



Emerging Market Multinationals and International Corporate Social Responsibility Standards: Bringing Animals to the Fore

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Received: 29 July 2018 / Accepted: 7 March 2019
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Abstract

The literature presents a broad approach to Corporate Social Responsibility (CSR), which aggregates a diversity of issues, such as the environment, labor conditions, and human rights. We addressed the impact of increasing CSR demands during the internationalization of emerging market multinationals (EMNs) on one particular subject, animal welfare (AW). This subject raises important ethical concerns, especially as we understand that animals are sentient beings. Through content analysis of annual reports, we tracked the evolution of AW-CSR activities throughout the internationalization of two large Brazilian meat-processing multinationals as they accessed markets with complex AW regulations. We also synthesized findings on broiler chicken on-farm AW research in Brazil and conducted interviews to gauge the impact of CSR standards on animals. Our findings show that, although EMNs that enter developed markets engage with various standards, the impacts of standard enforcement on actual welfare are not straightforward and call for broader AW and animal ethics developments. Uneven results among AW criteria indicate that some aspects are prioritized over others. Furthermore, some actions of actors such as EMNs and low-tier suppliers seem to counterbalance the expected impact of normative pressures to change the lives of animals for the better. We conclude that AW standards may improve AW in emerging markets; but these standards do not appear to be sufficiently stringent, and require improvements to have a more significant positive impact. A major signal emerging from this research is the fundamental need to broaden the animal ethics debate regarding the use of animals to produce meat.

Keywords Animal ethics · Animal welfare · Corporate social responsibility · Emerging market multinationals

Corporate Social Responsibility (CSR) in emerging market multinationals (EMNs) is receiving increasing attention due to their unique features and internationalization patterns (Thite et al. 2014), and the relevance of the social and environmental impacts of their operations at home and abroad (Doh et al. 2015). As they expand outside their home countries, these firms must comply with internationally required safety, quality, and CSR standards. Oftentimes, EMNs CSR

investments are also motivated by the need to strengthen their corporate image, especially when they internationalize to more developed markets (Zyglidopoulos et al. 2016), such as the US and the European Union (EU). These companies face a liability of origin (Marano et al. 2017; Fiaschi et al. 2017) due to institutional voids in their countries of origin (e.g., corruption and poor infrastructure), which may weaken trust in their organizational capabilities by stakeholders in developed countries. Hence, when they enter these markets, investments in CSR systematically improve (Zyglidopoulos et al. 2016) concomitantly with increased reporting of CSR initiatives to stakeholders (Marano et al. 2017).

Notwithstanding the advances in the discussion on CSR in EMNs, we argue that relevant gaps remain that deserve further investigation. First, most research so far has adopted a broad umbrella approach to CSR (Blowfield and Frynas 2005), which includes a broad range of social and environmental efforts (c.f. Marano et al. 2017). However, CSR may encompass issues as diverse as environmental protection,

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fair trade, health and safety, biotechnology, labor conditions, and human rights (Maloni and Brown 2006). Each issue, in turn, may involve a diversity of initiatives, standards, and implications for EMNs' activities. Within this diversity of issues, our contribution specifically addresses animal ethics and welfare. Our primary motivation in doing so is the intrinsic value of animals and our duty not to cause them suffering. Additionally, focusing on a more specific CSR topic such as animal welfare (AW) may enable a broader understanding of the institutional actors involved, the potential outcomes of firms' actions, and issues to be addressed.

Animal welfare involves the assumption that animals should not experience unnecessary suffering in activities such as handling, housing, transport, and slaughter (Maloni and Brown 2006, p. 39). Deficient AW may be observed in conditions such as reduced life expectancy, impaired growth, impaired reproduction, body damage, disease, immune suppression, and behavior anomalies (Broom 1991). The subject raises ethical concerns because non-human animals possess complex nervous systems and are therefore sentient beings, i.e., they are equipped with sophisticated cognitive structures that allow them to experience feelings, feel pain and pleasure, evaluate complex situations, recognize others and develop relationships (Broom 2014, 2016). Understanding and recognizing these complex capabilities in other species is necessary in order to advance a more informed approach to dealing with non-human beings (Burghardt 2009) and incorporate the intrinsic issues of animal rights that naturally emerge from such recognition. Thus, AW focuses not only on alleviating suffering but also considers three complementary domains: health and biological functioning, affective and emotional states, and natural behavior expression (Fraser et al. 1997). Moreover, the many animal ethics issues related to decisions on what is acceptable for us to do with animals are relevant to our discussion.

Animal welfare is a key issue for EMNs that internationalize to markets such as the EU, which have imposed AW standards on suppliers in emerging markets (e.g., poultry suppliers) since the nineties (Jones 1996). However, little attention has been paid to the issue of farm AW, which is of great importance to societies that are significantly involved in either producing or consuming animal products, or both. This condition seems an important characteristic of some emerging markets. According to the FAO (2017), more than 1 billion people worldwide depend on the livestock industry, and 70% of the 880 million rural poor partly depend on it. The livestock industry is also crucial in the case of Latin America, since it is the region that exports most beef and poultry worldwide. However, the intensification intrinsic to large-scale production has led to the adoption of confinement housing and management practices that may pose a threat to current AW conditions (Von Keyserlingk and Hötzel 2015).

Global value chain (GVC) theory (Gereffi and Fernandes-Stark 2016; Lee and Gereffi 2015) seems to be a possible framework for exploring AW issues in EMNs. A GVC involves all the activities that globally dispersed inter-firm networks perform to bring a product from its conception to final consumers and beyond (Lee and Gereffi 2015). The agrifood chain, for instance, may encompass the following basic inputs: production, packaging and storage, processing, distribution, and marketing (Gereffi and Fernandez-Stark 2011). GVC theory helps to understand the inter-firm transactional dynamics and informal chain governance mechanisms (Gereffi et al. 2005; Ponte and Gibbon 2005) involved in the development and dissemination of standards in GVCs. Major buyers in developed countries, such as retailers, fast food chains and supermarkets, press for the adoption of quality, food safety, social and environmental standards by firms, and suppliers in emerging markets (Gereffi and Lee 2009, 2012). Specifically, emerging markets often maintain minimal requirements and regulations on AW (Von Keyserlingk and Hötzel 2015; Tuytens et al. 2015). Hence, when they trade and internationalize into regions with more AW rules, they may be required to adapt to new standards.

With the objective of addressing the identified gaps in the literature, in this study we pose the following questions: (1) How does the internationalization of EMNs to more developed countries impact their adoption of AW standards? and (2) To what extent does this actually improve AW at the bottom of the chain, at the animal level? A GVC perspective was employed to show how major Brazilian multinationals in the meat industry increase their use of a wide variety of standards in response to pressures from developed markets pushing for improved animal welfare conditions. We also address how these standards are pushed down to lower-tier suppliers and the actual impacts at the animal level. In our analysis, we focus on broiler chickens that are traded by Brazilian meat-processing firms in the EU, which is one of their largest foreign markets and imposes complex AW standards (Tuytens et al. 2015; Von Keyserlingk and Hötzel 2015).

Institutional Forces Framing AW Initiatives and Standards

Corporate Social Responsibility (CSR) initiatives are significantly shaped through the interplay of political-economic-interorganizational vectors that act outside the organization (Brammer et al. 2012; Campbell 2007; Ransom 2007). For instance, according to Campbell (2007), organizations tend to invest more in CSR when they operate in institutional environments that have: (a) strong state regulations that pressure for responsible operations; (b) structured industrial self-regulation systems; (c) organized private and social actors that may press organizations to adopt responsible behaviors;

and (d) organizations with institutionalized communication channels with stakeholders, among other aspects.

Regarding AW, the case of the EU is illustrative because European legislation recognizes non-human animals as sentient beings (European Union 2007). Furthermore, considerable attention is paid to the subject and the existing regulatory system is intricate (Maciel and Bock 2013; Van Horne and Achterbosch 2008). Concerns for AW involve the interplay of a number of key institutions, such as national regulatory structures (e.g., the UK's Farm Animal Welfare Council—FAWC), supranational structures (e.g., the European Union and European Commission), global governance institutions (e.g., the World Organization for Animal Health—OIE), and private sector organizations (e.g., multinationals, industry groups and associations) (Ramson 2007; Tennent and Lockie 2012), as well as actors from the scientific community and civil society (e.g., consumers, social movements, activists, and NGOs) (Maciel and Bock 2013; Miele and Lever 2013). Moreover, due to international trade and GVCs, national legal schemes have been complemented by regional and international agreements (e.g., the World Trade Organization regulation scheme) (Maciel and Bock 2013).

