Miyazaki Jitokko without raising food safety risks.

Miyazaki Jitokko creates opportunities for a range of actors to connect through the agriculture of the middle and contributes to greater grower independence and higher animal welfare standards. Through the place-based connections to Miyazaki culture, history, and cuisine, Miyazaki Jitokko evokes and nourishes eaters' social trust.

Chapter Eight. Interlude: Collaborative ethnography on YouTube

As my dissertation research progressed over two years and I developed relationships with people affiliated with the Miyazaki Jitokko brand, some encouraged me to promote Miyazaki Jitokko. Given how much time and consideration people took to answer my questions and provide access to their operations, I sought to reciprocate through my unique role as a PhD researcher. I was attentive to their interest in becoming better known to consumers, given the challenges the Miyazaki Jitokko industry faces explaining the cost, quality, and meaning of their meat compared to industrial broiler chicken.

I realized that my approach would be different than most visual ethnographies of food. Alternative food researcher and anthropologist Cristina Grasseni (1998), for example, made a documentary film based on her research on uplands dairy farmers in Italy. The relationships she documents between herself and her collaborators were of a different kind than I experienced. In one scene, Grasseni videotapes women who are watching a video of their partners talking and making cheese. One woman turns to the camera and says, “Cristina, next time you go up, get him to pose and send kisses to his wife.” Another woman jokes, “He’ll get beaten up if he does.” This exchange reveals the playful and warm relationship between the researcher, the women, and their husbands. YouTube videos, however, are shorter and curated to portray things in a positive light. This creates a tension for ethnographic researchers who use participant observation, because in most cases, YouTube is an inappropriate medium for sharing unfiltered experiences from the field.

Keeping in mind Lassiter’s (2005) powerful arguments for collaborative ethnography, I used YouTube as the mechanism for creating and sharing videos about Miyazaki Jitokko with collaborators in the industry. I was surprised to find that many scholars use the term digital ethnography to refer to mining and analyzing data from user-generated media on the internet available through platforms like YouTube, Instagram, and Twitter. This extractive, impersonal process elides the crucial exchanges that occur between researchers and the communities they study that are, to me, the core characteristic of ethnography. In other words, ethnography is not reducible to data extraction. Rather, it encompasses situated observation, participation, exchanges, and reflection.

As a PhD researcher, I had unique access to growers and retailers. I also knew aspects of these operations I wanted to share with others. I had no experience, however, shooting, editing, or publishing YouTube videos or vlogs. In order to create the video, I purchased a Sony a6000 digital camera for around \$600 and other supplies — a camera case, bendable tripod, and 64 gigabyte high speed SD memory card. I selected the camera because it is compact, has an auto focus feature for video, and is suitable for novices. I also purchased the Cyberlink video editing suite for \$80. My biggest problem in editing the videos was that I ran the program on my laptop but kept the video data on an external hard drive, causing the program to slow and occasionally crash.

I tried to follow the same steps for each vlog. Before shooting on location, I explained the idea for the project to the collaborator, who was a farm owner, restaurateur, or corporate employee. If the collaborator expressed enthusiasm for the project, we would choose a time to shoot the video. I suggested the project only to people who I thought would be receptive, and as it turned out, all of them eagerly agreed to participate. I selected collaborators with an eye towards portraying different farms and restaurants. The restaurants included a ramen shop, a local izakaya that specializes in raw chicken, and Tsukada Nojo, a corporate chain restaurant. When filming at the restaurants, I invited a friend or two to join. The farmers included a direct marketer and two growers who contract with Tsukada Nojo. Before filming, I spoke with my collaborators about the questions I was planning to ask and inquired if there was additional information that they would like to include in the video. At the end of each interview with my main collaborators, I suggested that they encourage viewers to try their chicken.

For each video, I edited a rough draft, and then watched it with my collaborator. I edited these videos with the intention of being supportive of my collaborators and Miyazaki Jitokko. In one instance, for example, I edited out an image of a chicken with a genetic deformity. Three collaborators edited the videos with me, showing me what they wanted to cut. This process forced me to consider perspectives of the general public and any criticism that might come to my collaborators because of their participation in this project. I sought to minimize insults or criticisms that might be directed at them, so I blocked the comment section for these videos, even though that lowers the engagement and ranking of the videos. Before publishing the videos on YouTube, I shared a final draft of each and received final approval. I also worked with my

university's internal review board and received approval for the project. After I published the videos, I met again with each of my collaborators.

Figure 8. 1 Screenshot of the “Miyazaki Jitokko Series” playlist on YouTube



<https://www.youtube.com/playlist?list=PLrMQzlcV2vJxMJAlpBjT6DuLwkp31FeoX>

The view count for the video series remains fairly low. The highest-viewed video had 378 views, and the six videos together had 993 views as of February 15, 2019. A YouTube user named “Strictly Dumpling” with over two million followers posts vlogs about food; his video of a Miyazaki Jitokko restaurant in Tokyo called Kuruma has 788,000 views (Strictly Dumpling 2017). His professional food vlog has upbeat music, tons of enthusiasm, and inter-spliced video. After trying charbroiled Miyazaki Jitokko, the vlogger exclaims, “This is the best chicken in the world, in the freakin’ world! No chicken is better than this chicken. This is the holy grail of chicken right here.” That is a level of hyperbole I will never match. My videos lack music; they have lengthy interviews and extended footage of chickens.

Through this project, I sought to give back to people who supported my research and to spread greater consumer awareness of Miyazaki Jitokko. The videos enable them to share content about Miyazaki Jitokko’s farms, restaurants, and brand. And they enable me to share a curated glimpse of my field research. Another benefit for the collaborators and Miyazaki Jitokko brand is the way in which the videos, with their bilingual subtitles, perform international interest. When I speak to the camera, I intentionally use English. The word *kokusai*, or international, has

positive associations in Japan, especially for rural initiatives (Love 2007). The director of the Miyazaki Jitokko business cooperative expressed his approval of the videos and considered using them to market the brand at a convention in Hong Kong. In October 2018, a Japanese quiz show called Q-sama contacted me about using footage from a video as part of their broadcast. I gained permission from my collaborator and made the video available, but Q-sama did not broadcast the footage.

This project highlights the position of ethnographic researchers and offers an example of how to create a collaborative project that reciprocates the support our research receives from people in the field. This video series gave me new ways to interact with my collaborators. It also made me experience firsthand the challenge of trying to convey jidori farms and restaurants to consumers.

Chapter Nine. Conclusion: Food in a new dark age⁴²

In Japan and a large part of the world, eaters face an apparent overabundance of options and information, not just for chicken meat but for innumerable food items. Bridle (2018) describes how technology entangles people in increasingly inscrutable networks that interfere with their attempts to act ethically and promote justice. He coins the term “a new dark age” to highlight problems arising from rapid changes in computing and information technology. I argue that we should approach food as nested within this new dark age. Our market-based food choices are entangled in increasingly inscrutable networks. Coles (2016, 5) describes how a single plant in Brazil transforms 500,000 chickens per day from live animals into packaged commodities and how people struggle to grasp “the shocking materialities and temporalities of agri-capitalism.” Insights about the sprawling networks in which we find ourselves caution against optimistic readings of connectivity and knowledge as necessarily contributing to greater clarity or literacy.

While the Japanese state takes an active role in shaping agricultural policy, the goals of different organizations are often contradictory. For example, the local northern Akita JA developed the Hinai-jidori brand in the 1980s. The national MAFF office launched the JAS Jidori standard in 1999. While the JAS Jidori system could be used to promote regional cuisine and artisan chicken in prefectures throughout Japan, MAFF appears committed to maximizing production of industrial types of JAS Jidori as they cut the minimum lifespan in 2015 and permit corporations to certify furtive in-house brands. The state is exploiting the tools that local innovators created to promote greater transparency, connection, and care.

In this conclusion, I begin by reviewing the importance of social anxiety and social trust for broiler chicken and jidori. Then I propose a well-known object in Japanese popular culture as a metaphor, a conceptual image, for how consumers encounter food as a commodity. Last, I situate food in terms of the geographical concepts of space and place. I argue that ideas about alternative food and progressive politics should be situated within a unique coming together of place that considers historical and geographical context.

⁴² I integrated passages into “The space and place of food” section from a previously published journal article (Schrager 2018b).

Broiler chickens and jidori traditions

There are clear differences between categories of chicken meat sold in Japan in relation to social anxiety and trust. Imported chicken meat, and especially chicken meat from China, is regarded with high levels of social anxiety. One survey found that 90% of Japanese consumers had considerable anxiety about Chinese origin fresh foods compared to only 3% feeling that way about domestic fresh foods (NRC 2008, 8). Food safety concerns over Chinese imports have increased even as violations found in Chinese food imports more than halved between 2004 and 2014 (Walravens 2017a).

In July 2014, Japanese media devoted extensive coverage to a sensational story on the murky international food supply chain. It focused on a factory in Shanghai that regularly mishandled and used expired meat. This factory supplied a massive food processor called Shanghai Hushi Food that exported to Japan iconic products such as McDonald's Chicken McNuggets (Asahi Shimbun, 2014). Japanese officials disclosed that Japan had imported 6,000 metric tons of processed meat from Shanghai Hushi Food over the previous year. Most of this meat was used to make chicken nuggets for Japan-McDonald's and a convenience store called Family Mart (ibid.). Under the deluge of negative stories, McDonald's Japan's revenue declined by 17% in July 2014 as it temporarily suspended the sale of Chicken McNuggets (Yomiuri Shimbun, 2014). Less than a month after the furor over Shanghai Hushi Food, KFC-Japan announced that it would transition to 100% domestic chicken meat (Sankei News 2014).

