EMPLOYEE MANAGEMENT AND ANIMAL CARE: A COMPARATIVE

ETHNOGRAPHY OF TWO LARGE-SCALE DAIRY FARMS IN CHINA

by

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Abstract

Farm management can directly and indirectly affect animal care. I explored how farm management affected animal care on 2 large dairy farms in China (anonymized as Farm A and Farm B). I used a mini-ethnographic case study design, living for 38 days on Farm A and 23 days on Farm B. I conducted participant observation and ethnographic interviews with farm staff positions within 5 departments in Farm A and 6 departments in Farm B. In addition, I conducted 13 semi-structured interviews (7 on Farm A; 6 on Farm B). I used template analysis to generate key themes. On both farms, workers believed that animal care practices had improved over time, due to 3 key employee management factors: 1) organizational culture, 2) competency of worker and management, and 3) an effective incentive system. These results suggest that animal care may be improved in this context by: 1) promoting a culture in which workers have 'grit' and are eager to learn, 2) ensuring basic worker wellbeing, and 3) using animal care outcomes as performance indicators linked to pay.

Lay Summary

China's dairy industry is growing and restructuring to favor large-scale dairy farms. I lived on two large-scale dairy farms in China and through immersive fieldwork found that employee management critically shaped animal care. Cattle care may be improved through employee management practices such as ensuring working conditions or incentivizing farm workers.

Preface

M. Chen, D.M. Weary, M.A.G. von Keyserlingk, and S. Magliocco designed the study. M. Chen conducted ethnographic fieldwork to collect data. M. Chen analyzed the data and wrote the manuscript. D.M. Weary, M.A.G. von Keyserlingk supervised and provided feedback on the manuscript.

A version of Chapter 2 is in preparation for publication: Chen, M., Weary, D.M., von Keyserlingk, M.A.G., Magliocco, S. Employee management and animal care: Ethnographies of 2 large-scale dairy farms in China. This project received UBC research ethics board approval (#H18-03664).

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List of Abbreviations

CCP: Chinese Communist Party

CIWF: Compassion in World Farming

FAO: Food and Agriculture Organization

HSP: Household-Responsibility System

ICCAW: International Cooperation Committee of Animal Welfare

kg: kilogram

KPI: key performance indicator

mL: milliliter

NGO: non-government organization

OIE: World Organization for Animal Health

RSPCA: Royal Society for the Prevention of Cruelty to Animals

SCC: somatic cell count

SOP: standard operating procedure

TPB: Theory of Planned Behavior

WAP: World Animal Protection

%: percent

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Dedication

献给外公

To Grandpa

和丑丑

And Chou Chou

Chapter 1: Introduction

The People's Republic of China has undergone immense social, political, and economic changes since its formation in 1949, affecting many aspects of the lives of humans and non-human animals living in China. The increased economic development after Reform and Opening Up in 1978 has led to a shift in diet with people now including more animal protein, including dairy products. Though the Chinese dairy industry is relatively new, it is growing rapidly to match growing demand, by increasing both herd size and per head productivity. China is transitioning from predominantly traditional backyard farms to large-scale dairies. China is now home to approximately 10 million cattle, and there is an urgent need to address the welfare of these animals. On-farm welfare can be improved by better understanding the perspectives of individual livestock stakeholders, as well as how stakeholders interact within a farm system.

There are three chapters in this thesis. In the current chapter, I provide context on the Chinese livestock industry, summarize farm animal welfare developments in China, review literature on Chinese livestock stakeholders and animal welfare, identify gaps in the literature, and present my thesis aims. Chapter 2 describes the results of an ethnographic study, and Chapter 3 provides conclusions, discusses the strength and limitations of the thesis, and identifies opportunities for future research.

1.1   Contemporary Chinese Agriculture

According to a Chinese proverb, food comes first for the people (民以食为天). In 1949, the People's Republic of China was founded by the Chinese Community Party (CCP) (Zhang et al., 2017). Shaped by CCP ideologies, China's agricultural sector experienced many changes and reforms. Between 1949 to 1978, land was confiscated from landlords and given to poor peasants, agriculture was collectivized into People's Communes (where production was determined by the

government and private farming was prohibited), and heavy emphasis was placed on grain production (Zhang, 2007). Intended to bring about rapid industrialization, agricultural reform campaigns such as The Great Leap Forward (1958-1962) and People's Commune coupled with natural disasters such as droughts led to the Great Chinese Famine (1959-1961) (Kung & Lin, 2003). This resulted in an estimated 16.4 to 45 million deaths, the majority of which were starvations occurring in rural areas (Meng et al., 2015). Chen and Yang (2015) found that there continues to be persistent memories from this period for those who experienced the traumatic famine.

Under this context, food security became a critical issue requiring attention by Deng Xiaoping when he became leader in 1976. To rebuild the Chinese economy after the Cultural Revolution, Deng Xiaoping initiated 'Reform and Opening Up' in 1979, a series of policies to transition the market from a centrally planned economy to a mixed economy (Lu et al., 2019). Since then, China has grown rapidly and as of 2019 is now referred to as the world's second largest economy by GDP (*China Overview*, 2020). In the 1990s, approximately 14 million people were lifted out of poverty (though there is growing income and consumption inequalities between urban and rural populations) (Chen & Wang, 2001); with increased income came a shift in diet to increased consumption of animal products (Liu et al., 2009).

Deng Xiaoping's market-oriented rural reforms led to rapid growths in agricultural and livestock output. A major change included the decollectivization and disbanding the collective People Commune system to Household-Responsibility System (HRS; where each household became responsible for their profits and losses), which increased farmers autonomy and motivation to produce (Zhang, 2007). By 1985, 99% of farms had transitioned to becoming HRS. Meanwhile, government also promoted the diversification of non-grain (including livestock)

production as well as the intensification of animal agriculture due to efficiency and productivity (Li, 2009).

The Chinese livestock industry has been rapidly growing since 1979: as of 2018, China is by far the world's largest livestock producer, home to almost a quarter of the world's total terrestrial livestock (*FAOSTAT*, 2020). Though animal agriculture is still predominantly carried out by small-scale, family-owned farms, livestock are increasingly raised in large-scale, intensified farms modeled after Western farms (Li, 2009).

1.2 Chinese Dairy Industry

One of China's livestock industries which saw the most growth was dairy. Per capita consumption of dairy has risen, especially in urban regions (Fuller & Beghin, 2015). Annual per capita consumption of dairy has risen to 12.2 kg in 2018 (CNBS, 2020), though this is still only 11% of the world average of 113.0 kg (IDF, 2018). However, China has the world's largest population, approximately 1.4 billion people (CNBS, 2020), making China the world's third largest consumer of fluid cow milk (USDA, 2020). Domestic production has increased dramatically between 1949 to around 2008 (from 1,000 tons to 30 million tons) largely achieved by increases in both herd size and productivity per cow (CDIA, 2019). Between 2008 and 2018, industry restructuring (including increased farm size and vertical integration of the processing industry) led to a stagnation of domestic production. In 2019, overall production once again begun to increase and is currently at 32 million tons (CNBS, 2020), making China the third largest producer of cow milk worldwide (USDA, 2020). The Chinese government continues to support the growth of the domestic industry, viewing dairy products as an essential part of nutrition and an indicator of standards of living (Wang, 2019).

In China, cattle were traditionally used for multiple purposes including draught, meat, and hide (Huai et al., 1993). With the exception of northern and western pastoralist regions (e.g., Inner Mongolia), dairy products were not traditionally part of the diet of Han Chinese (who make up 95% of the Chinese population) (Hu, 2008). Dairy cattle were first raised in China in the late 19th century in eastern coastal cities (e.g., Shanghai) open to foreigners (Fuller & Beghin, 2015). Production was initially low due to prohibition of privatized farming and inefficiency of the few existing state-owned dairy farms (Delman, 2003). Food scarcity and the perceived nutritional value of dairy products meant these products were initially only rationed to children, sickly, and elderly (CDIA, 2019).

1.2.1   1978-2000: rapid industry growth

After Reform and Opening Up in 1978, the increased privatization, economic development, technological advancements, and foreign investment resulted in the rapid development of the dairy industry (DAC & MARA, 2019). The majority of dairy farms became distributed in Northern regions of China where abundant farmland, lower wages, and cooler temperatures favored cattle raising (Hu, 2008). Improved feed, genetics, and management led to increased productivity per cow, which coupled with increased herd size meant an overall increase in milk output (Fuller & Beghin, 2015). Meanwhile, technological advancements (e.g., ultra-high temperature processing and refrigerated transport) enabled the establishment of nation-wide dairy processing companies such as Yili and Mengniu (currently China's top two processors; Sharma & Rou, 2014).

1.2.2   2000-2008: food safety scandals

Food safety became a growing issue due to the rapid growth of the industry with lack of adequate quality control. In the 2000s, China's dairy farms and milk collection stations were

small and scattered (Gale & Hu, 2009). In 2002, 78% of China's 1.4 million farms had fewer than 5 cows, and half of the milk was milked by hand (PWC, 2020). Additionally, there was increasing competition among processors and milk stations who purchase milk from independent producers to collectively sell milk to processors. This created an environment where milk adulteration was tolerated as a means to raise profits (Gale & Hu, 2009; Chen, 2009) leading to a series of severe food safety scandals (see Wu et al., 2018). In the 2008 melamine milk powder incident, milk stations illegally added melamine and cyanuric acid to infant milk powder to boost protein content, resulting in 6 deaths and thousands of infants affected (Gossner et al., 2009). Many of China's largest dairy processing companies were found guilty; in Sanlu Group, melamine was added at 40 milk-collecting stations, propelling a national food safety crisis (Chen, 2009). Following this crisis, consumers became distrustful of the dairy industry (Qiao et al. 2010) and food safety of dairy products remains the top concern for Chinese consumers (Maitiniyazi & Canavari, 2020, 2021).

1.2.3   2008-present: stagnation and transformation

Government policies continue to shape China's dairy industry. After the food safety incidents, the government put in place policies to ensure food safety through industrialization of dairy farming, and vertical integration of the dairy supply chain (USDA, 2017; Wu et al., 2018). Enforcement of existing environmental laws became stricter in 2016, resulting in the disappearance of smaller farms that were unable to meet these requirements (USDA, 2017). China currently has a highly fragmented raw milk production sector (with the top ten dairy farming companies producing less than 20% of national milk output), and highly concentrated processing sector (with the top 3 processors accounting for 50% of market shares) (PWC, 2020).

Shifts in farm-structure, housing, technology, and genetics of dairy cattle presents new benefits and challenges to the welfare of dairy cattle residing in increasingly intensified farming systems (Barkema et al., 2015). In 2018, 45.2% of China's 10.3 million dairy cattle were in large-scale dairy farms (>500 cattle) (DAC & MARA, 2019).

1.3 Animal Welfare in China

1.3.1 The concept of 'animal welfare'

The interdisciplinary field of animal welfare science developed as a response to address questions regarding the ethical treatment of animals (Fraser, 2008). Although animal welfare is now a well-established science (Bracke et al., 1999), Duncan (2005) argued that it is impossible to give one scientific definition of animal welfare.

Fraser (2008) points out that the scientific study of animal welfare, and what "a good life for animals" (p. 23) means, is shaped by cultural context, values and beliefs. Traditional Chinese attitudes towards animals are complex and nuanced. Views of human superiority (as seen in Confucianism; Møllgaard, 2010) exist alongside values of respect, compassion, and kindness towards non-human animals (present in the three major Chinese traditions of Confucianism, Taoism, and Buddhism; Meng, 2008). Though animals are perceived as socio-ethically inferior to humans (Møllgaard, 2010), the virtue-based Confucianism promotes the virtue humaneness and compassion (*ren*; 仁) for both human and non-human animals (Blakeley, 2003). In contrast to the western view that humans are distinct from nature (Descola, 2013), Taoist and Buddhist ontology are holistic and eco-centric. Humans are seen as a part of, and interdependent on, nature (Cao & Chen, 2009; Levine, 2019). Taoists see a unity between man and heaven (天人合一) and promote the harmonious coexistence of all things (万物共存; Schönfeld & Chen, 2019). In the Chinese Buddhist worldview, all beings have 'Buddha-nature' (potential of becoming Buddha),

and strict Buddhist practitioners are forbidden to harm other beings and abide by a vegan diet (Cao & Chen, 2009). Cao (2020) argues that the modern concept of animal welfare is compatible with traditional Chinese values, though these historically important values are not always reflected in modern practices. In recent years, highly publicized animal cruelty cases and wildlife consumption has increased societal concerns among the Chinese public surrounding treatment of animals (Lu et al., 2013).

