FORUM

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ANIMAL-DERIVED FOOD INDUSTRY: RISKS AND OPPORTUNITIES DUE TO FARM ANIMAL WELFARE

Indústria de alimentos de origem animal: Riscos e oportunidades para o setor decorrentes das políticas de bem-estar dos animais

Alimentos de origen animal: Riesgos y oportunidades para la industria debido a las políticas de bienestar de los animales

ABSTRACT

Farm animal welfare (FAW) has emerged in recent years as a potential material issue for the animal-derived food products industry. The issue is global in scope, given the large trade flows and multinational structure of many companies in the agribusiness industry, a critical sector of the Brazilian and international economy. This exploratory study is an attempt to map the agendas of companies in the industry and compare them with the agendas of the principal stakeholders for a better understanding of the risks and opportunities facing the intangible assets of companies with regard to FAW. The mapping was carried out by consulting websites and corporate sustainability reports. The overarching result of the study is to show that the industry as a whole is neglecting FAW as a material issue.

KEYWORDS | Corporate sustainability, risks and opportunities, farm animal welfare, intangible assets, corporate valuation.

RESUMO

O bem-estar dos animais de produção emergiu, nos últimos anos, como um risco ou oportunidade potencial para a indústria de alimentos de origem animal. Essa questão tem alcance abrangente, devido aos grandes fluxos comerciais e à estrutura de muitas empresas multinacionais na indústria do agronegócio, setor crítico da economia brasileira e internacional. Este estudo exploratório tentou mapear as agendas de empresas do setor e compará-las com as das principais partes interessadas, visando a entender melhor os riscos e oportunidades que os ativos intangíveis das empresas enfrentam em relação ao bem-estar dos animais. O mapeamento foi feito por meio da consulta aos websites e relatórios corporativos de sustentabilidade. O principal resultado do estudo foi mostrar que a indústria está negligenciando a questão do bem-estar animal como um problema material.

PALAVRAS-CHAVE | *Sustentabilidade corporativa, riscos e oportunidades, bem-estar dos animais de produção, ativos intangíveis, avaliação de empresas.*

RESUMEN

El bienestar de los animales de producción ha surgido en los últimos años como un posible problema para la industria de productos alimenticios de origen animal. La cuestión tiene alcance amplio debido a los grandes flujos comerciales y a la estructura de muchas empresas multinacionales en la industria del agronegocio, sector crítico de la economía brasileña e internacional. Este estudio exploratorio fue un intento de mapear las agendas de empresas del sector y compararlas con las agendas de las principales partes interesadas para producir un mejor entendimiento de los riesgos y oportunidades que los activos intangibles de las empresas enfrentan en relación al bienestar de los animales. El mapeo se hizo a través de consulta a los sitios web e informes corporativos de sostenibilidad. El resultado general del estudio fue mostrar que la industria, como un todo, está descuidando la cuestión del bienestar animal como un problema material.

PALABRAS CLAVE | *Sostenibilidad corporativa, riesgos y oportunidades, bienestar de los animales de producción, activos intangibles, evaluación de empresas.*

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INTRODUCTION

The agribusiness sector occupies a significant part of Brazil's economic base. According to *Centro de Estudos Avançados em Economia Aplicada* (CEPEA), the agricultural sector was responsible for roughly 20% of Brazil's gross domestic product (GDP) in 2016. Within agribusiness, animal-derived food products (chicken, cattle, milk, eggs, etc.) were responsible for roughly 6% of Brazil's GDP (CEPEA, 2017). Therefore, risks to the future productivity of the sector merit analysis, as do potential opportunities to strengthen the sector's growth. This aspect is the focus of this research, conducted in a Brazilian public university. However, the study follows an international approach, without influence of specific issues of the Brazilian environment.

One potential source of risks as well as opportunities is farm animal welfare (FAW). Consumers may change their consumption habits toward products with higher FAW levels (or even move away from animal-derived products). Also, the industry may lose its social license to operate. Tougher legislation, both domestic and international, may find companies unprepared, and companies' reputations and brands may be damaged by poor FAW policies and programs. Likewise, many opportunities exist, ranging from the opportunity to become a market leader in a niche product to the chance of being the standard setter for the entire industry. Each opportunity comes with the possibility of adding value through FAW.

