

DOES THE FOOD SAFETY INFLUENCE THE TRANSACTION COST? AN EXPLORATORY STUDY IN THE EGG CHAIN

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INTRODUCTION

Food safety is a concern that worries people that care about what they are eating. So several cases of contaminated food ingestion (with biological, chemical and physical sources) led to the establishment of quality standards for the most diverse foods (Astill, Minor & Thornsbury, 2019, Buchanan, 1990, Fung, Wang & Menon, 2018, Hobbs, 2010, Unnevehr, 2015, U. S. FDA, 1997). Such standards are stipulated by different public and private agencies, that implies the absence of a general rule. Using these standards the organizations limits the use of preservatives, pesticides, and other additives for the production, hygiene and preservation of food (Hobbs, 2010). But since organizations could have national and international sales, the absence of a global quality standard generates divergences that require investments to adjust the transaction (Ménard, Nunes & Silva, 2014), generating transaction problems linked to food safety.

The Transaction Cost Economics (TCE) is a theory that contribute in the transaction management in two different and complementary approaches, being Oliver Williamson's governance structure and Yoram Barzel's measurement cost theory (Cunha, Saes & Mainvile, 2015; Ménard, Nunes & Silva, 2014). For Williamson (1991, 1998), the transaction structure is the determining factor of these costs, that are minimized using the market, the hierarchy or a hybrid form. The structure adopted is determined according to *ex ante* and *ex post* transaction costs, the latter correlated to monitoring costs. In turn, the measurement cost theory is based on the cost of measuring the attributes of the transaction products, that present a positive correlation with the difficulty to do this (Barzel, 1982; Cunha, Saes & Mainvile, 2015).

Previous research was conducted using TCE in the some food chain, but the egg one still underexploited. Besides few studies were developed to seek the link between food safety and transaction costs generated to assure this.

The eggs was chosen because they have great importance in the world's diet, being the fifth most consumed protein source; have a high cost-benefit ratio; and is a food rich in vitamins, proteins, fats and minerals at a low price, that makes an good ally in combat the hunger (Amaral *et al.*, 2016; Onono *et al.*, 2018). Additionally, egg safety have a huge importance, since this food could be a source of *Salmonella*'s contamination, a pathogen found mainly in eggs (Fung, Wang & Menon, 2018; Moffatt *et al.*, 2016).

In this context, it is relevant seek to answer the problem: How do food safety affect transaction costs generated in the relationship between the retailer and the farmer?

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THEORETICAL APPROACH

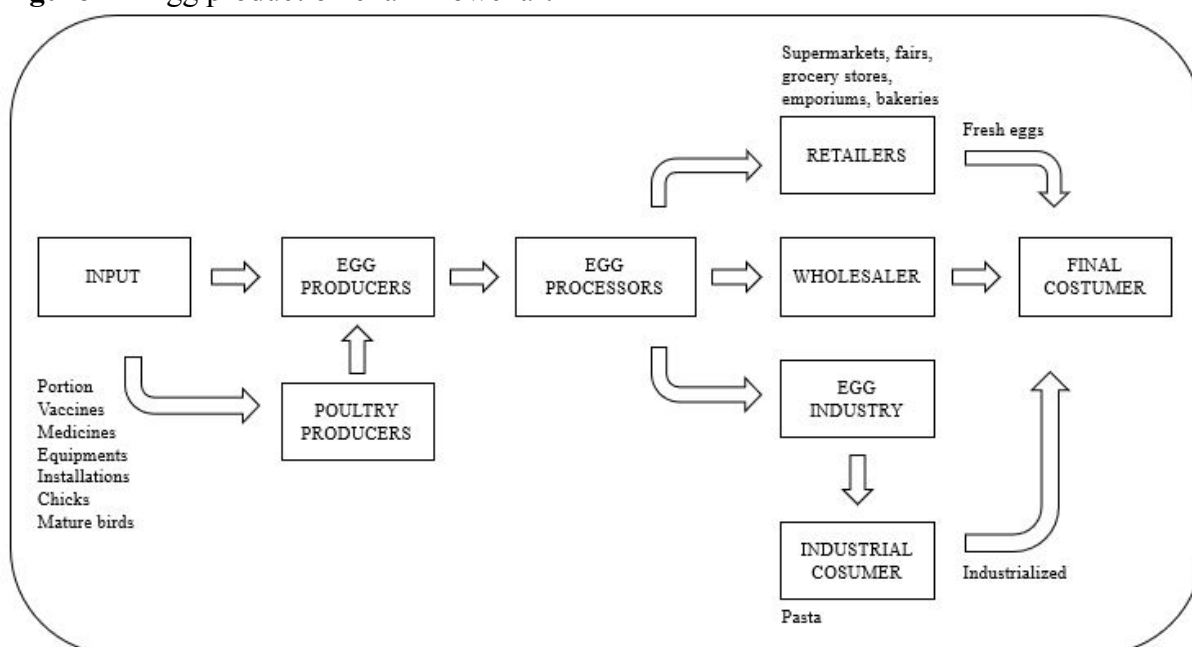
Food safety as quality aspect in egg chain

