

## **Influences of macro-institutional environment on packaging used in beef and chicken Agribusiness Systems**

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### **1. INTRODUCTION**

A survey developed by Brazilian Agricultural Research Corporation (EMBRAPA), in March of 2017, identified Brazil as a major producer of grains, meat and fruits (EMBRAPA, 2017). The agricultural department was responsible, in this period, for 22.5% of the Gross National Product (GDP) and 37% of the population's labor force (EMBRAPA, 2017). In agribusiness context, currently, Paraná is considered the largest producer of animal protein in the country. According to the Institute of Economic and Social Development (IPARDES), the state represents the largest beef meat production with 21% of participation in Brazil, in 2018.

In this article, two meat production chains were stand out: beef, which in 2016 represented 14% of the gross value of Brazilian production; and chicken, with a 10.5% share of the country production (EMBRAPA, 2017). However, these chains have grown differently over the years. Even though beef production represents the majority of Brazilian production, in the last 42 years its production has grown only 4.05 times, while the production of chicken protein increased 22.7 times (EMBRAPA, 2017). In addition, from 2000 to 2016, there was a 53.59% increase in the slaughter of cattle in the southern region of the country, while the slaughter of chickens for the same period increased 153% in the South (EMBRAPA, 2017).

An important aspect to be understood is the participation of packaging in chicken and beef market. This understanding brings up with references to the role of institutions in this process. Brazilian Health Regulatory Agency (ANVISA) defines packaging as "the article that is in direct contact with food, intended to contain them, from its manufacture to its delivery to the consumer, with the purpose of protecting them against external agents, changes and contamination, as well as adulterations "(ANVISA, 2001, p.2). In the refrigeration industry, packaging plays a key role in differentiating the product available to the consumer. Its functions, according to Revista Frigorífico (2012), go beyond the commercial appeal. It focuses on the safety of products to be consumed and, for this, must meet certain requirements such as not being toxic; ensure health protection; protect against contamination or loss; facilitate and ensure transport.

Considering also the manipulation and availability of meat in supermarkets and butchers, it is necessary to understand that these are produced within a complex productive chain. In this context, the role of institutions as influencers in their operational and competitive dynamics is highlighted. Azevedo (2000) states that the role of these institutions - understood as responsible for defining the formal and informal "rules of the game" that coordinate social, economic and political relations - is to control human actions. In other words, they arise to promote conditions for being economically efficient and to provide development. Considering these chains, it is evident that formal rules establish guidelines that deal with production and sanitary aspects, transport and storage, extending to the packaging.

In order to understand how these chains are organized, Azevedo (2000) and Zylbersztajn (2005), among others, point out that the New Institutional Economy (NIE) presents itself with important theoretical orientation. Its purpose, which originates from the seminal work of Coase (1937), is to clarify the relationship established between the Institutions and to analyze their influence in economic development. In this point of view, Zylbersztajn (2000, p.13) extends the analytical field of the chain to the Agribusiness System concept (AGS), defining it as "a set of contractual relations between companies and specialized agents, whose ultimate objective is to challenge the consumer of determined products". The author includes the institutions and organizations as influencers of these relations.

It should be noted that these chains in Brazil, as seen, show a differentiated performance (chicken slaughter increased by 153% and beef cattle, 53.59%), and the packaging sector follows this process, either by meeting the demand or by offering innovation. In this guideline, the question is how does the packaging work in each of them? In addition, is it possible to conclude that the laws and regulations governing packaging influence their distribution in retail? Thus, based on the concepts presented so far, the present research sought to understand how the rules of the institutional environment, related to packaging, influence the transactions in the distribution segment, in the beef and chicken AGS in Paraná.

Therefore, from the concepts presented, the research problem of this article sought to understand how the institutional environment rules related to packaging influence beef and chicken meat Agribusiness Systems distribution in Paraná. Although the study of innovation in productive processes in these two chains and packaging is significant, the focus of this study, as already mentioned, was to understand how institutional regulation is capable of influencing or monitoring the performance of a given sector. This work was accomplished through the general objective defined as: to understand how the macro-institutions, through their rules for packaging control, influence the beef and chicken meat distribution and performance in Paraná. In order to achieve this objective, the following specific objectives were defined: a. characterize the beef and chicken meat Agribusiness System; b. characterize the rules that operate in the beef and chicken AGS when considering the packaging presence in the final product; c. understand how the institutional environment rules influence the beef and chicken meat distribution in Paraná.