This value can be both tangible, such as increased margins on products with high FAW levels, and intangible, such as increased reputation and brand value. This study is interested in the latter, specifically in how FAW can create risks and opportunities in relation to brand and reputation management. Intangible assets, although difficult to measure, are widely accepted as increasingly important to understanding company value. According to Colvin (2015), intangible assets such as brand and reputation constitute 84% of the market value of companies in the Standard and Poor's 500 (S&P 500) index.

The primary objective of this study is to identify and explore the risks and opportunities facing the animal-derived food products industry in relation to FAW. Note that risks and opportunities are seen as reciprocal, meaning that any risk generates an opportunity, and vice-versa. A secondary objective is to initiate a discussion around the interaction between FAW, reputation, and company value. We believe that the risks and opportunities identified through this study would have a potentially large effect on company value, principally through brand and reputation. This study could be a first step toward potentially assessing FAW programs and policies through intangible asset valuation.

It is important to note that this is an exploratory study. To the best of our knowledge, no previous academic attempts have been made to map the risks and opportunities facing animal-derived food companies in relation to FAW, or to analyze FAW through the valuation of intangible assets.

LITERATURE REVIEW

Animal welfare has been an established scientific field of study since the 1980s. However, the widespread and organized interest in animal welfare can be traced back to the 1950s and 1960s, principally in the United Kingdom (UK). According to Broom (2005), the first significant academic work in the field was Ruth Harrison's book *Animal Machines*. Harrison (1964) defines factory farms, describes society's treatment of animals as if they were machines, and makes the case for a less anthropological world view.

Disturbed by Harrison's findings, the UK government decided to launch an investigation into FAW, and this led to the Brambell Report in 1965. The Report established the 5 Freedoms, to serve as the foundation of animal welfare as a formal area of study (Carenzi & Verga, 2007). It also served as the motivation for founding one of the first governmental bodies tasked with overlooking FAW in 1979, the Farm Animal Welfare Council, which consolidated the 5 Freedoms and published them in their most recognized form:

1. Freedom from thirst, hunger, or malnutrition;
2. Appropriate comfort and shelter;
3. Prevention, or rapid diagnosis and treatment, of injury and disease;
4. Freedom to display most normal patterns of behavior;
5. Freedom from fear.

Since then, animal welfare has grown as a science considerably. In 1986, Donald Broom became the world's first Professor of Animal Welfare Science, at Cambridge University (Broom, 2005). By 2014, roughly 100 universities in 26 European countries were offering courses on animal welfare (Illman et al., 2014). Over this same period, a number of large and important non-governmental organizations (NGOs) were founded, specifically focusing on farm animal welfare, such as Compassion in World

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Farming in 1967, People for the Ethical Treatment of Animals (PETA) in 1980, and World Animal Protection in 1981.

Although the status of animal welfare as a science has been consolidated over the last 50 years, there have been numerous debates on how to arrive at a consensus definition of animal welfare. Various schools of thought have debated on what needs to be included in the definition of animal welfare. These approaches can be broken down into three main groups of scientific thought: functional, feeling, and natural behavior (Carenzi & Verga, 2007).

One of the most prominent definitions under the first approach is Broom's definition, which states that animal welfare should be measured on the ability of an animal to cope with environmental stressors (Broom, 1986). This approach is probably the easiest to measure since it can be evaluated from visible health and physiological indicators.

The second approach argues that mental welfare, feelings, and emotions of animals, which are sentient beings, have also to be analyzed. Many scientists have objected to the functionally focused stressors approach. For example, an animal might be physically healthy, and yet be performing stereotypes, that is, making repetitive and invariant sequences of movements that indicate poor mental health (Terlouw, Lawrence, Koolhaas, & Cockram, 1993). This approach is significantly more difficult because it requires the measurement of animals' feelings and emotional states. However, there seems to be some convergence between the two approaches. According to Broom, both approaches acknowledge the holistic nature of any evaluation between environmental stressors and biological function (Broom, 1998).