In the 1990s, the English term 'animal welfare' was introduced to China as '动物福利' ('动物' meaning animal and '福利' meaning welfare; Bao & Li, 2016). Shi Jianzhong (Party Secretary of the National Animal Husbandry Bureau; 2020) argues that the initial translation of the term coupled with simplistic explanations during initial promotion of the concept, has led to potential misunderstandings from the general public. For example, 'welfare' can be misinterpreted to mean additional benefits like used in 'employee welfare'. Initially, English works related to animal welfare were translated into Chinese and discussed mainly among academia. After 2000, the concept became more familiar with other groups such as the general public, industry, and various organizations (Shi, 2020).

1.3.2   Farm animal welfare

Concerns regarding farm animal welfare are increasing in China (Nielsen & Zhao, 2012) and China has made stronger commitments to improving farm animal welfare (FAO, 2017). There is increasing interest in this area among the government, public, non-government organizations, industry, and academia. Several factors have motivated improvement to animal welfare, notably food safety issues, public disease concerns, access to international markets, and increased general interest in animal issues (Littlefair, 2006).

1.3.2.1 Consumers

A survey research of urban Chinese consumers revealed low but emerging interest in high welfare products; You et al. (2014) found that more than two thirds of survey participants had never heard of the term "animal welfare". However, 73% believed that improving welfare would improve the food safety, and 54% expressed willingness to pay for higher welfare. Lai et al.'s (2018) choice experiment further found that urban consumers preferred higher animal welfare independent of taste and product safety. Ortega et al.'s (2015) choice experiment survey revealed that urban consumers were willing to pay for animal welfare assurance depending on the product (e.g., consumers were more willing to pay for high welfare pork and egg compared to chicken). However, such willingness to pay was low, suggesting consumers were unwilling to pay premiums for animal welfare assurance (Ortega et al., 2015, 2016).

1.3.2.2 Laws and standards

Despite a proposed animal welfare law by Chinese scholars (Lu & Fei, 2012), there is a lack of animal protection legislation in China (Li, 2009). In 2005, the term 'animal welfare' was included in the Animal Husbandry Law (畜牧法) draft, though it was later removed due to its 'vague meaning' (Tian & Zou, 2005). Currently, legislation affecting farm animal welfare includes the Animal Husbandry Law (which addresses aspects of livestock rearing and transport; NPC, 2005) and relevant slaughter regulations (e.g., for pigs; PRC State Council, 2016). Promisingly, in 2016 China introduced the first humane livestock slaughter rules for poultry (MOA, 2016).

Chinese and international stakeholders have developed a variety of non-mandatory guidelines and standards for farm animal welfare. China became a member of the World Organization for Animal Health (OIE) in 2007, and in 2011, the OIE standards "Good Practice

for the Welfare of Farm Animals" was translated into Chinese (Lu & Fei, 2012). The International Cooperation Committee of Animal Welfare (ICCAW; a Ministry of Agriculture-approved Chinese non-profit organization formed in 2013) worked with industry and experts to develop welfare standards for layer hens, broilers chickens, pigs, beef cattle, and sheep (ICCAW, n.d.). Mengniu (China's second largest dairy processor) collaborated with experts to develop China's first dairy welfare standards in 2020 (Xinhuanet, 2020). However, the compliance of these voluntary standards relies on industry and producers.

1.3.2.3   Non-government organizations (NGOs)

Apart from developing standards, Chinese and international NGOs have worked collaboratively with relevant stakeholders such as industry, government, and academia to promote animal welfare within China. The NGOs have successfully facilitated a variety of forums, conferences, summits, and seminars. For example, foreign NGOs Royal Society for the Prevention of Cruelty to Animals (RSPCA) and Compassion in World Farming (CIWF) initiated the "International Forum on Animal Welfare and Food Safety" in Beijing in 2005, marking the first international event on this topic in China (China Development Brief, 2021). Since 2017, ICCAW has collaborated with the Food and Agricultural Organization (FAO) among other organizations to host annual World Conference on Farm Animal Welfare in China (Wei, 2019). At the 2017 conference, the Chinese government openly endorsed the importance of farm animal welfare: China's Vice Minister of Agriculture Yu Kangzhen noted that animal welfare is a "natural result and important hallmark of socioeconomic development", that its promotion is not only important for green development of agriculture, food safety, and human health, but "even more so an important embodiment of human caring" (Yu, 2017). In 2018, the Beijing consensus was established to encourage continued advancements in farm animal welfare (Wei, 2019).

NGOs have also incentivized the implementation of high animal welfare standards. For example, CIWF and ICCAW awards Chinese producers with animal welfare commitments with awards such as The Good Egg award, The Good Chicken award, and The Good Pig award, resulting in engagement of more than 100 producers (CIWF, n.d.). ICCAW and World Animal Protection also worked with experts and leading agricultural company Da Bei Nong to set up model pig farms (WAP, 2017).

1.3.2.4   The role of research

Academia plays a role in supplying the knowledge necessary for welfare improvements, and Sinclair and Phillips (2019) identified a need for further research on welfare research in China. Sinclair et al.'s (2020) bibliometric review of Chinese literature focused on pig and poultry welfare identified 854 papers from the last 10 years. Within this literature two concepts which stood out: 1. Yield and productivity, and 2. The Chinese philosophy of "生态农业" or "ecological agriculture". These areas of focus can also shed light on academic and industry priorities.

To improve the welfare of farm animals, it is necessary to not only understand the needs of animals using natural science research, but also use social science research to understand the views of stakeholders who make decisions affecting the lives of their animals. Interestingly, while there is a body of Chinese literature on 'animal welfare', there is currently none (as of February 22nd, 2021; *CNKI*, 2021) exploring farm employees views of 'animal welfare'[1]. Within the English literature, the growing body of research focusing on Chinese livestock stakeholders mainly focus on their attitudes (Platto et al., 2020; Sinclair et al., 2017a; Sinclair et al., 2019b;

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[1] searching for "animal welfare" (动物福利) and "farmers" （农名）; "employee" (员工)

Sinclair et al., 2019c), perceptions (Li et al., 2018; Sinclair et al., 2019d; Sinclair & Phillips, 2019), and knowledge (Descovich et al., 2019; Erian et al., 2019) of animal welfare.

Research on Chinese livestock stakeholders' perspectives have mainly used survey, interview, and focus group methods. More open-ended qualitative focus groups and interviews may yield more in-depth findings compared to quantitative surveys. For example, Sinclair et al. (2017a) conducted surveys with Chinese industry stakeholders and found law, governance, availability of resources, and knowledge were important motivators for improving animal welfare during transport and slaughter. Sinclair et al. (2019b) later used qualitative focus groups and spoke with Chinese stakeholders to identify factors motivating animal welfare improvements, and uncovered motivators such as food safety which was not included in the survey. The latter study also found that financial benefits were a strong motivator, though this was rated low in the survey. The focus group was also able to shed light on the complex relationship of between the intrinsic and extrinsic motivating factors that can lead to improved animal welfare.

In survey research, Chinese livestock stakeholders were found to perceive animal welfare as important (Sinclair et al., 2019d; Platto, 2020). Pig and poultry stakeholders recognized the need for improving welfare, though farmers involved in intensive systems were less likely to perceive a capacity to improve welfare compared to those in small farms (Sinclair et al., 2019d). Platto et al.'s (2020) survey also found that farmers perceived a difficulty in improving specific aspects of animal welfare on their farms, such as providing quality bedding, reducing painful procedures. Such surveys use predefined definitions (e.g., the OIE's definition of animal welfare; Sinclair et al., 2019d), or researcher generated categories (e.g., bedding, painful procedures; Platto et al., 2020), which may fail to reflect the priorities and concerns of participants. Platto et

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al. suggested that further qualitative research was needed to understand why workers perceive animal welfare as important but difficult to implement.

In Yang's (2020) interviews with Chinese layer producers, participants defined animal welfare primarily on biological functioning, and did not consider mental wellbeing and natural living as important, resulting in negative attitudes towards animal welfare and rejection of cage-free systems. Through qualitative interviews, Yang was able to understand more about the rationale behind the attitudes of stakeholders in a way which surveys cannot achieve.

While understanding the attitudes and knowledge of individual livestock stakeholders is important to improving animal welfare, when it comes to implementation of higher welfare practices on farms, Burton et al. (2012) identified a need for looking beyond the individuals and seeing the farm as a complex system involving the interaction between animals, humans, and the environment. As farms become larger and more business-like, more workers become involved and human resource management becomes important (Mills et al., 2020); even in facilities with similar environments, animal care and welfare can differ drastically due to management (Fraser & Koralesky, 2017; Hemsworth, 2018).

Burton et al. (2012) conducted interviews with dairy farm workers in New Zealand and found that changes in knowledge and attitude did not result in changed practices without also a change in "cowshed culture". These authors argued that the study of culture helps explain *why* attitudes and behaviours exist, suggesting the need for research to examine the farm systems and cultures to complement findings on stakeholder's knowledge and attitudes.

Though Burton et al.'s (2012) approach of shifting the focus from individual livestock stakeholder to the overall culture was important, their method of relying on interviews has its limitations when it comes to understanding culture. Culture can be described as "the collection of

values, beliefs, behaviours, customs, and attitudes that distinguish a society" (Fan, 2000, p. 3), and interviews alone will only reveal certain facets without the use of other methods such as observation.

1.4   Ethnography as a Tool to Understand Farm Culture

Ethnography is a suitable methodology for research about animal care within the context of the farm culture, as it is the systematic study of culture and lived experiences of a social group (Coffey, 2018). It is "rooted in the first-hand experience of the research setting, and ethnography is committed to interpreting the point of view of those under study" (Atkinson et al., 2001, p. 43). It involves a "commitment to holism – to situating the particular within the broader context while also recognizing that it is rarely or indeed ever possible to gain the complete picture" (Coffey, 2018, p. 11).

Studying people within their social context address some of the limitations of interviews, surveys and focus groups through extended immersion of the researcher into the society. By utilizing participant observation (where the researcher participates in and observes everyday activities), interviews, and other methods appropriate for exploring the research topic, the ethnographer is able to gain in-depth insight through their own experience at the field site and the words and observations of the participants (Coffey, 2018). The benefits of this approach are that the research question becomes finalized as the researcher learns the perspectives of the participants and what is important to them in their lives. This is useful for identifying locally relevant topics and reducing researcher assumptions common in less inductive approaches such as surveys with researcher-generated topics.

Within the humanities (including anthropology), focus on non-human animals as a topic of research is rather recent (Hurn, 2012b). Several ethnographies have been conducted exploring

issues concerning animal care and welfare, including work on an American cat shelter (Alger & Alger, 2003), a Scottish livestock system (Wilkie, 2010), Danish farms (Anneberg & Sandøe, 2019), East German dairy farms (Field, 2017), Canadian dairy farms (Ida, 2020), and British equestrian clubs (McVey, 2021). These ethnographies provided rich and nuanced descriptions of the field sites, and how stakeholders interacted and worked on a daily basis.

Originally used by anthropologists and sociologists to understand unfamiliar cultures (Atkinson et al., 2001), today ethnography is used by many disciplines including education (Gordon et al., 2001), health and medicine (see Bloor, 2001), and organizational studies (see Ybema et al., 2009). Watson (2011) argues for increased use of ethnographies in organization and management studies, recognizing that ethnographies can be pragmatic and are able to ground and contextualize researcher observations and accounts received from members within organizations. Similarly, Li et al. (2012) urges Chinese management scholars to use qualitative methods such as ethnographies and case studies to better understand the cultural context.

Ethnography offers a solution to the need for understanding the cultural context under which animal care takes place in Chinese farms, and the factors affecting animal care within these farms. I conducted this ethnography under a critical realist paradigm (Archer et al., 2013), meaning that reality exists separately from what can be observed by human investigators (ontological realism), but what can be learned about this reality depends on the time, place, and position of the knower (epistemological relativism) (Souza, 2014).

For the rest of this thesis, I will use the term 'animal care' (instead of animal welfare), as I considered that this would be more familiar to the study participants.

1.5　Thesis Objectives

The Chinese livestock industry is the largest in the world, and the dairy industry has experienced significant growth. This trend is expected to continue as China tries to meet growing demands for dairy products. While compassion towards non-human animals is valued in traditional Chinese philosophical traditions, there remains much to do in modern society to improve practices.

The topic of animal welfare is gaining attention from academia, government, public, non-profits, and industry. To improve the welfare of farm animals, it is crucial to engage the livestock stakeholders, including farm workers, in a culturally compelling way.

Recent research examining Chinese livestock stakeholders and animal welfare has focused on the attitudes, perceptions, and knowledge of individual stakeholders, using surveys, interviews, and focus groups that may fail to account for behaviours of workers within the broader context of their work environment.

To take a more holistic approach, I conducted mini-ethnographic case studies (short-term ethnographies; Fusch et al., 2017) on two large-scale Chinese dairy farms. My goal was to identify factors on the farm that affected animal care. I found that employee management was a key factor influencing animal care, so in this thesis I will focus on discuss on how employee management influences animal care.