In contrast to the public uproar over Shanghai Hushi Food, incidents where raw chicken meat of domestic origins sicken consumers hardly elicit any coverage. For example, during a Meat Festival held simultaneously in Fukuoka City and Tokyo from April 29th until May 8th, 2016, many fell sick from a raw chicken dish made from "herb chicken" rife with campylobacter (Asahi Shimbun 2016). A total of 157 people reported symptoms such as diarrhea and stomach pain, 108 from Fukuoka City and 49 from Tokyo, with two requiring hospitalization.

On November 4th, 2018, 75 of 114 customers at an *izakaya* in Miyasaki City, all aged between 18 and 25, fell ill after eating raw chicken containing campylobacter. Their symptoms included diarrhea, stomach pains, and fever, and one person required hospitalization. An advertisement posted on Facebook for the *izakaya* from about a month prior to the outbreak featured the daily recommendation (*honjitsu no osusume*) of a four-item combination of chicken sashimi for 790 yen (~\$7.50). The four-item combination included raw liver and heart made

from a domestic branded chicken called “Kirishima-dori” killed that morning (*asa shime*). The Miyazaki City Health and Hygiene Section Food Hygiene (*Hoken Eisei-ka Shokuhin-eisei*) responded by closing the restaurant for three days and requesting that in the future the restaurant “please not serve chicken meat intended for cooking (*kanetsu-yō*) raw as sashimi.”

Newspapers covered the food poisoning incident at the Meat Festival with small articles in the back section while the incident in Miyazaki City hardly registered a blip. The media and government shield restaurants and domestic food from searing coverage that harms their reputation. Raw chicken meat is a special category that illustrates the level of food safety risks to which people expose themselves in the name of taste, tradition, and social trust. In comparison to the Shanghai Husi food incident, the threat of possible food poisoning from imported food garners far more attention than actual incidents of widespread food poisoning from dishes known to pose food safety risks.

Avian influenza outbreaks pose a major threat to consumer confidence in domestic chicken meat, especially after the virus reentered Japan in 2004. With the first outbreak in Yamaguchi prefecture, officials were slow to confirm avian influenza and to cull birds on the infected farm. The third outbreak at Asada Nosan dominated the national news after a large layer farm failed to notify the authorities of irregular conditions. Eggs from the infected farm were distributed through the food system and the farm shipped infected chickens to the slaughterhouse which threatened to further spread the outbreak. The widespread condemnation of Asada Nosan for not reporting irregular conditions and subsequent suicide of Asada Hijimu and Chisako illustrates intense societal pressure exerted on farmers. Their suicide reinforced the obligation for growers to earnestly monitor their flocks and report any possible avian influenza outbreaks. Subsequently implemented state protocols stress the prevention of disease outbreaks and rapid intervention when outbreaks occur. The Japanese state and media portray avian influenza as a foreign disease carried by wild birds that cause outbreaks in poultry operations with inattentive managers. Through rapid intervention to contain outbreaks, the state performs biosecurity that reassures citizens of the safety of the broader food system.

Consumers express social trust in domestic chicken meat when compared to imported chicken meat, but trusted food also costs more at the cash register. With the increased accessibility of information and food options, food purchasers — primarily women — endure pressure to invest time and resources in making good food choices for their households and

children (Cairns et al. 2013, Mackendrick and Stevens 2016). These pressures include preparing a lunchbox (*bento*) that is nutritious, visually appealing, and tasty (Allison 1991).

The increasing complexity of food production and global connections among activists is another feature of food in a new dark age. As Schurman and Munro (2010) describe for GM food, activists build international networks that criticize the safety of the dominant industrial model of food production. As Kimura (2016) shows, a subset of Japanese citizens have lost confidence in the state's ability to ensure food safety. In the aftermath of the triple disaster in Fukushima, groups of enraged citizens used citizen science to monitor radiation levels in food and challenge the government's food safety assurances.

Japan has a lengthy history of promoting regional cuisine and educating citizens about food, a policy codified in the *shokuiku* law (Assmann 2017). The recognition of Japanese cuisine (*washoku*) by UNESCO as an intangible cultural world heritage in 2013 reinforced the state's longstanding commitment to both national and local cuisine (Rath 2016, Cang 2015). This support for regional food includes the goal of local consumption of local products (*chisan-chishō*) (Kimura and Nishiyama 2007) and the preservation of heirloom varieties (de St. Maurice 2017).

Jidori evokes greater social trust by using heirloom breeds. Unique prefectural branding also enables the development of jidori brands that resonate with prefectural history and cuisine. For example, Miyazaki Jitokko incorporates the Natural Monument Jitokko breed as a grandparent and tastes highly palatable when prepared as charbroiled chicken, a distinctive Miyazaki dish.

When JAS revised the JAS Jidori standard by shortening the minimum lifespan from 80 to 75 days, they correctly perceived that there would be no objection from consumers. For people who have never raised a chicken or visited a chicken farm, the minimum lifespan and maximum stocking density remain abstract numbers. Only industry insiders understood how the revision tilted the playing field to favor more industrial brands like Awa-odori.

An additional source of social anxiety for consumers making chicken meat purchasing decisions is concern about the authenticity of jidori labeling. A major mislabeling scandal struck Hinai-jidori in 2007, and the Consumer Affairs Agency chastised Tsukada Nojo in 2018 for misleading labeling on their menu. Lack of clarity in labeling threatens consumer trust in jidori. Another troubling sign for transparency in jidori labeling is the policy that allows for JAS Jidori

to certify in-house corporate brands but not disclose that information. In discussing JAS Jidori with Miyazaki Jitokko leadership, I was told that they do not consider JAS Jidori and brands like Awa-odori to be competitors, implying that Awa-odori is just a glorified broiler chicken.

I am sympathetic to the issues facing Miyazaki Jitokko and recognize the challenges of creating clarity for food in a new dark age. The category of jidori emerged in the 1980s, and MAFF introduced JAS Jidori in 1999. Who gets to arbitrate what counts as authentic jidori? Large industrial actors often influence alternative standards to their benefit, leading to conventionalization. Prefectural branding helps to preserve a niche for brands like Miyazaki Jitokko in the face of fierce competition and competing appeals of social trust. The local state tries to mitigate the effects of national policy.

Understanding food as a commodity

The widely used term “food networks” suggests connection and visibility. Here, I propose another term: a metaphor that emphasizes the commodification of food. It is *gachapon*, a Japanese vending machine that sells toys and trinkets concealed in plastic eggs that are stacked to form a wall of vending machines (see Figure 9.1).⁴³ *Gachapon* vending machines have descriptions of the contents inside, which span the range from popular anime characters to weird knick-knacks (Hornyak 2017). Shoppers of all ages put their money in the machine and twist the crank. Some study the *gachapon* descriptions closely and reflect at length before reaching a decision. Others decide in an instant. The purchaser cannot inspect the item before purchasing, but has to trust in the veracity of the description.

⁴³ “Gacha” refers to the sound of twisting a crank after inserting money and “pon” is the sound that the capsule makes on exiting the machine.

Figure 9. 1 *Gachapon* vending machines in Japan



(Wikimedia Commons 2010)

Pivoting back to food: consumers know little about how chickens are being raised and what the standards are for various varieties of branded domestic chickens and jidori. They struggle to differentiate between industrial broiler chicken, branded domestic chicken, and different brands of jidori. Indeed, most people rarely encounter jidori, and when they do it is significantly more expensive than typical chicken meat. Experiences and understandings of chicken meat for most consumers stay at a *gachapon*-level, by which I mean that consumers depend on labeling, with the relations between upstream and downstream actors remaining opaque. The commodity takes a central role in representing and translating claims about the upstream conditions of production to consumers. Just as eaters rely on intuitive understandings and embodied experience, *gachapon* shoppers rely on similar experiences, instincts, and habits to guide their decisions.

If we were to visualize a corridor of *gachapon* for chicken meat consumption in Japan, for every 125 non-jidori machines, one machine would be jidori. Then for every twelve jidori machines, roughly one would be Miyazaki Jitokko. Less than one out of every 1,500 *gachapon*

for Japanese chicken meat would be Miyazaki Jitokko.⁴⁴ This is how tilted the Japanese food system is towards industrial broiler chicken. Consider, by contrast, France, where half of all chicken consumption is certified premium by Label Rouge (Stevenson and Born 2007).

Jidori brands contribute to regional food systems and culinary identity. While many consumers perceive jidori as expensive and tasty chicken meat, jidori also creates an opportunity for consumers to learn more about the conditions of chicken production such as the lineage of chicken breeds, how long chickens live, and how much space chickens have. This visibility may also prompt some consumers to learn about jidori, industrial chicken, and contemporary food networks.

The space and place of food

While my research engages broadly with how the upstream conditions of production reshape consumer perceptions and practices, my dissertation focuses at length on broiler chicken and jidori industries in Miyazaki prefecture. A central challenge for critical food scholars is to draw connections between situated initiatives and broader theoretical insights, a distinction that geographers often make by contrasting space and place. In an influential essay, Agnew (2011, 317) distinguishes between two different conceptions of place: “The first is a geometric conception of place as a mere part of space and the second is a phenomenological understanding of a place as a distinctive coming together in space.” Agnew observes that most social scientists adopt the first conception of place, because it enables them to develop abstract concepts that they can generalize across time and space. Progressive politics is a central concept that critical food scholars use to generalize across different places through food. In contrast, the second conception of place emphasizes how historical and geographical contexts for food are created through connections between different places and scales. My research illustrates the importance of engaging with the second conception of place. While state and industry use and reinforce the peripheral economic space of southern Kyushu, place identity remains a resource for many producers.

⁴⁴ Based on estimates from ALIC (Multiple Years), Komai (2012a), and MAFF (2015b) cited in Figure 1.2.