Food safety is a social and public safety issue. Allied to food security (having quality food for everyone), it refers to the quality of products and their nutritional properties, that are risk-free of contracting any illness after consumption (FAO, 2010, Grunert, 2005, Henson, 2008). So, in order to management a problem we must first identify him, since are different ways and different sources that could generate insecurity. Basically, it is due to pathogens (microbes, parasites, bacteria); chemicals (adulterants, dyes, pesticides, heavy metals); and physical (foreign bodies) (Buchanan, 1990; Hobbs, 2010, Unnevehr, 2015, U.S. FDA, 2017).

Furthermore, once contaminated food is ingested, it can make the consumer sick or even kill him. Thus, safety standards are established in a preventive way (Astill, Minor & Thornsbury, 2019) and could be established by public (mandatory) or private bodies, in that the economic function is adhered to in the context of security, emphasizing functions such as product differentiation, emphasis on supply chain management and protection of the company's reputation (Hobbs, 2010).

To understand egg safety standards, it is necessary to see how the food chain is and how safety is integrated in each of its stages. As shown in Figure 1, the egg chain is basically composed of the supply of inputs, production, processing and distribution to the final consumer.

Figure 1 – Egg production chain flowchart



Source: Adapted from Mizumoto (2004) and Onono et al. (2018).

Production inputs must be evaluated as they help to determine the production capacity and quality of the final product. For Onono et al. (2018), the importance of the suppliers of chicks and mature birds is to determine the type of egg produced. To do this, genetics is the

main reference, determining the laying capacity of the birds, shell color and egg size, as well as the bird's predisposition to certain diseases linked to bird breeds (Amaral *et al.*, 2016). Genetics also influence the productive period of the bird, which can vary between 1.5 and 2.3 years, and hybrid birds can produce up to 330 eggs in up to 80 weeks of age (Mizumoto, 2004; Amaral *et al.*, 2016).

According to FAO (2003), the type of handling and feeding are the main determinants of the productive capacity of hen eggs. As highlighted by Amaral *et al.* (2016), the feed is mainly composed of corn and soybeans and can be supplemented as needed for poultry supplies. Additionally, food can vary according to the adopted production system, that can be intensive or extensive/alternative (Amaral *et al.*, 2016). The intensive are the most used system, due to greater efficiency in terms of cost-effectiveness, with low costs, high productivity, and easy handling, according to Humane Farm Animal Care (HFAC, 2018). However, it is a highly criticized system, due to the compromised welfare of birds.

Regardless of the production standard adopted, guideline 74/1999 and HFAC provide that, obligatorily: a) birds must be inspected daily; b) the noise level must be minimal; c) there must be sufficient light for a good view of the animals; d) as well as periods of darkness to allow birds to rest (Official Journal of European Communities, 199; Humane Farm Animal Care, 2018).