Corporate Social Responsibility (CSR) tends to be institutionalized within organizations through specialized structures and processes (Brammer et al. 2012), such as the adoption of standards, which emerge from the institutional context. Public standards may be mandatory, either national (public institutions and laws within each country) or international (e.g., European Union and WTO regulations), or voluntary (e.g., ISO 14000, ISO 26000) (Gereffi and Lee 2009). Sometimes voluntary public standards may nonetheless be required by potential buyers, becoming *de facto* mandatory. As for private standards, they may be set individually (e.g., McDonald's Global Animal Welfare Guiding Principles and Agricultural Assurance Programme), or collectively (by either a vertical or horizontal alliance of firms) (e.g., the GlobalG.A.P. certification scheme set and managed by European retailers). There are also third-party standards that are set by NGOs: World Animal Protection guidelines, Certified Humane and Free Farmed, for example. By standards, we mean formalized criteria used as conventions, definitions, and guidelines aiming to ensure consistency and patterns in production activities (Bain et al. 2005). They are used to evaluate the appropriateness of behaviors within an organization regarding AW. They may be developed by public and private bodies, by public–private partnerships, NGOs, and others (Maciel and Bock 2013), and they may take different forms (Nadvi 2008), involving broad and generic guidelines (e.g., the Five Freedoms framework of the Farm Animal Welfare Council/UK) and also very specific criteria (e.g., national and sector-specific AW regulations, compliance and codes of conduct in buyer–supplier relationships).

Furthermore, some standards are compulsory, while others are adopted voluntarily (Nadvi 2008; Ransom 2007).

The presence of EMNs in developed markets, such as Europe or the US, has led to their progressive engagement with international CSR standards (Zyglidopoulos et al. 2016). Given the wide variety of existing CSR standards and multiple stakeholder demands (Maloni and Brown 2006), EMNs tend to follow lead competitors in these markets, as explained by the concept of mimetic isomorphism (DiMaggio and Powell 1983; Martínez-Ferrero and García-Sánchez 2017; Ransom 2007). The adoption of the standards may already be in place at home, when EMNs imitate practices of multinationals from developed countries (Duarte 2010) or comply with local demands. The development of local standards based on regional cultural and socio-economic characteristics is welcome, for they may be more representative of both the demands of local societies and the field conditions in specific geographical locations. They may also result in innovations that might not have been imagined across all cultures. Thus, the value of fomenting autonomy in terms of proposing AW standards seems important when it comes to enriching the current configuration of AW regulations, especially considering the overall trend for low requirement levels (Souza et al. 2018).

Disseminating AW Standards in the Value Chain

Since the nineties, the number of private standards has increased. In the food chain, they are often set by major organizations, either individually or collectively, and enforced on their suppliers (Gereffi and Lee 2009). This is likely to take place in commodity chains, which are led and coordinated by global buyers (Gereffi et al. 2005; Gereffi and Fernandez-Stark 2016). The GlobalG.A.P. certification scheme (where G.A.P. stands for Good Agricultural Practice) is an appropriate example. It was created by a group of major and very influential European retailers, initially as a response to the UK's Food Safety Act (Gereffi and Lee 2009). Some of the current retail and food service GlobalG.A.P. members are Aldi, Albert Heijn, Hofer, Jumbo, Tesco, McDonald's, Morrisons, Sainsbury, Walmart, and US Foods (GlobalG.A.P. 2018a). It is an assurance program that sets codes of conduct intended to assess and improve farm conditions. It standardizes supplier activities concerning agricultural production, including those related to labor, animal welfare, and food safety (GlobalG.A.P. 2018b). Thus, it exemplifies the influence exerted by major buyers on the adoption of AW standards.

While the considerations of institutional pressure help to understand EMNs' adoption of standardized CSR practices, their insertion in GVCs should also be considered, as this

involves indirect governance mechanisms in which leading firms within the chain exercise varying degrees of power through the coordination of suppliers without any direct ownership of the firms (Gereffi and Lee 2012, p. 25). There are two main mechanisms of indirect governance that may lead to the development and adoption of standards in value chains (Gereffi et al. 2005; Gereffi and Lee 2012; Ponte and Gibbon 2005): (1) market governance, which refers to governmental and non-governmental institutions, mostly in developed countries; and (2) industrial governance, involving the management of supply chains and inter-firm relationships. In the latter case, leading firms such as major buyers or traders exert control over the chain and its players (Gereffi et al. 2005) and have the strongest influence on the adoption of CSR initiatives and standards. This process involves power asymmetries in buyer–supplier relationships and is more evident when lead buyers are pressed by consumers to adopt environmentally and socially responsible initiatives (Poulsen et al. 2016) (e.g., global supermarket chains). Therefore, buyers may assume the role of food authority, while suppliers adopt the role of standard takers (Bain 2010).

This GVC perspective is especially well suited to explain AW dynamics in the food industry (Maloni and Brown 2006). The meat value chain broadly comprises the following components (Lowe and Gereffi 2009): inputs and production, processing and distribution, and sales and marketing. While AW developments involve the activity of large buyers and EMNs, they are naturally centered at the other end of the chain, the producing farms where the animals are. Standards set by lead companies in developed countries are then enforced on EMNs. These firms, in turn, enforce them on their network of suppliers, as through GlobalG.A.P., for example. These standards are audited in the chain and then reinforced through rewards and punishments: price per volume of purchases, rules for exclusion and inclusion, and endorsement or punishment for non-compliance (Ponte 2007). Through such mechanisms, AW standards are disseminated across chain participants, from EMNs to their suppliers at home and abroad. Scholars have argued that standards set in developed countries may lead to the adoption of enhanced AW conditions by exporters and producers located in emerging markets that operate in GVCs (e.g., decreasing animal density and improving housing conditions in poultry production) (Van Horne and Achterbosch 2008). Actually, this is the basic rationale for the whole system, if the demand for a better life for the animals involved in food production is to be respected.

Method

To address our research questions, we analyzed the cases of the two largest and most internationalized Brazilian meat exporters and processors (Fundação Dom Cabral 2015): JBS

and BRF. First, we contextualized the meat sector in Brazil based on reports of the Brazilian Animal Protein Association (ABPA 2018), the Brazilian Meat Exporters Association (ABIEC 2018) and the Institute for Agriculture and Trade Policy (Sharma and Schlesinger 2017). In this regard, we showed how the Brazilian meat industry evolved, the resulting level of concentration, the emergence of a number of meat-processing multinationals and their influential foreign buyers. In addition, the main characteristics of Brazilian lower-tier suppliers are shown, addressing their dependency on EMNs and the related enforcement of standards. We also analyzed the content of annual corporate reports from JBS and BRF. Thus, since firms communicate their CSR activity to relevant stakeholders through annual reports (Notteboom et al. 2015; Marano et al. 2017), we were able to examine the evolution of AW disclosure to stakeholders over time throughout the internationalization of both companies. Reports from 2007 to 2016 were analyzed in order to include the earliest stages of their internationalization and their investments in developed countries. In the coding process (Notteboom et al. 2015), text units defined as sentences that refer to AW activity were identified and counted. In total, 881 pages were analyzed from JBS and 204 from BRF; 209 and 169 AW text units were counted, respectively. Examples of AW text units are: “Temperature and humidity control (are adopted) in extremely confined areas” (BRF 2016, p. 138); “All animals receive a minimum dark period without interruptions, so that they may rest properly” (BRF 2016, p. 136); “Care of the aviary bedding (substrate where the animals stay) is daily, and the integrated producers work to keep the bedding dry, fluffy, and free from foreign materials, at a comfortable temperature” (BRF 2016, p. 136); “(...) JBS facilities in every country conducted frequent internal animal welfare audits and third-party inspections.” (JBS 2016, p. 84); “The animal is slaughtered in line with animal welfare guidelines” (JBS 2016, p. 86).