One of the most significant developments in how critical scholars approach food is the idea of alternative food networks and its ties to more ethical relations around food. As the range of issues associated with food changed, so too did the way that scholars conceptualize the spaces and places of alternative food. In *Alternative Food Networks*, Goodman, DuPuis and Goodman (2012: 3) write, “These alternative projects are seen as templates for the reconfiguration of capitalist society along more ecologically sustainable and socially progressive lines.” Here Goodman et al. situate alternative food networks as transforming capitalist society and promoting progressive politics.

Despite widespread support for alternative food, Tregear (2011) critiques scholarship on alternative food in several ways that emphasize the significance of different conceptions of place. First, Tregear (2011: 425) warns that critical food scholars are too eager to generalize insights from situated and contextual places to abstract concepts that operate in space. Second, Tregear (2011: 425) observes that the emphasis by social scientists on “value-laden goals” could bias researchers to study food systems that pursue “virtuous goals” as opposed to those that “exhibit apparently non-virtuous goals.” Extending the critique of abstract concepts — here identified as “virtuous goals” — she cautions that critical food scholars are in danger of seeking out the discourses that resonate with their abstract theories. In the process, scholars hazard overlooking widespread resistance to industrial food.

Agnew (2011) agrees with Tregear that social scientists are often in a rush to extrapolate from contextual places to abstract concepts that operate in space. He cautions against assuming that place must be progressive, charging that “why the politics associated with a ‘progressive sense of place’ must necessarily be progressive is not explained” (Agnew 2011, 325). As critical scholars, I believe we can and should promote progressive goals, but categories such as “alternative food” and “the local” are often contradictory. Making alternative food and reflexive localism synonymous with progressive politics hazards becoming tautological. Consequently, I have little interest in questions such as: How does alternative agriculture promote progressive politics? Rather, I want to ask questions such as: How do places create ideas of alternative agriculture and the local? And how are progressive politics being expressed in these places? In looking at the attitudes of Japanese consumers to chicken meat, we should not focus on questions of animal welfare or global warming. Instead, we need to engage with the issues of tradition, taste, and regional identity that inform their practices.

Social scientists often face a tension between acknowledging the limitations of empirically situated studies and generalizing to abstract ideas that operate in space. For food, there are broad imperatives to embrace progressive politics, such as global warming, food insecurity, and animal welfare. Sayer (2015, 291) urges scholars to make normative judgments; he writes, “At this time of neoliberal austerity, standing on the brink of producing runaway climate change that threatens our futures, it seems irresponsible to continue the academic tradition of avoiding normative judgements of what is good or bad, life-enhancing or life threatening, just or unjust.” While I agree with Sayer’s admonition that scholars should make normative judgments, I urge critical food scholars to use caution when moving between place and space.

Ideas of alternative food and the local are often contradictory, progressive in some respects but regressive in others. For example, farmers’ markets are often located in predominately majority and wealthy areas instead of in predominately minority and lower income areas. Widely held progressive goals include veganism and animal rights, but these goals conflict with contexts where animals and animal products are invested with cultural and economic significance. Certainly, we should not shy away from pointing out injustice, but the battle for more just food is an incremental slog that occurs in situated places and will take generations.

Given the emphasis on activism and normative judgments, critical food scholars should also recognize their positionality as outside experts. Rather than turning to abstract questions of progressive politics, the unique context of place helps to reveal the types of goals and tactics that have the greatest likelihood of contributing to just outcomes. In this moment of neoliberal austerity, rising authoritarianism, and backlash against technocratic governance, our normative judgments and activism should recognize food — and the political opportunities that food engenders — as situated within a unique coming together of place. Situated initiatives provide a necessary foundation for broaching the growing chasm within food networks and generating broader systemic knowledge, understanding, and transformation.

References

- Abrams, K., Meyers C., & Irani T. (2010). Naturally confused: Consumers' perceptions of all-natural and organic pork products. *Agriculture and Human Values*, 27(3), 365-374.
- Agha, A. (2011) Commodity registers. *Journal of Linguistic Anthropology*, 21(1), 22-53.
- Agnew, J. (2011) Space and place. In J. Agnew and D. Livingstone (Eds.), *Handbook of geographical knowledge* (pp. 316-331). London: Sage.
- Akagi, M. (1993) *Shōkei*. Nobeoka: Zero Kikaku.
- ALIC. (Multiple Years). Statistics of livestock supply and demand (Japanese: *Chikusanbutsu no jukyū kankei no sho tōkei dēta*). ed. Agriculture & Livestock Industries Corporation.
- Allison, A. (1991) Japanese mothers and obentōs: The lunch-box as ideological state apparatus. *Anthropological Quarterly*, 195-208.
- Amano, S. (1938) Husbands to the war front, wives to the poultry front! (Japanese: *Otto wa sensen ni, tsuma wa yōkei sensen ni!*). *Niwatori no Kenkyū*, 15(1).
- Andreyeva, T., Long, M. W. & Brownell, K. D. (2010) The impact of food prices on consumption: A systematic review of research on the price elasticity of demand for food. *American Journal of Public Health*, 100(2), 216-222.
- Asahi Shimbun. (1985). Residents raise issues opposing Shibushi development (Japanese: *Shibushi kaihatsu, hantai jūmin no uttae*). *Asahi Shimbun, Evening Edition*, March 22.
- (1986). American grain processing trading company Cargill advances (Japanese: *Momeru Bei-kokumotsu shōsha Kāgiri no shinshutsu*). *Asahi Shimbun, Evening Edition*, March 4.
- (1996). Major grain corporation Cargill withdraws from Japan (Japanese: *Kokumotsu mejā no Kāgiri-sha, nihon tettai*). *Asahi Shimbun, Evening Edition*, Dec 13.
- (1999). Jidori riding on a gourmet boom (Japanese: *Jidori o kiwameru gurumbūmu*). *Asahi Shimbun, Weekly Edition*, July 5.
- (2004a). 160,000 chickens left, what to be done? The costs? Producers despondent from avian influenza (Japanese: *Keisha ni seizon 16 man-ba taisho wa? Hiyō wa? Nayamu gyōsha tori infuruenza*). *Asahi Shimbun, Evening Edition*, Feb 28.
- (2004b). “Did not intend to hide” avian influenza says farm owner (Japanese: *Tori infuruenza 'kakusu ito nakatta' to nōjō kaichō Kyōto*). *Asahi Shimbun, Evening Edition*, March 2.

- (2004c). Hurrying 35,000 chickens euthenized due to avian influenza (Japanese: *Isoge, 35,000 ba shobun tori-infuruenza*). *Asahi Shimbun, Morning Edition*, Jan. 14.
 - (2004d). No deliveries for a week, timeline of response from massive chicken die-off in Kyoto (Japanese: *Mu todoke 1-shūkan, taiō gote Kyōto no niwatori dairyō-shi*). *Asahi Shimbun, Morning Edition*, Feb 28.
 - (2005). Avian influenza in Ibaraki prefecture, weak subtype shipping prohibited within a 5 km radius (Japanese: *Ibaraki de tori infuruenza dokusei yowai taipu, hankei 5-kiro shukka kinshi*). *Asahi Shimbun, Morning Edition*, June 27.
 - (2007a). Difficult to distinguish between old laying hens and Hinai-jidori (Japanese: *Hinai-jidori to haikai muzukashī chigai hantei*). *Asahi Shimbun, Morning Edition*, Oct. 28.
 - (2007b). Hinai-jidori's "prefectural certification system" (Japanese: *Hinaijidori no "ken-ninshō seido"*). *Asahi Shimbun, Morning Edition*, Nov 22.
 - (2007c). Safety betrayed... one after the other cases of mislabeling: "Hinai-dori" Corporation apologizes for "a long lie" (Japanese: *Azen... uragiri, tsugitsugi to gisō "Hinai-dori"-sha ga shazai "nagai aida uso tsuita"*). *Asahi Shimbun, Morning Edition*, Oct. 23.
 - (2007d). *What is jidori?* (Japanese: *Jidori to wa?*). *Asahi Shimbun, Morning Edition*, Nov 6.
 - (2010). Hoof and mouth disease: unresolved issue 3: (Japanese: *Nokosareta kadai: 3 kōteieki*). *Asahi Shimbun, Miyazaki Prefecture*, Dec 22.
 - (2011). With the source of avian influenza unclear, unease as production resumes (Japanese: *Tori infuruenza gen'in wa fumei, shiiku saikai mo kinchō-kan*). *Asahi Shimbun, Morning Edition*, Dec 22.
 - (2014). District court of Nobeoka rules that producers are culpable for fatality from eating egg (Japanese: *Tamago o tabe shibō, seisan-sha ni kashitsu chisai Nobeoka shibu hanketsu*). *Asahi Shimbun, Morning edition*, March 29.
 - (2016). Food poisoning of 157 people at Meat Festival (Japanese: *Nikufesu de shokuchūdoku 157-nin*). *Asahi Shimbun Weekly*, June 3.
 - (2019). 9,800,000 yen fine for "jidori" label (Japanese: *'Jidori' hyōji ni kachōkin 980 man-en*). *Asahi Shimbun, Morning Edition*, March 2.
- Asami, I. (1974). Yōkei shiryō no seisan to ryūtsū. In K. Yamanaka (Ed.), *Nihon yōkei sangyō no hatten to genjō* (pp. 216-227). Tokyo: Niwatori no Kenkyūsha.