Chapter 2: Employee Management and Animal Care: A Comparative Ethnography of Two Large-scale Dairy Farms in China

2.1 Introduction

The changes in technology, genetics, housing and management associated with increased farm size have resulted in benefits and challenges to dairy cattle welfare (Barkema et al., 2015). Commonly discussed welfare issues affecting dairy cattle include those associated with health (e.g., lameness, mastitis), negative affective states such as pain (e.g., due to procedures like dehorning), and the inability to express key natural behaviours (e.g., grazing and maternal-young interactions) (von Keyserlingk et al., 2009). While poor animal health can lead to reduced production, production alone is not a reliable indicator of welfare, in part because higher production can be associated with a higher incidence of health disorders (Coignard et al., 2014).

Fraser (2008) points out that the study of animal welfare and what it means to provide "a good life for animals" is shaped by cultural context and values. Attitudes towards animals in China are complex and nuanced. While Confucianism is anthropocentric (Blakeley, 2003), it promotes the virtue of compassion (ren; 仁) towards non-human animals. Taoism emphasizes harmonious existence of man within nature (Schönfeld & Chen, 2019). Buddhists promote respect for animals (Cao & Chen , 2009). Cao (2020) argues that the concept of 'animal welfare' is compatible with major traditional Chinese philosophies. Although such ideals are not always expressed in modern society (Cao, 2020), public reaction to highly publicized animal cruelty cases indicates that there is growing concern for treatment of animals (Lu et al., 2013).

The term 'animal welfare' was introduced to China in the 90s as 动物福利 (动物 meaning animal; 福利 meaning welfare) (Bao & Li, 2016). China's focus on this area thus lags around 30 years behind Western counties (Jiang, 2021). Shi (2020) suggests that the direct

translation of 'animal welfare' and its simplistic explanations during initial promotion led to misunderstanding. Presently, there is low but increasing interest in animal welfare by the Chinese government (Sohu, 2017; Wei, 2019), agricultural industry leaders (Sinclair & Phillips, 2019), students (Davey, 2006; Phillips et al., 2012), and the general public (Littlefair, 2006; You et al., 2014), and an increasing body of Chinese academic literature that explores questions related to animal welfare (Shi, 2020; Sinclair et al., 2020).

To improve farm animal welfare, it is critical to understand and engage livestock stakeholders whose decisions impact their animals (Sinclair & Phillips, 2018). Work to date has used surveys and focus groups to understand Chinese stakeholder attitudes (Platto et al., 2020; Sinclair et al., 2017a; Sinclair et al., 2017b), perceptions (Li et al., 2018; Sinclair & Phillips, 2019), and knowledge (Descovich et al., 2019; Erian et al., 2019). However, Burton et al. (2012) argued that attitudes and knowledge of individuals play a minor role compared to what they termed "cowshed culture"; understanding the culture and context on farm provides insights into what shapes actual behaviors.

Human resource management (e.g., affecting the skills, knowledge, and motivation of workers) is critical in addressing farm animal welfare issues (Hemsworth, 2018). Although there is research about human resource management in the dairy industry (Mills et al., 2021), no work to date has focused on how employee management impacts animal care practices in a Chinese context. Ethnography (a set of methods for understanding cultural and social worlds; Coffey, 2018) provides insight into participants' experiences and the farm culture.

We used mini-ethnographic case studies to explore factors influencing animal care on two large dairy farms in China, with a special focus on factors related to employee management.

The phrase 'animal care' was used during this study, as the term 'animal welfare' may not have been understood by participants.

2.2 Materials and Methods

2.2.1   Mini-ethnographic case study

As ethnographies have not commonly been used in animal welfare research (McVey, 2021), we first describe ethnography, clarifying what our study intends to achieve. Ethnographies are methods used to understand social groups and involve immersive fieldwork and participant observation (Coffey, 2018). MC actively engaged and participated in daily farm life to understand insider perspectives of farm workers. Strengths and limitations of this approach are explored in Section 2.4.4. Mini-ethnographic case studies typically last a few weeks and focus on a few cases (Fusch et al., 2017).

Ethnographic research utilizes an inductive and exploratory approach: our initial goal was to explore factors influencing animal care, and through fieldwork we found that employee management shaped animal care on both farms. Thus, our study focused on how employee management shaped animal care on the two farms MC visited.

Though our study focuses on animal care, our participants only included humans; observations of animals occurred only tangentially when participants interacted with them (e.g., during herding, milking, feeding), thus we do not make direct claims about animal welfare on these farms. Inferences about animal care practices are the result of MC's observations, available farm data, and conversations with workers.

China is a geographically and culturally diverse country, and ethnographic data are based on locally relevant anecdotes and observations. As such, findings are not intended to be generalizable. However, we can draw useful conclusions using thorough analysis (see Section

2.2.5) and strategies to increase trustworthiness (see Section 2.2.6). We make claims specific to farms we studied, but with an understanding of these practices and context, our conclusions may be transferred to similar contexts.

2.2.2 Research ethics

This study was approved by The University of British Columbia's Behavioral Research Ethics Board under #H18-03664. Farms and participants are anonymized to protect their identities. Legal representatives of both farms provided written consent and farm access, while participants provided verbal consent.

2.2.3 Farm context

Ethnographic findings are specific to the culture under study, so we first provide relevant context necessary for understanding data generation and results. Farm A and Farm B were selected based on meeting the inclusion criteria of being large Chinese dairy farms (herd size >500 cattle; CDIA, 2019), feasibility of access (Coffey, 2018), and ability to allow for cross-case comparison (Yin, 2018). MC's mutual connections introduced her to the legal representatives of both farms who then granted access.

Farm A (herd size ~1,500; ~50 farm employees) is located in central China. It is the only farm owned by Company A, a private dairy processing company who sources most of its milk from small farms nearby. Farm B (herd size ~11,000; ~200 farm employees) is located in east China. At the time of writing, it was the newest and largest farm owned by state-owned dairy company. Overall, Farm B workers had more qualifications and were generally younger compared to Farm A (see Table 1).

Table 2.1. General farm information (accurate as of November 2019) for the two Chinese dairy farms used as study sites

	Farm A	Farm B
Farm location	Central China	East China
Building date	2000s	2010s
Owned by	Privately-owned company	State-owned company
Number of workers	~50	~200
Worker age	30s-60s (average ~ 45)	20s-40s (average ~ 30)
Worker education	3 Trade school 10+ High school Rest: ≤ Middle school	2 Master's 25 Trade school 30+ High school Rest: ≤ Middle school
Cattle breed	Holstein	Holstein
Herd size	~1500	~11000
~ milk yield/cow/d	25 kg	34 kg

2.2.4 Data generation

MC paid an introductory 5 day visit to Farm A in April 2019, and later conducted fieldwork for 38 days on Farm A (September 27 to November 4, 2019), and 23 days on Farm B (November 11 to December 3, 2019).

MC conducted daily participant observation, ethnographic interviews (unstructured conversations), and critical reflections which all generated fieldnotes. Participant observation

involved participating in the daily activities of the workers to gain insight into common animal care practices on the farms. Purposive sampling was used to identify participants who could discuss factors influencing animal care.

On Farm A, MC conducted participant observation with 20 employees including the farm management team (farm manager, deputy farm manager, 2 veterinarians, reproductive specialist, and nutritionist), and members from the 5 farm teams (maternity, calf and heifer, milking parlor, reproductive, waste management).

On Farm B, MC conducted participant observation with 21 workers from the farm management team, various department leaders, team leaders, and farm workers. Participant observation took place across 6 out of 8 departments: data collection, veterinary, maternity, calf and heifer, milking parlor, and reproductive. Due to limited time on this farm, MC did not conduct participant observation with nutrition and environmental department (waste management and recycling of manure).

Participant observation with each department lasted between 2-8 days, dependent on the participants' comfort level and their contribution to data generation. Participation ranged from observer (witnessing procedures such as surgery and hoof trimming) to complete participant (taking part in calf feeding, milking, manure cleaning). MC participated as much as possible to try gaining an insider perspective, given her own comfort level, skill level, and relationship with the worker.

Ethnographic interviews were conducted in Mandarin by MC and the participant's preferred Chinese dialect. These dynamic, purposeful conversations were open-ended, but often focused on the research topic and the daily activities (Coffey, 2018). For example, during calf

feeding, MC asked, "why are we feeding this amount?" and "how do you know this is the right amount?" to understand worker decision-making.

Throughout fieldwork, MC took descriptive, handwritten fieldnotes on conversations, setting, and verbal and non-verbal interactions between cattle and humans. Descriptive fieldnotes were a mixture of English and Chinese to capture local phrases and meaning.

Since MC was integral to the data generation process, she wrote daily reflective fieldnotes to critically reflect on how her identity shaped her findings. For example, her identity as a female, Chinese-Canadian graduate student studying in an animal welfare program with little experience working on a dairy farm shaped her relationships and interactions with workers.

In addition, MC conducted 13 semi-structured, audio-recorded interviews (7 on Farm A; 6 on Farm B) using an established interview guide (see Appendix A). These interview questions focused on worker background, perception of cattle well-being, and animal care on the farm. MC also collected relevant documents (e.g., standard operating procedures, SOPs, which were made available on Farm B).

2.2.5   Data analysis

MC transcribed all interviews, then uploaded and organized fieldnotes, documents, and interview transcripts in NVivo 12.6.0 (QSR International, Vancouver, Canada).

MC used template analysis to analyze all data, including fieldnotes, documents, and interview transcripts (King & Brooks, 2016). As a type of thematic analysis (Braun & Clarke, 2019), the goal was to examine all data and eventually develop 'themes', or overarching patterns and conclusions relevant to the research topic.

Following King and Brooks (2016), MC first familiarized herself with the data by transcribing the interviews, and re-reading documents and fieldnotes. MC then selected 5 days of

data and interviews which involved diverse participant roles and contained rich data relevant to the research topic of employee management's influence on animal care. Next, MC started preliminary 'coding' of this subset of data. 'Coding' was a process of labelling segments of text with a relevant phrase called a 'code' (e.g., "eager to learn"). This list of codes was compiled into a 'template', where related codes were 'clustered' together and arranged in a hierarchical way. For example, the codes "eager to learn" and "responsibility" fell under the 'parent code' of "work ethics", under the larger theme of "competent workers".

The rest of the data were then coded using this initial template as a starting point. MC closely read the remaining data, refining, adjusting, and adding to the codes in the template based on what she interpreted from the data. Once no more major codes were added to the template, the final template was used to complete a final coding of the whole dataset (see Appendix C for final template).

To help generate findings, MC also created a document to identify data that were similar, different, contradictory, or surprising to her. Through template analysis, MC generated three major themes relevant to how employee management shaped animal care.

2.2.6 Trustworthiness

MC used several strategies to improve trustworthiness of findings in accordance with Nowell et al. (2017). To improve credibility of the data, MC engaged in prolonged participation in, and observation of participants' daily life. Data was triangulated from a variety of sources (observations, MC's experiences, interviews with multiple individuals). During analysis, MC created an audit trail by keeping successive versions of the templates accompanied by commentary to changes (see Appendix D for sample). MC continued to write reflexive journal entries throughout analysis (entries written after fieldwork were not analyzed). To reduce

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meaning being lost in translation, quotes were translated during final write-up. MC's translations were checked by four individuals fluent in Mandarin and English.

2.2.7   Data representation

Findings are summarized into three themes, each reported using relevant fieldnote and transcript excerpts. Long excerpts are indented while direct quotations are italicized. Where translations could be ambiguous, we provide the original Chinese in brackets. Original Chinese text to longer quotes and excerpts are presented in Appendix B. Participants are identified in the format 'A1', with the letter representing their farm, and the number as an anonymous identifier of individuals within that farm. Participant role and identifier are occasionally omitted to protect the anonymity of participants.

2.3   Results

We begin by describing contextual factors related to animal care on Farm A and B and then present the 3 themes of how employee management improved animal care: 1) organizational culture, 2) competent workers and management, and 3) an effective incentive system. For the first theme the organizational culture is described separately for each farm, but for the second and third themes the findings on both farms are described together to ease comparison.

2.3.1   Animal care context

Farm A's workers reported that the CEO hired a new farm management team in March 2019 in response to a series of challenges. Workers reported that during the previous winter (i.e., before the change in management), on average one cow and one calf died each day (A18, cleaner; A7, calf caretaker). Other than high mortality, a farm management team member (A12) mentioned "*there was low productivity, many ill and emaciated cattle, mastitis and metritis were*

left untreated". Lameness was high, estimated by a farm management team member (A13) to be more than 50%. By the time of MC's visit in September 2019, workers commented that the new farm management had brough about improvements in animal care, including reduced mortality and morbidity (A5, calf veterinarian; A7, calf caretaker), mastitis and metabolic diseases (A11, maternity veterinarian), improved productivity and hoof health (A14, milker), cleaner barn environment and improved heifer growth (A19, heifer barn cleaner).