A third approach proposes that animals should be allowed to live their lives according to their natural impulses and tendencies (Fraser, Weary, Pajor, & Milligan, 1997) This approach, however, has some drawbacks, such as the difficulty of measuring natural behaviors and their complicated relation with animal welfare (Špinka, 2006). It can also be philosophically difficult to define "natural behavior" because, by definition, an animal that lives on a farm and interacts daily with humans no longer lives a "natural" life (Segerdahl, 2007). Lastly, a long history of research shows that domestication has potentially modified the genetic makeup of farm animals, probably altering the behaviors that might be classified as natural (Jensen, 2014; Price, 1984).

Whatever definition or combination of definitions are used, there is clear evidence that animal welfare can be objectively and empirically measured. One example is the altered cortisone levels in cows during transport, signaling fear, which can be measured and used as a proxy for animal welfare (Grandin, 1997). This scientific, empirical approach to animal welfare is often used as justification for legislation. For example, the European Union's (EU's) extensive animal welfare standards, which include technical standards such as minimum space required in square meters and light intensity in lux, reference scientific reports (Veissier, Butterworth, Bock, & Roe, 2008).

The idea of a latent and powerful consumer demand for animal welfare is very relevant to this study. If that demand becomes evident, it could have serious effects on the animal food industry. In fact, previous research seems to indicate evidence of a general change in consumption of animal products, viewing it as non-sustainable.

Independent of specific definitions and measurements, ignoring or not properly addressing animal welfare in general presents a number of potential risks to the animal product industry. These risks include, but are not limited to, the growing moralization of meat eating, public awareness of current practices, and potentially costly legal requirements. Similarly, the failure to think strategically about FAW can cost a company a range of good opportunities, such as increased revenue from specialized niche products, overall positive brand image and reputation, and the potential to get in front of a sea change in the industry.

The first issue is the moralization of meat eating. According to Rozin (1999, p. 218), "Moralization is the process through which preferences are converted into values, both in individual lives and at the level of culture." Many philosophers and ethicists argue that animal rights are a fundamentally moral issue. For some of them, it is non-negotiable, as animals should never be considered meat, while others are more lenient. A small handful of these philosophers (Peter Singer, Tom Regan, etc.) have become famous animal rights activists, touring the world, giving lectures, and writing books. Regan (1983) espouses the view that animals have certain inalienable rights.

People in general are said to have the ability to, on the one hand, care about animals and, on the other, eat meat. This tendency toward cognitive dissonance leads people to avoid thinking about meat as coming from a formerly living animal (Bastian, Loughnan, Haslam, & Radke, 2012).

Beyond the question of moralizing meat consumption, consumers may begin to view the current industrial farm practices as unsustainable and demand change. If a system is no longer perceived as sustainable, it may lose its social license to operate, which can be defined as the approval or acceptance of a company's activities by the people (stakeholders) affected (Wilburn & Wilburn, 2011).

The public perception of sustainability of the current animal welfare practices is highly complex. As already shown, we often find a lack of consensus on what qualifies as animal welfare and a high level of disconnect between people's opinions and intentions and their actions. Beyond this, people are widely ignorant about the current and potential production systems, making it difficult for customers to analyze the potential changes in animal welfare across systems (Norwood & Lusk, 2011; Souza, Casotti, & Lemme, 2013; Tawse, 2010. However, despite peoples' claims, these preferences or actions oftentimes do not translate into measurable purchasing habits. People have a tendency to proclaim support for high standards of animal welfare while, at the same time, buying animal products with little regard for the system of production employed (Schröder & McEachern, 2004).

One study estimates the potential market size for differentiated animal welfare products as 36.1% of the consumer market (Vanhonacker, Verbeke, Van Poucke, Buijs, & Tuyttens, 2009), while another estimates it at around 50% (Jonge & van Trijp, 2014). Most of these customers face an unmet demand for "compromise products" with animal welfare levels somewhere between those of industrially produced (very low) and organically produced (very high) products (Jonge & van Trijp, 2014). Another potential risk for the food products industry is the risk of prohibitive legislation. Currently, the EU is considered the leader in FAW legislation with relevant and adequately stringent legislation covering the four main farm animal species (cattle, pigs, laying hens, and broilers) and the various phases of production (housing, transport, and slaughter) (Schmid & Kilchsperger, 2010).

