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Dealing with Precarity in the Hog Industry and Resilience on Okinawa Island: A Case Study of the 2020 Classical Swine Fever

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Keywords

Hog, classical swine fever (CSF), resilience, Okinawa

Introduction

This article investigates the relationship between humans and pigs in Okinawa and the ways in which Okinawan people handled the most recent classical swine fever (CSF) outbreak in 2020 in Okinawa. The livestock industry in island communities deals with issues of space and cost that limit the operation of large plants. To begin with, the island environment does not provide island farmers with protection of their animals from imported infectious diseases, nor does it give them an operating advantage in the animal food industry due to the physical distance from other cities. In fact, their livestock industry has always been threatened by globalization on top of other disadvantages of risks in this precarious industry.

To understand these farmers' motivations in restarting their hog farms after setbacks, one must know the historical background of hogs in Okinawa and their cultural contribution to Okinawan people's identity. Hogs in Okinawa are economic animals that are reproduced, fattened, slaughtered, and their meat sold in markets for people's consumption. However, there is more than just an economic aspect to the hog industry in Okinawa: the cultural aspects of Okinawans' close relationship with hogs, which needs to be reevaluated in the context of a hog disease outbreak on the island.

In this study, a descriptive analysis conducted from interviews with a local hog farmer, whose hog farms were allegedly found to harbor the first classical swine fever (CSF) case in Okinawa in 2020 in thirty-four years,¹ and from local news media reports on the other affected farm to highlight local perspectives on hogs and on the hog industry in Okinawa. Based on the interviews and news articles, it also illustrates the ways in which Okinawan hog farmers who lost their hogs have regained their motivation to restart

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their operations again. What role do hogs play in Okinawan culture? How have local perceptions of hogs and their impact on the environment shifted the industry's operations on the island? What were the reactions of farmers whose farms were affected by CSF cases and of the local media that reported the CSF cases? How did the outbreak change the hog farmers' views of their hogs and their environment risks? Based on the narrative of the hog farmers and the local news articles that reported on the CSF outbreak, this paper explores the sociocultural aspects of Okinawans' connection to and perceptions of hogs.

The paper first examines previous studies on the Okinawan cultural aspect of hogs, which stress a close relationship between people and hogs, and the historical background in which Okinawan culture was characterized as "sweet potatoes and pigs." Second, it analyzes how the proximity between hogs and the human living space changed due to industrialization and people's concerns over environmental pollution caused by the animal-farming industry. Third, it examines the CSF outbreak and the media's reaction to it. The image of the control-measure team carrying bags of carcasses and burying them deep underground evoked the anxiety of food contamination among the people, as well as creating both sympathy and agitation toward the first hog farmer who had waited to report his abnormal cases to authorities. Fourth, the paper sheds light on the local farmers' experience of losing hogs from their farms and the ways in which they coped with the crisis. By focusing on their narratives, it depicts the relationship between farmers and their animals; even though hogs were produced and kept for an economic purpose, farmers considered them as a part of their family. Their narratives readdress Okinawan hog farmers' psychological closeness to their economic animals. Lastly, this study discusses the socio-cultural aspects of hogs in Okinawa and to what extent the discourse of Okinawan culture associated with hogs reflects on contemporary Okinawa.

Contextualizing Hog Production in Ryukyu-Okinawan History

Historical records suggest that the first hogs were brought to Okinawa Island from Ming dynasty China by messengers of Ryukyu King Satto in the fourteenth century. In the sixteenth century, Chinese families who immigrated to Okinawa brought more hogs from Fujian, China, to Okinawa, along with their knowledge and skill in raising and multiplying domesticated hogs, which spread to commoners around the castle. This was considered to be the first introduction of hog raising in Okinawa. During the Ryukyu Kingdom period (1429–1872), people were encouraged to raise hogs by the Shuri royal authority for use in reception ceremonies for envoys from the Chinese emperor, under the tributary system, and for delegations from the Edo shogunate in Japan, which required four to nine months of traveling (Hirakawa 2005, 65).

Hog raising in Okinawa developed along with organic horticulture. In the Meiji period, sweet potatoes were introduced in Okinawa, and they became people's main starch source and feed for hogs. The animal waste became good fertilizer for their sweet potato fields. Because of the introduction of the sweet potato, most households in Oki-