Relatively speaking, Farm A's average daily yield was 25kg/cow/day in November 2019, slightly lower than the 2018 averages for China (26.2kg/cow/day) and Chinese dairy farms with ≥1000 cattle (30.9kg/cow/day) (DAC & MARA, 2019). High somatic cell count (SCC) is often an indicator of mammary gland infections (Sharma et al., 2011), and management reported SSC to be over 400,000/mL, higher than the 2018 averages for China (262,000/mL) and Chinese dairy farms with ≤1000 cattle (237,000/mL).

Farm B's lactating cattle produced on average 34kg/cow/day in November 2019, higher than the 2018 averages for China and Chinese dairy farms with ≤1000 cattle. SSC in November 2019 was 130,000/mL, lower than the 2018 averages for China and Chinese dairies with ≤1000 cattle. Unlike Farm A, Farm B kept records that enabled them to report that in 2019 they had a 99% survival rate for calving and a clinical lameness prevalence of 2%. Clinical mastitis prevalence was reported below 2%, much below the national average estimated in 2019 (33.4%; Gao et al., 2019).

Farm B's workers did not report major shifts in farm management prior to November 2019. According to workers, productivity (B2, data management department member), calf growth and health (B14, calf caretaker), fertility (B1, member of farm management; B7,

department leader), and barn cleanliness (B15, department leader) have steadily improved since the farm started operating.

2.3.2 Fostering a healthy and positive organizational culture

Schein (2010) defined organizational culture as the visible artifacts, beliefs, values, and assumptions of an organization. We found organizational culture, shaped by the leader of a group (company level, farm level, and department level), seemed to affect animal care. This section explores aspects of organizational culture which were deemed to substantially contribute to animal care outcomes. Farm B's section is longer as we describe how the Chinese Communist Party (CCP) culture influenced the state-owned farm culture and provide an example where the unique reproductive departmental subculture influenced animal care.

2.3.2.1 Organizational culture: Farm A

According to a member of the new farm management team (A12), "*organizational culture is the soul of an organization, something that unites people's hearts to do things*". Company culture seem determined by company-level leadership (some are the CEO's relatives), which the farm management team (without familiar ties to the CEO) perceived were not under their influence. The poor company culture was perceived to negatively impact animal care and limit farm management's ability to improve, reflected in this conversation with the farm management team:

> A12: *"This is a very, very complex privately-owned company… I gave them a nickname, the 'three steals farm' (三偷牧场)."*
> MC: *"'Three steals'?"*
> A12: *"Yes. Those with power, steal money. Those in charge of things, steal things. Those with no power, are lazy. (有权的人，偷钱。中层干部，偷东西。老百姓，偷懒儿。) [...] This is a terrible farm. It is related to company culture…"*

MC: *"So you are managing, but you can't manage the company's culture"*

A12: *"We can't change that! Company culture is a boss' (CEO) culture [...] the biggest change we could make was changing the people, getting them to work more diligently [...]."* He sighs. *"We can only change some aspects of the people. But we can change the cattle's health. Their nutrition is better, there is less lameness, mastitis. The cattle are full, healthy, and not dying. These are our changes. But [we, the farm management team] cannot change their company culture[...] This is why there are some things we cannot implement."*

In this dialogue, A12 conveys his belief that although some changes took place, company culture still limited the extent to which farm management is able to encourage workers to work more diligently and thereby positively impact animal care. This culture was further described by one member of the farm management team (A13) who stated that the 'boss' "*does not really value raising cattle on this farm [...] the farm only provides [a small portion] of the company's milk supply.*" Workers share material evidence such as the use of outdated equipment (e.g., broken, manual headlocks, broken hoof trimming chute) (A16; A17). MC observed how poor infrastructure occasionally led to rough handling, for example whened headlocks did not close properly on cattle with thicker necks.

A member of the farm management team (A12) commented on the lack of both integrity and transparency from the leaders, which conveyed a sense of not being valued by the company. This was also evident other three workers' comments: "*not getting paid on time*" (A12), "*underpaid and overworked*" (A6), and too little time off work (A18; A6).

Worker A8 appeared frustrated by nepotism; for example, stating that the individual responsible for medication was the boss' relative and so could not be held accountable for purchasing cheaper "*fake*" products, such as caustic paste which did not properly disbud calves. Additionally, the individual failed to purchase medication promptly, meaning veterinarian A5

felt the need to personally intervene: "*This calf is about to die, so I bought this medicine. Using my own money! You know what I mean, to save her first*." Without clear direction and support from leadership, the responsibility of animal care on this farm seemed to depend, at least in part, upon personal ethics of the individual workers.

In addition to organizational culture issues mentioned above, workers also referred to other challenges (see Animal Care Context Section 3.1.) and described the infrastructure as 'outdated' (落后) and 'archaic' (原始). Despite these challenges, workers reported that there were improvements in animal care, attributing these to the competence of the new farm management team. Worker A18 shared that before the change in management there were daily cattle deaths, but "*now we have better veterinarians so they can raise cattle well*." Members of the new management team came with relevant expertise, a change that was clearly respected by the workers; according to A9 this was a clear improvement as the previous farm manager "*knew how to manage people but not cattle*".

2.3.2.2   Organizational culture: Farm B

The state-owned Company B (and thus also Farm B) placed emphasis on the CCP's values and culture, reinforced by the mandatory presence of Party member workers who met frequently with other workers to disseminate Party teachings. As departmental leader and Party member B18 explained, the goal was "*to spread positive energy from the Party*". For example, one meeting was about "*iron man spirit/attitude*" (铁人精神), a story of historical Chinese figures who used hard work, dedication, science, and a Chinese approach to ensure the growth of China's oil industry; these attributes were then tied back to farm work, as illustrated by excerpt of B18's speech below:

"*Farm work can get monotonous and boring, but we need to have high spirits! To achieve the Chinese dream[2] is not easy [...] We need to have an unyielding spirit. Be fearless of hard work/endure hardships (不怕苦)... and not forget about the hardworking spirit of the older generations...We need to become farm 'iron man', 'cattle people' (牛人[3]).*"

This Party culture appeared to improve worker motivation, sense of identity, pride, engagement, and spread the value of persevering through hardship and repetitive work, as well working towards a shared purpose (the Chinese dream).

A sense of discipline and respect of hierarchy was evident among farm workers. Department leader B15 shared: "*When the country's political orders arrive, you need to execute without question*". This allowed for rapid implementation of top-down changes; for example, one of the team managers explained that when the government imposed stricter environmental regulations in 2015, the farm was quick to implement this directive by installing a manure recycling biogas facility (resulting in the usage of manure recycled stall bedding) and reducing usage of outdoor pens due to waste management concerns.

Farm B's culture was also reflective of farm level leadership. When asked what aspects of the farm he was most proud of, B5 (farm management team) smiled humbly and answered: "*I think what we do best is identifying and solving problems... We need to ensure the cattle are most comfortable, the humans have good welfare, and our farm is prosperous [...] If there is need for change, we need to do so immediately and be aware of our shortcomings.*" Both younger and older workers shared a preference for younger workers, who were perceived to be

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[2] The Chinese dream is a concept and ideal of "the great rejuvenation of the Chinese nation". It is promoted by Chinese Communist Party General Secretary Xi Jinping as the hallmark of his administration since 2012.
[3] 牛人, literally translated as 'cattle people', is also Chinese slang for "awesome people"

more "*aggressive/energetic*" (闯劲儿), proactive in trying new ideas, motivated and productive compared to the older generation.

Workers shared how higher worker welfare translated to improved animal care. During discussions about worker entertainment activities (e.g., speech contests and singing festivities), B5 (farm management team) explained that "*this is [farm B's] specialty. Not just production related activities, but entertainment too. Give workers [higher] welfare, more free gifts, so everyone will see the farm as their home (以场为家). This actually means workers work more effectively*." Workers also shared how this aspect of farm culture attracted them to the farm and also improved animal care. Veterinarian B19 explained that he came to work at the farm because of "*high wages, good [worker] welfare [...] Only after you ensure the people's [quality of] life, can you ensure the cattle's [quality of] life*." Worker B2 shared this sentiment: "*they recently improved our meal plan, everyone is more motivated to work! [...] Cattle welfare is basically human welfare, only when humans live better can they take good care of the cattle.*"

The conversations with, and the observations of, the farm workers showed evidence that both cattle comfort and humane treatment were viewed as important for productivity. Veterinarian departmental leader B11 shared "*of course [there is hitting], but this occurs rarely.... The farm doesn't allow hitting now. [...] We rely on cattle for a living, how can we hit them?*" Indeed, interactions observed between workers and cattle were calm, with few exceptions such as when cattle were forced to enter the hoof-trimming chutes, and for loading of adolescent bulls.

Leaders within each department shaped the departmental subculture. The reproduction department exemplified how a positive subculture may impact animal care outcomes. Many workers on the farm singled out this team's unique culture and performance, including a member

of farm management: "*The percentage of infertile cows when I came was 12% [in 2016].*

Manager B6 arrived in February 2017, after which we updated our SOPs. Now our infertility

rate is 3%. Our reproductive team is doing really well, the best [out of all the farms at Company

B]".

The leader of the reproductive team (B7) explained that "*The best management is*

militarized (军事化管理); I use this style in my management". From participant observation, this

involved a clear sense of shared purpose, frequent communication and reflection, discipline, and

respect for the chain of command. Below is a field note excerpt taken during the team's daily

meeting:

> The departmental leader stands in the corner of the cramped meeting room as the
> workers takes notes. He says: "*we need to read lots and learn lots, not just about*
> *reproduction, but also history [...] Don't be short sighted. We must look at the*
> *bigger picture. Look at China's dairy industry. We lack talent who can dedicate*
> *themselves. No matter which aspect [of cattle rearing], we need to take things to*
> *the next level, become world leaders [...] Who are we depending on? Us, brothers.*
> *We must have these large ambitions and push through despite hardships*."

By tying daily work to the overall success of the Chinese dairy industry, workers were

given a greater sense of purpose. These values and beliefs were not just communicated in

meetings; MC observed workers (and especially the department leader) trying to reflect these

values in their actions. B2 (from another department) shared how the reproduction team leader

was unique in that he spent time individually with team members having "*heart-to-heart chats*".

Another distinguishing feature of reproductive team's culture was respect for chain of

command, following directions given by the leader and SOPs. An example of the team's

militarized discipline was that workers would march to the dorms from the office in formation,

which the department leader explained was to "*set the tone*".

Trust and respect in the leadership was the norm in this department. When MC asked worker B9 about what aspects on the farm could be improved upon, he responded: "*I've actually never thought about this… I just do my job properly […] The department leader is the one 'taking the wheel'.*" He went on to share how his role was to "*make sure my execution skills are at 100%*".

2.3.3 Competency of workers and management

Competent individuals, in terms of formal education, personal experience and work ethic, affected animal care. For example, farm management at Farm A complained that the company management's lack of knowledge resulted in high morbidity and mortality. A13 (farm management) thought the cull rate set by the company management was unreasonably low. This meant as farm management, he could not cull enough cattle with low productivity, illnesses, and fertility issues, likely increasing on-farm deaths. He linked this to poor morale: **"***[Workers] are frowning every day, of course their motivation is low. Additionally, medical fees are high, and many cattle are sustained by medication.***"** He further explained: "*We provide training, and the workers agree (认可) with what they are taught. But they don't execute it in practice. They know it is good to do this, but they say, 'I can't execute it, I have no energy', there's a vicious cycle.*" This illustrates how lack of cattle knowledge at the company management level can ultimately lead to a vicious cycle of poor worker performance and animal care outcomes on the farm which is out of the farm management's control.

Farm A's management team appeared to make efforts in matching competent workers with positions appropriate to their skill set. To address high lameness rates, managers hired professional hoof trimmers to come and work for three weeks; MC observed that these experts handled cattle calmly and efficiently compared to farm workers who were not trained in this task.

In another example, the farm manager commented on changing to a veterinarian with more calf experience - which according to workers improved calf health.

Farm management and technical staff (e.g., veterinarians, reproductive staff) on both farms commented on the importance of formal education for ensuring high standards of animal care. On Farm B, many departmental leaders were trade school graduates with diplomas in Animal Science. One such individual was department leader B17 who shared the benefits of hiring trade school graduates: "*when it comes to hiring, I would definitely choose trade school [students]. [...] firstly, they are obedient, secondly, they can do everything, thirdly they can endure hardships*" (吃苦; literally 'eat bitter'). However, workers also acknowledged that education needed to be coupled with experience. For instance, departmental leader B11 shared "*Even if you have extremely high education [...] you need to be able to apply this within farm context.*" He argues that without "*work experience*", "*understanding farm procedures*", and "*management experience*", "*no one will listen to/respect you*" (他不服你). Department leader B15 shared how the farm manager asked him to adapt the company SOPs for the farm because of his experience. This suggests that education needs to be coupled with relevant experience, especially for managers or technical staff.