The next step was to analyze the results of a set of studies conducted on Brazilian broiler chicken farms to gauge the actual impacts that selling to EU buyers and adopting AW standards have had on the animals themselves. Thus, a meta-analysis was conducted to investigate AW conditions in Brazilian farms that adopt international standards, supply major Brazilian meat processors and target developed countries. The meta-analytical approach enables a systematic synthesizing of the findings of previous research in order to identify knowledge gaps (Vesterinen et al. 2014; Schmidt and Hunter 2014) and is an appropriate method when primary data are very difficult to collect (Shaw and Ertug 2017).

In searching for studies assessing AW in emerging markets, which are scarce (Von Keyserlingk and Hötzel 2015), several criteria were imposed. First, a specific focus on broiler chicken was chosen because Brazil is one of the leading poultry meat exporters (Silva et al. 2011), supplying

nearly 65% of the poultry meat imported into the EU (Tuytens et al. 2015). Furthermore, comparisons of AW studies are more suitable when they focus on a single animal species, since different AW criteria are used for broiler chickens, cattle, pigs, and other animals. Second, we looked for studies that adopted the same method for assessing AW conditions on farms, i.e., the Welfare Quality (WQ) Protocol (Welfare Quality 2009) to allow for reasonable comparisons. Finally, we selected farms that supply major Brazilian multinationals such as JBS and BRF.

Despite studies focusing on AW through the Welfare Quality Protocol in emerging markets being extremely scarce, we identified three studies that met the established criteria, encompassing a total of four different samples (41 Brazilian farms) (Table 2). Although this number of studies suffices for meta-analysis (Valentine et al. 2010; Lipsey and Wilson 2001), interpretations of the results should be cautious because of the limited number of studies and samples. Although a fourth research was also identified (Tuytens et al. 2015), it was not included in the analysis because it basically used the same sample as one of the other works.

As shown in Table 1, broiler chickens in samples 1 to 3 were destined for the European market. These farms supply major Brazilian food companies, which systematically audit them using standards and compliance norms that are required for exporting to the EU. Thus, the farms were subject to European AW regulations that focus on aspects such as the number of drinkers, access to feeding, litter,

ventilation, lighting, inspection, cleaning, and, which is very important, set the limits for stocking density (33 kg/m²). These farms were similar in terms of stocking densities, positive ventilation of facilities and within the temperate climate area of Brazil. In sample 4, in turn, the farms did not adopt a typical large-scale industrial production. Free-range broiler chickens were slow-growing birds that could roam in open areas during the day. These farms showed a diversity of sizes, reflecting the greatest heterogeneity seen in the free-range production chain in comparison with the industrial production chain (Sans et al. 2014). Moreover, these free-range farms exclusively targeted the Brazilian market, which maintained only basic AW requirements and regulations and did not adopt international AW standards.

In the empirical analysis, we basically examined and compared the AW scores obtained by standardized and non-standardized farms. First, weighted means and their dispersions were descriptively analyzed. Second, meta-regression analyses were used because they allowed a further exploration of the existing relationships between farm characteristics (e.g., being standardized or not) and chicken welfare scores. Meta-regression is a weighted linear regression that considers sample and study characteristics as covariates and tests the extent to which covariates explain the heterogeneity between the studied samples (Vesterinen et al. 2014; Schmidt and Hunter 2014). Hence, we tested the relation between farms being AW standardized (or not) and their AW scores (0 = not standardized, domestic market;

Table 1 Description of the studies and samples included in the meta-analysis

Study 1: Federici et al. (2016) Assesses AW conditions on Brazilian farms using the WQ protocol	Sample 1 11 industrial broiler chicken farms in the state of Rio Grande do Sul, Brazil The farms supply to a major Brazilian meat slaughter house and processor and produce for the EU Large-scale intensive industrial production
Study 2: Souza et al. (2015) Assesses AW conditions on Brazilian farms using the WQ protocol Compares AW in Global G.A.P. certified with non-certified Brazilian farms	Sample 2 10 Brazilian Global G.A.P. certified farms in the state of Parana, Brazil The farms supply to a major Brazilian food company and produce for the EU Large-scale intensive industrial production
Study 3: Sans et al. (2014) Assesses AW on Brazilian free-range ^a broiler chicken farms that operate only in the domestic market. Uses the WQ protocol	Sample 3 Ten non-Global G.A.P. certified farms in the state of Paraná, Brazil The farms supply to a major Brazilian food company and produce for the EU Large-scale intensive industrial production
	Sample 4 10 farms in the state of Parana, Brazil; farm sizes range from small to large The farms do not have international trade and are not standardized in accordance with EU guidelines

^aFree-range birds can roam in outdoor areas during the day, whereas in typical large-scale industrial production birds are confined

Table 2 Profiles of the interviewees

Interviewee	Profile
A	Veterinarian. Worked for more than 15 years for a major Brazilian meat-processor in on-field activities. Operated as an on-field technician. Was responsible for advising, supervising and auditing producers/farms on issues regarding animal productivity, handling, health, welfare, farm infrastructure, etc. Witnessed the firm's transition to standardized AW practices Currently works as a consultant, researcher and professor in animal productivity and welfare
B	Veterinarian. Was a production manager for over fifteen years in a major Brazilian integrator. Was responsible for coordinating a team of on-field technicians and for advising, supervising and auditing producers on issues concerning productivity, farm management, animal health and welfare, etc Is currently an executive at a veterinary pharmaceutical company
C ^a	Farmer. Has been the owner of five integrated aviaries for more than 20 years Is an integrated supplier to a major Brazilian meat-processing firm
D	Animal scientist. Specialist in AW with more than ten years' experience Has worked for more than 5 years in the Brazilian office of an internationally-renowned NGO in the field of animal welfare and protection. Advises major companies and producers on AW-related subjects
E	Veterinarian. More than 10 years' experience in farm AW issues, specializing in poultry welfare assessment Poultry welfare auditor since 2010, working with major welfare labels and participating in discussions regarding how major Brazilian meat-processing firms may aggregate different certification status

^aWas interviewed together with his son, who is also a broiler chicken producer, and made some contributions during the interview

1 = standardized, target the EU). Thus, the chosen studies allowed an analysis of the extent to which compulsory standards led to AW improvements in lower-tier suppliers. The analyses were supported by Comprehensive Meta-analysis software.

Additionally, since only a limited number of studies were available, to understand better the findings of the meta-analysis, we conducted interviews with five participants that have had extensive professional relationships with major Brazilian meat companies and are experienced in broiler chicken production or welfare issues (see Table 2 for further detail on the profiles of the interviewees).

Respondents A and B were invited to participate because they worked in managerial roles in a major meat-processor for over fifteen years, mostly in broiler production activities. Therefore, they have wide experience in dealing with integrated farms, supervising low-tier suppliers regarding issues such as productivity, quality, compliance with standards, and animal welfare. Moreover, they have substantial knowledge of the Brazilian broiler chicken production chain and required standards. Interviewee A in particular has witnessed the transition to standardized AW practices in one company. They also have a broad view on how integrated farms manage AW, how they relate to the company and what the animal raising conditions are.

The farmer (C), in turn, is an integrated supplier to one company. This participant has vast experience in broiler production and has also witnessed the gradual adoption of AW standards and initiatives in the last two decades. The participation of a farmer seemed essential, due to the particular view farmers may have in this discussion and because they are the ones in close everyday contact with animals. On the

other hand, participant D has worked in the Brazilian office of an internationally-renowned animal protection NGO and has acted as a consultant on AW issues to major meat processors in Brazil. This participant was included because NGOs are relevant actors in the development of public and private standards. Furthermore, they tend to present a broader view on animal welfare, seeing animals as sentient beings and setting standards that tend to surpass national and private regulations (Veissier et al. 2008), which is the case of the NGO in question. Their view is also scientifically grounded, and the interviewee is familiar with the Brazilian production system. Respondent E has advised the major Brazilian firms on AW and auditing-related topics. Furthermore, our respondent E has a solid background in broiler chicken welfare auditing, with national and international experience, and could introduce the viewpoint of those used to working with more stringent AW requirements, as compared to basic EU legislation.