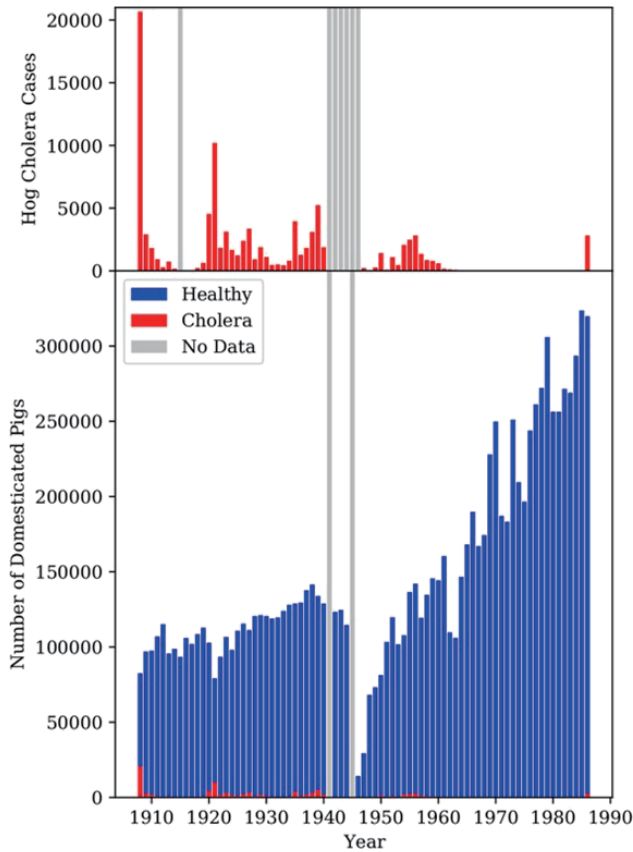
nawan were able to keep at least one hog in their house compound in addition to their main farming practice. From the Taisho period to pre-World War II, Okinawa became the prefecture that had the largest number of hogs per population in Japan. Before the war, Okinawa Prefecture had about 120,000–130,000 hogs (1.5 hogs per household) (Toyama 1979, 121). Therefore, Okinawan culture was referred to as the “culture of sweet potatoes and pigs” in Japan (Hirakawa 2005, 62–63; Tamaki 2007, 14–15).

For Okinawans, hogs had become more than just economic animals whose life forms and reproduction were controlled by humans for economic purposes. Hogs were treated as precious economic resources that provided Okinawan families with rich nutrition at special occasions such as New Year and other celebrations. Before World War II, people kept their hogs in cells made of limestone that were built in proximity to a family’s main house in the same compound. Okinawans deemed hogs as guardians that had magical power to expel evil spirits; when they came home late at night, they made their hogs squeal before entering the house. Even today, hogs are still fondly referred to by people whose families are engaged in hog production in Okinawa. For Okinawans, hogs not only helped them recover from the war but also enabled their children to go to university to get better job opportunities. As a daughter of a hog farmer, Okinawan local Diet member Sueko Yamauchi says, “I was raised by my family’s hogs. I am deeply indebted to hogs” (*Okinawa Times* 2020a) (my translation). This is a commonly shared sentiment by Okinawan people whose families sent their children to higher education after the war.

During World War II, Okinawa became the only place where Japanese civilians were embroiled in the ground battle by soldiers.² Not only people but also livestock were victimized. Referenced from the testimonies in *Okinawa Times* (1971), Toyama (1979) suggested that after the war, the number of hogs decreased from 100,000 to 1,000 on Okinawa Island (*Okinawa Times* 1971 in Toyama 1974, 114).³ The post-war period experienced a critical food crisis that needed to be quickly resolved. In 1946, the United States Civil Administration of the Ryukyus (USCAR) imported sixty hogs from the USA, mainly to breed for food (Ryukyu kyōdō shiryō kabushiki gaisha 2012, 114). Two years later, Okinawan immigrant communities in Hawai‘i raised funds for shipping hogs from the US mainland to Okinawa. In 1948, seven Okinawan Hawai‘i immigrants brought 536 western white hogs on the US military ship *Owen* to Okinawa after a twenty-five-day voyage through great effort (Fukuchi 2016, 21). These pigs were distributed throughout Okinawa. Within four years, imported white hogs were bred and multiplied. These hogs became the base of the current Okinawan hog industry.

Until the mid 1960s, hog production in Okinawa relied on swill (untreated food garbage) from their homes and restaurants on US military bases to feed their hogs (Tōyama 1979, 160). In such an environment, hog cholera (classical swine fever) outbreaks hit Okinawa until the mid-1960s (table 1).

TABLE 1. Numbers of hogs and hog cholera cases in Okinawa from 1935 to 1986



Source: Data from *The History of Disease Control in Okinawa* (Ura 1985, 130).

During the mid 1960s and 1970s, the swine industry in Okinawa shifted to a corporate style, which is characterized by large operations and less manpower, and specialization in the production (Tōyama 1970, 160). As mixed forage started replacing sweet potatoes and swill, the number of livestock started increasing from the mid 1960s and 1970s. In 1965, the supply of mixed forage for hogs was 5,287 tons in Okinawa, which increased to 42,905 tons, eight times higher, in the 1970s. There were only 200 households that kept more than 100 hogs in 1965, but the number doubled to 409 households in 1977 (161).