On both farms there were indicators that employee education, experience and work ethic were respected. Department leader B15 shared how he studied each night, despite it being tiring, because "*there is high competition, you need to know more than those you manage, you need to let them respect you!*" (你得让他们服你啊!). His knowledge of cattle, animal science diploma, and constant learning earned him respect from his workers, helping him to manage even older workers. Workers on both farms shared that regardless of education (or *"being cultured"*; 有文化), eagerness to learn and a good work ethic (学习态度；工作态度) played a major role in

worker performance. For instance, a strong work ethic was observed in members of the new management team in Farm A; veterinarian A5 proudly shared: "*I didn't go to school. I trained myself as a 'barefoot veterinarian[4]'*"; those who, despite being "*uncultured/uneducated*" (没文化), "*use experience and skills to service the common folks*". He added as he patted a calf affectionately, "*I am very dedicated to my technical skills. I will figure out every mistake I make. You need to know why you cured or failed to cure. That is the way of the successful.*" When MC asked department leader A8 what makes a good worker, he shared "*it's not the education. It's not the master/teacher. It's your willingness to learn.*"

One component of work ethic was being responsible. When asked about what makes him proud, department leader B15 said: "*As a veterinarian, I want to be competent (称职) at my job. I am not fooling around. […] Back when I worked as a veterinarian on [another farm at Company B], every year my performance was top 3 in the company! I feel like I am not letting down the cattle I am responsible for. No matter what job, if you want to master it, you need to devote experience and time to study it. You can't 'put away the cup after taking a tiny sip' (浅尝辄止)*". Similarly, a member of Farm A's management team shares how the new farm manager's high sense of responsibility combined with expertise bought improvements to animal care outcomes.

Notably, individual worker attitude and work ethics appeared to be influenced by organizational culture and norms. For example, on Farm B there appeared to be stronger norms regarding work ethic. Workers were generally more detail-oriented (e.g., picking up small pieces of rubbish from cattle feed even in the absence of supervisors), and interactions with cattle in the

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[4] barefoot doctor (赤脚医生) is a term that arose during the Cultural Revolution in reference to rural doctors, without formal medical training, who bring healthcare to places where urban doctors would not settle.

milking parlor were consistently gentle. Members of high performing departments (such as the reproduction department) were engaged (e.g., they appeared focused and took notes during group meetings), studious and eager to learn. Within this department, one worker (B8) told MC they also wished they could do a research project to understand cattle reproduction, and another (B20) was reading about how to improve motivation in his spare time.

Workers on both farms reported challenges in finding competent and qualified workers. Departmental leaders on Farm B described challenges associated with the lack of talented individuals (especially younger workers) willing to dedicate themselves to farm work. This challenge was attributed by two departmental leaders B15 and B17 as being a consequence of China's one child policy. This policy combined with the improvements in quality of life, was viewed to result in "*one child*" (独生子女) who is "*given everything they want*" (有求必应), "*spoilt*" (娇生惯养) and therefore "*unable to adapt*", to do "*dirty work*" or "*endure hardship*" (吃苦) on farms. This gritty attitude and ability to endure hardship was repeatedly mentioned as critical to achieving success on both farms.

Qualified and educated workers might also be picky according to departmental leader B17, "*people with college education might arrive and say: 'the environment is not nice, I quit'*". For veterinarians this appeared to be a particularly relevant issue; team leader B2 (a veterinary school graduate) shared that most veterinary graduates prefer to work in city clinics where the pay is better. Departmental leader B15 also shared the difficulty to attract and retain veterinary students to the farm, even with a relatively high starting wage. Interestingly, on Farm B, all veterinary graduates were in leadership positions such as department leads, but only two of them were working on the veterinary team. The move to appoint educated workers directly into managerial positions (e.g., milking parlor department leader) seemed to be common; whereas, in

the case of technical positions, they were required to work their way up to leadership positions (e.g., the reproductive departmental leader started off as a team worker). Veterinarians (兽医) was the title given to any staff who carried out medical care, regardless of qualifications. Veterinarians on both farms were mostly workers hired from nearby villages and trained on site. Departmental leader B15 shared how "*there's no requirements for becoming a vet in China*", arguing that this lack of qualified veterinarians resulted in preventable illnesses being left untreated, and that this hindered his ability to take a more proactive approach to disease prevention.

On Farm A, the farm management shared the view that qualified workers may not want to work on the farms due to low wages. Recognizing the difficulty in attracting and maintaining competent workers, Farm B's management implemented a strategy of improving conditions via providing improved accommodation, food, wages, and worker benefits.

2.3.4 Incentives

Both farms used incentive systems that tied worker performance with rewards and punishments, providing a structure for encouraging certain outcomes. Workers reported that these incentives were effective in motivating behavior change. Both companies identified key performance indicators (e.g., increased profit; increased milk yield and quality) and utilized rewards to mutually benefit the farms and individual workers.

Farm managers on both farms reportedly increased performance appraisal (Farm A since the arrival of the new farm management team in March 2019, and Farm B since 2018). On Farm A, the farm management team's compensation was based on farm profit, determined by milk quantity (kg) and quality (e.g., SCC). As such, the team saw the cattle's well-being as instrumental to increased profit. Comments reflecting this mindset were conveyed by the farm

management team. At a monthly meeting, one member of this team (A12) told workers, "*see the cattle as your partner in earning money, when they are comfortable, they will produce more, and we will benefit*" and another member (A13) added "*if it is in the cow's interest then it is correct*."

To achieve improved farm level outcomes, Farm A's new farm management team set merit-based pay for farm workers. The farm manager conveyed that since his arrival, he increased wages and merit-based pay for workers, including calf caregivers. Following wage increases, calf caretakers and veterinarians reported reductions in calf mortality and morbidity, and increased calf growth. One calf caregiver described: "*I'm proud our calves grew more. The milk yield went up! [...] When there's more milk, workers earn more with merit-based income*." Similarly, Farm A's reproduction team members shared how they took pride in their work and that when more cattle became pregnant, they earned more for their families.

Farm B had implemented a three-level performance appraisal system (三级考核) to align performance outcomes to company goals. In the first level, the company set farm level key performance indicators (KPI) (e.g., daily yield should be 29.5kg/cow/day; % cattle lying in stalls should be 80%) which determined how much each farm earns. In the second level, each department within Farm B was assessed based on relevant KPI (e.g., daily yield was a KPI for the milking parlor department; mastitis rates for the milking parlor department, veterinary department, environment department; and successful calving for maternity department). Within each department, the department leader was in charge of distributing wages to workers based on assessment of KPI. An example where having a performance outcome was viewed as important was conveyed by calf caretaker B14. In this case calf weight gain was tied to her monthly merit-based income, which was a strong motivator for this employee as she used her income to support her children. Below is a fieldnote excerpt as MC shadowed her:

"Before we fed the calves manually, using little buckets. Now we [use ad libitum feeding of acidified milk]. Each year is better than the last. The performance is better, the benefits are clear. You can see the effects of your work, and you can tell the worker's ability. If [the calves are] fed well, [I'll] earn better. With performance appraisal, if the calves gain weight, I will earn more. I quite like this job. Each month if the weight is above the goal, I am extremely happy!" She smiles broadly, looking very proud. *"I'm so happy in my heart!"* As we continue to feed the calf starter, she says to her calves *"Eat more! Grow heavier!"*

This kind of assessment was made possible given the data management department on Farm B, who collected data such as monthly calf weight gain, gait scores, and body condition scores for performance appraisals. These performance indicators were not measured on Farm A, in part, due to lack of a dedicated workers needed to generate this data.

Farm B also coupled training and education to performance appraisal, likely providing motivation for workers to implement what they learnt. For example, Farm B's veterinarians were trained and tested on theoretical and technical knowledge and also clinical applications such as surgeries, while herders were trained and tested on low stress handling. Workers who received the top scores were given cash bonus as well as honorary red badges to wear (many recipients were seen proudly wearing them).

The effectiveness of the incentive system appeared to differ on the two farms, possibly due to differences in company culture, especially related to transparency, integrity, and fairness when it comes to finances. A member of farm management on Farm A complained *"The key is the leader. His thinking determines the company's direction. […] With performance indicators, it is important for the leader to clarify what happens if I achieve my goals, and what happens if I don't. That's it! Then keep your word. Don't have internal conflicts. It's that simple."* Workers

shared how corruption within Company A meant even if the owner wanted to pay them the individual in charge of finances may not do so.

In contrast, on Farm B compensation appeared to be more transparent; all farm workers, including the farm managers, had their wages displayed on the canteen wall, and workers were observed comparing each other's wages to see who benefited the most from the merit-based pay. This comparison appeared to be a strong motivator according to milker B20 who shared "*you see each other's wages, [the departmental leader tells you] why other people did so well, then I want to do even better*". However, not everyone saw this increase in performance review as ideal; department leader B15 shared how performance appraisals also increase rivalry and pit workers against each other. Departmental leader B17, who was in charge of paying his team members, emphasized the importance of transparency on Farm B: "*If you are paying employees things must be completely clear and transparent. Everyone is here to earn money. Food comes first for the people, right? (民以食为天) [...] So anything concerning money must be handled carefully.*"

Punishments, such as fines, were used on both farms and were felt by some to be useful in discouraging poor behavior. For example, after the veterinary department leader on Farm B increased fines for veterinarians who made mistakes when writing their daily reports about cattle, these mistakes noticeably reduced. However, Farm A's manager recognized that he could not enforce too many fines given that the base wage was low, and he expressed concern that implementing such an approach could result in some employees quitting their jobs.

Workers on Farm B (including departmental leaders and farm managers) were subjected to regular performance appraisals. B1, a member of farm management on Farm B indicated that they would be placing increasing emphasis on performance reviews. "*Everyone will start from the same starting point. [After performance appraisal a] team leader with good performance can*

be promoted to be department leader, while a department leader with poor performance will no longer hold that position anymore. Give them a sense of crisis and competition. Let them prove their technical skills and ability."

Although the implementation of incentive systems appeared to help align worker performance with company goals, they were almost always profit focused, which can cause some tension with regards to animal care. For example, on Farm B it was viewed to be profitable to cull and sell the cattle alive vs. euthanizing; this may have resulted in some compromised cows suffering during transport and slaughter. On Farm B, any worker causing a cow to die was fined; thus, workers stated that they chose to keep animals alive and cull them rather than euthanize.

2.4   Discussion

Chinese livestock farms are now viewed as being run more like a business compared to previous modes of traditional farming, meaning farm performance is closely tied to employee management and organizational culture (Peng & Tan, 2006). Keeping in mind that high farm performance and productivity do not necessarily indicate higher animal welfare, we discuss some animal welfare implications of our findings.

2.4.1   Organizational culture

Leadership affects culture, which in turn impacts performance (Boyce et al., 2015), employee attitudes (O'Reilly et al., 2014), and job satisfaction (Belias & Koustelios, 2014). While attitudes towards animals and work impact animal welfare (Hemsworth & Coleman, 2009), changing the attitudes of some workers is not sufficient in promoting a self-reinforcing culture of positive animal welfare (Burton et al., 2012). Previous research has examined individual stakeholder attitudes using the Theory of Planned Behavior (Platto et al., 2020; Sinclair et al., 2017a), with the assumption that attitudes shape intentions, which in turn dictate

behavior (Ajzen, 1991). However, intention to change often does not result in actual behavior change (Sinclair et al., 2019c)**.** Chinese society is highly collectivist and hierarchical (Hofstede, 2011), suggesting individual attitudes and intention may play less of a role in shaping behavior within a group context. It is thus critical to understand farm context (e.g., organizational culture and norms) where behavior takes place.

Under a top-down management system, animal welfare initiatives require approval and support of company and farm leaders (Sinclair et al., 2019c). For example, Farm B's animal welfare related goals (such as reducing lameness and reducing SCC) were set by the company. These SOPs were adapted within each farm and department to ensure these were locally relevant and achievable. However, strong hierarchies coupled with Chinese cultural traits of deference to authority and conflict avoidance (Fan, 2000) may cause challenges. For example, subordinates may hesitate to provide critique or feedback to superiors, and workers may not have enough agency to make changes they find important.

Leadership approval is more likely if animal welfare improvement is viewed as beneficial (e.g., associated with increased productivity and profit; Sinclair et al., 2019b). However, challenges can arise when outcomes focused on improving animal welfare conflict with economic outcomes, as was observed on Farm B where culling was viewed as financially beneficial compared to euthanasia.