To work in accordance with the needs of the birds, the farm must be equipped with the necessary machinery for production, such as feeders and drinkers, and other technologies to assist in egg collection and packaging for the safety and conservation of products (Amaral *et al.*, 2016). Laying birds must be well treated, applying due care to their health and well-being, as birds contaminated with any type of pathogens can affect the quality of eggs. An example is the spread of the avian influenza virus, which can contaminate the bird's body, muscles, blood, oviduct, and also transmit to eggs (European Food Safety Authority *et al.*, 2018, Onono *et al.*, 2018). In the case of *Salmonella*, the care of the birds is essential, since the contamination can be due to the handling of the birds, given even before laying, and it is also linked to hygiene and storage factors after laying (Brazil, 2009).

To reduce contamination and raise quality standards to international levels, the National Health Surveillance Agency (ANVISA) prepared some resolution, such as: a) the Resolution of the Collegiate Board - RDC No. 7, of January 2, 2001 to approve the use of Lactic Acid (INS 270) as a supporting technology, acting as an agent for controlling microorganisms in egg washing, providing optimization for the reduction of pathogens in the product's shells (Brazil, 2001); and b) there is also RDC, n° 35, of June 17, 2009, which implies mandatory conservation and consumption instructions on egg labeling and other measures. In this resolution, it is recommended that eggs are stored chilled and not consumed raw, avoiding any type of contamination (Brazil, 2009).

It is essential to have a good relationship with the production agents to achieve the goals and optimize food safety throughout the production chain (Grunert, 2005; Khalid, 2016; Unnevehr, 2015), because the cooperation between agents allows a better flow of information, establishes a relationship of trust between seller and buyer and allows for more effective quality monitoring, that implies a reduction in transaction and monitoring costs (Hobbs, 2010). However, the establishment of control measures incurs new costs to be split along the chain (Unnevehr, 2015).

So the need for food quality safety demands that integrations are carried out, certifications are employed and other monitoring methods are adopted, that implies an increase in transaction costs (Unnevehr, 2015), the subject of the next topic.

Transaction Costs in egg chain

Transaction Cost Economics (TCE) is a strand of the New Institutional Economy that is concerned with the governance systems developed to support the management of economic exchanges and their alternative modes of organization. In this sense, the institutional environment and the way relationships are formed is one of the main factors that make up TCE analyses (Williamson, 2005; Scott, 2013).

Transaction Cost Economics has two complementary theoretical strands: governance structure and the measurement cost. Williamson developed the theory of transaction costs based on the idea of Ronald Coase, who criticizes the economic system of price mechanisms (law of supply and demand) and states that each transaction results from negotiations, agreements, inspections, among other formalities of the commercial relationship, that incur costs is the transaction cost (Coase, 1937, 2005).

Williamson argues that the ideal is for the relationship between economic agents to be determined within the firm's boundaries and thus maintain control, so that transaction costs are not excessive (Williamson, 1975). According to Williamson (1991; 1998) the asset specificity of the transaction determine the transaction cost on the governance structure, that could be market (price systems); hierarchical form; and hybrid forms, that create bilateral dependence between agents and determine the integrity of the transaction (Cunha, Saes & Mainville, 2013, Williamson, 1991, 1998).

Additionally, the determined governance structure are the one with the lowest transaction cost, taking into account three essential factors: i) the asset specificity; ii) uncertainty; and iii) the frequency. These factors are determined as the tripod of TCE, that contribute to determine the governance structure adopted (*ex ante* factors), as well as for the monitoring cost of transactions (*ex post* factors) (Williamson, 1991; Lietke, Boslau & 2007).

Williamson (1991) defines asset specificity as the company's ability to sell the product by allocating it to alternative uses and customers without compromising its productive value. This author refers to uncertainty as external and uncontrollable disturbances in the transaction, and these factors must be analyzed according to the form of governance adopted (unilateral adaptations in the form of the market, decree in the form of hierarchy and consensual in the hybrid form). Sugano (1999) states that frequency refers to the recurrence of transactions, that is, how many times they occur.

Williamson (1979) and Ménard, Nunes and Silva (2014) argue that the choice of governance structure is mainly given due to the asset specificity of the transaction. So we must consider how the commercial relationship between the economic agents involved will be established, including *ex ante* costs incurred in the preparation, search and elaboration of a contract. If there are changes in the attributes of the transaction, the initial planning must be changed to keep up to date, resulting in costs, called “ex post costs of monitoring, adjustment and adaptation” (Cunha, Saes & Mainville, 2015, p. 69).