The industrialization of hog farms started causing social and environmental problems. Sewage, animal waste, and noise from industrial hog farms emerged as new environmental problems. Higa (2015) critically analyzed that hog production and the meat process became invisible within Okinawan communities, not because the animals are filthy but because people “found” the odor expelled from hog farms to be a new environmental “pollution” that needed to be regulated and prevented by laws (49–54). Between 1970 and 1971, several environmental protection laws⁴ (*kankyō hozen rippō*) were enacted

(Tōyama 1979, 175). As a result, many hog farms were pushed toward the periphery in rural environments close to mountains and hills. Between 1973 and 1976, hog farms in the south and central parts of Okinawa established clusters of hog farms (*yōton danchi*) to deal with the environmental “pollution” problems (161).

Although sporadic outbreaks still occurred in the 1960s, they almost disappeared from Okinawa by the early 1970s due to the new regulations to improve the environment of the hog industry and disease prevention schemes.

The CSF Outbreak and the Media Discourse on the Disaster

Hog cholera is officially referred to as classical swine fever (CSF), which is a highly contagious infectious disease for hogs. CSF is caused by the CVS virus, a single stranded RNA virus, and it causes various symptoms, including loss of appetite, fever, listlessness, decreased growth, and death (Food and Agriculture Organization of the United Nations 2010). The CSF virus is highly contagious, and it is spread orally by ingestion of contaminated swill (food leftovers) or contaminated meat products (2010). The virus can be found in bodily fluids (blood, urine, saliva, semen, and nasal secretions) of affected hogs and piglets, which are vertically infected through their infected mother pigs, which can become immunotolerant to the virus and thus become reservoirs of the virus. Therefore, if a CSF case is found on a farm, mandatory control measures must be taken immediately by each prefectural governor’s order in Japan (Ministry of Agriculture, Forestry, and Fishery 2020). According to the control measures, entire herds must be culled on the affected farm, the movement of animals within a radius of three kilometers from the affected farms must be controlled, and vehicles in the area must be disinfected at control-points (Shimizu et al. 2020, 2).

In January 2020, a CSF outbreak was found on a hog farm located in Uruma City in the central region of Okinawa. According to a news article, the first hog farmer noticed abnormal symptoms (diarrhea and loss of appetite) among his hogs on one of his farms in late November 2019; thus, he consulted with a veterinarian and injected his pigs with prescribed medications himself, which has been usually conducted by farmers in Okinawa. The symptoms of the hogs did not improve thereafter. He started spotting deaths among his hogs on December 20, 2019. However, even after he saw the deceased hogs, he waited to report it to authorities, presuming that the offices were closed during the end of the year period. It was already January 6, 2020, when he finally called the office. Two days later, laboratory test results confirmed that the hog farm was affected by the CSF virus. The first farm was located in *yōton danchi*, sharing sewage facilities with other owners’ hog farms. A few days later, other farms’ hogs were also confirmed as CSF positive.⁵

The CSF virus had not been found in Okinawa since 1986. Local news media showed the disease control teams in hazmat masks, fully covered in white gowns, conducting their duties on the hog farm sites in the local newspapers and on TV using drone images (fig. 1).



FIGURE 1. Picture showing disease control staff removing bags containing carcasses of euthanized hogs from farms (*Ryukyu Shimpo* 2020a) (Courtesy of *Ryukyu Shimpo*).

Due to the urgent and massive operational needs, it required a large workforce from various sectors for the disease control duties. People who engaged in the operation were quickly assembled at the central sanitation station, check points, hog farms, burial sites, and so forth. Throughout days and nights until the last carcasses were disposed of, people who lived in the affected cities saw vehicles of the Self Defense Force and trucks on the roads. One member of the Uruma City Council testified about his experience at a council meeting in February 2020:

I received a call from someone who worked at a construction company late at night, and I was asked to help with the operation. Thus, I quickly went to the central sanitation station, and I was dispatched to the first farm. The disease control site was a mess. At first, I was surprised at the terrible working environment there; I was further surprised at the fact that there was no one who was taking command. After waiting one hour, I was finally instructed to drive a truck carrying bags of pig carcasses to the burial site, but there was no one who knew where it was. (Testimony by Mr. Hisashi Teruya at the February Diet Meeting in Uruma City, held from March 9 through 17, 2020) (my translation).

The Okinawa Prefectural Governor, Denny Tamaki, also requested that the Ministry of Defense dispatch units of the Japan Ground Self-Defense Force, which were stationed in Okinawa, to the disaster relief operation after the disease outbreak. Every day, news articles reported the voices of local community people and members of the prevention teams. A person who lives near the first hog farm reportedly told a news reporter: “I was surprised that it happened near our house. It must be a big blow for the pig farmers. The local administration should provide us with accurate information as soon as possible” (*Ryukyu Shimpō* 2020b) (my translation).

The outbreak continued after the first cluster, and the media kept reporting the details of each affected farm. In the news articles by the *Okinawa Times*, the connections between each farm were explained in details: sharing the animal waste company, frequent contacts by people, vehicles, and hogs, for instance (*Okinawa Times* 2020b).