The interviews were semi-structured. They were mostly conducted by both authors, except for one interview conducted by a single interviewer through video conferences. The interviews were recorded. They lasted 60 min on average, following an interview guide that focused on the drivers for Brazilian companies in adopting AW standards, the role of international AW standards enforced by EMNs with regard to setting AW levels, how suppliers manage to ensure AW and their views on the actual welfare of the chickens. We also discussed and clarified the findings of the meta-analysis with the interviewees. All the participants formally agreed to participate following approval by our university's ethics committee (Certificate Number 2.963.757, October 16, 2018). The confidentiality of the participants and

organizations was assured and disclosure of their detailed profiles and professional backgrounds must be done in such a way as to preserve their anonymity.

Results

Overview of the Brazilian Meat Sector

Brazil is one of the largest meat producers in the global market. Total Brazilian meat production in 2017 was (in millions of tons): 13.06 broiler chicken meat, 9.71 beef, and 3.75 pork (ABPA 2018; ABIEC 2018). The proportion of Brazilian products that are internationally traded is 33.1% for broiler chicken meat, 20.9% beef, and 18.5% for pork. Currently, Brazil is the second largest producer of broiler chicken after the US, and is its largest exporter, followed by the US and the EU. The European market is the largest importer of processed chicken, followed by the Americas (ABPA 2018).

Regarding the internationalization of Brazilian meat companies, the Brazilian National Development Bank (BNDES) launched the so-called “National Champions” program, maintained from 2007 to 2013, which invested heavily in selected Brazilian resource-based and commodities corporations, including meat processors and exporters, in order to turn them into major multinationals in their sectors (Sharma and Schlesinger 2017). Before that period, the Brazilian meat chain encompassed a heterogeneous group of players, ranging from well-structured and large farms to small family producers, from high-tech meat processors to small and precarious slaughterhouses. The resources granted by the BNDES stimulated the acquisitions of smaller firms and of companies abroad for mergers, and, eventually, consolidation across several meat segments (beef, pork, poultry, etc.) and other parts of the value chain (feed, additives) (Sharma and Schlesinger 2017, p. 10). Consequently, a few major EMNs emerged, capturing more than 50% of the meat industry market, the largest of them being JBS and BRF. Other EMNs of relevant sizes, though with smaller market shares, are Marfrig and Minerva (Sharma and Schlesinger 2017).

AW Standardization in the Largest Companies: JBS and BRF

JBS is currently the world’s largest animal protein-processing firm, selling a variety of meat products based mostly in poultry, beef, pork, and lamb. It maintains processing units in over 15 countries (JBS 2016; MarketLine 2016b). It internationalized through investments in South America (in 2005) and the acquisition of Swift Foods in the US (in 2007), with the financial support of the BNDES. It also acquired

units in several other regions, such as in the EU, Australia, Canada and, in 2015, Moy Park, intending to increase the firm’s presence in Europe (JBS 2016). BRF also operates in several meat segments, including poultry, pork and beef, and it is responsible for more than 9% of the world’s exports of animal protein, selling to more than 150 countries (MarketLine 2016a; BRF 2016). Its internationalization started through the acquisition of PlusFoods’ meat-processing units in Europe in 2007 and 2008, supplying retailers and supermarkets in the region. There have been recent foreign direct investments (FDI) in other regions, such as the Middle East. Most of BRF’s production of *in natura* meat is concentrated in South America (Brazil and Argentina), where the company manages a network of animal suppliers (BRF 2016).

Their major buyers in Europe include supermarkets, retail and food service firms (e.g., Aldi, Albert Heijn, KFC, Tesco, and McDonalds), and *in natura* product importers. BRF also delivers poultry to their units abroad. Overall, it is a buyer-driven chain, where EMNs seek to adjust products to buyers’ specifications, while foreign firms actively control food safety and quality. Therefore, private standards are imposed along with public standards (Gereffi and Lee 2009).

Analysis of JBS and BRF Annual Reports

The content analysis showed that the focus on AW issues consistently increased over the years since JBS and BRF intensified their commitment to resources and operations abroad (Fig. 1) (note that JBS’s annual reports for years 2009 and 2014 are not available). JBS went from two references to AW in 2007 to 88 in 2016. BRF, in turn, went from one reference in 2007 to 55 in 2016. Spearman’s correlation between the frequency of AW references and year was statistically significant for both companies (BRF: $r=0.88$; $p<0.01$; JBS: $r=0.97$; $p<0.01$). Figure 1 also shows the number of pages of the reports, which also increased over the years. However, the correlation between AW frequency and report length is not statistically significant (BRF: $r=0.54$; $p=0.11$; JBS: $r=-0.02$; $p=0.96$), suggesting that the increase in AW disclosure was not associated with report length. Furthermore, as shown in their 2007 reports, both companies complied with the European Union’s compulsory standards in the earliest stages of their internationalization. The mandatory GlobalG.A.P. and the British standards for poultry and retail, the latter only in the case of JBS, were adopted as soon as the companies intensified their presence in the European market. JBS reported the adoption of the McDonald’s certification scheme when the firm acquired Swift Foods, in 2007. Figure 1 shows that those firms increasingly informed stakeholders their CSR activity concerning animals throughout their internationalization.

Table 3 displays a more detailed list of AW standards adopted by JBS and BRF over the period in question. It

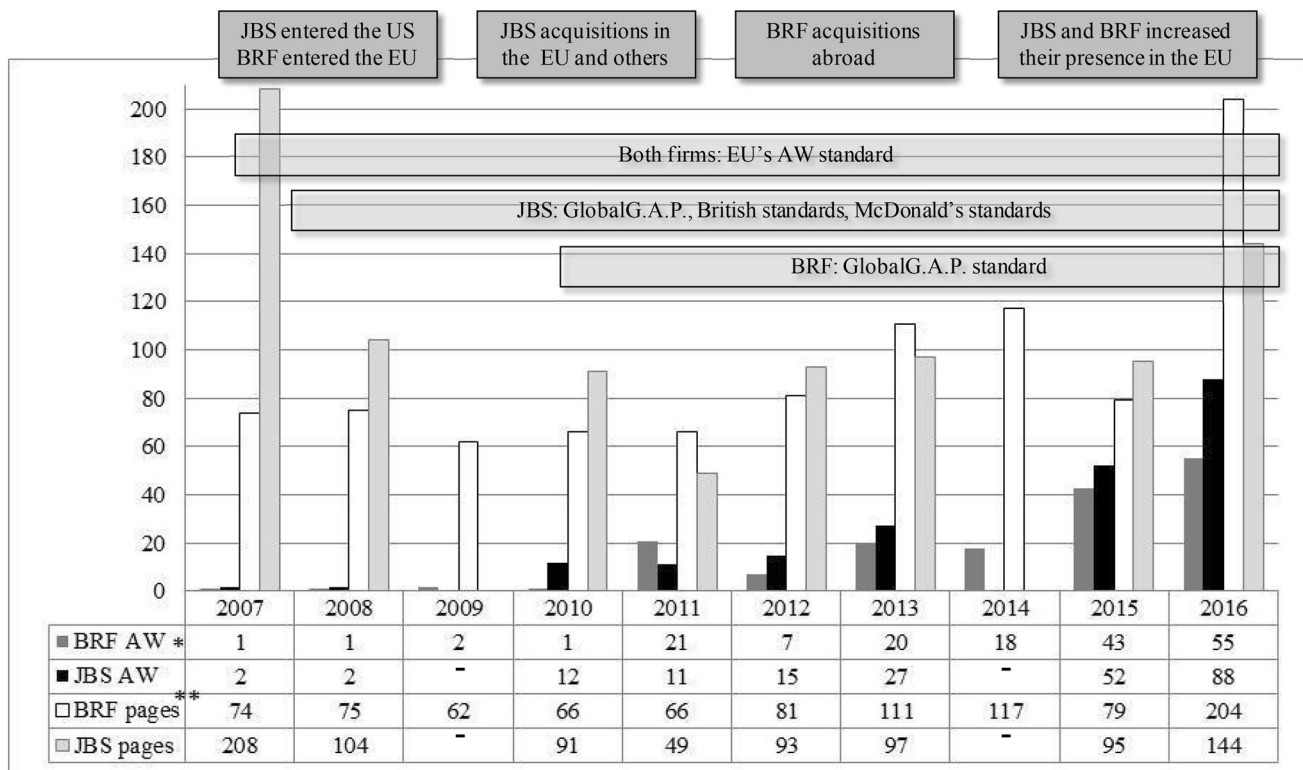


Fig. 1 Animal welfare (AW) disclosure over time as per annual reports of the two largest Brazilian meat exporters and processors. *Notes* *Frequency of AW text units; **total number of pages in the report; JBS's annual reports for 2009 and 2014 were not available

encompasses both generic and specific standards that may be adopted by poultry companies. Only standards that apply to the EU market were included. In the case of JBS, the firm reported its compliance with the EU regulations, British standards, GlobalG.A.P., and the McDonald's certification scheme. Voluntary AW standards such as Five Freedoms, WAP guidelines, Compassion, and KFC were reported later, when the company reinforced its presence in Europe through the acquisition of Moy Park.