Legislation can lead to higher costs. It primarily affects capital costs, because very often it dictates the use of new production systems entailing high capital expense (Menghi et al., 2011). These costs can be significant. For example, Grethe (2007) estimates such costs to represent as much as 20% increase in current production costs.

METHODOLOGY

The current study examines the risks and opportunities that companies face due to FAW programs and policies, specifically in relation to cattle, pigs, and chicken. These risks and opportunities come from the difference between the companies' and their stakeholders' publicly available information on FAW. A FAW program or policy not in alignment with the demands of stakeholders is believed to place the company at risk, be it from a damaged reputation, loss of consumers or investors, or other negative outcomes. Likewise, a company with well-aligned FAW programs and policies can enjoy certain unique opportunities. Some of these opportunities include high-margin niche products, increased brand value, a leadership role in the industry, and the potential to move ahead of future legislation. Since the focus of the study is on the outside perception of the company, it considers only publicly available and easily accessible information.

The first step in this study is to collect and analyze public information on companies' FAW policies and programs. The second step is to collect and analyze the public information on stakeholders' positions on FAW. The companies' aggregate information is then compared with the stakeholders' aggregate information. In case of a significant difference between the aggregate information presented by companies and the stakeholders on a certain subject or issue, this difference is identified as a potential source of risk or opportunity—a risk for the companies that ignore the difference, and an opportunity for the companies that are aligned with the stakeholders. For example, if most stakeholders publish information on cage-free eggs, but most companies do not do so, the issue of cage-free eggs could be a risk or opportunity for the companies—a risk for the companies that ignore the issue, but an opportunity of competitive advantage for the companies that address the issue.

Our goal is to study the global companies involved in the commercialization of animal-derived food products. The population is limited to large, global companies, because companies above a certain size and those with global operations (in at least two countries) are assumed to have more influence on and be more influenced by public discussions surrounding FAW.

A well-known ranking called the Business Benchmark on Farm Animal Welfare (BBFAW) is then evaluated. This is a ranking of 80 global companies involved in the animal-derived food products industry, at all levels of the value chain, on their FAW policies and practices. The companies are categorized into six different levels based on the quality of their FAW programs and policies, where Tier 1 is the highest level and Tier 6 is the lowest level. We believe that this ranking serves as the best possible basis for our sample, for a couple of reasons. First, it includes a good international mix of companies, both private and public, from all along the value chain. Second, it analyzes the companies' FAW policies and programs by itself. Therefore, we decided to examine 80 global companies of the BBFAW. This would allow for a direct comparison between the results of the current study and the BBFAW.

The second important group to be studied is the animal-derived food products industry's stakeholders. Since the goal of the study is to map the FAW-related risks and opportunities facing companies in the industry, we need to know the external

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demands that are placed on the industry. Thus, FAW NGOs have become the focus of the study. FAW NGOs are a critically important stakeholder of the animal-derived products industry because they exert constant pressure on the companies to change their policies. They have made an impressive number of advances through advocacy, including government bans and legislation, consumer boycotts, and voluntary corporate action (Wilkins, Houseman, Allan, Appleby, & Peeling, 2005). This led to the use of Google as the sampling mechanism, to end up with a list of 13 NGOs.

The next step was to determine the data to be used and how to collect such data. For a company, the first source of data is its sustainability and annual reports. Since this research was held during the second half of 2015 and first half of 2016, we mainly use the sustainability reports of either 2013–2014 or 2014–2015, with the annual reports and websites used only in case of missing data. The search for additional information was originally conducted in July 2015, and this was updated in January 2016. The focus was specifically on finding policies, positions, and statements.

The main source of data on NGOs is their websites. Once again, the idea of the study is to use only the most easily accessible and readily available information, so as to serve as proxy for what an average stakeholder would encounter when browsing sites. Also, the NGOs themselves are assumed to use the information that they considered most relevant and most easily and readily accessible. The search for data on NGOs was conducted in July 2015.

As mentioned earlier, the main goal of this study is to analyze the risks and opportunities facing companies as regards their FAW programs and policies. Thus, we need to find out what companies and NGOs think about FAW by mapping and comparing their agendas using the data collected in the previous section. This comparison can help us to identify their risks and opportunities.