## **2. LITERATURE REVIEW**

In his 1937 paper, Coase contrasts old concepts about economics - understood as a coordinated entity, seen as an independent body - and firm theory, that must respond to planning and undergo changes from changes in the economy. In other words, it seeks to emphasize that, unlike studies conducted up to that time, events related to the economy are capable of affecting the performance of the firm. According to the author, institutions matter and play a fundamental role in economic development (COASE, 1937).

The New Institutional Economy analyzes two complementary strands applied in its studies. The first one is linked to the macro-institutional environment, developed by North (1991), which seeks to understand and analyze the origin, structure, and changes of institutions, as well as the impact they are capable to generate in the firm. It focuses on explaining the origin and changes of institutions, being seen as the rules that discipline behavior in society. The second aspect refers to the micro institutional environment, where the organizations, with their work routine, internal rules, procedures, and the different institutional arrangements are in fact analyzed. Both consider the importance of institutions and complement each other on the basis that they define the rules of the game, while the firm, at the micro level, adjusts to the environment in which it is inserted and establishes its contracts (ZYLBERSZTJAN, 2005).

The institutional micro level is defined and characterized by Azevedo (2000) as being responsible for regulating a specific transaction. Its coordination is given from the relationship between the economic agents of a society with the main purpose of reducing transaction costs. For the author, "The more appropriate the coordination between the components of the system, the lower the costs of each of them and the faster the adaptation to changes in the environment and the less costly the conflicts inherent relations between customer and supplier" (AZEVEDO, 2000, p.35). These internal mechanisms are called "governance structures", involving spot market, regular supply contracts, long-term contracts, vertical integration, among others (WILLIAMSON, 2000). The micro institutional level is one in

which organizations will organize to respond to the regulation imposed at the macro-institutional level and work to reduce transaction costs.

In macro-institutional environment, formal regulation is exemplified by the constitution and its complementary legislation and setting public policies' society. This regulation causes frequent effects on the business and is intended to induce certain actions in main economic agents. On the other hand, it is clear that human behavior is not conditioned only by formal rules. Also according to Azevedo (2000), another set from institutions with equivalent importance are informal restraints. These are neither written nor explicit and do not even result from a rationalized choice from the members of society. In addition to the formal rules and informal restrictions, the Guarantee Mechanisms or Enforcement arise to guarantee that these rules are effective, fulfilled by the organizations, and thus achieve sustainable economic growth - the regulation imposed by the institutions aims at the efficiency of the agents within the productive chain.

### **3. BEEF AND CHICKEN AGS CHARACTERISTICS**

In 1998, studies by Nelson Siffert and Paulo Faverett already defined the beef AGS in Brazil from two basic characteristics: its diversity and incoordination. These authors affirmed that the diversity was related to the breeds difference, creation systems as well as sanitary conditions of slaughter and commercialization ways. Besides the low stability in relations between creators, refrigerators, wholesalers, and retailers, the lack of coordination was related to the lack of policies to control this chain. This way, it gave the opportunity to clandestine abattoirs, relationships based only on price mechanisms and absence of contracts or agreements. Some years later, this system continued described in Brazil with low levels of coordination. Researchers like Malafaia and Barcelos (2007) describe that the commercialization was still dependent on a lagging and inefficient system, surrounded by opportunism, information that does not follow a specific pattern and low price stability. In addition, other problems in this chain is sanitary and the existence of clandestine abattoirs.

Considering the distribution of beef in the retail market, this is done through supermarkets, butchers, boutiques and free markets (AGUIAR, SILVA, 2002). Considering the packaging sector, it is observed that, for the beef AGS, the flexible plastic, with vacuum or not, presents itself as the most used packaging in commercialization, composing with the use of trays for partitioned products, the main form of retail distribution (EMBRAPA, 2018a). Regarding the regulation, Normative Instruction 83 of November 21<sup>st</sup> of 2003 regulate corned beef and ground beef quality providing that "the product must be packed with materials suitable for the storage and transport, so as to provide it with appropriate protection"(Legislation Consult System - SISLEGIS, 2003).