BRF, in turn, acquired industrial units in Europe in 2007 and 2008, when it started supplying local retailers and supermarkets. According to the reports for those years, the company also started certifying its plants with regard to AW issues to adjust to buyer and consumer demands. Furthermore, it emphasized its commitment to EU regulations. The 2011 report stressed that increased investments in international food safety and CSR standards were a response to the demands of international markets. The company then disclosed the adoption of the GlobalG.A.P. standard and the voluntary Five Freedoms framework of the Farm Animal Welfare Council/UK (Table 3). In 2013, the company emphasized how rigorously it selected suppliers and evaluated their compliance with standards, and additionally reported its conformity to the standards of the World Organisation for Animal Health (OIE). In 2014 and 2015, BRF

formed a joint venture with Invicta Foods (UK) to supply European countries, when the adoption of the WAP guidelines was reported.

Actual Impacts of Standards on AW at the Animal Level

The Context of Brazilian Lower-Tier Suppliers

As mentioned in the “Method” section, this analysis focuses on the broiler chicken chain, which is mostly formed by small and medium-sized broiler farms, vertically integrated with large Brazilian meat processors such as JBS and BRF (Sharma and Schlesinger 2017). Thus, unlike the cattle chain, which also involves larger and independent producers, contract farming prevails in the broiler segment. Through these contracts, firms like JBS and BRF supply basic inputs (e.g., feed at lower prices) to their integrated farmers and set guidelines regarding aspects such as the required infrastructure, production management, and quality standards. When animals have grown and are ready for slaughter, they are sold to the integrators. In this governance model, suppliers are dependent on their large buyers, and control mechanisms are intensified (Gereffi et al. 2005). Consequently, general and AW standards are enforced on the suppliers. This is the

Table 3 Animal welfare standards^a observed in the annual reports of the two largest Brazilian poultry exporters and processors from 2007 to 2016

Standard type	JBS	Regions/Countries ^b	Year ^c reported	BRF	Regions/countries	Year reported
Public mandatory	EU legislation/European commission	EU	2007	EU legislation/ European Commission	EU	2007
Public voluntary participation	Guidelines of the “Five Freedoms” (FAWC)	EU/UK	2014	Guidelines of the “Five Freedoms” (FAWC)	EU/UK	2011
Private mandatory	McDonald’s certification	EU (and US)	2008	Standards of the World Organisation for Animal Health (OIE)	International	2013
Private collective mandatory	KFC Agriculture GlobalG.A.P	UK EU	2016 2007	GlobalG.A.P	EU	2011
Private non-profit voluntary participation	World Animal Protection (WAP) guidelines	EU/International	2016	World Animal Protection (WAP)	EU/International	2014
Private collective voluntary	Compassion in World Farming (CIWF) British Poultry Council (BPC) and British Retail standards	EU, UK	2016	ALO FREE Swiss Animal Protection (STS) GenesisGAP	Switz./EU Switz./EU EU and US	2015 2016 2016

^aOnly standards disclosed in the annual reports were included (other standards may also apply). The focus is on standards that may apply to the poultry sector and to trade in Europe

^bRefers to the main region/country where the standard is developed or managed

^cRefers to the year it was first reported

context of the broiler farms, which are described in the following analysis.

Synthesis of Previous Studies at the Animal Level

Table 4 displays WQ's principles and the criteria they include (absence of prolonged thirst, absence of disease, etc.). It also shows the weighted mean scores (*WMI*) for the individual welfare criteria of the farms that sell to the EU and the mean scores (*M*) of the free-range broiler chicken farms. Weighted mean scores consider relative contributions of each sample (see Schmidt and Hunter 2014; Vesterinen et al. 2014). The higher the resulting score for each AW indicator, the better the AW condition (maximum score is 100) regarding that specific measure. This applies to all criteria with the exception of disease, because only the mortality level was available in all the studies. The higher the value (in %), the higher the mortality. Furthermore, the WQ protocol sets the following thresholds for overall AW conditions on farms (Botreau et al. 2009; Czycholl et al. 2015): AW scores below 20 are considered "not classified"; between 20 and 55 "acceptable"; between 55 and 80 "enhanced"; and above 80 AW scores are deemed "excellent" (Botreau et al. 2009; Czycholl et al. 2015; Welfare Quality 2009). We used the

same thresholds designed for overall farm scores to study criteria individually (Table 4).

In the case of farms that targeted the EU, three criteria were rated as excellent or enhanced (absence of prolonged thirst and hunger and good human-animal relationship), while all the other scores fall into the acceptable welfare level, which represents minimal AW requirements. Some of those acceptable scores were close to the "not classified" edge (absence of injuries and positive emotional state). As for absence of disease (mortality), the 3.3% rate is analogous with the levels found on European farms (Bock and De Jong 2010). It should be noted, however, that some items showed a higher dispersion (see standard errors and confidence intervals), suggesting that there were variations in the status of AW among the standardized farms. This was the case for thermal comfort, absence of injuries and absence of prolonged hunger, which presented the largest standard errors (SE). Moreover, Table 4 shows that the true means of these items could fall anywhere in their confidence intervals (CIs), whose lower limits were close to the "not classified" level (the CI of thermal comfort, for instance, ranged from 24.69 to 65.65). On the other hand, dispersions were lower in absence of disease (mortality), positive emotional state, and absence of prolonged thirst.

Table 4 Synthesis of animal welfare (AW) conditions as per assessments on Brazilian broiler chicken farms

Welfare quality principles and criteria	AW standardized/target the European market					Domestic market/free range		
	WMI (SE)	Condition individualized per criteria	95% CI	Z	M (SE)	Condition individualized per criteria	95% CI	Z
Good feeding								
Absence of prolonged thirst	95.46 (1.42)	Excellent	92.68–98.25	67.12*	81.75 (5.40)	Excellent	71.17–92.33	15.14*
Absence of prol. hunger	76.72 (4.24)	Enhanced	68.41–85.02	18.10*	–	–	–	–
Good housing								
Comfort around resting	53.88 (3.48)	Acceptable	47.06–60.70	15.49*	60.25 (6.00)	Enhanced	48.49–72.01	10.04*
Ease of movement	48.24 (3.13)	Acceptable	42.11–54.37	15.14*	56.50 (5.70)	Enhanced	45.33–67.67	9.91*
Thermal comfort	54.17 (10.45)	Acceptable	24.69–65.65	4.32*	100.00 (0.10)	Excellent	99.80–100.19	1000.00*
Good health								
Absence of injuries	30.10 (5.04)	Acceptable	20.23–39.97	5.98*	69.90 (7.00)	Enhanced	56.18–83.62	9.99*
Absence of disease	3.30 (1.08)	Do not apply ^a	1.18–5.41	3.06*	3.20 (0.50)	Do not ap	2.22–4.18	6.4*
Appropriate behavior								
Positive emotional state	29.97 (1.38)	Acceptable	27.27–32.68	21.70*	74.00 (5.40)	Enhanced	63.42–84.58	13.70*
Good human–animal relationship	85.39 (2.68)	Excellent	80.14–90.63	31.92*	66.30 (2.20)	Enhanced	61.99–70.61	30.14*

Random effect is assumed in the analysis due to the diversity of farms sizes, regions, etc. (Schmidt and Hunter 2014)

WMI Weighted mean scores encompassing samples one, two, and three, *SE* Standard error, *CI* Confidence interval (lower – upper), *Z* Z-value tests the null hypotheses that the true mean difference is 0.00, *M* mean scores for free-range farms

^aAbsence of disease refers to on-farm % mortality only (the lower the % the better the welfare condition; WQ assessment does not apply)

* $p < 0.01$

Free-range farms showed enhanced or excellent levels in all scores. As expected, marked dispersions are seen in most items (e.g., absence of injuries, comfort around resting, ease of movement); reflecting the diversity of sizes of the farms and the fact that they are not AW standardized. Even so, lower ends of their CIs were still at the acceptable or enhanced levels. Furthermore, AW scores of free-range were higher than those of standardized farms in most items, especially thermal comfort, absence of injuries and positive emotional state. Nonetheless, standardized farms showed better scores in absence of prolonged thirst and good human–animal relationship.