The first step in comparing the agendas was to create a list of relevant topics within FAW. This list would then be crosschecked with the data sources of the 80 companies and 13 NGOs comprising the samples for each group. The more frequently a topic appeared in the data, the more it was judged as important to that group. The final goal of this process was to see which topics were important to companies and which were important to NGOs, and compare and contrast the two groups. The final version of the list can be seen in Exhibit 1 (the topics are listed in alphabetical order).

Exhibit 1. **List of relevant subjects in FAW for a comparison between company and NGO agendas in terms of relevance of each subject**

Item	Subject
1	Antibiotics/Hormones
2	Breeding
3	Cage-Free Eggs
4	Chronic Conditions/ Disease
5	Compliance/ Monitoring
6	Cull Cow / Male Chick/ Slaughter
7	Diet
8	Free Range/Pasture/Space
9	Gestation Crates
10	Mutilations
11	Natural Light
12	Slaughter
13	Training
14	Transport

The result of this analysis was a spreadsheet that allowed for a per-company and per-NGO analysis of the topics in Exhibit 1 that were discussed. From this spreadsheet, we could obtain aggregate information, such as the ranking of topics from the most to the least present. The focus was on the aggregate information related to the list of topics used to identify the potential risks and opportunities related to FAW.

The first analysis of the data consisted of creating a number of tables showing the descriptive statistics of the companies' and NGO's results. Two inferential statistical tests were then performed on this aggregate information. The first test was Fisher's exact test, a test widely used on contingency tables, especially the 2 x 2 contingency tables.

The following were the null and alternative hypotheses considered:

> Ho: The probability of a FAW subject to be present or not present was equal for the NGOs and companies;
>
> H1: The probability of a FAW subject to be present or not was different for NGOs and companies.

The test was performed using a 2 x 2 contingency table simulator from Graphpad.com, with a significance level $\alpha = 0.05$.

The second test performed was Kendall's rank-order correlation coefficient, also known as Kendall's tau. The purpose of the test is to measure the level of correlation between two ordinal variables. It is a non-parametric alternative to the parametric Pearson correlation test and an alternative to the Spearman rank-order correlation coefficient. In general, Kendall's tau functions better on smaller samples that have ties in rankings.

In this case, we used a specific version of Kendall's tau, called Kendall's tau-b. This version of Kendall's tau functions best when there are ties in rankings of the two variables. Kendall's tau-b requires that the data be ordinal or continuous. In this case, the data analyzed was ordinal.

For this study, Kendall's tau compared the results from the companies' sources of information and NGO website analysis. The test used the following null and alternative hypotheses:

> Ho: There is no subject coverage agreement between FAW company sources of information and FAW NGO websites.
>
> H1: There is subject coverage agreement between FAW company sources of information and FAW NGO websites.

The tests were performed using SPSS 21, with a significance level of $\alpha = 0.05$.

RESULTS

We analyzed information obtained from 80 companies and 13 NGOs. We could find some information on corporate FAW programs and policies for 58 (73%) companies, while 11 (85%) NGOs addressed FAW on their websites.

We found sustainability or annual reports for 67 companies, while 25 (37%) made no mention of FAW. Only 42 companies (53%) of the total sample addressed FAW subjects in their reports, meaning that more than one-third of the companies that did release a sustainability or annual report over this period did not mention FAW even once. This indicates that a large part of the industry does not acknowledge FAW and its importance to their business model and is unaware of the issue.

Of the 80 companies, 46 (58%) showed material relating to FAW on their websites. This means that no information relating to FAW was located on the websites of 34 companies. This appears to confirm that a large part of the industry simply does not publicly discuss or acknowledge FAW.

While 73% of the companies in the sample objectively address or acknowledge FAW in some form, the information could be of poor quality or lacking in quantity. The researcher's qualitative perception of the annual and sustainability reports and the websites is that a significant percentage of these companies presented partial, superficial, overly generic, or otherwise non-ideal information on their FAW policies and practices.

Compliance/Monitoring was the most frequently found subject in the companies' website analysis, and, unlike with the annual and sustainability reports, this was seen in more than 50% of the companies' websites. However, the next most commonly found subject, Antibiotics/Hormones, was seen approximately 33% fewer times.