From January through March 2020, a total of 12,381 pigs⁶ were disposed of for disease control from ten hog farms, and thousands of individuals were engaged in the control measures. Based on laboratory tests, all CSF viruses detected from the first four farms were the same sub-genotype that had been found in central Japan (Press release by the Okinawa Prefecture and Ministry of Agriculture, Forestry, and Fisheries 2020). A national team from the Ministry of Agriculture, Forestry, and Fisheries (MAFF) tried to trace the transmission route from the mainland Japan to Okinawa but in vain. Unable to identify the transmission route, the Okinawa prefectural livestock section and the MAFF concluded that the 2020 CSF outbreak in Okinawa was caused by manmade factors: the CSF outbreak in Okinawa might have been caused due to the swill feeding practices of the first hog farm owner (*ibid.*). Further adding to the fact, the first farmer’s delayed report and his maintained marketing until he finally stopped on December 26, 2019, were criticized publicly by the ministry and the local government. After detailed articles came out in the media, it was apparent that the main condemnation was directed toward the first hog farmer. Minister of Agriculture Taku Eto said in a press conference: “It was very regretful that reporting of the abnormal deaths of hogs was delayed (by the first hog farmer) even though some cases had already been confirmed since last year” (*Ryukyu Shimpō* 2020c) (my translation). At first, the local media did not hide reports of critical views toward the first hog farmer as the man to be blamed for causing the disaster. However, once the media reported the official statement of the outbreak cause, its focus quickly shifted to other aspects, such as the delayed compensation allowance and voices of regret from other CSF-affected farmers.

Farmers’ Narratives on the Outbreak

In this section, I mainly focus on narratives of the first hog farmer who reported to the local government the health condition of his hogs. Parallel to his narratives, I also refer to the narratives of another CSF-affected farmer who accepted interviews by the local news media a year after the outbreak. The owner allowed the media to identify her name and

her company. I interviewed two hog farmers for this study. The latter farmer's farm was not affected by CSF virus, but like the first farmer, he had also inherited his hog farm from his father in the southern region of Okinawa Island, and he spoke of the economic and social aspects of the Okinawan hog industry and hog farmers. I use pseudonyms for the first farmer and my other informants in this article to keep their interviews confidential.

Mr. Oshiro had two pig farms that were 2.5 kilometers away from each other in Uruma City. Prior to the outbreak, the first farm had 422 hogs (fattening to finish), and the other farm had 705 hogs in multiple stages (i.e., piglets, weaned hogs that weighed up to thirty kilos, and sows). Although the epidemiological team did not confirm any CSF cases on his second farm, disease control measures were taken at the two hog farms, and a total of 1,127 hogs, including pedigreed mother hogs and piglets, were slaughtered. The farmer lost not only his herd but also his reputation as a skilled hog breeder.⁷ Mr. Oshiro had inherited his father's pig farms, and because of his contributions to a festival event that was held to commemorate the history of the hogs presented by the Hawaii Okinawan community to Okinawa, he had received a letter of appreciation from the city and had been invited to an annual event at the monument for the pigs brought by the US military ship *Owen* in Uruma City on the 27th of September every year (fig. 2 and fig. 3).

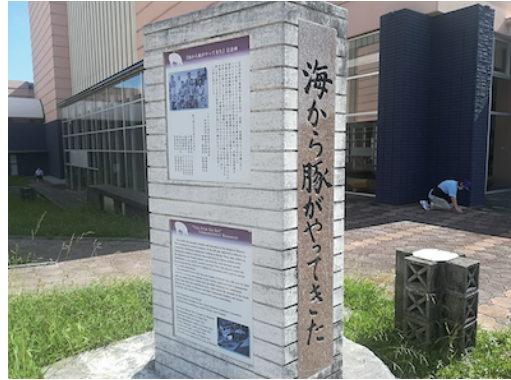


FIGURE 2 & FIGURE 3. Monuments commemorating the friendship and hard work by the seven Hawaii Okinawa immigrants who voyaged with 550 pigs to present them to Okinawa in 1948. The monument was erected in 2016.

Prior to the interview, I assumed that pig farmers viewed their animals as just objects to gain income and their operations for handling hogs' lives were impersonalized. I learned that was not the case with Mr. Oshiro. As I greeted him at his house, he told me that his mother hogs had recently delivered dozens of piglets, which was keeping him busy at the moment. He mentioned how adorable those newborn piglets were, and just by looking at those piglets rushing toward the mother sow's nipples and competing to get good feeding positions, he felt content with these new lives, and he thought that they were a source of energy and motivation for him. During the interview, I asked him why he had gone to feed his hogs for their last meal knowing that they would be slaughtered soon on

that day. He replied:

I was not supposed to enter my farm at that point. But they had been left starving for two days. I went to see them, and they were making noise because they were so starved. I went in to feed them their last meal. It was around 6:00 a.m. But the media reporters had already flocked in in front of my farm, so I could not get out. They asked me how I felt, and I answered that I could not think of anything right now. (Interview with Mr. Oshiro, May 9, 2021) (my translation)

Mr. Oshiro was not present at the control sites, but he saw them both on TV and in the news articles that showed images of his hog farms, and he was shocked watching them on the news. He imagined the tasks of the disease control operation, and he sympathized with the members who had to engage in the tasks.