Complementarily to the previous analysis, we also tested the relationship between being AW standardized and the AW scores through meta-regressions (Table 5), as mentioned in the methodology section. Meta-regression makes it possible to test whether covariates explain the heterogeneity between the studied samples (Vesterinen et al. 2014; Schmidt and Hunter 2014). Hence, we tested the relation between being AW standardized (0 = not standardized/ domestic market; 1 = standardized/ targets the EU) and the overall mean scores of all studies ($WM2$).

Besides means, SE and CI, Table 5 also shows that the null hypothesis that the means in the original studies are not different can be rejected since Z -values were significant in

all the WQ items (see Z column). Furthermore, most items, with the exception of “absence of prolonged hunger”, presented heterogeneity between samples, since the Q -values were above the degree of freedom (df) and statistically significant (See Q test in Table 5). It should be noted that the score of absence of prolonged hunger was not available in the free-range study (Sans et al. 2014), which influenced its Q test. Finally, the I^2 statistics estimate the amount of the variance that is not attributed to sampling errors, which were high in all items except for absence of prolonged hunger. These results suggest that the variances are likely to be related to covariates whose moderating effects can be tested through meta-regression.

Therefore, AW standardized farms were positively and significantly related to higher scores in absence of prolonged thirst (birds per drinker ratio) and good human-animal relationship (Table 5). According to Tuytens et al. (2015), good results in the latter often indicate that chickens are more accustomed to human handling and therefore have less fear of proximity and touch. Free-range chickens, in turn, tend to have less frequent contact with humans and are therefore less sociable than large-scale production broiler chickens (Sans et al. 2014). They are also better able to move around, which may influence avoidance and touch test results. On the other hand, standardized farms were negatively and significantly

Table 5 Statistical significance of the impact of level of animal welfare standardization on the scores for individual animal welfare criteria using meta-regressions

Welfare Quality principles and criteria	$WM2$ (SE)	95% CI	Z	Q (df)	I^2	β^c
Good feeding						
Absence of prolonged thirst	94.49 (1.52)	91.51–97.46	62.22*	39.31 (3)*	92.37	13.71*
Absence of prolonged hunger ^a	76.72 (4.24)	68.41–85.02	18.10*	0.52 (1)	0.00	–
Good housing						
Comfort around resting	54.97 (2.94)	49.21–60.73	18.70*	6.41 (3)**	53.16	–6.36
Ease of movement	49.41 (2.88)	43.76–55.05	17.16 *	24.57 (3)*	87.79	–8.26
Thermal comfort	59.46 (24.26)	11.91–107.00	2.45**	1758.53 (3)*	99.83	–54.83*
Good health						
Absence of injuries	37.37 (5.13)	27.31–47.43	7.28*	136.35 (3)*	97.80	–39.80*
Absence of disease ^b	3.30 (0.75)	1.83–4.78	4.39*	23.03 (3)*	86.97	0.10
Appropriate behavior						
Positive emotional state	40.79 (7.68)	25.74–55.84	5.31*	69.77 (3)*	95.70	–44.03*
Good human-animal relationship	80.88 (4.33)	72.38–89.37	18.66*	74.29 (3)*	95.96	19.09*

Random effect is assumed in the analysis due to the diversity of farm sizes, regions, etc. which is supported by all the significant Q (df) tests

$WM2$ Weighted mean scores of samples one to four, SE Standard error, CI Confidence interval (lower–upper), Z Z -value; Q Q -value (weighted sum of squares), df degree of freedom, Q (df) tests the null hypothesis that the means are identical across all studies/samples and that variation is caused by sampling error, I^2 variance that is likely to be explained by the covariate, β regression coefficient

^aAbsence of prolonged hunger was not available for free-range farms

^bAbsence of disease refers to on-farm % mortality only

^c0 = not standardized/ domestic market; 1 = standardized/ target the EU

* $p < 0.01$

** $p < 0.05$

related for thermal comfort, absence of injuries, and positive emotional state scores. As for thermal comfort, it may be related to issues in the ventilation systems, which are not sufficiently capable of reducing the heat stress of the chickens. Moreover, fast-growing chickens are less capable of handling heat (Federici et al. 2016). Injuries involve painful locomotion problems, skin injuries, genetic disorders related to the fast-growing characteristics of the birds, and other issues. On the other hand, a decrease in positive emotional state may be related to low animal activity among industrial-intensive birds (Souza et al. 2015), and also suggests an increase in negative emotions and a decrease in positive emotions (Federici et al. 2016). Free-range chickens, in turn, have access to open areas, which allows them to enjoy pleasant activities such as running, jumping, dust-bathing, etc., and are better at tolerating higher temperatures (Federici et al. 2016; Sans et al. 2014; Souza and Molento 2015), among other factors, which may result in increased positive emotional states. Finally, meta-regressions for absence of disease, comfortable resting, and ease of movement were not statistically significant (Table 5).

Interviews

All the participants were initially asked to share their views on what the drivers for EMNs and farms investing in AW may be. There was a common sense that all initiatives were mostly led by market pressures, consumer demands, and, more importantly, the strict requirements of foreign markets and buyers. Only one respondent (E) claimed to believe that around 20% of the pressure for AW standard adoption stemmed from national market niches. Europe, foreign retailers, and Switzerland were literally mentioned not only regarding AW but also due to their demands concerning quality and food safety. As emphasized by the farmer, broiler chicken production has been “(..) reshaped over the years because of demands from foreign buyers”. More specifically, regarding welfare conditions, he stated that, “(..) decades ago, aviaries were open, birds were exposed to weather conditions and had more injuries”. Moreover, according to A: “(..) Swiss buyers, for instance, asked us to install concrete floors in our aviaries, which was not common in Brazil.” The systematic adoption of AW and other productivity and quality standards is seen by producers, at first hand, as a means of achieving value-added products and sales. Furthermore, they claim that welfare management increases product quality, e.g., through injury reduction.

As expected, the dependency of producers on their integrators was confirmed by all the respondents. Through the integration contract, farmers must comply with a series of requirements, including minimal required infrastructure, management procedures, productivity, and quality standards.

They are regularly audited by their integrators and occasionally by foreign auditors (e.g., from the EU). With specific regard to welfare management, farms are systematically supervised concerning aspects such as stocking density, alkalinity control (the cleanliness of the birds' bedding), lighting and ventilation.

When the participants were asked whether AW standards actually improve the welfare of animals, there was less of a consensus. According to the farmer, increases in welfare have been clear in the last two decades because “in the past, the birds were more exposed to suffering (...), to extreme heat since there was no temperature control (...). There was a higher death rate (...) and broilers grow faster now and are fatter”. Interviewee C expressed a similar view, emphasizing the improvements in providing feeding and enhancing environmental conditions (lighting comfort, less density, cleaner beds, thermal comfort, etc.) and related benefits with regard to productivity. According to respondent E, the great contribution of the introduction is the promotion of a paradigm shift, a new way of addressing broiler chicken management issues, which in the beginning may achieve low real impact for animal lives, but may open the door for greater future improvements: “it is the big start of a process”.