Chinese culture places importance on interpersonal relationships (*guanxi*) (Luo, 2007), which potentially facilitates corruption (Luo, 2008). Such relationships in Company A appeared to hinder the farm management team's ability to improve animal care.

2.4.2   Competence

Success of a dairy business depends on a competent workforce (Milligan, 2017). Competence was perceived to require a strong work ethic and knowledge of animal care (acquired through formal education, on-farm training, and personal experience).

As reported by workers, lack of skill can lead to issues such as poor detection of health problems. Classroom and online training can help increase Chinese livestock stakeholders' knowledge of animal welfare issues (Descovich et al., 2019). Senior veterinarians, agriculture advisors, and scientific experts are considered influential by Chinese farmers (Platto et al., 2020). For example, Farm A's nutritionist was a well-respected advisor for farms across China. Although there is increasing Chinese literature about animal welfare (Sinclair et al., 2020), academic journals are not a common source of knowledge for Chinese livestock stakeholders (Erian et al., 2019). Future efforts should focus on disseminating animal welfare knowledge from academia to influential leaders and workers – for example through extension and collaboration with veterinarians (Mills et al., 2021). That said, it is important to realize that increased animal welfare knowledge does not necessarily lead increased empathy (Erian et al., 2019) or changes in worker behavior (Burton et al., 2012), especially without appropriate incentives.

Competent workers were eager to learn and had a strong work ethic. High performance among Asian workers often includes drivers such as perseverance through hardship and a desire to become experts in the field (observed in Farm B's reproductive team), and the acknowledgment that they can learn from past mistakes to transcend deficiencies (observed when veterinarian A5 perceived himself as uncultured but learning through mistakes) (Vera et al., 2015). This type of 'growth mindset' (belief that ability can improve overtime) can be a predictor of higher performance compared to a 'fixed mindset' (Yeager & Dweck, 2012). Grit (*chiku,* 吃

苦, the ability to 'eat bitter' and persevere) is a key determinant of success (Duckworth et al., 2007) and considered by workers to be an important factor shaping farm success. These attitudes were articulated by workers on both farms and promoted in farm meetings, especially by leaders of high performing departments.

Though Chinese farmers did not rate 'farmer well-being' as highly important for improving animal welfare in surveys (Platto et al., 2020), qualitative research conducted in Finland (Kauppinen et al., 2013) and Denmark (Anneberg & Sandøe, 2019) found that farmer well-being was critical to ensuring animal welfare. We found competent workers were attracted and motivated by improved working conditions, suggesting that improving worker welfare would improve animal welfare.

2.4.3 Incentive systems

Effective incentive systems help increase work performance; linking performance appraisal to pay is common in Chinese businesses (Cooke, 2013). Increased pay appeared to motivate workers on both farms. That said, incentives tied to measures of profit will be only indirectly (and sometimes even negatively) associated with animal welfare; the animals are most likely to benefit if incentives are directly tied to welfare outcomes (e.g., Farm B linking successful calving to the maternity team's wage). Sinclair et al. (2017a) recommended that animal welfare outcomes be included in key performance indicators. In farms with existing performance appraisal systems, animal welfare can be improved by incorporating animal-based welfare indicators (e.g., lameness and mastitis assessments were used in performance appraisal on Farm B).

Sinclair et al. (2019b) suggested that extrinsic motivators can shape behavior, even in the absence of intrinsic motivation. Creating clear and measurable goals during performance

appraisal is associated with improved performance (Verbeeten, 2008). Our findings, similar to those of Armstrong (2009), noted that accuracy, fairness, and transparency were important in performance appraisal. To improve worker satisfaction and performance, Peng and Tan (2006) highlighted the need to include both material incentives (such as merit-based pay and gifts), and psychological incentives (such as having a pleasant work environment, and fun social activities). There is currently no mention of 'animal welfare' in Chinese legislation (Lu & Fei, 2012; Tian & Zou, 2005), though farm animal welfare is affected by the Animal Husbandry Law (畜牧法; NPC, 2005) and slaughter regulations (e.g., in 2016 China introduced its first humane poultry slaughter regulation; Gao, 2016). Within the dairy industry, leading processors such as Mengniu have created cattle welfare standards (Xinhuanet, 2020). Relevant regulations and standards may be implemented by using such on-farm incentive systems.

2.4.4   Strengths and limitations

How participants perceived MC shaped her findings. MC was often perceived as a curious foreign student (外国留学生) from the city. As such, most workers willingly explained farm life and animal care with her, but sometimes were uncomfortable sharing aspects of farm work which they perceived as "dirty" or embarrassing.

Ethnographic interviews and participant observations were valuable in engaging workers as they carried out daily practice such as calf feeding, herding, milking. Walking while interviewing stimulated richer discussion about the surroundings (Evans & Jones, 2011). Additionally, more participants consented to informal, non-recorded conversations compared to formal, recorded interviews.

Immersive fieldwork allowed the researcher to participate in daily activities. While participants may have behaved differently in front of the researcher due to the observer effect

(MC noted differences in behavior in certain participants on Farm A during the first 2 weeks of her visit), this was mitigated by spending more time with participants, developing trusting relationships, and becoming a normal presence. MC noted increased participant trust and willingness to share after receiving support from key decision-makers at each farm.

Triangulation using a variety of methods (e.g., interviews, observation, document collection, and participation) meant gaining a deeper and more holistic picture of the farms. Fieldwork involved interacting with a variety of workers. This included participants who might not have participated in surveys (e.g., hard to reach employees working directly with animals); these sampling issues are discussed by Li et al. (2018). Previous survey, interview, and focus group research on Chinese stakeholder's perceptions of animal welfare may have suffered from self-selection of participants with an existing interest in the topic (e.g., Li et al., 2018). The farms and participants in the current study were not selected based on interest in animal care and welfare, reducing this selection bias.

The mini-ethnographic case study was practical, but results are limited by the relatively short time spent in the field. Given the annual and seasonal changes in dairy farm operations, MC's one-month stay inevitably missed key events. We also only included two dairy farms that differed in ownership (state-owned vs privately-owned), herd size (1500 vs 11000), farm age, location, and many other factors. Our findings are not intended to be generalizable to all Chinese dairy farms, but the results may be transferable to farms with similar contexts. Due to limited time, we did not include company-level management; we acknowledge that these individuals can also impact animal care decisions.

2.5   Conclusions

Addressing complex animal welfare issues on farms requires an understanding of their cultural contexts. Qualitative approaches such as ethnography and participant observations can capture cultural factors that may be missed using other approaches. Our results indicated that farm worker satisfaction, competence, and motivation played a critical role in shaping animal care. We suggest that strategies to improve animal care include developing a positive organizational culture that unites individuals to pursue common goals, attracting and retaining competent workers (for example through improving worker welfare), and providing incentives for achieving animal care outcomes.

Chapter 3: General Discussion

The initial objective of my project was to identify factors that affected animal care on two large-scale Chinese dairy farms. Throughout my time in the field, I found that employee management was a key factor shaping animal care, and this thesis thus focused on how employee management influences animal care. In this chapter I will summarize the thesis findings, identify strengths and limitations, and suggest future directions for research.

3.1   Thesis Findings

In Chapter 1, I explored how social, political, and economic factors have contributed to the growth and development of China's livestock industries, in particular the dairy industry (CDIA, 2019). Since the severe food safety issues in the mid-2000s (Wu et al., 2018), the dairy industry has been trying to address food safety concerns by restructuring to favor large-scale dairy farms (Zhong et al., 2018).

While there is a growing body of Chinese literature focused on understanding animal welfare (Shi, 2020), none focuses on the perspectives of stakeholders such as farm workers who work directly with the animals. English literature focusing on Chinese livestock stakeholders mainly examines individual attitudes and perceptions (Platto et al., 2020; Sinclair et al., 2017a; Sinclair et al., 2019d), or knowledge of animal welfare (Descovich et al., 2019; Erian et al., 2019). This research, utilizing surveys, interviews, and focus groups, can fail to take into consideration factors that shape animal welfare on the farms, such as farm context, the behavior of individuals and the interaction among stakeholders.

My research (described in Chapter 2) used the mini-ethnographic case study method to identify factors which influence animal care on two dairy farms. By participating in farm work, observing and interacting with a variety of stakeholders working within the same farm, I found

that employee management was key to shaping animal care outcomes on both farms. For example, participants reported that Farm A's new management team was able to make certain improvements to animal care outcomes (e.g., reduce morbidity and mortality) without improving infrastructure. These findings confirm the well-established importance of farm management in shaping animal care (see Mills et al., 2021). My findings are also in line with Burton et al.'s (2012) conclusions that the complex interactions between human, cattle, and the environment forms a farm culture, which in turn shapes animal care.

My analysis of the ethnographic data generated three major themes on how employee management can impact animal care: 1) facilitating a healthy organizational culture, 2) having competent workers, and 3) incentivizing good animal care practices. Organizational culture at the company level, farm level, and department level appeared to shape animal care. Schein (2010) defined organizational culture as the visible artifacts, beliefs, values, and assumptions of an organization. This culture is influenced by leadership and as Burton et al. (2012) suggested, changing farm culture may be a slow process requiring sustained effort. I observed in Company A how a relatively challenging company culture (involving corruption and lack of transparency) can be detrimental to animal care. In contrast, a more positive culture on Farm B (where workers felt well treated and had a more unified identity and purpose) enabled better animal care outcomes. The culture and norms of each organization was reflected in the work ethic and attitude of the individual farm workers.

Worker competence in terms of education, relevant experience, and work ethics, shaped animal care outcomes. Workers on both farms identified a challenge in obtaining educated and experienced workers, especially younger ones. Yang (2013) found that China's farming demographic is aging as younger individuals migrate to cities. Participants reported an

unwillingness of qualified staff to do "dirty" work in rural farms and suggested that improvements to working conditions might help. Workers on both farms emphasized that the ability to *chiku*, or persevere through hardship, a positive attitude towards work, and willingness to learn were all key to being a competent worker. An emphasis on bearing hardship was identified by Fan (2000) to be a key trait in Chinese culture.

Sinclair and Phillips (2019) recognize a need to identify mutual benefits between animals and humans to improving animal welfare. Promisingly, farm managers on both farms perceived a link between cattle welfare and farm profitability. To improve profitability, both farms utilized incentive systems such as merit-based pay, using animal care outcomes as KPI to evaluate farm-level, department-level, and individual performance. Such incentive systems are more successful when there is transparency in data collection, performance assessment, and financial consequences, as seen on Farm B. However, KPI were not always focused directly on measures related to animal care, and in some cases a focus on measures associated with farm profitability may have been in conflict with good animal care practices.

3.2   Strengths and Limitations

This work builds on the existing literature on animal welfare issues from the perspectives of livestock stakeholders in China, but it is the first to use ethnography to understand Chinese stakeholder perspectives within their farm context. Ethnographic case-studies offer strengths and limitations as detailed below.

3.2.1   Researcher identity

My identity as a 'third culture kid' (having grown up in various cities in different parts of the world) positioned me to be open-minded and adaptable to new cultures. This identity also meant that I am typically perceived, at least partially, as an outsider no matter where I go. During

my fieldwork I realized that I was perceived as an outsider to a much greater extent than I had anticipated. Though a part of the ethnographer's task is to learn to 'fit in' and gain an insider perspective, this felt difficult as most participants labeled me as a "foreigner" (外国人). However, I also found that most participants, many of whom had not met people who have lived abroad, were just as curious about my life as I was about theirs. Throughout the duration of my fieldwork, I learnt to be more comfortable revealing who I am to the participants, to exchange life stories and engage in dialogue while accepting our differences, rather than having an interviewer mindset where I 'extract data' from the participants and give nothing of myself.

Other aspects of my identity gave me an advantage to engaging stakeholders. For example, as a friendly, relatively younger female, I felt participants were not intimidated and were thus often willing to open up with personal stories. At the same time, people also viewed me as "highly educated" (高学历) and a "student studying abroad" (外国留学生), which meant it was easier for me to speak to people on farms higher in the power hierarchy, such as farm management and the CEO of Company A.

3.2.2 Open-ended exploration

A hallmark of ethnographies is the open-ended, inductive research process which focuses on generating findings based on data from the field. Though it is not possible to be empty of assumptions before entering the field, I included critical reflections when writing fieldnotes which recorded how my assumptions might be shaping my research. Reducing assumptions during research question development, data generation, and data analysis can help to increase the legitimacy of the findings, and also increase the chance of unexpected findings (Bauman & Adair, 1992). Through starting with a very open-ended question of "what factors affected animal

care", I was able to narrow down to what participants on the ground found most relevant -- employee management.