- Assmann, S. (2015). The remaking of a national cuisine: The food education campaign in Japan. In J. Farrer (Ed.), *The globalization of Asian cuisines: Transnational networks and culinary contact zones* (pp. 165-186). New York: Palgrave Macmillan.
- (2017). Culinary politics in Japan: The shokuiku campaign. *Gastronomica: The Journal of Critical Food Studies*, 17(3), 15-23.
- Avenell, S. (2012). Japan's Long environmental sixties and the birth of a green leviathan. *Japanese Studies*, 32(3), 423-444.
- Barham, E. (2003). Translating terroir: The global challenge of French AOC labeling. *Journal of Rural Studies*, 19(1), 127-138.
- Beagan, B. L., Chapman, G. E., Johnston, J., McPhail, D., Power, E. M., & Vallianatos, H. (2014). *Acquired tastes: Why families eat the way they do*. UBC Press.
- Berman, M. (1970). *The politics of authenticity*. New York: Atheneum.
- Bestor, T. C. (2004). *Tsukiji: The fish market at the center of the world*. Berkeley; London: Univ of California Press.
- (2011). Cuisine and identity in contemporary Japan. In V. Bestor, T. C. Bestor, & A. Yamagata (Eds.), *Routledge handbook of Japanese culture and society* (pp. 273-285). New York: Taylor & Francis.
- Bestor, T. C., Steinhoff, P. G., & Lyon-Bestor, V. (2003). *Doing fieldwork in Japan*. Honolulu: University of Hawaii Press.
- Biomass (2009a). Miyazaki Biomass Recycle. *Biomass Association for Identification and Utilization of Biomass in Kyushu*.
- (2009b). Nangoku Kosan Corporation. *Biomass Association for Identification and Utilization of Biomass in Kyushu*.
- Blaser, M. J. (2015). *Missing microbes : How the overuse of antibiotics is fueling our modern plagues*. New York : Picador.
- Bloor, M., Frankland, J., Thomas, M., & Robson, K. (2001). *Focus groups in social research*. London; Thousand OAKS, Calif.: SAGE Publications.
- Boyd, W. (2001). Making meat: science, technology, and american poultry production. *Technology and Culture*, 42(4), 631-664.
- Boyd, W., Prudham, W. S., & Schurman, R. (2001). Industrial dynamics and the problem of nature. *Society and Natural Resources*, 14(7), 555-570.

- Boyd, W. & Watts, M. (1997). Agro-industrial just-in-time: The chicken industry and postwar American capitalism. In D. Goodman & M. Watts (Eds.), *Globalising food: Agrarian questions and global restructuring* (pp. 139-165). London; New York: Routledge.
- Bridle, J. (2018). *New dark age: Technology and the end of the future*. Verso Books.
- Buller, H., & Roe, E. (2014). Modifying and commodifying farm animal welfare: The economisation of layer chickens. *Journal of Rural Studies*, 33, 141-149.
- Burch, D., & Lawrence, G. (2005). Supermarket own brands, supply chains and the transformation of the agri-food system. *International Journal of Sociology of Agriculture and Food*, 13(1), 1-18.
- Busch, L. (2011). *Standards: Recipes for reality*. Cambridge, Mass.: MIT Press.
- Cairns, K., & Johnston, J. (2018). On (not) knowing where your food comes from: meat, mothering and ethical eating. *Agriculture and Human Values*, 35(3), 569-580.
- Cairns, K., J. Johnston & N. Mackendrick (2013). Feeding the 'organic child': Mothering through ethical consumption. *Journal of Consumer Culture*, 13(2), 97-118.
- Cameron, J., & Wright, S. (2014). Researching diverse food initiatives: From backyard and community gardens to international markets. *Local Environment*, 19(1), 1-9.
- Cang, V. (2015). Unmaking Japanese food: Washoku and intangible heritage designation. *Food Studies*, 5(3), 49-58.
- Carolan, M. (2018). Big data and food retail: Nudging out citizens by creating dependent consumers. *Geoforum*, 90, 142-150.
- Carolan, M. S. (2012). *Embodied food politics*. Farnham; Burlington, VT: Ashgate.
- Castree, N. (2001). Commodity fetishism, geographical imaginations and imaginative geographies. *Environment and Planning A*, 33(9), 1519-1525.
- Cavanaugh, J. R., & Shankar, S. (2014). Producing authenticity in global capitalism: Language, materiality, and value. *American Anthropologist*, 116(1), 51-64.
- Chien, Y. J. (2013). How did international agencies perceive the avian influenza problem? The adoption and manufacture of the 'one world, one health' framework. *Sociology of Health & Illness*, 35(2), 213-226.
- Chikusan (1939). Chikusan no' [Animal husbandry]. *Chikusan no Kenkyū*, 25(1), after table of contents and pictures, no page number.

- Chikusan Shinkō-ka (2017). Hinai-jidori's condition (Japanese: *Hinai-jidori no jyōsei*). Akita Prefecture.
- CIA (2018). The world factbook. Available at: <https://www.cia.gov/library/publications/the-world-factbook/> accessed 2/5/2018.
- Coles, B. (2016). The shocking materialities and temporalities of agri-capitalism. *Gastronomica: The Journal of Critical Food Studies*, 16(3), 5-12.
- Constance, D. H. (2008). The southern model of broiler production and its global implications. *Culture & Agriculture*, 30(1-2), 17-31.
- Convery, I., Mort, M., Baxter, J., & Bailey, C. (2008). *Animal disease and human trauma : Emotional geographies of disaster*. Basingstoke [England]; New York: Palgrave Macmillan.
- Cwierotka, K., & Chen, Y. (2012). The shadow of Shinoda Osamu. In K. W. Claflin & P. Scholliers (Eds.), *Writing food history: A global perspective* (pp. 181-196). London; New York: Berg.
- Cwierotka, K. J. (2006). *Modern Japanese cuisine: Food, power and national identity*. London: Reaktion Books.
- Davis, M. (2005). *Monster at our door: The global threat of avian flu*. New York: The New Press.
- de St. Maurice, G. (2017). Everything but the taste: Kyoto's Shishigatani squash as culinary heritage. *Food, Culture & Society*, 20(2), 281-301.
- DeSoucey, M. (2016). *Contested tastes: Foie gras and the politics of food*. Princeton University Press.
- Dixon, J. (2002). *The changing chicken: Chooks, cooks and culinary culture*. Sydney: UNSW Press.
- Drewnowski, A., & Popkin, B. M. (1997). The nutrition transition: New trends in the global diet. *Nutrition Reviews*, 55(2), 31-43.
- DuPuis, E. M. (2002). *Nature's perfect food: How milk became America's drink*. NYU Press.
- Enticott, G. (2003). Risking the rural: Nature, morality and the consumption of unpasteurised milk. *Journal of Rural Studies*, 19(4), 411-424.

- Evans, A., & Miele, M. (2012). Between food and flesh: How animals are made to matter (and not matter) within food consumption practices. *Environment and Planning D: Society and Space*, 30(2), 298-314.
- FAMIC. (2016). Overview of the revision of JAS standard for chicken meat (Japanese: *JAS kikaku no kaisei gaiyō toriniku*). ed. Food and Agricultural Materials Inspection Center, 2-3. Available at: http://www.famic.go.jp/public_relations_magazine/kouhoushi/back_number/201605-44.pdf accessed 2/5/2018.
- Fitzgerald, A. J. (2015). *Animals as food : (Re)connecting production, processing, consumption, and impacts*. East Lansing: Michigan State University Press.
- Foer, F. (2017). *World without mind: The existential threat of big tech*. Penguin.
- Forsyth, T. (2004). *Critical political ecology: The politics of environmental science*. Routledge.
- Freidberg, S. (2017). Big food and little data: The slow harvest of corporate food supply chain sustainability initiatives. *Annals of the American Association of Geographers*, 107(6), 1389-1406.
- Fukumoto, T. (2006). Analysis of the reason for success and efficiency of regional brands (Japanese: *Chiiki burando no seikō yōin to kōka ni kansuru jissō bunseki*). In *Intellectual Property Program*. National Graduate Institute for Policy Studies.
- GAIN. (2012). Japan agricultural biotechnology annual. In *USDA Foreign Agricultural Service Global Agricultural Information Network*. USDA GAIN. Available at http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Agricultural%20Biotechnology%20Annual_Tokyo_Japan_6-7-2012.pdf accessed 3/11/2017.
- (2017). Japan agricultural biotechnology annual. In *USDA Foreign Agricultural Service Global Agricultural Information Network*. USDA GAIN.
- George Mulgan, A. (2000). *The politics of agriculture in Japan*. London: Routledge.
- (2004). *Japan's interventionist state: The role of the MAFF*. Routledge.
- (2006). *Japan's agricultural policy regime*. New York: Routledge.
- Gibson-Graham, J. K. (1997). The end of capitalism (as we knew it): A feminist critique of political economy. *Capital & Class*, 21(2), 186-188.
- Gibson-Graham, J. K. (2006). *Postcapitalist politics*. Minneapolis: University of Minnesota Press.