However, A expressed a different view, that if only the impacts on production indicators (animal quality and productivity, for instance) are considered, AW in farms seems to have improved. However, in such a controlled and confined environment, animals cannot behave naturally, which, in turn, indicates poor welfare. To D, however, standards have indeed promoted welfare improvement, for instance: “(..) procedures prior to slaughter (hanging time, for example) have improved, substantially reducing animal suffering”. However, the respondent notes that regular standards, such as the EU's directives, mostly lead to minimal welfare requirements and reduced suffering: “this is the minimum acceptable for AW”. The same interviewee also posits that “(..) the focus is on reducing negative states rather than on promoting positive states, which is also relevant when it comes to AW”. Thus, to A and D, this aspect helps to explain the low scores concerning emotional states found in the meta-analysis. As for free-range broilers, they argue that despite farms having a poorer infrastructure, better scores regarding emotional states reflect animals' greater freedom to express themselves naturally which, in turn, indicates much better welfare conditions. They can move and roam more freely and spend less time inside on the bedding, which also lead to less bedding alkalinity-related injuries.

Participant A also emphasized that some international standards are less useful in Brazil. This is the case of the directives for density because Brazilian farms traditionally adopt lower density than European farms, which have less available space and are subject to a colder climate. Similarly, D shared an additional example of a standard that is of little

use in Brazil: “European aviaries are wider, allowing the installation of perches, which does not work in Brazil”. Furthermore, A and D noted that some recent impositions have also worsened AW conditions in Brazil. This is the case of the imposed adoption of closed buildings (dark house type) for aviaries, which have controlled ventilation and lighting. Brazilian aviaries were traditionally open-sided, allowing better air flow and decreasing the alkalinity of beds and alkalinity-related injuries. Open-sided buildings also provide a more natural environment (A, D) and animals are exposed to natural lighting. However, they have been substituted on a large scale (75% of Brazilian aviaries are now closed houses, according to A).

Regarding the results of our meta-analysis (Tables 4, 5), all the participants agreed that the Good Feeding principle (animal feeding and avoiding thirst) is indeed the one that is expected to show the best performance on farms. First, according to the participants, it is composed of the most objective indicators and is, thus, the easiest to measure. Second, it is the easiest and least expensive to manage, especially considering that producers receive the full amount of ready-to-use animal feed from the companies. Of course, this decreases variation. Finally, it has the most visible and obvious impacts on productivity and quality, and also helps to decrease mortality. Thus, since producers easily relate Good Feeding to productivity indicators, they are more likely to take care of it systematically.

As for the other domains (Good Housing, Good Health), they are seen as more expensive and complex to manage and sustain. Moreover, their efficacy depends not only on the available infrastructure and resources but largely on farmer behavior and initiatives (A, B, C, D, E). For instance, some farmers are more sensitive and aware than others in identifying that “(...) beds should occasionally be stirred to reduce alkalinity and lower the number of injuries” and “(...) that heat has increased and should be reduced” (A). As D puts it: “some farmers are more careful and sensitive with their animals while others easily increase fear and anxiety”, “(...) some farmers find it really difficult and even resist perceiving the needs and actual condition of the chickens”. Moreover, “on some farms you see dead animals left in the aviary, in others you don’t”. Additionally, some suppliers become more active in solving these issues only when quality is affected, resulting in warnings in slaughterhouses (A). This behavioral aspect of farmers partially explains the aforementioned variations in AW criteria like thermal comfort and absence of injuries on the farms in question (A, B, C, D, E), since they are similar in terms of size and available infrastructure and are operated under similar climate conditions (the farms under study were all in Southern Brazil).

Furthermore, according to A, B and E, integrators adopt some level of flexibility regarding producer compliance with AW standards. Supervision and advice are provided

systematically, but integrators also attempt to adjust to each farmer’s characteristics, such as their investment potential, infrastructure availability, management proactivity and understanding of the required standard. Integrators increasingly impose pressure regarding performance, quality and food safety issues. However, higher tolerance is seen with respect to AW compliance in spite of continuous supervision (C, E), which may be in part explained by a motivation of integrators to avoid the social problems that originate from excluding producers (E). Additionally, this may be necessary to sustain the production capacity of the integrator, as D posits that performance is indeed prioritized. For instance: “In a crisis, meat-processing firm can undo contracts with some farms. The birds may be then reallocated among the remaining producers, resulting in increases in bird density”, with all related AW problems.

Discussion

Global Value Chain (GVC) theory shows the role played by major foreign buyers and local integrators in the imposition of international standards to local suppliers (Gereffi and Lee 2009), especially in chains where lower-tier suppliers are largely dependent on their buyers and controlled by them (Gereffi et al. 2005). This is the case of the Brazilian broiler chicken chain, which is also characterized by a significant concentration of major processors and powerful foreign buyers that set required standards. This process of standardization is expected to benefit AW activity along the chain, leading to better animal lives in emerging markets (Souza and Molento 2015; Van Horne and Achterbosch 2008), where AW standards are inexistent or highly deficient (Van Horne and Achterbosch 2008). However, our findings showed that the impacts of standards enforcement on actual welfare at the animal level are not straightforward, i.e., it is not a simple relation of having standards in place and animals with better welfare.

First, the benefits to animals are inconsistent, as they increase in some domains (e.g., good feeding, avoiding thirst and hunger) but remain poor in others (absence of injuries and positive emotional states), which are areas for urgent improvement since standards have failed to produce consistent results. These results are in some aspects in keeping with previous studies that observed uneven improvements in GVCs when CSR standards were adopted (Klerkx et al., 2012; Mamic 2005; Barrientos and Smith 2007; Sinkovics et al. 2016). Barrientos and Smith’s (2007) study on workers’ rights, for instance, identified that most advances were related to more visible outcomes (such as salaries and working hours), while weaker impacts were seen in process-related rights (unionization, avoiding discrimination, skills development), which could challenge established labor

and social relations. This pattern may be more prevalent in advances related to animal welfare, considering that serious consideration of animal ethics issues by western societies is more recent compared with human labor issues. In the context of the Chilean fruit sector, another relevant example, firms invest more in social issues (poverty reduction, working conditions) than in the environmental aspects of CSR (Klerkx et al. 2012). As for extensive livestock farming, however, we found that the prioritized AW domains are those that more explicitly converge on farm performance and productivity results, such as bird growth rate and weight (good feeding, avoiding thirst and hunger), as seen in the meta-analysis outcomes and reinforced by the interviewees. Prioritized criteria also have more objective measures (number of drinkers, stocking density, access to feeding) and are easier and less costly for farmers to handle. These results suggest that the prevailing approach to on-farm AW management actually focuses on productivity and economic outcomes. Moreover, as identified in the interviews, the integrators' increasing pressure for productivity and quality was accompanied by more flexible and tolerant supervision regarding producer compliance with AW.

Thus, the context seems to present a complex pattern that tends to favor resistance to significant AW improvements. This may require a broader ethical approach, calling into question the appropriateness of intensive animal production systems, such as that employed by the broiler chicken industry. The discussion also demands recognition of the ethical challenges of killing sentient animals for food, especially considering the blossoming of more acceptable methods of food production, through innovation in biotechnology related to cell-based meat production (Donaldson and Carter 2016).

Additionally, uneven results between emotional states and other criteria may reflect the resource-based approach that prevails in public and private standards, i.e., their focus is on environmental conditions such as availability of drinkers and feeders, stocking density, and ventilation (Tuytens et al. 2015). These aspects are more easily measured and have a greater focus on reducing suffering instead of promoting positive welfare conditions. Standards target animal-based measurements less frequently, although such indicators allow for measuring the actual impacts of available resources on animal behavior, health and emotional conditions (Blockhuis et al. 2010). As stressed by one interviewee, international standards mostly address minimal resource requirements and reinforce alleviating suffering, which is also pointed out in the AW literature (Souza and Molento 2015). Thus, standards still appear to be limited and need to be improved in their scope, if the aim is to have a more positive impact at the animal level, embracing improvements in areas such as affective states and the expression of natural behavior, which are essential for the welfare of sentient beings (Fraser 1997).