3.2.3 Immersive fieldwork

The open-ended, exploratory approach coupled with immersive fieldwork involving participatory observation led to many unexpected findings, highly relevant to the local context. For example, I was surprised to find that only one person on Farm A had a veterinary degree, and that most people with veterinary degrees on Farm B were department leaders rather than veterinarians.

Through participant observation and trying my best to 'learn the ropes' of my participants' day-to-day activities, I demonstrated a sincere effort to understand their perspective which helped workers respect and bond with me. This process of being taught by the farm workers was humbling and the first-hand experience was also a positive way to generate data on local phenomenon. For example, through working alongside the barn staff on Farm A, and struggling to herd cattle into headlocks that were too small, I shared their feelings of frustration when working with old infrastructure which they could not change.

Field immersion can also lead to developing relationships that required both trust and time. The relationships I developed with Farm A's management team and workers over 38 days meant that I was able to learn more about the culture of this farm and company than would have been possible via surveys, interviews, or shorter visits, and allowed me to identify challenging areas such as lack of transparency and nepotism. Spending time on Farm A also meant I built a trusting relationship with a knowledgeable individual well connected in the Chinese dairy industry, who introduced me to his friend who was Farm B's farm manager. Farm B's farm manager was very welcoming and granted permission to access internal documents, and ability

to interact with all workers because I was introduced by his friend. I believe this kind of relational connection is especially important when working in a Chinese context where *guanxi*, or personal connections, are highly valued (Gold et al., 2002).

3.2.4   Contextualize findings

The immersive fieldwork allowed me to focus on the context of each farm, which helped contextualize more general findings from other research. Platto et al.'s (2020) found that even though Chinese farmers reported in a survey that aspects of animal care were important (e.g., providing favorable environment, adequate animal health, humane treatment, and farmers' well-being), they perceived it difficulty to improve these aspects. While Platto et al. found that Chinese farmers did not rate their well-being as highly important, I found that farmers did prioritize their well-being. Indeed, my observational findings showed that factors such as animal health, favorable environment and farmers well-being were interconnected.

Current surveys which use individual, attitudinal theories such as the Theory of Planned Behavior (TPB; Ajzen, 1991) aim to understand stakeholder intention in order to predict their behaviors. Using TPB to understand diverse, nonhomogeneous groups such as 'Chinese pig and poultry farmers' (Platto et al. 2020), or 'Chinese livestock transport and slaughter stakeholders' (Sinclair et al., 2017a), may result in generalized findings which cannot predict the behavior of these stakeholders when working in different contexts.

I found that though both farms I visited can be classified as 'large-scale Chinese dairy farms', the two farms differed in company ownership, farm age, decision-making process, farm size, geographical location, and organizational culture, all of which may affect animal welfare. It is thus important to not only understand stakeholders' intention to improve welfare, but also the

specific farm context where behaviours will take place to reduce the gap between intention and behavior identified by Sinclair et al. (2019c).

3.2.5   Cross-case comparisons

Selecting two research sites enabled cross-case comparison, and identification of similarities and differences across different farm contexts (Yin, 2018). This allows for insights which may be missed if a single site was used (Simmons & Smith, 2019). For example, workers on both farms reported their own well-being as important, which strengthens the potential transferability of this finding.

One comparison of interest was that, despite the lower worker-to-cattle cattle ratio on Farm B, animal care still appeared relatively better on this farm. On Farm B, fewer workers may have been able to better care for more cattle due to better infrastructure, and to economies of scale. For example, herders on both farms would herd one barn at a time during milking, but to Farm B's larger barn size allowed them to herd more cattle with the same staff.

I also found that across both cases, there was a gendered division of labor. For example, the reproductive team and veterinary team on both farms were exclusively male, with the exception of one female veterinarian on Farm A. A female worker on Farm B with veterinary qualification shared how most female veterinarians preferred to work in cities or with pets. Even on farms, female workers may prefer (or have been assumed to prefer) work in departments less involved in physical labor. There were fewer female workers in management positions. Instead, most females worked as in the office, as calf caretakers, or as milkers (despite the most physically demanding nature of this job). Ethnographies present a way of understanding the nuances of how demographic factors such as gender interact with daily animal care practices.

3.2.6   Relationships and reciprocity

During the research process, I struggled with the question "who is this research for?" Specifically, I wondered whether my research would benefit the participants. I became aware that my methods were, as Brereton et al. (2015) described of the traditional anthropological approach, "anti-interventionist" in that I tried to understand local phenomenon without trying to change them.

In this context, I made the following efforts to give back to the community and my participants. I showed appreciation by giving my participants gifts from Canada, and I treated all farm workers on Farm A to a feast before I left. More importantly, I was grateful that participants on both farms shared non-material ways which I contributed. Firstly, I listened to their experiences and valued them without the societal judgements which they are used to and provided an audience to the stories which they wanted to tell. A veterinarian and a member of the barn staff both shared how I made them feel valued at a job which did not seem to be valued in society. I listened with an open-heart to the stories of individuals and treated everyone as the experts of their own experiences. Participants on Farm A joked that it was funny that a "well-educated person" (高学历) could learn from someone who was less educated or "uncultured" (没文化), but workers showed appreciation that I took their views seriously.

Secondly, I told all workers that their work is valuable and that their personal actions can have impact on animals. I tried to take an asset-focused approach and encouraged workers to share aspects of work they took pride in, which challenged several workers to see beyond their negative views of their own farm work. I also highlighted aspects of the farm which I considered to be beneficial for cattle, such as calves having group interactions and not docking the tails of cattle.

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Thirdly, I provided a source of information and entertainment about experiences and perspectives from various cities which the participants were curious about. Workers were curious about my life, as much as I was curious about theirs. I started off being focused on learning about the participants without revealing much about myself, but I quickly realized the need to share as much about my life as was professional and appropriate. Duysburgh and Slegers (2015) also identified making participation fun and pleasurable, giving informants a voice, allowing informants to exhibit their strengths, and offering practical help as ways to increase reciprocities in small ways in rapid ethnographies.

On a farm level, I plan to give back by compiling a short Chinese report about the main findings on each farm, several aspects of animal care which the farm did well, and several aspects of the farm which participants found could be improved. This will give voice to participants who do not usually share their insights with the manager or CEO. As a respected third-party, I can offer these insights to the farm leadership, and encourage worker pride for the areas where they are doing well.

I found relationships a crucial component of Chinese culture and I believe there is more potential for reciprocity in my ethnography, and future ethnographies. As Wilson (2004) articulated in their Indigenous research paradigm, relationships shape reality and understanding of knowledge, and healthy relationships require mutual respect and reciprocity. Brereton et al. (2014) shares a need to move beyond ethnographies which *learn from* participants to co-creating localized, pragmatic solutions by *working with* participants.

3.2.7   Limited field time

Though I spent 38 days on Farm A and 23 days on Farm B, there were limits to what I could learn in this time. On Farm A, the management team (who were from all over China)

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spoke Mandarin, but the majority of the remaining staff spoke in the local dialect. I spent time (around 1.5 weeks) learning the dialect on Farm A, impeding data generation because I couldn't fully understand many conversations, especially conversations between participants which was often when locally relevant topics were spontaneously brought up.

I also felt my 23 days on Farm B was not enough to fully understand the day-to-day running of the farm, especially the organizational culture, which involved understanding the underlying values and assumptions of the workers. Farm B had 8 departments (with the veterinary, reproductive, milking departments having multiple teams), so I only spent between 2 to 4 days with each group. This was not enough time to develop familiarity with procedures and I noticed that some workers were shy during my presence in the first few days.

3.2.8   Generalizability

A characteristic of in-depth case studies is that the findings are not intended to be generalizable, although it is hoped that key findings may be transferable within similar contexts. Workers on both farms suggested that, in general, state-owned enterprises were less productive than privately-owned enterprises due to a stronger focus on profit on the private enterprises and farms. However, I found that productivity and performance was better on the specific state-owned farm, potentially due to factors including organizational culture, and the better working conditions and more effective incentive system.

3.2.9   Direct measures of animal welfare

Due to limited time and resources, I did not systematically collect data intended to directly assess the welfare of the animals. I was able to obtain some relevant data collected by the farm managers, for example SCC (an indicator of udder health) on both farms. Farm A did not collect other relevant data (e.g., lameness, mortality, calf growth, % cows lying in stalls).

Thus, even though these data were available for Farm B, I could not make cross comparisons using these more direct, animal-based measures.

3.3   Future Directions

Based on my findings, I suggest several strategies to implement improved welfare practices on large-scale farms and identify areas for future research.

3.3.1   Decision-making processes

Sinclair and Phillips (2019) suggested that engaging industry leaders was a first useful step in developing strategic plans to improve animal welfare; and in other work from this lab researchers found that farm managers identified company approval as the most important motivator for improving animal welfare (Sinclair et al., 2017b). Prior to implementing change, it is important to understand how things work 'on the ground', for example, by identifying decision-makers who impact animal welfare and mapping out their relationships. Ethnographies can be a suitable method to understand these relationships and decision-making processes in a local context. For example, I found that large infrastructure changes need to be approved by the CEO, and potentially by the state on state-owned farms. Private companies and state-owned companies in China have distinct governance characteristics and decision-making processes (Tong & Junarsin, 2013); future studies should examine how these different characteristics shapes the process of implementing changes affecting animal welfare.

3.3.2   Leadership and workplace approval

Animal welfare can be improved through identifying mutual benefits for both the animals and key stakeholders such as business leaders (Sinclair & Phillips, 2019). To find localized solutions, researchers can work directly with company leaders to identify their goals and find animal welfare improvements that can help achieve these. These benefits will likely vary among

farms. For example, suppliers who export their products (e.g., Chinese egg producers) may be motivated to meeting the animal welfare requirements of importing regions (Littlefair, 2006).

Similar to Sinclair et al. (2019b), I found that farm managers on both farms were motivated to improve animal care, especially when this was associated with profit. Welfare improvements do not always bring increased profits (Coignard et al., 2014). However, on Farm A, where cattle health was compromised to such an extent that it is affecting farm profitability, the farm management team recognized that addressing the basic health needs would improve welfare and productivity.

When there is a perceived conflict between animal welfare and profitability, farm workers may be hesitant to make decisions which compromise profits. Farm management appeared receptive towards evidence-based, pragmatic approaches to improving profit, so providing evidence that specific animal welfare improvement will have economic advantages may be beneficial to obtaining work-place approval. There is an existing body of literature directly examining the link between animal welfare outcomes (e.g., humane handling; Coleman & Hemsworth, 2014, lameness; Villettaz Robichaud et al., 2018, 2019) and farm profitability. Such literature can be used to improve buy-in on specific changes which can impact these outcomes.

3.3.3 Involve all stakeholders

As Mills et al. (2021) identified, participatory research projects that involve various stakeholders can help produce results which are more useful for participants. Chinese culture often involves strong hierarchy, deference to authority, and a tendency to avoid conflict (Fan, 2000). Direct critiques of supervisors be seen as disrespectful and may cause the supervisor to 'lose face'. I noticed that some subordinate workers were reluctant to voice their concerns to key

decision makers. In such cases, researchers may be useful in facilitating respectful conversations, taking care to include those who may usually be excluded from decision-making (such as lower-paid animal care staff). By including all stakeholders in the research design process, findings may better fit the needs of the organization and be more feasible to adopt.

3.3.4   The role of the animals

The ultimate goal for animal welfare research is to improve the lives of the animals. Current animal welfare research is often mono-disciplinary, focusing exclusively on the animal's perspective or the people's perspectives (Bock and van Huik, 2007). Despite my use of ethnography to focus on animal welfare issues, my research remained anthropocentric as my participants only involved humans.

Methods such as multi-species ethnographies (see Hurn, 2012) offer a possibility to including both workers and animals as participants. The addition of measurable animal welfare data coupled with an understanding of the worker's experience may help facilitate the creation of locally relevant changes.

3.4   General Conclusions

I conclude that employee management on two dairy farms in China was critical to animal care. On both farms, workers were willing to learn and to improve. Workers on both farms reported the possibility to improve animal care under differing contexts (e.g., with old and newer infrastructure, in private or state-owned companies). Ethnographic case studies offer unique advantages in generating a holistic, in-depth description of farm contexts and interactions between various stakeholders, findings that are critical to implementation of higher welfare practices in different contexts.

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Appendices

Appendix A Initial interview guide

This is the initial interview guide which was used during the 13 semi-structured interviews with farm workers on both farms.