- Gibson-Graham, J. K. (2008). Diverse economies: Performative practices for 'other worlds'. *Progress in Human Geography*, 32(5), 613-632.
- Gisolfi, M. (2017). *The takeover: Chicken farming and the roots of American agribusiness*. Athens: University of Georgia Press.
- Goodman, D., DuPuis, M., & Goodman, M. K. (2012). *Alternative food networks : Knowledge, practice, and politics*. London; New York: Routledge.
- Goodman, D., & Redclift, M. (1991). *Refashioning nature: Food, ecology, and culture*. London and New York: Routledge.
- Goodman, D., B. Sorj & J. Wilkinson (1987). *From farming to biotechnology: A theory of agro-industrial development*. Oxford and New York: Basil Blackwell.
- Gotō, T. (2013). Geography of agribusiness (Japanese: *Aguribijinesu no chirigaku*). Tokyo: Kokon Shoin.
- Grasseni, C. (1998). Those who don't work don't make love. London: Royal Anthropological Institute.
- Grasseni, C., & Paxson, H. (2014). Introducing a special issue on the reinvention of food: connections and mediations. *Gastronomica: The Journal of Critical Food Studies*, 14(4), 1-6.
- Gunderson, R. (2011). From cattle to capital: Exchange value, animal commodification, and barbarism. *Critical Sociology*, 39(2), 259-275.
- Guthman, J. (2004). *Agrarian dreams : The paradox of organic farming in California*. University of California Press.
- Hall, D. (2010). Food with a visible face: Traceability and the public promotion of private governance in the Japanese food system. *Geoforum*, 41(5), 826-835.
- Hansen, P. (2010). Milked for all they are worth: Hokkaido dairies and Chinese workers. *Culture & Agriculture*, 32(2), 78-97.
- (2014a). Culturing an agricultural crisis in Hokkaido. *Asian Anthropology*, 13(1), 1-20.
- (2014b). Hokkaido's frontiers: Blurred embodiments, shared affects and the evolution of dairy farming's animal-human-machine. *Critique of Anthropology*, 34(1), 48-72.
- Hardesty, S., G. Feenstra, D. Visser, T. Lerman, D. Thilmany-McFadden, A. Bauman, T. Gillpatrick & G. N. Rainbolt (2014). Values-based supply chains: Supporting regional food and farms. *Economic Development Quarterly*, 28(1), 17-27.

- Harootunian, H. D. (1959). The progress of Japan and the samurai class, 1868-1882. *The Pacific Historical Review*, 255-266.
- Harvey, D. (1990). Between space and time: Reflections on the geographical imagination 1. *Annals of the Association of American Geographers*, 80(3), 418-434.
- Hatano, T. (1943). Research on how to turn weed seeds into poultry feed (Japanese: *Zassō shushi no yōkei shiryō-ka ni kansuru kenkyū*). *Niwatori no Kenkyū*, 20(7), 4-10.
- (1947). If only there was feed (Japanese: *Esa sae areba*). *Niwatori no Kenkyū*, 22, 2-6.
- Hayes-Conroy, A., & Martin, D. G. (2010). Mobilising bodies: Visceral identification in the slow food movement. *Transactions of the Institute of British Geographers*, 35(2), 269-281.
- Heynen, N., Kaika, M., & Swyngedouw, E. (2006). *In the nature of cities: Urban political ecology and the politics of urban metabolism*. Routledge.
- Hibino, K. (1938). Continental poultry is growing! (Japanese: *Nobiyuku tairiku yōkei!*). *Niwatori no Kenkyū*, 15(12), 70-75.
- (1941). *The New Manchuria poultry method* (Japanese: *Manshū yōkei-hō*). *Niwatori no Kenkyū-shya*.
- (1947). Yōkei saikō e no michi. *Niwatori no Kenkyū*, 22(2), 2-3.
- (1955). Revolutionary method for making feed from 90% wild grasses (Japanese: *Zassō kyūwari katsuyō no kakumei yōkei*). *Niwatori no Kenkyū*, 32(7), 16-28.
- Hilton, M. (2009). *Prosperity for all : Consumer activism in an era of globalization*. Ithaca: Cornell University Press.
- Hinchliffe, S. (2015). More than one world, more than one health: Re-configuring interspecies health. *Social Science & Medicine*, 129, 28-35.
- Hinchliffe, S., Allen, J., Lavau, S., Bingham, N., & Carter, S. (2013). Biosecurity and the topologies of infected life: From borderlines to borderlands. *Transactions of the Institute of British Geographers*, 38(4), 531-543.
- Hinchliffe, S., Bingham, N., Allen, J., & Carter, S. (2016). *Pathological lives: Disease, space and biopolitics*. John Wiley & Sons.
- Honma, M., & George Mulgan, A. (2018). Political economy of agricultural reform in Japan under Abe's administration. *Asian Economic Policy Review*, 13(1), 128-144.
- Honma, T. (1991). *A cultural history of meat-eating in Japan* (Japanese: *Nihon shokuniku bunkashi*). Tokyo: Ito Kinen Zaidan.

- Hornyak, T. (2017). Gachapon: Tracing the evolution of Japan's colorful toy capsules. *The Japan Times*, Aug 19.
- Horowitz, R. (2006). *Putting meat on the American table: Taste, technology, transformation*. Baltimore: Johns Hopkins University Press.
- Hosokawa, Y. (1974). Fifty year history of the development of the Japanese poultry industr (Japanese: Nihon yōkei sangyō hattatsu 50-nen-shi). In K. Yamanaka (Ed.), *Nihon yōkei sangyō no hatten to genjō* (pp. 33-144). Tokyo: Tokyo: Niwatori no Kenkyūsha.
- Howard, P. H. (2016). *Concentration and power in the food system : Who controls what we eat?* London : Bloomsbury Academic.
- Humane Slaughter Association. (2015). Effective Neck-Cutting of Poultry. Available at: <https://www.hsa.org.uk/downloads/hsatipeffneckcutpoultry14oct2015.pdf> accessed 2/5/2019.
- Imhoff, D. (2010). *The CAFO reader: The tragedy of industrial animal factories*. Berkeley: Watershed Media.
- Iriya, T. (2000). *Nagoya Kōchin sakushutsu monogatari*. Bukku Shoppu 'Maitaun'.
- Jackson, P. (1999). Commodity cultures: The traffic in things. *Transactions of the Institute of British Geographers*, 24(1), 95-108.
- (2015). *Anxious appetites: Food and consumer culture*. London, New Dehli; New York; Sydney: Bloomsbury Publishing.
- Jackson, P., & Everts, J. (2010). Anxiety as social practice. *Environment & Planning A*, 42(11), 2791-2806.
- Jackson, P., Ward, N., & Russell, P. (2009). Moral economies of food and geographies of responsibility. *Transactions of the Institute of British Geographers*, 34(1), 12-24.
- Jackson, P., Watson, M., & Piper, N. (2013). Locating anxiety in the social: The cultural mediation of food fears. *European Journal of Cultural Studies*, 16(1), 24-42.
- Jaffee, D., & Howard, P. H. (2010). Corporate Cooptation of organic and fair trade standards. *Agriculture and Human Values*, 27(4), 387-399.
- Janssen, M., & Hamm, U. (2012). Product labelling in the market for organic food: Consumer preferences and willingness-to-pay for different organic certification logos. *Food Quality And Preference*, 25(1), 9-22.

- Japan Times (2004). Poultry exec, wife commit suicide over bird flu fiasco. *The Japan Times* March 9.
- (2011). Editorials: Raw beef poisoning. *The Japan Times*.
- Jasanoff, S. (1999). The songlines of risk. *Environmental Values*, 8(2), 135-152.
- Jin, S., & Zhou, L. (2014). Consumer interest in information provided by food traceability systems in Japan. *Food Quality and Preference*, 36, 144-152.
- Johnston, J. (2008). The citizen-consumer hybrid: Ideological tensions and the case of Whole Foods Market. *Renewal and Critique in Social Theory*, 37(3), 229-270.
- Kadohira, M., Hill, G., Sawada, M., & Yoshida, S. (2011). Bridging the gap between BSE risk assessment and consumer perception of the surveillance system in Japan. *Research Bulletin of Obihiro University*, 31, 1-13.
- Kagoshima Yōkei Kyōkai (1985). *Kagoshima poultry history (Japanese: Kagoshima-ken yōkei-shi)*. Kagoshima-ken Yōkei-kyōkai.
- Kahneman, D. (2011). *Thinking, fast and slow*. New York : Farrar, Straus and Giroux.
- Katō, M. M., Numata, S., Watanabe, K., & Hata, M. (1995). Japanese natural monuments (Japanese: *Nihon no ten'nenkinenbutsu*). Kōdansha.
- KFC-Japan. (2000). *WE'RE no.1: 30th anniversary*. Tokyo: Nihon Kentakkī Furaido Chikin Kabushikigaisha.
- Kimura, A. H. (2011). Food education as food literacy: Privatized and gendered food knowledge in contemporary Japan. *Agriculture and Human Values*, 28(4), 465-482.
- Kimura, A. H. (2016). *Radiation brain moms and citizen scientists: The gender politics of food contamination after Fukushima*. Durham: Duke University Press.
- Kimura, A. H. & M. Nishiyama (2007). The chisan-chisho movement: Japanese local food movement and its challenges. *Agriculture and Human Values*, 25(1), 49-64.
- Kirksey, S., & Helmreich, S. (2010). The emergence of multispecies ethnography. *Cultural Anthropology*, 25(4), 545-576.
- Kirschenmann, F., Stevenson, G., Buttel, F., Lyson, T. A., & Duffy, M. (2008) Why worry about the agriculture of the middle. In T. A. Lyson, G. W. Stevenson, & R. Welsh (Eds.), *Food and the mid-level farm: renewing an agriculture of the middle* (pp. 3-22). MIT Press.
- Kitamura, S. (1987). Wagakuni ni okeru yōkei-gyō no chiiki-teki tenkai. *Nagoyadaigaku bungakubu kenkyū ronshū shigaku*, 33, 149-174.