Our findings also showed that bird welfare levels in some domains can vary from one producer to another. Furthermore, the nature of such varying domains and the roles of integrated farms and integrators were also revealed. Measures such as prolonged hunger showed smaller variations within the upper thresholds. However, other measures had greater variations, crossing these thresholds. This was the case of thermal conditions and bird injuries (Table 4). These variations were less expected since the farms in question were AW standardized and targeted the EU market. Since standards set guidelines that are supposed to promote consistency in CSR activity (Bain et al. 2005; Ransom 2007), greater consistency regarding AW conditions would be expected among farmers. However, managing injuries and thermal variations requires continuous attention and effort from producers. Therefore, as seen in the interviews, they largely depend on farmer profiles and attitudes towards animals. Besides farmer behaviors, responses to the interviews also suggested that, at least to some extent, integrators prioritize performance and exert less rigorous supervision on AW issues, which could lead to uneven results among suppliers. This is in line with previous work that claims that suppliers are not always punished by major buyers when they do not fully comply with CSR (Lund-Thomsen and Lindgreen 2014).

Another difficulty is that some standards may be useless in Brazil, and some international trends may even lead to worse welfare. A point in question is replacing the Brazilian typical open-sided aviaries with closed ones. These facts exemplify that standard setting in developed countries and their enforcement in buyer-driven chains may overlook supplier embeddedness in their economic, social, and cultural contexts (Lund-Thomsen and Lindgreen 2014) and even climatic conditions, as in our case. Consequently, in accordance with Souza et al. (2015), the adoption of standards set by institutions in developed countries may have limitations when it comes to promoting AW improvements in emerging markets. In this regard, further development of standards and regulations should consider the local characteristics of Brazilian broiler chicken systems, including decisions regarding which animal welfare requirements should be part of the compliance scheme. This need for the localization of CSR initiatives is consistent with previous research (Arenas and Ayuso 2016; Muller 2006; Jamali 2010), which points out the need to include local stakeholders and use more participative decision making to increase the local effectiveness of CSR initiatives. This could lead to the adoption of CSR solutions that have already been tested and are proven to be more efficient in the local landscape. It could also prevent the adoption of standards that might worsen local conditions or require expensive investments from suppliers, which is a major challenge for CSR implementation in value chains (Lee and Gereffi 2015). The localization of welfare

assessment measures refers to refinements in the ability to verify AW in a solid and context relevant manner. However, if real improvements for the animals are to be achieved, it is necessary to combine the refinements in AW assessments with higher thresholds of acceptability for each measure, since at the moment they generally appear not to be high enough to induce significant changes.

Finally, broiler chickens traded in the EU showed weaker scores for absence of injuries and positive emotional states. These two criteria may be quite problematic for a variety of reasons. Injuries are seen as important indicators of animal suffering. Poor results regarding positive emotional state are related to the presence of negative emotions and exposure to unpleasant situations, which have been regarded as indicators of animal discomfort and decreased AW (Boissy et al. 2007). Despite not being standardized, free-range farms showed better AW conditions than typical industrial producers, in many criteria (Tables 4, 5). This result sheds light on the role played by large-scale production systems regarding poultry welfare. More extensive animal farming has been pressed to increase productivity and efficiency. However, it has also been criticized for a number of reasons. For instance, the need to cut costs means pressure to increase stock densities, and this in turn decreases AW. Furthermore, confined animals are stimulated to grow quickly and have very low physical activity levels, which lead to locomotion and metabolic disorders and suffering (Bessei 2006).

The present study makes several contributions to the existing CSR literature on EMNs. It demonstrates, for instance, that GVC theory may add to the commonly used neo-institutional (NIT) approach on CSR standardization in EMNs (Fiaschi et al. 2017; Marano et al. 2017; Yin and Zhang 2012), which allows an exploration of the roles played by institutional environments in shaping standards and their adoption by organizations. NIT also focuses on how firms may influence each other in adopting standards (Ransom 2007) and on legitimacy issues that may stimulate EMNs to invest in CSR when they access foreign markets (Zyglidopoulos et al. 2016). However, NIT overlooks EMNs' embeddedness in international business networks with underlying power asymmetries, which those firms present when they enter new markets, and which can also influence their CSR and AW initiatives. Nor does NIT explain how EMNs spread standards to other firms along their value chains or shed light on actual implications at the bottom of the chain that can be addressed through a GVC approach. Furthermore, our findings put into perspective legitimacy-seeking explanations for the adoption of CSR by EMNs that internationalize to developed countries (e.g., Zyglidopoulos et al. 2016) because, as seen, firms may not consistently comply with standards at the bottom of the chain, which could actually weaken EMNs' legitimacy and reputation abroad. Moreover, our study shows the challenges of implementing standards

at this level, due to the actions of chain actors (suppliers, integrators). They seem to manage to align compliance with standards for their business priorities. Thus, unlike the previous literature on CSR in GVCs, we have shown that CSR activity that overlaps with or increases performance may be prioritized. The article also shows the merit of approaching CSR research in a more piecemeal fashion, through a more in-depth analysis of particular areas (in this case, animal welfare) that are commonly subsumed under the generic CSR label. Finally, we answer the call from Currie, Davies, and Ferlie (2016) to "lower the walls" of business schools in order to engage in interdisciplinary collaboration to generate social value.

Conclusion

According to the findings presented in this study, although standards may improve AW in industrial-intensive production, they do not seem to solve most of the problems. While AW standards may improve AW in emerging markets, especially when no previous regulation is in place, these standards do not seem to be stringent enough, since welfare thresholds in some domains are rather modest. Moreover, local characteristics seem to be overlooked. Uneven results among AW domains were also observed, suggesting that performance-related aspects are prioritized over other relevant AW issues, which had low scores. Thus, improvements are still needed for standards to have a more significant positive impact. Additionally, our findings indicate that supplier actions associated with a less rigorous supervision by EMNs may contribute to important AW variations between farms. Thus, the choices and actions of actors appear to counterbalance the expected impact of normative pressures to change the lives of birds for the better. Our findings also show that farmers and integrators are not just passive recipients of imposed standards and put into perspective legitimacy-seeking explanations for the adoption of CSR by EMNs. As attempted in this article, interconnecting knowledge from applied social and veterinary sciences may add to the debate on CSR, shedding light on the bottom of the food chain and bringing non-human animals to the fore. While exercising this interconnection it became clear that significant advances in broiler chicken welfare rely on broader animal ethics discussions beyond the adoption of modest AW standards within CSR incorporation by EMNs. Thus, a major signal emerging from this research is the fundamental need to broaden the animal ethics debate regarding the use of animals to produce meat.

Limitations and Directions for Future Research

Future work may complement our findings with data from primary sources collected with the aim of hypothesis testing. The scarcity of available studies publishing broiler chicken welfare assessment in EMNs limited our meta-analyses, which may be improved as specific scientific literature develops. At this stage, we attempted to overcome this restriction by conducting interviews with professionals with in-depth knowledge of the Brazilian broiler industry. However, limitations continue to persist and should be further managed in future studies. The outcomes of the meta-regressions, for instance, should be interpreted cautiously since the number of cases restricts the generalizability of the identified relationships. Interview outcomes, in turn, may be influenced by a respondent's personal perceptions and judgments. Moreover, a larger sample of interviewees would mean greater diversity of perspectives and potentially additional insights. Finally, our findings are not necessarily generalizable to other emerging markets. Precisely because contextual factors seem to play a large role in CSR initiatives, our research points out the need to expand the data collection to other countries and other industries to further explore the role of CSR standards and GVCs in AW.

The study offers several avenues for future research. More works and larger samples are needed to confirm or reject our findings. Future research could also explore whether there are significant AW differences in European farms compared with those in emerging markets and the extent to which specific certifications (e.g., GlobalG.A.P. scheme) are positively associated with improved AW. Moreover, other potential causes of the AW variations identified among standardized suppliers could be explored (climate changes, regional aspects, farm infrastructure, etc). In addition, more in-depth qualitative research on local farms is needed to provide a better understanding of how stakeholders' actions impact AW and how the local context may affect the overall effectiveness of standardized measures imported from developed countries. Additionally, due to the problems inherent to large-scale production systems, we suggest that future research explore in detail the welfare benefits of alternative systems (organic, free-range, etc.) and emerging technologies that might completely transform the meat chain, which is the case of slaughter-free meat technology (see, for instance, Stephens et al. 2018).

Acknowledgements The authors would like to thank the section editor Suhaib Riaz and three anonymous reviewers, who have made significant contributions to this paper.

Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Certificate Number 2.963.757, October 16, 2018.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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