So the higher the asset specificity and the greater the transaction risk, so the hierarchical structure is the more adequate (Ménard, Nunes & Silva, 2014; Cunha, Saes & Mainville, 2015). Assets specificity are not easily exchanged, so increases transaction risk and agent dependence to a particular buyer, leveraging opportunistic behavior and transaction costs (Dal Belo Leite *et al.* 2014, Ménard, Nunes & Silva, 2014). The asset specificity also increases the monitoring costs, that can exceed internal management costs (Ménard, Nunes & Silva, 2014).

Other aspect of TCE addresses the measurement cost theory, coined by Barzel (1982) and supported by Williamson (1991) as being complementary to the governance structure theory. The basic assumption is that each product has specific attributes and values and, therefore, it is necessary to know them in their particularities, so that, thus, there is interest in exchange for property rights (Cunha, Saes & Mainville, 2013). Therefore, measurement costs arise in this context generated to “transfer, capture and protect the property rights of products” (Cunha, Saes & Mainville, 2015, p. 70).

According to Cunha, Saes and Mainville (2015), measurement costs are higher when product attributes are more difficult to be determined and, for this reason, such products tend to remain within the firm's boundaries. Barzel (1982) states that it is not necessary to effectively measure product attributes to determine an effective governance structure, to do this we must be able to identify whether this measurement is complex or simple.

Covering the variations of the TCE tripod, some authors addressed particular aspects about them within the egg production chain. Sugano (1999) identified a high local and human asset specificity in the agro-industrial system of Bastos/SP. Mizumoto (2004, p. 31) find high uncertainty in the transaction between egg processor and distribution channels, given the perishability of the product, that “[...] implies the challenge of adjusting to preferences of the consumer and to variations in the quantity and quality of the offer” .

This author also indicates another form of uncertainty since, for most part, the producer and retailer transaction contracts are designed with the aim of providing the supplier with greater security in sales and is a useful tool for registration purposes and exclusive supply. Also for the author, price and quantity are closed weekly between the retailer and registered suppliers in the auction system. For Kirsten and Sartorius (2002) the contractual arrangements ensure a safe and higher quality product, especially when it comes to fresh products, such as eggs. Thus, there is a close relationship between the elaboration of contracts and food safety.

Finally, Mizumoto (2004) identified high frequency in the transactions, however, without specifying details about this. The literature regarding the frequency of transactions in agro-industrial systems, especially eggs, is scarce.

The literature review shows that transactions throughout the production system are different for each link in the chain(Sugano, 1999, Mizumoto, 2004, Ortmann e King, 2010). A specificity identified in the egg production system is that the relationship between producer and feed supplier must be close in order not to compromise food quality and safety (Mizumoto, 2004). For the author addresses the integration between some links in the production chain, since sometimes egg producers incorporate the production of feed on the

farms, to ensure greater nutritional quality for the birds, that directly interferes in the productive capacity of eggs and their quality.

In the transaction between farm and distribution, this author also draws attention to opportunism on the part of farms, that can often market a product with a unique pattern, such as enriched, organic or free-range eggs, without in fact any changes in the system productive. The lack of certification allows this opportunism to occur, due to the lack of information along the production chain.

However, opportunism is also seen at the other end of the transaction with regard to agrifood chains. Ortmann and King (2010) point out that this is a great characteristic of chains in the sector, given the predominance of distribution channels over producers, who rarely have the resources to integrate their activities and depend on these giant retailers to market their products.

On the institutional arrangements in the egg production chain, Mizumoto (2004) discusses that commercialization is derived from the hybrid structure, varying according to the selected distribution channel.