The work at the disease control site must have been terrible. There was a mother pig that was just delivering piglets, but even amid the delivering, the team had to kill the mother by giving her an electric shock. I heard that there were some Self-Defense Force members who were shedding tears. It must have been a terrible time when they engaged in the control practice. (Interview with Mr. Oshiro, April 29, 2021) (my translation)

After the outbreak hit his farms, he could not go outside and thought that he was “not entitled to keep pigs anymore” because he was “the very person who let the virus seep into my farm and spread the virus to other farms” (my translation).

Before the outbreak hit his farm, Mr. Oshiro had bought new breeding hogs that produced more piglets than regular pigs and had invested in setting up new facilities to handle animal waste. He was aiming to restructure his hog farm so that it would not emit any pollution into the environment. However, due to the steeply increasing cost of mixed animal forage,⁸ he was using swill from other cities to feed his hogs. Asking him why he used swill for animal feed, he immediately told me that he was now using mixed animal forage from a company even though it cost him more. But according to him, the mixed animal forage was expensive; thus, it was not sustainable. Then he also explained that farmers have been raising hogs by feeding them swill and other vegetables in Okinawa for a long time. Mr. Oshiro feels that hogs have become weaker and much more fragile than before, and he wonders why they cannot survive without various antibiotics and veterinary medicines nowadays.

Kinjo Farm’s owner, Ms. Kinjo, is a daughter of an Okinawan hog farmer, and she inherited the family’s hog farm company, located in Okinawa City. Their farms were not a great distance from each other (1.6 km), and they both used the same company to treat animal waste. Although their farms’ locations are in two different cities, they were still within a three-kilometer radius, which is the targeted scale of the disease control measures. Thus, the disease control team also sample-tested a few dozen hogs at the Kinjo Farm, and the tests were also confirmed positive.

A news article reported that Ms. Kinjo was present at the site to witness 3,012 pigs culled by the disease control teams. It took one week to complete the disease control

measures, and Ms. Kinjo did not leave her farm until the last one was slaughtered. The article summarized the details of an incident on the disease control site from Ms. Kinjo's viewpoint: "The scenes looked unreal. A mother pig weighing 150 kilograms tried to escape, and she fell into a well on the farm. One of their employees secured himself with a rope and went down to get the mother pig out (only to send her to be slaughtered) from the well. During the culling of the pigs, she kept telling them, 'It was my fault. I am sorry.' At the control site, she sometimes made demands and annoyed the prefectural staff and the Self-Defense Force team who were engaged in control duties, but she did not back off, saying 'This is my and my father's farm,' and she did not leave the farm. After the incident, she could not eat, and she lost ten kilos. Retrospectively, Ms. Kinjo also expressed her guilt over her pigs, saying that "we were the assailants who killed pigs" (*Ryukyu Shimpo* 2021) (my translation).

Due to the outbreak, the social lives of pig farmers were also interrupted. Mr. Takara owns a corporate pig farm in the southern region of Okinawa. He said that when the outbreak was discovered on one farm after another in the central region of Okinawa, he had a plan to attend someone's wedding, to which many hog farmers were also invited. However, to avoid physical contact amid the outbreak, the administration advised them not to get together (Interview with Mr. Takara, April 7, 2021) (my translation). The CSF virus is one that can survive on material surfaces and can be transmitted by vehicles, persons, or things. Therefore, after the CSF outbreak, hog farmers avoided each other even outside of their farms. Under such circumstances, not just the hogs but also humans themselves were in danger of carrying pathogens. To keep their valuable hogs from CSF contamination, human relations and their social activities became the target of monitoring.

Mr. Oshiro received calls from his friends, relatives, and hog farmers in his network. They encouraged him to restart his hog farms once he was ready. They knew that he was a hog farmer who had experienced this occupation from an early age along with his father, who was one of the main contributors to hog production in Okinawa. According to Mr. Oshiro, he could not think of restarting the hog farms. However, being encouraged by many people, he restarted his hog farms again.

During the interview, the first thing I noticed before starting my interview was several colorful thank you cards and a decorated message board from school students that said *chibariyo* (the Okinawan expression for "cheer up!") on the wall in the main room of his house. When I asked him about them, he mentioned that they were from the neighborhood elementary school students who had visited one of his farms with their teacher before the outbreak, and who wanted to teach *shokuiku* (the study of food and life).

For months, Mr. Oshiro frequently had visitors from the prefectural government. Local civil servants mediated between him and the national Ministry of Agriculture, Forestry, and Fisheries (MAFF) for compensation for the lost livestock. It was frustrating for Mr. Oshiro because he had to deal with civil servants who had never worked in hog farms and had known little about hog production, and they were also replaced by new people in the new fiscal year. It took him three months to reach an agreement.