The focus on quality and safety in transported meat began by approving Ordinance 304, in April 1996, which remains unchanged and applied in more than 17 Brazilian states currently (SISLEGIS, 1996). In essence, the main purpose of this ordinance was to make all meat destined for the market to leave the slaughter already prepared in its different cuts and properly packaged according to its normative instruction (ARAKAKI et al, 2018). In addition, Ordinance 90, of July 1996, also established that beef intended for distribution in the retail trade should arrive already packed, containing a label with information regarding the sex and animal species from which the meat was obtained (MAPA, 1996). In 1998, this ordinance was updated by law 7.634/98, which provides that meat cuts must contain official marks and stamps, with identification labeling in them and not only on the packaging.

More recently, Decree 9.013 established in March 2017, that all meat products must be sterilized and submitted to thermal processing no more than two hours after closing the packaging. In addition, when packaging is poorly closed or defective after sterilization, it has

to be sterilized again within the first six hours after the defect is verified, or when the defect is checked at the end of production and the containers are kept in cold rooms with a temperature not exceeding 1°C. This same decree foresees that after the closure of the packaging, these will still undergo tests of closure and resistance of their material (PLANALTO, 2017).

As in beef production chain, characterized and studied the chicken meat production chain in 1998. At that time, these two chains were already seen in a different way. Unlike the beef chain, Siffert and Faverett (1998) shown that the chicken chain had two fundamental characteristics and was responsible for unifying the leading companies in the segment. The first was related to its system of integration, in which thousands of small farmers were responsible for the animal fattening stage and the second refers to the high production scales in the industrial stage.

Currently, the two production chains - chicken and beef - continue to present differences in structure, organization, and regulation. The main one is the fact that the chicken chains can organize themselves in a way that integrates suppliers of inputs, production, industrial processing, and the consumer market. This is possible because there are organs and companies controlling the entire production process. The purpose of these companies is to coordinate the AGS, supplying elements necessary to start production until distribution of final products to customers. This fact enables poultry producers to adapt easily to market trends and requirements, something that did not happen on beef AGS (OAIEN, 2010 apud OLIVEIRA, 2017).

Considering the current formal regulation on packaging for poultry meat production, the Ordinance 210/1998, already established guidelines, among others, for classification before or after packaging; surface for carcasses packaging; and others according to Agricultural and Livestock Defense Secretariat (SDA/MAPA, 1998). In addition, the Resolution 13/2001, published by ANVISA (2001), in order to protect the population health, and considering the presence of Salmonella in poultry meat, has instituted a standard with the objective of including instructions for the packaging used to avoid contamination. Thus, it has been mandatory on the poultry packaging to use that to warn the consumers not to consume raw chicken and instructions on how to keep it refrigerated and stored the product before consumption. It is identified that, even finding a lower number of standards in poultry AGS compared to that in beef, the normative instructions for this sector are clearer, more detailed and with more inspection.

It is noticed that, looking for the packaging used in these two AGS, it is important to use high permeability materials to oxygen, in order to maintain the product coloration. This can be flexible plastic, vacuum, carton boxes, aluminum trays or coated carton. All of them aim to keep fresh processed meat (EMBRAPA, 2016). However, the differences in orientation in favor of the poultry AGS are evident, what cannot yet be concluded is the rule influence level in the distribution dynamics of these AGS.