The next step was to examine the information obtained from the analyses of NGO websites. A few points become clear from Table 1. First, no topic was found in 100% of the FAW NGO websites, where Free Range/Pasture/Space were the most frequently located topics, found in 85% of the NGO websites. Second, there is a wide gamut of frequency in topics, with the topic least found appearing in 15% of the NGO websites.

Table 1. **Ranking of FAW subjects based on information obtained from the analysis of NGO websites**

Item	Subject	Number of NGOs	Percentage of total NGOs
1	Antibiotics/Hormones	11	85%
2	Breeding	10	77%
3	Cage-Free Eggs	10	77%
4	Chronic Conditions/ Disease	9	69%
5	Compliance/Monitoring	8	62%
6	Cull Cow/Male Chick/ Slaughter	8	62%
7	Diet	7	54%
8	Free Range/Pasture/Space	6	46%
9	Gestation Crates	6	46%
10	Mutilations	3	23%
11	Natural Light	3	23%
12	Slaughter	3	23%
13	Training	3	23%
14	Transport	2	15%

By combining the results of the companies' sources of information and the NGO analyses, we could explore the differences and similarities between the two. A raw comparison of frequencies shows a large difference in frequencies where

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FAW subjects appear. This difference is both in terms of percentages themselves and in the order of subjects (most frequent to least frequent).

The Fisher's test results are summarized in Table 2. The results are statistically significant for Antibiotics/Hormones, Breeding, Cage-Free Eggs, Chronic Conditions/Disease, Free Range/Pasture/Space, Gestation Crates, Mutilations, Slaughter, and Transport. Thus, we have sufficient evidence to reject the null hypothesis that the probability of these subjects occurring or not occurring is equal for NGOs and companies. In other words, there is a difference between NGOs and companies as regards the subjects analyzed.

Table 2. **Fisher's test results for comparing the differences and similarities between company sources of information and NGO websites in terms of relevance of FAW subjects analyzed**

Subject	NGOs that mention the subject	NGOs that do not mention the subject	Companies that mention the subject	Companies that do not mention the subject	p-Value from (Fisher's test)
Antibiotics/Hormones	7	6	6	36	0.0070*
Breeding	8	5	3	39	0.0001*
Cage-Free Eggs	10	3	9	33	0.0005*
Chronic Conditions/Disease	6	7	2	40	0.0013*
Compliance/Monitoring	3	10	18	24	0.3279
Cull Cow/Male Chick/Slaughter	2	11	3	39	0.5817
Diet	3	10	6	36	0.4277
Free Range/Pasture/Space	11	2	7	35	0.0014*
Gestation Crates	9	4	8	34	0.0014*
Mutilations	8	5	6	36	0.0017*
Natural Light	3	10	2	40	0.0798
Slaughter	10	3	9	33	0.0005*
Training	3	10	6	36	0.4277
Transport	6	7	6	36	0.0242*

*Indicates significance at the 5% level.

As expected, the data show that NGOs give more importance to these issues than companies do. The exception to this is Compliance/Monitoring; while 44% of companies focused on the issue, only 23% of NGOs did so.

For the remaining issues, Compliance/Monitoring, Cull Cow/Male Chick Slaughter, Diet, Natural Light, and Training, the association between the rows and the columns is not statistically significant. Therefore, we fail to reject the null hypothesis of no difference between NGOs and companies as regards the subjects analyzed.

Therefore, both the comparison of percentages and comparison of rankings appear to contain potentially pertinent information. Table 3 shows the relative ranking of each FAW subject for the NGOs' websites and the companies' annual and sustainability reports.

A Kendall's tau test performed on the two rankings yielded a correlation coefficient of 0.319. The p-value of the correlation coefficient was 0.112, implying no sufficient evidence to reject the null hypothesis. In other words, the sample results indicate that the two rankings are statistically different. The results can be interpreted as that NGOs and companies appear to hold different views on the FAW subjects that are most relevant and deserving to be addressed. This lack of consensus between companies and a key stakeholder creates both risks and opportunities.

In this study, we consider risks and opportunities as reciprocal, meaning that any circumstance that generates risks can also generate opportunities, and vice-versa. To help organize the discussion, groups of risks and opportunities are referred to as risk factors. These risk factors are then analyzed for potential consequences.