In the end, I felt that they (the Japanese government) just wanted me to swallow what they offered; thus, I agreed to receive the amount they offered. Computing the allowance based on a complicated chart was difficult. The number of piglets, track their number of days after they were born, calculate the amount of feed they ate and how much feed was still left uneaten. They had a detailed chart made by MAFF. I had 50 *agus* (locally bred brand hogs), which were not sold at the market price. Their value was not on the chart because of their breed. After calculating, the prefectural staff said, “hog farming doesn’t make any profit!” I said, “I mentioned that already; you think that hog farming is a lucrative business, but it isn’t. If anyone learns how much money we pay for expenses and gain at the end, no one will ever want to start the business.” (Interview with Mr. Oshiro, May 9, 2021) (my translation)

Nine months after the outbreak, Mr. Oshiro bought new mother pigs from the prefectural breeding center. He said that he had been living on his savings for a year and a half already, and he looked forward to his piglets getting fattened so he would be able to provide delicious and healthy meat to the market. Despite the economic and psychological burdens, as well as the discouragingly long process of negotiations, he restarted one of his hog farms again.

Kinjo Farm also bought mother pigs and restarted their farm six months after they lost their entire herd. Ms. Kinjo openly revealed that her corporation was one of the farms affected by the CSF virus in the recent outbreak, but because of the terrible experience of losing her herd, she invited vets to give seminars at her farm, and they received biosecurity training. The corporation aims to be a HACCP⁹-certified farm that complies with all the strict food production protocols to supply highly safe, reliable, and clean food products (*Ryukyu Shimpo* 2021).

Discussion on the Animal-Human Relationship in the Okinawan Context

The main discussion in this paper is to analyze hog farmers’ perceptions of their animals and the Okinawan people’s relationship with hogs. Tim Ingold provides an insight into animal agency in hunter-gatherer societies. He interprets that prey animals are situated outside of the hunter’s control; thus, both have equal agency in nature. However, he denies animals such agency in industrial livestock. According to Ingold, livestock in industrial production became mere objects, which is how Western scholars always depicted them since there was a disengagement between humans and animals (Ingold 2000, 75).

Anthropologist Rima Higa argues that Ingold’s critique of livestock agency was misleading. From her fieldwork on industrial hog farms in Okinawa, Higa finds that Ingold’s view of a lack of agency in domesticated livestock does not fully explain the human-animal relationship in the Okinawa context. According to Higa’s extensive fieldwork on Okinawa Island, previous studies on hogs in Okinawa do not reflect the reality of the modern hog industry, in which local hog farmers met with strong opposition from their communities for the pollution from their hog farms. Hog farms became targets of accusations of environmental pollution. Because of the efforts to separate the hog industry from

the human space, the relationship with hogs has changed (Higa 2015, 45–48). She even went on in her argument to state that the hog industry in Okinawa has become a “necessary evil” in their communities; thus, they were pushed to more remote places and disappeared from people’s living space.

While she did not clearly give her answer in her critiques of Ingold’s lack of animal agency in industrial livestock in her work, some of her claims seem rational and require further investigation. Studies of Okinawan people and hogs have often tended to minimize their social and cultural relationship by putting too much stress on the human-to-human (vender-consumer) dimension or by emphasizing the food-culture aspect of pork as an important item for Okinawans without critically reviewing the shifting environment (Arakaki 2010; Hirakawa 2005; Komatsu 2002). As Higa emphasizes the importance of critically reviewing things within the local context, this paper also attempted to analyze narratives of Okinawan hog farmers in their local contexts. What this study found was that the farmers were proud of their families’ histories in the hog farming business, and they were motivated to restore their farms again by the encouragement they received from their local communities.

Another important study by Alex Blanchette makes a strong argument for discussion of massive production sites such as industrial hog factories as post-humanized worksites. According to Blanchette, previous studies often tended toward the idea that industrial production sites are “*ahuman* landscapes,” in which strict biosecurity protocols and corporate governance strictly separate humans from hogs’ lives (Blanchette 2015, 646). Blanchette calls that a fantasy. The massive hog industries in the Midwest of the United States, as an anthropocentric practice, often put animals over humans. The new mode of corporate governance redefines the human-animal relationship, where the workers’ everyday life and their social spaces come to be strictly self-regulated due to the precarity of the industrial environment.

This viewpoint poses an important aspect to review in the contemporary hog industry in Okinawa. After the CSF outbreak, hog farmers in Okinawa also became more careful about physical contact with each other, and they monitored their visitors and every vehicle that entered their farms other than their own. While these facts are true, I still describe the space of hog farms in Okinawa as rather a “mingle space” for humans and hogs. From the narratives of hog farmers, this study articulates that animals were neither separated from humans, nor did they become merely objects in the lifestyle of the people on the island. The farmers’ reluctance and hesitation to restart their farms changed after they received support from their communities. In other words, it would have been difficult for affected hog farmers in Okinawa to restore their businesses without considering their family inheritance of hog production and contextualizing expectations from the local communities to those hog farmers.