#### **4. METHODOLOGY**

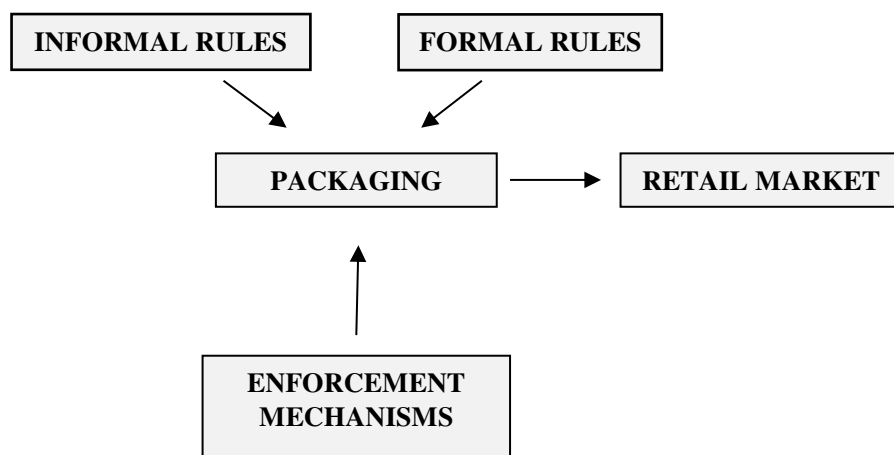
This work is characterized by qualitative and descriptive research, which is related to the objective to study the packaging in beef and chicken meat distribution in Paraná. More specifically, how the packaging rule influences or monitors this segment development. This article was limited to study beef and chicken only since they represent the highest performance in the world and national market. For this, we analyzed secondary data, which seek to understand and characterize this department performance, and primary data, to understand how packaging acts in these meats distribution.

Secondary data were obtained from websites specialized in studies about beef and chicken protein and packaging regulations. The primary data in this study were collected from

semi-structured interviews, following Triviños (1990) and Manzini (1990) guidelines. The primary data collection was done from six semi-structured interviews in street butchers and supermarkets, as well as meat boutiques located in Paraná northern region. Respondents were selected from an unintentional search. In this case, the primary and secondary data were organized into categories based on the theory studied.

The primary data were analyzed based on a content analysis method, understood as the communication analysis technique, comprising what was said in interviews and observed by the researcher (SILVA, FOSSÁ, 2015). This phase consisted by three basic steps: pre-analysis, in which the objectives and the research central theme are taken up; material exploration, based on indexes and indicators for better understanding and, finally, the data treatment and interpretation, considering category analysis, in order to transform them into information. Finally, this research considered the following proposition: "the packaging presence contributes to quality being able to favor and improve the distribution performance in beef and chicken meat chain." For this, based on the analysis categories demonstrated in figure 1 which seek to demonstrate and understand how the formal and informal regulation combined with enforcement mechanisms can influence the sector and the definition of packaging, which, in turn, influence the beef and chicken agroindustrial system distribution in all the retail segment.

Figure 1 – Analysis Categories



Source: Authors.

## 5. RESULTS AND FINDINGS

This research achieved six retail emporia interviewed in all, including two street butchers, two supermarket chains, a grocery store and a meat boutique, using a semi-structured interview script, which was characterized in Table 1. In all the establishments were interviewed those responsible for the contact with the distributor and for sailing the meat to the customers. On average, were surveyed 10 years butchers working on market and all selling Beef, Pork and Chicken.

Chart 1 – Respondent’s Characteristics

Respondent	Business Type	Time	Products	Best selling meat
1	Grocery store	10 years	Beef, pork and chicken	Chicken meat
2	Street butcher	8 years	Beef, pork and chicken	Beef meat
3	Street butcher	12 years	Beef, pork and chicken	Beef meat
4	Meat shop	3 years	Beef, pork, chicken and lamb	Beef meat
5	Supermarket	17 years	Beef, pork, chicken and exotics	Beef meat
6	Supermarket	13 years	Beef, pork and chicken	Beef meat

Source: authors.

Looking for a better research organization, the interviews script were divided into three categories, which served as the basis for the subsequent data analysis: Formal and Informal Rules; Packing; Distribution. These categories were divided based on what this study intends to understand: if the packaging presence contributes to the operational and distribution dynamics in these chains, being able to favor and improve beef and chicken chain performance. Therefore, the first analysis category seeks to understand how the formal and informal rule is presented in beef and chicken agroindustrial system from the distribution perspective segment. The second category sought to visualize how the packaging, its laws and norms are able to influence or not the product delivered and, consequently, in the last category of analysis, the study tried to understand how the regulation and packaging can influence these systems performance.