Table 3. **Rankings of FAW subjects by NGOs and companies based on NGO websites and company annual and sustainability reports**

Subject	Ranking by NGOs	Ranking by companies (reports)
Antibiotics/Hormones	7	8
Breeding	5	11
Cage-Free Eggs	2	3
Chronic Conditions/Disease	8	13
Compliance/Monitoring	11	1
Cull Cow/Male Chick/Slaughter	14	12
Diet	10	10
Free Range/Pasture/Space	1	5
Gestation Crates	4	4
Mutilations	6	9
Natural Light	12	14
Slaughter	3	2
Training	13	7
Transport	9	6

The most immediate industry-wide risk factor is the widespread lack of attention paid to FAW. From the results of this study, the animal-derived food products industry simply does not address FAW as a serious and material issue. If FAW really is a material issue for the animal-derived food product industry's stakeholders, this lack of attention could be a serious risk, with many potential consequences.

One potential consequence is that the entire industry could suffer damage to its reputation, leaving little room for companies to differentiate themselves, thus creating an industry-wide association with the issue. This could further lead to an industry-wide dip in reputation and brand value, as well as more tangible costs, such as increased stock volatility and higher risk premiums on debt. Another risk is that it could lead stakeholders to act without input from the industry. If stakeholders feel that the industry is ignoring a material issue, they may attempt to directly address the issue without consulting the industry first. This could come in the form of new laws, high-profile protests by NGOs, migration by consumers to alternatives, etc.

The opportunity presented by this risk factor is the chance to overcome a material issue. The animal-derived food products industry as a whole could better recognize FAW as a material issue. In addition to the individual players in the industry better addressing FAW, this could also come in the form of increased participation in industry-wide organizations, groups, and forums; industry-wide declarations; and better cooperation in the industry. The benefits of this approach could be a potentially higher industry-wide reputation (or at least the avoidance of an industry wide slip in reputation), a larger role in collaborating with stakeholders to address the issue, and lower costs due to shared standards, technologies, and implementation.

A second industry-wide risk factor is the possibility of misplaced focus on the subject of Compliance/Monitoring. In the analyses of the companies' annual and sustainability reports as well as websites, Compliance/Monitoring is the most cited topic. In comparison, the NGO analysis found Compliance/Monitoring to be the 11th most-cited topic. This indicates that NGOs appear to place a higher value on other more direct FAW issues (i.e., issues directly related to a certain aspect of the welfare of an animal), whereas the animal-derived food products industry is more concerned with proving that it is monitoring itself and compliant with the law. A large number of the companies' reports deal exclusively with Compliance/Monitoring or may at the most touch one or two other issues.

The possible effects of this risk factor are similar to the first one. This misplaced focus could lead to the perception that the animal-derived food products industry is at best out of touch with its stakeholders or at worst attempting to deliberately mislead stakeholders. Once again, this could lead to an industry-wide drop in reputation and brand value and also raise the potential threat of stakeholders acting without consulting the industry.

Opportunities are also similar to the other industry-wide risk factor, although more specific. Assuming that the industry's concern with regard to Compliance/Monitoring is genuine, there is a real opportunity to take the lead in creating industry-wide standards. This allows for the industry to play a more active role in framing the issues to other stakeholders. Currently, a large number of companies have their own internal Compliance/Monitoring schemes. The industry could cut costs by pooling the companies' resources and working with stakeholders such as NGOs and the government. This would allow the industry to create an industry-wide Compliance/Monitoring scheme and to piggyback on the reputation of their external stakeholders. This in turn would allow individual companies in the industry to spend less money, time, and space on their reports and Compliance/Monitoring sites and more on 10 other issues that the NGO analysis found to be more relevant.

The last industry-wide risk factor identified is the list of FAW topics found to be statistically significantly different in total frequency between the companies' annual and sustainability report analyses and the NGO analyses. While all these topics represent a risk, the ones that are also very differently ranked

in relative frequency by the two separate analyses appear to be the biggest risks.

For example, Cage-Free Eggs and Gestation Crates are topics that showed statistically significant differences in frequency between the companies' report analysis and the NGO website analysis. However, the ranking of the topics relative to the 13 other FAWs places them nearly identically for both companies and NGOs, with both topics as the top four most mentioned for both companies and NGOs. In other words, companies appear to have correctly prioritized these FAW topics in relation to other FAW topics; however, still too few companies in aggregate mention them.