Conclusion

By elucidating the social and cultural aspects of the hog industry in Okinawa, the media discourse, and hog farmers' narratives of the CSF outbreak in Okinawa, this study discussed the relationship between the Okinawan people and hogs in the contemporary livestock industry and how the CSF outbreak demonstrated the sociocultural as well as economic aspects of the hog industry in Okinawa. The reemerging infectious CSF virus impacted local farmers' perceptions of their livestock as fragile and precious economic animals. Also, it made hog farmers change their practices in handling livestock and everyday operations on their farms.

Remembering the time when pigs were still a central part of their lives, Okinawan people try to maintain their cultural identity and keep their connections to the history of the island, even if they themselves barely have contact with hogs. Learning the local farmers' narratives of hogs and the history of the animals' significant contribution to the Okinawan people's survival both in the pre-war and post-war periods, hogs remain a special livestock for the Okinawan people. In a sense, hogs are one of the cultural vectors that connects the different prewar and post-war generations in Okinawa, and it is one of the Okinawan cultural icons that represents the resilience of local Okinawans and the revitalization of Okinawans' cultural identity in a crisis such as the CSF outbreak.

Acknowledgements

I am indebted to my informants, who opened their doors to invite me in to interview them and even to visit one of their farms. I would like to express special thanks for their hospitality. I would also like to thank the editors, colleagues, and staff of the Research Institute for Islands and Sustainability (RIIS) of the University of the Ryukyus. Their regular seminars and workshops gave me new insights into island studies and the concept of resilience. Also, this study was supported by RIIS.

Notes

1. The most CSF cases found in Okinawa before the 2020 outbreak were in 1986.
2. During the war, more than 120,000 civilians were involved in the ground battle along with Japanese and US soldiers. The number of civilian victims was twice as great as the number of deaths of both Japanese and US military soldiers combined.
3. The number of hogs in Okinawa Prefecture was more than 100,000 before the war, and it drastically decreased to approximately 1,000 (*Okinawa Times* "Okinawa no Shogen—Gekidou no 25 Years" [Testimonies from Okinawa: 25 Years of turbulence], 1971. In Tōyama 1979, 114). This number seems to apply only on the main Okinawa Island, however.
4. These laws included: "Water Pollution Control Law" [suishitsu odaku boushi hou]; "Offensive Odor Prevention Law [akushū boushi hou]"; and "Waste Disposal and Cleaning Act" [haikibutsu shori oyobi seisou] (Tōyama 1979, 175).
5. After a surveillance team investigated those farms, several owners admitted that they had lost 100 hogs in total in around the same period when the first hog farmer spotted abnormal symptoms. However, this was not reported by the media. The first pig farm owner also told me that when he had chatted with other farm owners before, they had also had some pigs that had lost their appetite and whose condition did not seem to

improve.

6. This number constituted approximately six percent of the total hog population in Okinawa.

7. Mr. Oshiro and his father both received awards for the best hog of its kind in a national-level competition. According to his relative, they were the only award recipients at the national level from Okinawa for the best hog in two generations.

8. Although it was not clear which years he compared, Mr. Oshiro told me that the mixed animal forage cost him about 30,000 JPY per ton prior to 2020, but the cost increased to 50,000 JPY per ton as of the interview date on May 9, 2021.

9. The Farm-HACCP (Hazard, Analysis, Critical Control Point) is a third-party certification system that promotes “hygienic management in accordance with the hygienic management standards for raising livestock established in Japan’s Animal Infectious Disease Control Law” (Japan Livestock Industry Association 2017).