Unnevehr (2015) said that the standards adopted by the private sector led to changes in the forms of governance. For own private standards, Hobbs (2010) discusses that their incorporation exerts great influence on transactions and on the supply chain. This happens since the suppliers need to make costly investments to suit the needs of the transaction, but with no guarantees of the commercial relationship, that causes an opportunistic behavior called hold-up (Henson, 2008; Hobbs, 2010). Thus, as could be seen in several other production chain, in the egg one, the greater the its complexity, the greater the transaction costs to ensure its food safety, what explains why most of their commercialization are carried out through contracts (hybrid structure) and vertical integration (hierarchical structure) (Viator et al., 2016)

METHODOLOGY

To answer the problem and achieve the research objective, a single case study was developed, with a large national and international retail chain and its main egg supplier. Participants were interviewed in November/2020 about issues relating to food safety practices; to the means of marketing used by company; and the type of specific governance structure used. The interview included questions that identify, also, what is the concern of the practices of its supplier, how they are handled to monitor and arrive at their adequacy so that the commercial transaction can be consolidated.

Using ATLAS.ti® software, first the data were organized and then a content analysis were done. In a first step, the patterns were identified and coded. The assigned codes were related to food safety practices, internal standards, safety measures, organizational culture, costs, transaction costs, measurement costs, among others, all being related to the egg chain. In a second step, the standards were revised and grouped according to the themes addressed. Table 1 shows all the codes created and how they were grouped.

Table 1 – Codes and groups

Groups	Codes
Animal welfare concern	Animal welfare; Cleaning; Physical protection; Animal health
Conformity	Cleaning; MAPA; Animal health; Vaccine
Consumer	Consumer culture; Egg manipulation
Contractual relationship	Confidence; Contracts; Supply criteria; Fruits, vegetables and vegetables; Social questions
Food safety	Egg integrity; Private label; Exposure problems; Quality; Input quality; Traceability; Food safety; Vaccine; Variety
Inputs	Feed sampling; Composter; Feedstock; Input quality; Portion; Vaccine
Lack of information	Doubts
Logistics	Distance; Distributors; Egg manipulation; Deadlines; Exposure problems; Logistical problems; Supply process; Receipt quantity; logistical issues; Supply Advantages
Losses	Higher costs; Egg handling; Losses
Measurement/monitoring cost	Required attributes; Audits; Belief goods; Certifier; Conformity; Hygiene criteria; Monitoring cost; Internal monitoring cost; Costs paid by the customer; Costs paid by suppliers; Asset specificity - location; Asset specificity - brands; Asset specificity - temporal; Oversight; Frequency; Irregularity; Standards; Supply process; Traceability
Negotiation	Discounts; Preferred suppliers; Farm "x"; Information; Investments; Auction; Private label; Traffic ticket; Negotiation; Payments; Company size; Deadlines; Prices; Rural producer; Receipt quantity; Social questions; Supply advantages; varieties
Organization	Centralization; Organizational culture; Decentralization; Laboratory; Private label; Company size; Professionalism
Product quality	Loss; Quality; Input quality
Production	Pest control; Laboratory; Cleaning; Production
Safety and occupational health	EPI; Worker safety; Workers; Training; Uniform
Social concern	Social questions
Transaction attributes	Egg integrity; Private label; Egg; Standards; Varieties

Source: Authors

Finally, a table was created that relates the code to the document and shows the frequency of occurrence of the code. Thus, it was possible to identify which code was most cited by which supplier. Given this primary identification, the main results were obtained. Observing the citations in the documents, the justification for the main results was identified.

RESULTS ANALYSIS

The retail chain interviewed has a wide national and international coverage. In Brazil, the chain has different negotiation cells (Manaus, Nordeste, Centro-Oeste, Minas Gerais, Rio de Janeiro, São Paulo, Paraná and Rio Grande do Sul). Most stores adopts the same product acquisition system, that buy from local producers to enhance their region; to be social

responsible; and to provide high-quality products, especially fresh fruits and vegetables (FFV).

The researched store is the representative matrix of the region in São Paulo/SP. The purchase of products use certain standards, established by contracts, according to the retailer's needs. In order for the egg producer to become a supplier, first he is registered and then it is necessary several monitoring action such as inspections and audits, but the purchase is not certain. This happens because, as informed by interviewee 1, since August/2020 only the registered producer that can meet the demand participate in a weekly digital auction and who offer the lower price will win and will sell this. This finding is in agreement with Mizumoto (2004), that identified that the contracts in the egg chain are forms of registration for the retailer. To observe the supplier point of view of this relationship, one of the main suppliers of eggs of this retail chain was asked to participate in the survey and accepted. The interview was carried out, the data collected and analyzed.