- Kjaernes, U. (2013). Risk and trust in the food supply. In A. Murcott (Ed.), *The handbook of food research* (pp. 410-424). New York: Bloomsbury Academic.
- Kjærnes, U., Harvey, M., & Warde, A. (2007). *Trust in food : A comparative and institutional analysis*. Hampshire [England]; New York: Palgrave Macmillan.
- Kneafsey, M., Cox, R., Holloway, L., Dowler, E., Venn, L., & Tuomainen, H. (2008). *Reconnecting consumers, producers and food: Exploring alternatives*. New York: Berg.
- Komai, T. (1953). Towards a broiler industry in Japan as well! (Japanese: Nihon ni mo buroirā sangyō o!). *Niwatori no Kenkyū*, 28(2), 32-37.
- (2012a). Changes in branded and jidori chicken: From 1995 until 2011 (Japanese: *Meigaradori to jidori no henshen: 1995-nen kara 2011-nen made*). *Livestock Research*, 66(9), 881-884.
- (2012b). Chicken trading and retail standards (Japanese: Shokkei no ryūtsū keitai no henka to shokkei torihiki kouri kikaku 1). *Livestock Research*, 66(10), 982-986.
- Kosugi, M. (1926). *Yokei no jitchi kenkyu*. Tokyo: Niwatori No Kenkyu-sha.
- Koyama, S. (1979). *Japanese chicken compendium* (Japanese: *Nihon niwatori taikan*). Petto Raifu-sha.
- Koyu Shokuchō. (2018). Company profile. Available: <http://www.koyushokucho.co.jp/about/outline.html> accessed 2/05/2019.
- Kyushu Denryoku. (2015). Renewable energy “Miyazaki Biomass Recycle” (Japanese: *Saisei kanō enerugī ‘Miyazaki baiomasurisaikuru’*). *Youtube*. Available at: <https://www.youtube.com/watch?v=btOnfvJihfo> accessed 2/5/2019.
- Lassiter, L. E. (2005). *The Chicago guide to collaborative ethnography*. Chicago: University of Chicago Press.
- Levenstein, H. A. (1994). *Paradox of plenty : A social history of eating in modern America*. Cary, NC, USA: Oxford University Press.
- Lorimer, J. (2017). Probiotic environmentalities: Rewilding with wolves and worms. *Theory, Culture & Society*, 34(4), 27-48.
- Love, B. (2007). Fraught fieldsites: Studying Community decline and heritage food revival in rural Japan. *Critical Asian Studies*, 39(4), 541-559.
- Lowe, C. (2010). Viral clouds: Becoming H5N1 in Indonesia. *Cultural Anthropology*, 25(4), 625-649.

- Mackendrick, N., & Stevens, L. M. (2016). “Taking back a little bit of control”: Managing the contaminated body through consumption. *Sociological Forum*, 31(2), 310-329.
- Maclachlan, P. L., & Shimizu, K. (2016). Japanese farmers in flux: The domestic sources of agricultural reform. *Asian Survey*, 56(3), 442-465.
- MAFF (2003). Highly Pathogenic Avian Influenza Quarantine Manual (Japanese: Kōbyōgensei tori-infuruenza bōeki manyuaru). *MAFF Consumer Safety Division (Shōhi-Anzen Kyoku)*.
- (2011). Regarding the outbreak of highly pathogenic avian influenza interim epidemiological report (Japanese: Heisei 22-nendo kōbyōgenseitori infuruenza no hassei ni kakaru ekigaku chōsa no chūkan torimatome). *MAFF Highly Pathogenic Avian Influenza Epidemiology Survey Team (Japanese: Kōbyōgenseitori Infuruenza Ekigaku Chōsa Chiīmu)*. Available at: http://www.maff.go.jp/j/syouan/douei/tori/pdf/ai_report.pdf accessed 2/5/2019.
- (2015a). About the revision of JAS Jidori (Japanese: *Nihon Nōrinkikaku no kaisei ni tsuite jidoriniku*). Ministry of Agriculture Forestry and Fisheries Livestock Department. Available at: http://www.maff.go.jp/j/jas/kaigi/pdf/jas_tyousa_kai_sryou2_150609.pdf accessed 2/5/2019.
- (2015b). Statistical research on poultry distribution (Japanese: *Shyokuchyō ryūtsū tōkei chyōsa*). Statistics of Agriculture, Forestry, and Fisheries. Available at: <http://www.j-chicken.jp/museum/tokei/data/26nenndosyokutyō-ryūtutoukei.pdf> accessed 2/5/2019.
- (2018a). 2017 Agricultural output and production (by prefecture) (Japanese). Available at: http://www.maff.go.jp/j/tokei/kouhyou/nougyou_sansyutu/attach/pdf/index-6.pdf accessed 2/5/2019.
- (2018b). 2017-year food self-sufficiency. Available at: <http://www.maff.go.jp/j/press/kanbo/anpo/attach/pdf/180808-2.pdf> accessed 2/5/2019.
- (2018c). Conditions of feed (Japanese: *Shiryō o Meguru Jōsei*). *Seisan-Kyoku Chikusan-bu Shiryō-ka*.
- (2018d). Information on caloric self-sufficiency rate (Japanese). Ministry of Agriculture, Forestry and Fisheries Livestock Department. Available at http://www.maff.go.jp/j/seisan/boueiki/mugi_zyukyuu/attach/pdf/index-17.pdf accessed 2/5/2019.

- (Multiple Years). Japan statistical yearbook (Japanese: *Nōgyō nenkan*). In *Japan statistical yearbook*, ed. Ministry of Internal Affairs and Communications.
- MAFF Census. (Multiple Years). World census of agriculture and forestry in Japan. (Japanese: Sekai nōrin-gyō sensasu). Ministry of Agriculture, Forestry and Fisheries.
- Mann, S. A., & Dickinson, J. M. (1978). Obstacles to the development of a capitalist agriculture. *Journal of Peasant Studies*, 5(4), 466-481.
- Matsumoto, J. (1990). *Written by a poultry farmer: The book of chicken meat* (Japanese: *Yōkeiya-san ga kaita: Toriniku no hon*). Tokyo: Sansui-sha.
- McDonald, M. (2000). Food firms and food flows in Japan 1945-98. *World Development*, 28(3), 487-512.
- McDonald, M. G. (1997). Agricultural landholding in Japan: Fifty years after land reform. *Geoforum*, 28(1), 55-78.
- McKenna, M. (2017). *Big chicken: The Incredible story of how antibiotics created modern agriculture and changed the way the world eats*. National Geographic Books.
- Miele, M. (2011). The taste of happiness: Free-range chicken. *Environment and Planning A*, 43(9), 2076-2090.
- Miller, D. (2001). *The dialectics of shopping*. University of Chicago Press.
- Misawa, N. (2013). Campylobacter infection in humans caused by ingestion of fresh raw meat. *Japanese Journal of Food Microbiology*, 30(2), 108-111.
- Mitsubishi. (2010). *A 50-year history of Mitsubishi Corporation, 1954-2004*. Mitsubishi Shōji Kabushiki Kaisha. Tokyo: Mitsubishi Corporation.
- Miwa, R. (2016). History Of AP X Nichinan part 1. *Baton: AP Company culture magazine*, 2, 15-18.
- Miyanichi. (2016). Net damaged at house where outbreak occurred, results of MAFF epidemiological survey (Japanese: Hassei keisha netto ni hason Nōsuishō ga ekigaku chōsa kekka). *The Miyanichi, Morning Edition*, Dec 28.
- Miyazaki Jitokko (2013). Miyazaki Jitokko feed management manual (Japanese: *Miyazaki Jitokko shiyō kanri manyuaru*). Miyazaki Jitokko Cooperative Association.
- (2017). What is Miyazaki Jitokko? Miyazaki Jitokko Cooperative Association. Available at <http://www.mjitokko.jp/enpamphlet.pdf> accessed 3/11/2017.

- Miyazaki Kumiai Chicken Foods (2018). Company profile. Available at: <http://www.ja-zcf.co.jp/miyazaki/corp/profile.html> accessed 2/4/2019.
- Miyazaki Prefecture. (2007). Plan for serving chicken meat as raw chicken (Japanese: *Namashokuyō-shoku toriniku no eisei taisaku*). Available at: <https://www.mhlw.go.jp/file/05-Shingikai-11121000-Iyakushokuhinkyoku-Soumuka/0000040840.pdf> accessed 2/05/19.
- (2015). Highly pathogenic avian influenza epidemic prevention manual (Japanese: *Kōbyōgenseitori infuruenza bōeki manyuaru*). ed. Miyazaki Prefecture Avian Influenza Prevention Division.
- (2016). Miyazaki prefecture hoof and mouth disease prevention manual (Japanese: *Miyazaki-ken kōteieki bōeki manyuaru*). ed. Miyazaki Prefecture Hoof and Mouth Disease Prevention Division.
- (2018). Miyazaki's livestock. *Miyazaki Prefecture Livestock Promotion Division*.
- MLIT. (2014). Port statistics (annual report) database (Japanese: *Kōwantōkei [nenpō] dētabēsu keishiki shiryō*). ed. Ministry of Land, Transport and Tourism.
- Moen, D. G. (1997). The Japanese organic farming movement: Consumers and farmers united. *Bulletin of Concerned Asian Scholars*, 29(3), 14-22.
- Monetroza. (2017). Yamauchi shop search. (Japanese: *Yamauchi tenpo kensaku*). ed. Monteroza Corporation. Available at: http://www.roza.monteroz.co.jp/monte_view/Search_shop.php?yamauchi accessed 3/11/2019.
- Moore, J. W. (2010). The end of the road? Agricultural revolutions in the capitalist world ecology, 1450–2010. *Journal of Agrarian Change*, 10(3), 389-413.
- Moore, R. (2013). Preserving soybean diversity in Japan. In *Seeds of Resistance, Seeds of Hope*, eds. V. D. Nazarea, R. E. Rhoades & J. Andrews-Swann, 177-195. Tuscon: University of Arizona Press.
- Morgan, K. (2010). Local and green, global and fair: The ethical foodscape and the politics of care. *Environment and planning. A*, 42(8), 1852.
- Morris-Suzuki, T. (2014). Touching the grass: Science, uncertainty and everyday life from Chernobyl to Fukushima. *Science, Technology and Society*, 19(3), 331-362.