References

- Arakaki, Akihisa. 2010. 沖縄の在来家畜—その伝来と生活史 [Okinawa-originated domesticated animals—Their origins and history]. Naha: Naha Publications.
- Blanchette, Alex. 2015. “Herding Species: Biosecurity, Posthuman Labor, and the American Industrial Pig.” *Cultural Anthropology* 30, no. 4: 640–69.
- Food and Agriculture Organization of the United Nations. 2010. “Good Practices for Biosecurity in the Pig Sector: Issues and Options in Developing and Transition Countries.” *Animal Production and Health Paper* 169.
- Fukuchi, Yoshio. 2016. “海から豚がやってきた—ハワイから送られてきた豚を巡って” [Pigs came from the ocean—Essay on pigs sent from Hawaii]. 氷室 [Journal Himuro], 20–25.
- Higa, Rima. 2015. 沖縄の人とブタ—産業社会における人と動物の民族誌 [Okinawan people and pigs—Ethnography of the people and animals in the industrial society]. Kyoto: Kyoto University Publications.
- Hirakawa, Munetaka. 2005. 豚国沖縄—あなたの知らない豚の世界 [Pig country Okinawa—The world you do not know]. Naha: Naha Publications.
- Iha, Taeko. 1999. “豚移送と具志川との関わり” [Relations between the transported pigs and Gushikawa-shi]. In 具志川市史だより [Reports of the history of Gushikawa-shi], edited by Gushikawa Civic Board of Education, 15–24. Gushikawa: Gushikawa Civic Board Education.
- Ingold, Tim. 2000. *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*. London: Routledge.
- Japan Livestock Industry Association. 2017. “Hygienic Livestock Farm Management Control and Certification Standard.” Accessed September 13, 2021. https://jlia-farm-haccp.jp/haccp_info.html.
- Komatsu, Kaori. 2002. “第一牧志公設市場の行方—観光化による市場の変容” [The future of the first Makishi Market—Tourism impacts on the market]. In 開発と環境の文化学—沖縄地域社会変動の諸契機 [Cultural studies of development and environment—Circumstances of regional social movement in Okinawa], edited by Takeshi Matsui, 165–186. Ginowan: Youju Shorin.
- Ministry of Agriculture, Forestry, and Fishery. 2020. “豚熱に関する特定家畜伝染病防疫指針” [Guidelines to the specific livestock infectious disease prevention regarding CSF]. July 1, 2020. Accessed September 30, 2021. https://www.maff.go.jp/j/syouan/douei/katiku_yobo/k_bousi/attach/pdf/index-33.pdf.
- Okinawaken kachiku eisei shikenjou. 2003. 沖縄県家畜衛生試験場八十年史 [Okinawa Prefectural Institute of Animal Health—Eighty years of the institute history]. Naha: Okinawa Prefectural Institute of Animal Health.
- Okinawa Prefecture Press Release. 2020. “CSF 疑似患畜（豚）の遺伝子検査の判定について” [Results of the genotype of CSF-like sick swine] co-released with the Ministry of Agriculture, Forestry, and Fishery, January 20. Accessed September 28, 2021. <https://www.pref.okinawa.jp/site/norin/chikusan/eisei/documents/200120puresu.pdf>.
- Okinawa Times. 1971. 沖縄の証言・激動の25年誌 [Testimonies of Okinawa—Twenty-five years of turbulent history].
- . 2020a. “記者のメモ：農家の娘心痛める” [Writer’s note: A daughter of a farmer is distress]. February

- 4, 2020.
- . 2020b. “収束の難しさ浮き彫り” [Emerging difficulty in containment]. February 3, 2020.
- Ryukyu Kyodo Shiryō Kabushiki Gaisha. 2012. 琉球協同飼料株式会社 50 年史: 1962–2011 [Ryukyu corporate livestock forage: Fifty years of the company history: 1962–2011]. Haebaru: Ryukyu Kyodo Shiryō.
- Ryukyu Shimpō. 2020a. “豚コレラ感染確認” [Hog cholera infection case confirmed]. January 9, 2020.
- . 2020b. “危機拡大を警戒—全身防護服で消毒、処分急ぐ作業員心が痛む” [Alarming risk expansion: Disinfecting with full-cover protect suit and hurrying to dispose; members were heart-broken].
- . 2020c. “通報体制に課題” [Issues in the reporting system]. January 11, 2020.
- . 2021. “農場 HACCP 習得へ” [Becoming HACCP accredited]. January 7, 2021.
- Shimizu, Yumiko, Yoko Hayama, Yoshinori Murato, Kotaro Sawai, Emi Yamaguchi, and Takehisa Yamamoto. 2020. “Epidemiology of Classical Swine Fever in Japan: A Descriptive Analysis of the Outbreaks in 2018–2019.” *Frontiers in Veterinary Science*, September 7: 1–14.
- Simon, Scott. 2015. “Real People, Real Dogs, and Pigs for the Ancestors: The Moral Universe of ‘Domestication’ in Indigenous Taiwan.” *American Anthropologists* 117, no. 4: 693–709.
- Sutton, Mark Q. and E. N. Anderson. 2004. *Introduction to Cultural Ecology*. Lanham, Maryland: Altamira.
- Tamaki, Naotake. 2007. “沖縄の養豚の歴史と今後の展開” [The history of swine industry in Okinawa and its perspectives on the future]. In *養豚の友* [Journal of swine industry company], 14–20. Tokyo: 日本畜産振興会 [Japan Livestock Promotion Association].
- Tōyama, Masahide. 1979. 沖縄県畜産史 [History of Okinawa prefectural livestock industry]. Naha: Naha Publications.
- Ura, Souki. 2015. “沖縄県における豚熱の防疫史” [History of disease control for CSF in Okinawa Prefecture].” In *沖縄県における豚コレラ発生記録* [Records of hog cholera outbreak in Okinawa], 129–135. Accessed May 16, 2021. <https://www.pref.okinawa.jp/site/norin/eiseishiken/documents/bouekisi.pdf>.
- Uruma City Diet Meeting. 2020. A Testimony by Mr. Teruya Hisashi at the 2020 February Uruma City Diet Meeting, held from March 9 through 17, 2020.