Topic	Question	Translation
Demographics	你的老家是哪里的？	Where is your hometown?
	你在场上干了多久？	How long have you been working here?
	你为什么来这里/这个岗位工作？	Why are you working here/in this position?
Cattle well-being	对牛来说，什么是好的生活？	For cattle, what is a good life?
	什么对牛很重要？	What is important to cattle?
	牛喜欢/不喜欢什么？	What do cattle like/dislike
	你听过"动物福利"吗？	Have you heard of "animal welfare"?
Cattle care on farm	场上有什么变化吗？	Have you seen any changes on this farm?
	有什么样的变化？	What kind of changes?
	你觉得场上哪方面做得比较好？	What do you think your farm is doing well?
	你觉得场上哪方面还可以提高？	What do you think your farm could improve on?
	哪方面让你最骄傲？	What are you most proud of in your work?

Appendix B Longer quotes and excerpts in English and Chinese

Longer quotes and excerpts which appear in the results section are presented here, along with the original Chinese. The participant is represented by the anonymized identifier (e.g., A12).

<u>Organizational culture: Farm A</u>

A12: Organizational culture is the soul of an organization, something that unites people's hearts to do things.

A12: 企业文化是一个企业的灵魂，是凝聚人心，做事的。

<u>Organizational culture: Farm A</u>

A12: This is a very, very complex privately-owned company… I gave them a nickname, the 'three steals farm' (三偷牧场).

MC: 'Three steals'?

A12: Yes. Those with power, steal money. Those in charge of things, steal things. Those with no power, are lazy. (有权的人，偷钱。中层干部，偷东西。老百姓，偷懒儿。)

[...] This is a terrible farm. It is related to company culture…

MC: So you are managing, but you can't manage the company's culture

A12: We can't change that! Company culture is a boss' (CEO) culture [...] the biggest change we could make was changing the people, getting them to work more diligently [...]." He sighs. "We can only change some aspects of the people. But we can change the cattle's health. Their nutrition is better, there is less lameness, mastitis. The cattle are full, healthy, and not dying. These are our changes. But [we, the farm management team] cannot change their company culture[...] This is why there are some things we cannot implement.

A12: 是个非常非常复杂的一个民有企业。。。我原来给他起了一个外号儿。叫三偷牧场。

MC: 三偷？

A12: 啊。有权的人，偷钱。中层干部，偷东西。(MC chuckles) 老百姓，偷懒儿。

[…] 这是一个非常不好的牧场。和企业文化有关系…

MC: 就是你们管理，也管不了这个企业的人的文化。

A12: 改变不了!他企业文化是老板的文化[…]我们最大的能改变的就是这些人，现在去勤奋的劳动。[…]哎～改变人能改变一部分。但是能改变牛的健康。哦，这不是营养好了。瘸的少了。乳房炎少了。是吧。牛吃饱了，牛健康了，牛不死了。那就是我们改变的嘛。但是我们改变不了他们企业文化。[…]这就有一些，施展不开的。

Organizational culture: Farm B

B18: Farm work can get monotonous and boring, but we need to have high spirits! To achieve the Chinese dream is not easy [...] We need to have an unyielding spirit. Be fearless of hard work/endure hardships (不怕苦)….and not forget about the hardworking spirit of the older generations…We need to become farm 'iron man', 'cattle people' (牛人[5]).

B18: 农场上的活也会单调，乏味。但是我们也应该有精神！要实现中国梦，不是那么容易。[…]我们要有不服输的精神。不怕苦。[…]不能忘了以前老一辈的人的吃苦精神。[…]我们也要做牧场'铁人'，'牛人'。

Organizational culture: Farm B

B5: I think what we do best is identifying and solving problems… We need to ensure the cattle are most comfortable, the humans have good welfare and our farm is prosperous […] If there is need for change, we need to do so immediately [and] be aware of our shortcomings.

B5: 我觉得我们做的最好就是发现问题。解决问题。[…]要做到让牛最舒服，人福利好，场好。要改立即改，认识到不足。

Organizational culture: Farm B

B5: this is [farm B's] specialty. Not just production related activities, but entertainment too. Give workers [higher] welfare, more free gifts, so everyone will see the farm as their home (以场为家). This actually means workers work more effectively.

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[5] 牛人, literally translated as 'cattle people', is also Chinese slang for "awesome people"

B5: 对，这就是我们场的特色。不光是生产的活动，也有很多娱乐，生活。给员工福利，多给点免费的礼物，让大家以场为家。这样实际上人们工作起来也最有效。

Organizational culture: Farm B

B19: high wages, good [worker] welfare […] Only after you ensure the people's [quality of] life, can you ensure the cattle's [quality of] life.

B19: 工资高，福利好。[…]保障人的生活，才能保障牛的。

Organizational culture: Farm B

B2: they recently improved our meal plan, everyone is more motivated to work! [...] Cattle welfare is basically human welfare, only when humans live better, then they can take good care of the cattle.

B2: 这边最近改善伙食，大家干劲儿大了！[…] 其实牛的福利就是人的福利，就是人过得好，才能管好牛。

Organizational culture: Farm B

B7: we need to read lots and learn lots, not just about reproduction, but also history […] Don't be short sighted. We must look at the bigger picture. Look at China's dairy industry. We lack talent who can dedicate themselves. No matter which aspect [of cattle rearing], we need to take things to the next level, become world leaders […] Who are we depending on? Us, brothers. We must have these large ambitions and push through despite hardships.

B7: 我们要多读书，多学习，不光是关于繁育，也一定要了解历史。[...]不要说把眼光放的很短。不要看的这么近。一定要看大格局。你看看中国的奶业。我们缺少大量的这个能钻研的人才。不管是哪一块儿[...] 我们要把这些事情，推向高水平，推向世界前沿。[…]靠谁，就靠我们。兄弟们。就靠在坐的咱们。[…]要有这种大志向。一定要心存更高境界。然后你靠的什么？靠的是艰苦奋斗。

Competency of workers and management

A13: [Workers] are frowning everyday, of course their motivation is low. Additionally, medical fees are high and many cattle are sustained by medication." He further explained: "We provide training, and the workers agrees (认可) with what they are taught. But they

don't execute it in practice. They *know* it is good to do this, but they say, 'I can't execute it, I have no energy', there's a vicious cycle.

A13: [员工]每天愁眉苦脸，他精力是肯定降下来的。其次是药费，会很高，以药物维持的牛也特别多。。[…] 给他们培训了是吧，他们也认可了是吧，认可了，可是咱们现实当中没有去这么执行。[…] 他们*知道*这么做是好的。但是'我无法去执行。没有精力'。所以说等等一些方面，就是恶性循环。

Competency of workers and management

B15: As a veterinarian, I want to be competent (称职) at my job. I am not fooling around. […] Back when I worked as a veterinarian on [another farm at Company B], every year my performance was top 3 in the company! I feel like I am not letting down the cattle I am responsible for. No matter what job, if you want to master it, you need to devote experience and time to study it. You can't 'put away the cup after taking a tiny sip' (浅尝辄止).

B15: 我技术兽医，我要认为我是一位称职的技术兽医吧，就是我认为我不是一个什么糊弄工作的。[…]不管是我原来在[公司另一个牛场]从事兽医的时候，年年都是公司的，成绩都是前三名嘛.而且我觉得，我对得起我负责的牛. 不管是任何行业吧, 你想学精的话，还是需要花一些经历和时间去研究它。你不能浅尝辄止.

Competency of workers and management

A12: see the cattle as your partner in earning money, when they are comfortable, they will produce more and we will benefit

A12: 你把牛看成合作或挣钱的伙伴，他们舒服了，就高产，有回报。

Setting up an effective incentive system

A12: The key is the leader. His thinking determines the company's direction. […] Just set goals. With performance indicators, it is important for the leader to clarify what happens if I achieve my goals, and what happens if I don't. That's it! Then keep your word. Don't have internal conflicts. It's that simple.

A12: 关键是一把手。他的思维，决定了企业的方向。[…]定目标就行了嘛。企业发展的目标。是吧。考核。你达到了我给你怎么着，你达不到了我给你怎么着，就行了。对不对。然后说话算数。但是中间不要内耗。就齐了！就这么简单。

Setting up an effective incentive system

B17: If you are paying employees things *must* be completely clear and transparent. Everyone is here to earn money. Food comes first for the people, right? (民以食为天)

[…] So *anything* concerning money must be handled carefully.

B17: 这个，给员工发工资的话*一定*一定要算得明明白白，清清楚楚的。别人出来上班都是挣的这份儿钱的。民以食为天嘛。[…]所以说对*任何*跟钱挂钩的事，一定要谨慎。

Setting up an effective incentive system

B14: "Before we fed the calves manually, using little buckets. Now we [use ad libitum feeding of acidified milk]. Each year is better than the last. The performance is better, the benefits are clear. You can see the effects of your work, and you can tell the worker's ability. If [the calves are] fed well, [I'll] earn better. With performance appraisal, if the calves gain weight, I will earn more. I quite like this job. Each month if the weight is above the goal, I am extremely happy!" She smiles broadly, looking very proud. "I'm so happy in my heart!" As we continue to feed the calf starter, she says to her calves "Eat more! Grow heavier!"

B14: "以前是人工喂奶，用小盆儿。现在是[自由采食酸化奶]。一年比一年好。效益好，绩效好。就能看到干活儿的本质，体现出能力。喂的好，挣得好。绩效考核，体重增了，我的工资就增了。我挺喜欢这个工作。一个月增重超标，特别高兴！"她骄傲地笑着说"心里老高兴！"我们继续喂犊牛饲料时，她对牛说"多吃！喂重点儿!"

Setting up an effective incentive system

B1: Everyone will start from the same starting point. [After performance appraisal a] team leader with good performance can be promoted to be department leader, while a department leader with poor performance will no longer hold that position. Give them a sense of crisis and competition. Let them prove their technical skills and ability.

B1: 大家都在同一个起跑线上。[绩效考核后]组长干得好就能当上主管，主管当不好就不能当。给他们点危机感。让他们凭技术，凭能力。

Appendix C Final template

This is the final template generated during data analysis.

Theme	Parent code	Child code
Organizational culture 企业文化 (OC)	OC-Leadership 领导 (LD)	LD-Integrity 诚信
		LD-Transparency 透明度
		LD-Nepotism 关系
		LD-Value worker welfare 员工福利
		LD-Value cattle 关注奶牛
	OC-Worker definitions 员工定义 (NV)	NV-Youthful 活力
		NV-Three steals 三偷牧场
	OC-Militarized management 军事化管理 (ML)	ML-Hierarchy
		ML-Shared purpose
		ML-Discipline 自律
		ML-Execution skills 执行力
		ML-Communication and reflection 沟通
Competent workers 称职员工 (CW)	CW-Education 教育 (ED)	ED-Trade school 专科
		ED-Uneducated 没文化
		ED-Training 培训
	CW-Experience 经验 (EX)	EX-Respect for knowledge 服气
		EX-Cattle knowledge 养牛
		EX-Management knowledge 员工管理
	CW-Attitudes/work ethics 工作态度 (AT)	AT-Shaped by organizational culture 企业文化
		AT-Eager to learn 学习态度
		AT-Grit 吃苦
		AT-Conscientious 认真
		AT-Responsible 责任心

	CW-Availability 缺少人才	
	IS-Performance appraisal 绩效考核	
		CQ-Rewards 奖励
	IS-Consequence 后果 (CQ)	CQ-Punishments 处罚
	IS-Motivation 动力	
	IS-Accurate data 数据	
Incentive systems 激励机制 (IS)	IS-Accountability	
	IS-Implementation 执行	

Appendix D Sample of edited audit trail

During data analysis, MC created an audit trail of commentaries on successive versions of templates. These reflections helped MC modify the template to better reflect what she was noticing in the data during analysis. This sample of the audit trail was modified to help improve ease and clarity of reading.

2020-07-22, 11:15 AM

Summary of major template changes:

I collapsed the previous 4 themes ('incentive systems'; 'execution'; 'organizational culture'; 'training and expertise') into 3 main themes ('incentive systems'; 'organizational culture'; 'competent workers')

Incentive systems as was quite distinct theme and remained relatively unchanged, while the other themes were modified as there were significant overlap of codes in 'execution', 'organizational culture', and 'training and expertise'.

Detailed notes:

The previous theme 'execution' covers when workers mention the importance of hierarchy, following rules, and having decision-making power, but as I am looking at the fieldnotes from when I was with the repro team at Farm B I feel these factors are also influenced by organizational culture and norms in a group. So, I shifted the 'execution' codes under 'organizational culture'.

I was reading about one vet on Farm B saying he wants to be a "称职的兽医" ("competent veterinarian"). I feel worker 'competence' as a new theme can cover all the codes which once fell under 'training and expertise'. Also, by broadening the category from training

and expertise to exploring overall worker competence, I can also include codes about work ethics and attitudes, which once fell under organizational culture.

I think talking about individual worker competence as a theme is helpful because in the organizational culture theme, I talk about how these norms shape individuals, but I still want to explore what makes an individual a 'competent worker' (e.g., Farm A's vet promoting ability to 吃苦/endure hardship).