- Murai, G., & Ozaki, M. (1904). *Tamago ryōri toriniku ryōri ni-hyaku-shu oyobi katei yōkei-hō* (Japanese: *Two hundred egg and chicken meat recipes and methods for household poultry*). Hōchisha Shuppan-bu.
- Nagasaka, M. (1990). A geographical study on the production area formation of the broiler industry in Japan. In *Dissertation Ph.D. Geoscience University of Tsukuba*.
- (1993). *Aguribijinesu no chiiki tenkai: Buroirā sangyō no sanchi hikaku*. Tokyo: Kokon Shoin.
- (2004). The development of the production and distribution of the Hinai-jidori chickens in Akita prefecture (Japanese: *Akita-ken ni okeru Hinaidjitori no seisan to ryūtsū no tenkai*). *Regional Study*, 44(2), 10-24.
- Nagata, K. (2015). Raw pork liver fans say goodbye to banned sushi. *The Japan Times*, June 12.
- Nagatomo, S. (1972). *Oldtime stories of poultry and reflections on artificial incubation* (Japanese: *Yōkei no mukashibanashi to jinkō fuka no konjaku*). Hyuga-shi.
- Nakamura, C. (1910). *Results from side-job poultry* (Japanese: *jikken fukugyo yokei*). Tokyo: Maruyamasha.
- NARO. (2018). The possibility of producing corn for domestic concentrated feed (Japanese). ed. T. Kanno. National Agricultural Food Research Organization.
- Nejime, M. (1955). Jitokko's poultry industry value (Japanese: *Jitokko no sangyō yōkei-teki kachi*). *Niwatori no Kenkyū*, 32(7), 75.
- Nenji Toukei. (2019a). Chicken meat price (Japanese: *Tori-niku kakaku*). Ministry of Internal Affairs and Communications Statistics Bureau Retail Price Statistics Survey (Japanese: *Sōmushōtōkeikyoku no Kouri Bukka Tōkei Chōsa*).
- (2019b). Household expenditures on food (Japanese: *Engeru kei-sū*). Source: Household survey (Japanese: *Kakei chōsa*).
- Niwatori no Kenkyu. (1943). Jitokko - Kyushu livestock, a chicken breed with short legs. *Niwatori no Kenkyū*, 20(4), 1.
- Niwatori no Kenkyū. (1939). "Dedication of army machinery" (Japanese "Ken'nō rikugunki"). *Niwatori no Kenkyū*, 16(8), after table of contents no page number.
- NRC. (2008). Comparative study between China and Japan concerning tourism, food safety and environmental problems (Japanese: *ryokō, shoku no anzensei, kankyō mondai ni tsuite no Nicchū hikakuron chōsa*). eds. Nihon Research Center & Gallup International.

- Nuttavuthisit, K., & Thøgersen, J. (2017). the importance of consumer trust for the emergence of a market for green products: The case of organic food. *Journal of Business Ethics*, 140(2), 323-337.
- Oana, H. (1943a). *History of Japanese chickens* (Japanese *Nihon-kei no rekishi*). Niwatori no Kenkyū-sha.
- (1943b). Summary of Japanese chickens (Japanese: *Nihon-kei ryakkai*). *Niwatori no Kenkyū*, 20(4), 70-83.
- (1951). *History of Japanese chickens* (Japanese *Nihon-kei no rekishi*). Niwatori no Kenkyū-sha.
- Ogata, T., Y. Yamazaki, N. Okabe, Y. Nakamura, M. Tashiro, N. Nagata, S. Itamura, Y. Yasui, K. Nakashima & M. Doi (2008). Human H5N2 avian influenza infection in Japan and the factors associated with high h5n2-neutralizing antibody titer. *Journal of Epidemiology*, 18(4), 160-166.
- Ōkawara, S. (1972). The American style of selling chicken meat will spread (Japanese: *Kakudai suru Beikoku-shiki toriniku hanbai*). *Niwatori no Kenkyū*, 49(12), 38-9.
- Oku, K. (1937). A sudden cessation of feed imports and the problem of domestic self-sufficiency (Japanese: *Shiryō yunyū tozetsu to kokunai jikyū mondai*). *Niwatori no Kenkyū*, 14(10), 2-7.
- Okuyama, M. (2005). The development and improvement of Miyazaki Jitokko (Japanese: *Miyazaki Jitōkko no kaihatsu to tokusan-hin-ka*). *The West Japan Journal of Animal Science*, 48, 11-16.
- Ostrom, M., K. De Master, E. NOE & M. Schermer (2017). Values-based food Chains from a transatlantic perspective: Exploring a middle tier of agri-food system development. *International Journal of Sociology of Agriculture & Food*, 24(1).
- Ōta, A. (2015). *The collected works of Itō Jakuchū* (Japanese: *Itō Jakuchū sakuhin-shū*). Tokyo Bijyutsu.
- Pachirat, T. (2011). *Every twelve seconds: Industrialized slaughter and the politics of sight*. Yale University Press.
- Paxson, H. (2008). Post-Pasteurian cultures: The microbiopolitics of raw-milk cheese in the United States. *Cultural Anthropology*, 23, 15-47.
- Pepper, D. (1996). *Modern environmentalism: An introduction*. London; New York: Routledge.

- Perreault, T., Bridge, G., & McCarthy, J. (2015). *The Routledge handbook of political ecology*. Routledge.
- Pollock, D. L. (1999). A geneticist's perspective from within a broiler primary breeder company. *Poultry Science*, 78, 414-418.
- Rath, E. (2010). *Food and fantasy in early modern Japan*. Berkeley and Los Angeles, CA: Univ of California Press.
- Rath, E. C. (2016). *Japan's cuisines: Food, place and identity*. London: Reaktion Books.
- Reiher, C. (2016). Lay people and experts in citizen science: Monitoring radioactively contaminated food in post-Fukushima Japan. *ASIEN*, 140, 56-73.
- Richards, C., Bjørkhaug, H., Lawrence, G., & Hickman, E. (2013). Retailer-driven agricultural restructuring--Australia, The UK and Norway in comparison. *Agriculture and Human Values*, 30(2), 235-245.
- Rosenberger, N. (2009). Global food terror in Japan: Media shaping risk perception, the nation, and women. *Ecology of Food and Nutrition*, 48(4), 237-262.
- Rosenberger, N. (2017). Young organic farmers in Japan: Betting on lifestyle, locality, and livelihood. *Contemporary Japan*, 29(1), 14-30.
- Saitō, A. (1985). *Japanese chickens: History and raising methods* (Japanese: *Nihon niwatori: Rekishi to kanshō kaikata*). Tokyo: Nōgyō tosho.
- Saito, T. (1937). The trick to poultry management (Japanese: *Yōkei keiei no kotsu*). *Niwatori no Kenkyū*, 14(11), 18-23.
- Sankei News. (2014). KFC's stores are making a "domestic chicken" safety appeal. *Sankei News*, Aug 19.
- Saotome, Y. (1934). Nihon yōkei-shi. In *Nihon yōkei taikan*, ed. S. Adachi. Nagoya: Tokyo: Aichi Yōkei Shinbun-sha.
- Sarmiento, E. (2017). Synergies in alternative food network research: Embodiment, diverse economies, and more-than-human food geographies. *Agriculture and Human Values*, 34(2), 485-497.
- Sato, M. (2013). History and development of the local brand: A case of the chicken crossed in Tokushima Prefecture (Japanese). *Keiei Jōhō Kenkyū*, 20(2), 89-104.
- Satō, Y. (2011). The origin and definition of *jidori* (Japanese: *Jidori no kigen to teigi*). *Poultry Disease Newsletter*, 47(1), 1-11.

- Sayer, A. (2015). Time for moral economy? *Geoforum*, 65, 291-293.
- Schatzki, T. R. (2002). *Site of the social: A philosophical account of the constitution of social life and change*. University Park, PA: Penn State Press.
- Scherer, A. (2002). Drawbacks to controls on food distribution. In E. Pauer (Ed.), *Japan's war economy* (pp. 106-123). London : Taylor and Francis.
- Schrager, B. (2014). Seeds from paradise: The rise of Hawaii's seed corn industry. M.A. Thesis. University of Hawai'i at Mānoa.
- (2018a). Different conceptions of place: Alternative food networks and everyday meals. *Geoforum*, 95, 21-24.
- (2018b). The internationalization and the industrialization of chicken husbandry in Japan in the 20th century. *Japanese Studies*, 38(2), 207-227.
- Schrager, B., & Suryanata, K. (2018). Seeds of accumulation: Molecular breeding and the seed corn industry in Hawai'i. *Journal of Agrarian Change*, 18(2), 370-84.
- Schudson, M. (2007). Citizens, consumers, and the good society. *The Annals of the American Academy of Political and Social Science*, 611(1), 236-249.
- Schurman, R., & Munro, W. A. (2010). *Fighting for the future of food : activists versus agribusiness in the struggle over biotechnology*. Minneapolis, Minn.: University of Minnesota Press.
- Sekine, K., & Bonanno, A. (2017). Geographical indication and resistance in global agri-food: The case of miso in Japan. In A. Bonanno & S. A. Wolf (Eds.), *Resistance to the neoliberal agri-food regime a critical analysis* (pp. 106-119). London: Earthscan from Routledge.
- Sheraton, M. (1976). For the colonel, it was finger-lickin' bad. *NY Times*, Sept 9.
- Shibushi Silo. (2019). Company brochure. Available at:
<http://www.sbss.co.jp/common/img/top/pdf/siro.pdf> accessed 2/5/2019.
- Smil, V., & Kobayashi, K. (2012). *Japan's dietary transition and its impacts*. MIT Press.
- Soper, K. (2004). Rethinking the "good life": The consumer as citizen. *Capitalism Nature Socialism*, 15(3), 111-116.
- Stevenson, G. W., & Born, H. (2007). The "Red Label" poultry system in France. In C. C. Hinrichs & T. A. Lyson (Eds.), *Remaking the North American food system: Strategies for sustainability* (pp. 144-162). University of Nebraska Press.