The criterion to determine the most important topics mentioned in the interviews with the farm and the retailer was appear in at least 10 citations. After this each code has been grouped into a larger set of codes. It is important to highlight that all groups are related to each other. So, one explains the other. The main codes groups were: transaction attributes; measurement/monitoring costs; logistics; negotiation; production; product quality; contractual relationship; and food safety. Table 2 shows the frequency at which the topics were cited according to each interview in descending order.

Table 2: Frequency of citations by group and interview

	Farm interview Gr=34	Grocery interview Gr=62	Total
Measurement/monitoring cost Gr=59; GS=19	17	42	59
Negotiation Gr=34; GS=18	7	27	34
Food safety Gr=28; GS=9	6	22	28
Transaction attributes Gr=25; GS=5	3	22	25
Contractual relationship Gr=17; GS=5	3	14	17
Logistics Gr=14; GS=10	2	12	14
Production Gr=13; GS=4	12	1	13
Product quality Gr=12; GS=3	4	8	12
Total	54	148	202

Source: Authors based on research data

The first group is measurement/monitoring costs (59 citations) with more than 70% of these citations done by the retailer, which demonstrates their greatest concern about this aspect addressed. It is observed that this major concern has an intimate relationship with the quality of the egg, as can be seen in the following excerpt:

“(…) first, we are guided by certifiers. We only register certified farms, they have to go through our certifiers at the time of unloading on the platform, we have a quality control team to check this standard, they will open the boxes and do it via sampling according to ABNT standard, they check box by box, batch by batch, and statistically they can even return a whole batch or return a box, for example. If a problem is identified, I will return it immediately to my supplier. So, there are people who work before, on receipt, and then the product goes to the store.”
(Interviewee 1)

Only in this citation, it is possible to identify that there are several monitoring costs that are involved in the acquisition of the egg, including a strict supplier registration criterion, internal monitoring process at receipt and inside the store. There is also a veterinarian responsible for the store and inspection teams who daily check the quality of the product using laboratories, checking the temperature and expiration date.

Eggs are sold exclusively under their private label, that implies in more monitoring processes, as the respondent explained. Annual audits are carried out to certify the quality of the product and whether the production complies with the specifications required by the retailer. Thus, it was evident that monitoring costs are employed in a preventive manner, avoiding problems in product quality.

The same preventive pattern was identified in the quotes from the farm, which, in addition to having the laying activity, produces the feed consumed by the birds. This production system was also observed in the literature (Mizumoto, 2004). So the monitoring costs are related to the two activities: a) the inspection is weekly at the feed mill, to identify possible failures in the production process; and b) the monitoring of the farm takes place in relation to the health of the birds for egg production itself. The respondent mentions that an evaluation of the batch (of laying birds) is carried out by the veterinarian responsible for the farm, observing the symptoms, performing necropsies and, if necessary, collecting samples to send to specialized laboratories in the case of identification of sick birds. As for eggs, monitoring is carried out by the retailer.

Negotiation was the second highlighted group, with 34 citations. It was mentioned among the retailer's quotes about the negotiation cells in Brazil, include the scope of negotiation with small producers and the digital auction. Regarding the management of the purchase of eggs, the interviewer informed that there is a demand for different types, such as white, red, rustic, quail, etc and so the negotiation is carried out with suppliers capable of meeting this need in terms of volume, date, frequency and quality.

An interesting issue about the negotiation mentioned by the retailer was about a margin in their budget for damaged eggs, since that it is not a producer's problem, but a handling problem, since it is a sensitive product and there may be a cracking of the skin. In these cases, the entire box is discarded, to avoid contamination and prevent the quality of others. Who bears the costs of such products are the retailer, it is his responsibility, most of the time, but in rare cases of spoiled batches suppliers could pay this costs.