Overall, these FAW topics create the highest industry-wide risk factors of all the FAW topics. They are the topics with the largest disconnect between what NGOs present in their websites and what companies present in their annual and sustainability reports. Therefore, these are the topics most likely to damage the industry's overall reputation and create disconnect between the companies and stakeholders.

Another opportunity in the industry is to create niche FAW products. This opportunity coincides with the risks from the widely ignored topics, such as Breeding and Chronic Diseases/Conditions. Niche products focusing on specific FAW topics show that the company is aware of the topic and would allow for testing the consumers' willingness to pay (WTP) for higher FAW products. These niche products, beyond generating a higher margin and reaching new customers, can also elevate the company's brand and reputation. In the future, these niche products could evolve into mainstream or even market leading products, giving the company a first-mover advantage and a potentially lasting competitive advantage within the industry. Many examples of niche products focusing on one specific FAW issue could be found in the companies' reports. The most common ones focused on Cage-Free Eggs, Gestation Crates, or Free Range/Pasture/Space differentiated products. However, some examples of products that focus on generally ignored topics were also found. A good example is the slow-breed chicken marketed by a company in the Retail and Wholesalers sector.

CONCLUSION

This study has provided some evidence that the animal-derived food industry is not addressing FAW as a key material issue. In addition, when the industry does address FAW, the issues do not appear to be the same or have the same relevance as those addressed by one of their key stakeholders, FAW NGOs. Our results suggest that companies need to do more to address this misalignment with key NGOs.

This creates potential risks for the industry that could damage the companies' reputations and brands, spur action by other stakeholders, and ultimately lead to the migration of customers to alternatives to animal-derived food products. However, the silver lining is that these risks also represent opportunities for companies in the industry. Companies can seize these opportunities and differentiate themselves from their peers in terms of FAW. This differentiation could come in many forms: development of new, innovative product lines that focus on certain FAW issues, early adaptation of new FAW technologies and processes, and increased cooperation within the industry and between the industry and key stakeholders.

Companies that achieve this differentiation stand to gain in reputation and brand value, and may reap more tangible benefits of increased revenue from discerning consumers and new market opportunities, as well as lower costs from potentially more efficient operations. Moreover, the largest benefit may be the ability to build up a reservoir of brand and goodwill to shield them from any potential industry-level fallout over changing stakeholder perceptions on FAW.

While the industry itself is a key target audience of this study, other groups can also benefit from the results and lessons of this study. FAW NGOs could adopt positions more favorable to cooperation and transparency, making it clear what they are looking for from companies along the value chain and establishing priorities within FAW. Government agencies, such as the United States Department of Agriculture (USDA) in the United States and *Ministério da Agricultura, Pecuária e Abastecimento* (MAPA) in Brazil, could work together to create universal standards and expectations, dialoging with stakeholders and the industry to ensure a desirable minimum standard. Investors and funds with a focus on sustainability issues, such as the FTSE4Good and Dow Jones Sustainability Index, could begin to systematically integrate measurements of FAW, such as its potential effect on reputation and brand, into their indexes. Lastly, academics in various fields such as economics, finance, and sociology could better interact and dialogue with biologists, animal welfare scientists, and agricultural scientists to further holistic and interdisciplinary study on the many aspects of FAW.

It is also hoped that this study serves as a wakeup call to companies in the animal-derived food products industry. They should take heed from examples of other industries, such as the textile and tobacco industries, which have historically ignored material issues only to be caught unprepared when a critical mass of stakeholders began to demand change. Brazilian exporters of animal-derived food products, who generally operate large-scale slaughterhouses and export unprocessed or slightly processed

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products, have to be especially aware of the risks involved in FAW, as they respond to a large number of external stakeholders from other countries and cultures (the EU, developed world consumers, and international FAW NGOs), giving them potentially limited control over the discussions surrounding FAW.

A potential path for future studies could be analyzing other stakeholders' (consumers, governments, etc.) roles, performing case studies with individual companies, or attempting the valuation of FAW as an intangible asset.

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