- Strictly Dumpling. (2017). Japan's Miyazaki chicken: The tastiest chicken in the world?!
Available at: <https://www.youtube.com/watch?v=GJQjmG0q04E> accessed 2/15/2019.
- Striffler, S. (2005). *Chicken: The dangerous transformation of america's favorite food*. New Haven; London: Yale University Press.
- Stuesse, A. (2016). *Scratching out a living: Latinos, race, and work in the deep south*. Oakland, California: University of California Press.
- Stull, D., & Broadway, M. (2012). *Slaughterhouse blues: The meat and poultry industry in North America*. Boston: Cengage Learning.
- Takeda, H. (2008). Delicious food in a beautiful country: Nationhood and nationalism in discourses on food in contemporary Japan. *Studies in Ethnicity and Nationalism*, 8(1), 5-30.
- (2017). National solidarity of food insecurity: Food practice and nationalism in post-3/11 Japan. In A. Niehaus & T. Walravens (Eds.), *Feeding japan: The cultural and political issues of dependency and risk* (pp. 475-501). Cham, Switzerland: Palgrave Macmillan.
- Takigawa, M. (1965). How to manage poultry as a corporation (Japanese: *Kigyō-teki yōkei keiei no ari-kata*). *Niwatori no Kenkyū*, 40(6), 70-78.
- Tanaka, K. (2008). Seven samurai to protect "our" food: The reform of the food safety regulatory system in Japan after the BSE crisis of 2001. *Agriculture and Human Values*, 25(4), 567-580.
- Taniguchi, N. (2013). *Farewell liver sashimi: 438 days until the ban* (Japanese: *Sayonara, rebazashi: Kinshi made no 438-kaka*). Takeshobō.
- Tessari, A., & Godley, A. (2014). Made in Italy. Made in Britain. Quality, brands and innovation in the European poultry market, 1950–80. *Business History*, 56(7), 1057-1083.
- Thaler, R., H., & Sunstein, C., R. (2008). *Nudge: improving decisions about health, wealth, and happiness*. New Haven: Yale University Press.
- Thorsøe, M. H., Christensen, T., & Povlsen, K. K. (2016). "'Organics' are good, but we don't know exactly what the term means!" Trust and knowledge in organic consumption. *Food, Culture & Society*, 19(4), 681-704.
- Tokiwa, Y. (2017). Izakaya "Tsukada Farm", the reasons behind changing stores over the last 33 months (Japanese: *Izakaza 'Tsukada nōjō', kizonten 33-kagetsu-ware no riyū*). *Toyokeizai Online*, February 12.

- Tregear, A. (2011). Progressing knowledge in alternative and local food networks: Critical reflections and a research agenda. *Journal of Rural Studies*, 27(4), 419-430.
- Trubek, A. B. (2008). *The taste of place : A cultural journey into terroir*. Berkeley: University of California Press.
- Tsuchida, M. (2014). *Yakitori and the Japanese: From outdoor stalls to Michelin stars* (Japanese: *Yaki-tori to Nihonjin: Yatai kara Hoshi-tsuki made*). Kōbunsha.
- Turner, M. D. (2016). Political ecology II: Engagements with ecology. *Progress in Human Geography*, 40(3), 413-421.
- Walker, P. A. (2005). Political ecology: Where is the ecology? *Progress in Human Geography*, 29(1), 73-82.
- Wallace, R. G. (2009). Breeding influenza: The political virology of offshore farming. *Antipode*, 41(5), 916-951.
- Walravens, T. (2017a). Chinese food threatening the Japanese table: Changing perceptions of imported chinese food in Japan. In A. Niehaus & T. Walravens (Eds.), *Feeding Japan : The cultural and political issues of dependency and risk* (pp. 253-286). Cham, Switzerland: Palgrave Macmillan.
- (2017b). Food safety and regulatory change since the ‘mad cow’ in Japan: Science, self-responsibility, and trust. *Contemporary Japan*, 29(1), 67-88.
- Warde, A. (2014). After taste: Culture, consumption and theories of practice. *Journal of Consumer Culture*, 14(3), 279-303.
- (2016). *The Practice of eating*. Malden, MA : Polity Press.
- Warman, A. ([1988] 2003). *Corn & capitalism: How a botanical bastard grew to global dominance*. Univ of North Carolina Press.
- Watts, M. (2000). Political ecology. In E. S. Sheppard & T. J. Barnes (Eds.), *A companion to economic geography* (pp. 257-274). Oxford: Blackwell Publishing.
- Weis, T. (2013). *The ecological hoofprint: The global burden of industrial livestock*. London; New York: Zed Books Ltd.
- (2018). Ghosts and things: Agriculture and animal life. *Global Environmental Politics*, 18(2), 134-142.
- Weiss, B. (2016). *Real pigs: Shifting values in the field of local pork*. Duke University Press.

- Whatmore, S., & Thorne, L. (1997). Nourishing networks: Alternative geographies of food. In M. Goodman & M. Watts (Eds.), *Globalising food* (pp. 211-224). New York: Routledge.
- White, R. J. (2017). Capitalism and the commodification of animals: The need for critical vegan praxis, animated by anarchism! In D. Nibert (Ed.), *Animal oppression and capitalism* (pp. 270-294). Santa Barbara, CA: Praeger.
- Wikimedia Commons. (2010). Gashapon machine. Available at:
https://en.wikipedia.org/wiki/Gashapon#/media/File:Gashapon_machine.jpg accessed 2/5/2019.
- Wolfe, M. (1955). The concept of economic sectors. *The Quarterly Journal of Economics*, 69(3), 402-420.
- Yamaguchi, H. (1988). *Kentakkī furaido chikin no kiseki*. Japan: Keirinshobō.
- Yamaguchi, T. (1983). *Niwatori (Japanese: Chicken)*. Tokyo: Hōseidaigaku Shuppan-kyoku.
- Yamanaka, K. (1938a). Is it okay to rely on manchuria for our corn? (Japanese: *Tōmorokoshi wo manshū ni makasete anshin shiteite yoi ka?*). *Niwatori no Kenkyū*, 15(5), 6-13.
- (1938b). New world record 363 egg laying chicken (Japanese: *Sekaishinkiroku 363 tamago niwatori*). *Niwatori no Kenkyū*, 15(12), 60-64.
- Yamauchi Farm. (2017). Gurandomenyū Satsuma Yamauchi Jidori (Japanese: *Grand Menu Satsuma Yamauchi Jidori*). Monteroza Corporation. Available at:
http://www.monteroza.co.jp/new/menu/859re/pdf/859_satumayama_grand.pdf accessed 2/5/2019.
- Yamazaki, Y., M. Doy, N. Okabe, Y. Yasui, K. Nakashima, T. Fujieda, S.-i. Yamato, Y. Kawata & T. Ogata (2009). Serological survey of avian h5n2-subtype influenza virus infections in human populations. *Official Journal of the Virology Division of the International Union of Microbiological Societies*, 154(3), 421-427.
- Yomiuri Shimbun (1998). Jidori meat to become JAS (Japanese: *Jidori no shokuniku o JAS hyōji taishō ni*). *Yomiuri Shimbun Tokyo Morning Edition*, March 28.
- (2004a). Avian influenza confirmation took a half-month (Japanese: *Tori Infuruenza shindan okure, kakutei made hangetsu*). *Yomiuri Shimbun Morning Edition*, Jan. 14.
- (2004b). Avian influenza even spread to Oita. Where is the virus from? Focusing on vectors (Japanese: *Tori infuruenza, Ōita demo uirusu doko kara? Kansen 'ten' no mama*). *Yomiuri Shimbun Morning Edition*, Feb. 18.

- (2004c). Charges eyed for Asada Nosan. *Yomiuri Shimbun, English Version*, March 4.
- (2004d). Cooking chicken at 75 c for 1 minute kills bird flu virus. *Yomiuri Shimbun, English Version*, March 10.
- (2005). Ibaraki avian influenza industry inspection, spread through ‘cross-contamination’ or ‘illegal vaccine’? (Japanese: *Ibaraki tori infuruenza, gyōsha junkai de ‘kōsa osen’ shin’nyū rūto ‘ihō wakuchin’ ka*). *Yomiuri Shimbun Evening Edition*, Oct 29.
- (2009). Stop global warming contest: Chicken waste generator wins special prize (Japanese: *Sutoppu ondan-ka zenkoku taikai keifun hatsuden ga tokubetsu-shō*). *Yomiuri Shimbun Western Morning Edition*, April 3.
- (2011). 70-year-old woman dies in Nobeoka from salmonella, recalls initiated (Japanese: *Tamago ni sarumonerakin 70-sai dai josei ga shibō Nobeoka, kaishū no gyōsei shidō*). *Yomiuri Shimbun, Saito Morning Edition*, August 11.
- (2016). Six tourists have food poisoning (Japanese: *Kankōkyaku 6-nin shokuchūdoku*). *Yomiuri Shimbun, Morning Edition Miyazaki*, April 19.
- Yoneyama, H. (2012). Not typical: A new approach to dining out (Japanese: *Ariki tari janai shin gaishoku*). Shōgyōkai.
- (2014). Changing japan’s food and drinks (Japanese: *Nihon no inshoku o kaeru*). *SCOPE*, 7-8.
- Yoshida, R. (2009). Colonel stages a comeback in Osaka. *Japan Times*, Mar 11.
- Young, L. (1998). *Japan’s total empire: Manchuria and the culture of wartime imperialism*. Berkeley: University of California Press.
- Zenkoku Nihon Niwatori Hozon-kai. (2004). *Japanese chickens foreign chickens color version* (Japanese: *Nihon niwatori gaikoku niwatori: Karā-ban*). Japan: Ienohikarikyōkai.