Both interviewed (retailer and farm) stated that the negotiation is aligned between the parties. There is a standardization carried out via contracts in terms of purchase, payment,

term, but this relationship are flexible when a problem such as a delivery failure, due to fleet problems, happens. To solve this there is a new schedule without applications of fines, although these are in contract.

The third and fourth place in the citation ranking was occupied by food safety groups and transaction attributes, respectively. To improve food safety, the retailer use external certifying bodies and external and internal inspection processes, such as one with the private tracking company [Food Traceability and Monitoring project - RAMA (acronym in portuguese)], that monitors the producer on the farm.

The farm interviewed (Interviewee 2) has stated concern to "providing a quality feed for the birds, free of pathogens and microtoxins so that the birds reach their maximum production efficiency and animal welfare." Thus, corroborating to the literature in reaffirming that the intake of a quality feed is directly related to a better product (FAO, 2003). Likewise, the retailer stated that he is concerned about the quality of the birds' food, developing a system of partnership with the WWF so its suppliers buy soybean (one of the main components of the feed) that are not from an illegal deforestation area.

Regarding the attributes of the transactions, retailer quote about the size of the supplier, since this ensures greater quality as results of a series of requirements to have the commercial activity, especially the concern about the specificity of egg perishability, that inside the store have the expiration date of 7 days. Inside the farm, the concerns are different, relate to the classification of eggs, to identify anomalies, and to separate according to their weight.

Contractual relationship, logistics, production and product quality were the other topics presented. It is noted that these groups are related to those previously discussed, since the quality of the product is valued in this relationship with the supplier, as could be seen since they are just registered if they have this and others contractual demands. In logistics, the retailer's concern is given by the distance from suppliers; and the handling of the product, from its arrival to the exhibition in the sales area. The producer's logistical concern is related to transport packaging, so that it is adequate and does not damage the product until it reaches its customer.

Finally, about production, the only category that the farm presented more quotes, it was discussed about the adopted production system (vertically climatized system). The care used in production was also informed, including: screens in aviaries; wheelhouse for disinfection of vehicles; cleaning the aviary; pest control; proper disposal of dead birds; veterinary evaluation in birds with some frequency. Such approaches are adaptation to the productive system demanded by public agencies. So it was not identified an great concern about the production system, neither in farm or in the retailer.

CONCLUSION

Since it was observed that the retailer is more concerned in relation to almost all groups identified, with the exception of production, it is possible to observe that this generates more monitoring costs (transaction costs) on the part of this economic agent and that this is managed in this relationship through contracts. Besides the higher transaction cost generated, it is possible to observe that contracts are almost exclusively used to address these issues of product quality assurance required by the supplier to be guaranteed by the retailer, mainly

because it is a private label, that uses the name of this supermarket chain as a guarantee of quality for the consumer. This is because elements such as quantity and price, normally present in more "traditional" contracts are not included in this contract observed here, since these items are contemplated via the described virtual auction, what makes this observed situation closer relationship to the "Market" governance structure than itself in a "hybrid forms" as could be expected (WILLIAMSON, 1985).

So this relationship is strongly favorable to the retailer, who has a great purchasing power. On the other hand, to supplier, it generates an uncertainty relationship, since in the contracts there is no information on quantity (for production planning), or sales price.

The retailer's demands for register the supplier are high, since there are constant inspections and annual audits due to the sale of eggs with its private label, affecting the entire production. But in the interviews conducted, no asset specificity was found in these requirements, in this transaction, what means if the producer has other demands, from different buyers the production processes used will be the same as those demanded by the retailer surveyed. As there is no guarantee of sale, the producer is not held hostage by the retailer and, if the sale is not carried out, he must sell his production in other marketing channels, but what can often mean a loss, as their predicted volumes may not be the same as those realized due to this non-guarantee of purchase.

Therefore, at the end of this paper it is concluded that food safety does influence the transaction costs of the egg chain, mainly in its form of monitoring costs to ensure the presence of this attribute for consumers of this food.

The research was limited to identifying the relationship only between a retailer and one of its main suppliers. For future research, it is recommended that more suppliers be researched as well as other supply chains are also covered, with different retailers and suppliers.

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