## 5.1 Results and description analysis

The view on Formal and Informal Rules is evidenced by analyzing the answers obtained. Mostly respondents affirmed knowing laws and norms which supervise their meat distribution. From the total, only respondent 1 did not know laws and regulations and trusts only on the information their distributor passes. The following institutions were cited as being responsible for the formal regulation: ANVISA, Sanitary Surveillance and Federal Inspection Service (SIF). According to them, these agencies instituted control standards on the temperature distribution and storage of meat, packaging conditions, hygiene and meat quality to be sold to the consumers.

Some respondents look for information like transport temperature, meat origin and the animal type in the slaughterhouses. This fact confirms the studies initiated by Coase (1937), that institutions matter and what they define is capable to influence the routine of work in the organizations. Currently, these establishments seek knowledge about what is defined as a rule and suit them by shaping their practices for manipulation, packaging and distribution.

Respondents 3 and 4 also stated that they have veterinarian assistance who is responsible for examining the meat quality sold, as well as the transferring information about laws and regulations destined to their system. In addition, respondent 6 reported having monthly visits from ANVISA inspector to inform him and adjust his services to what is required by law. The majority of respondents claimed to exist more customer requirements in addition to what is defined by law. Factors such as meat quality (color and freshness) and animal origin are the most frequent consumers’ doubts. This fact is related to the informal regulation existing in the macro-institutional environment, defined by Williamson (1993) and North (1991), in which the individual has the power to act on formal rules already established, characterizing informal constraints, ratifying the existence of requirements that confirms the necessity for rules and laws in force in this market.

According to the respondents, the inspection is essentially carried out by Sanitary Surveillance and through the City Hall, in a period of three to six months and possible

monthly visits. In supermarket chains, this inspection also happens through visits from ANVISA, Weights and Measures Paraná Institute (IPEM) and Metrology, Quality and Technology National Institute (INMETRO). This information ratifies North's (1991) theory of Enforcement Mechanisms, which arise to ensure that formal and informal rules are effectively enforced by organizations. The enforcement effectiveness can be exemplified by respondent speech 5: "Today, in this case, they release the license and then they come every 90 days too. But nothing prevents them from coming at any time to make a hit. City Hall Vigilance, INMETRO, IPEM are examples [...]"

Considering the packaging rule, most of the respondents claimed to receive beef partitioned into front and back cuts packed in protective plastic and consisting of labels with the meat type, expiration date, and the supplier brand. Only the respondents 4 and 5 stated that they received the meat also in boxes, already partitioned and packaged for sale. In relation to chicken meat, it was unanimous that the meat already comes packed, separated according to its specific cuts and partitioned in the way that goes to the sale place. Thus, it is evident that Ordinance 304/1996, which aims to ensure that all beef destined for the market is already packaged and partitioned from slaughterhouses, is being complied with and inspected. As for chicken meat, it is also enforced by SDA/MAPA Decree 210/1998, noting that the chicken cuts should reach the final distributor separately and packed in their different cuts.

Now, considering these meats availability for sale, with the exception of respondents 4 and 5 who also sell the beef already partitioned and packed in a vacuum package, in all the researched establishments, the meat is sold sliced and packaged in the purchase, in simple plastic packaging containing only the scale label. Regarding chicken meat, they all claimed to sell the meat in their own packaging that arrives from the distributor, and even with the option of slicing right away, their customers opt for the already packed and cooled meat. However, most of the respondents believe that there are no laws and regulations specific to these packaging, only that they also undergo the same inspection and must obey the institutions already cited as enforcement mechanisms. When analyzing the information on the packaging, most of the respondents listed data such as the meat type, expiration date and brand of the supplier. Few were able to differentiate information from the beef and poultry packaging, with the exception of respondents 1 and 5, who reported presenting Nutritional Information on chicken meat packaging.

None of the respondents showed knowledge about the necessary information, in particular, what is described in Resolution (RDC) 13/2001, which establishes instructions for chicken meat handling and hygiene in order to avoid contamination by *Salmonella* sp. In addition, most said that customers question only about price and whether the beef is new or whether it has already been frozen and thawed. Regarding chicken meat, respondents say that customers do not ask anything specific and report that they end up buying based on the price and processor brand. Finally, everyone considered there is already sufficient information on the packaging labels.

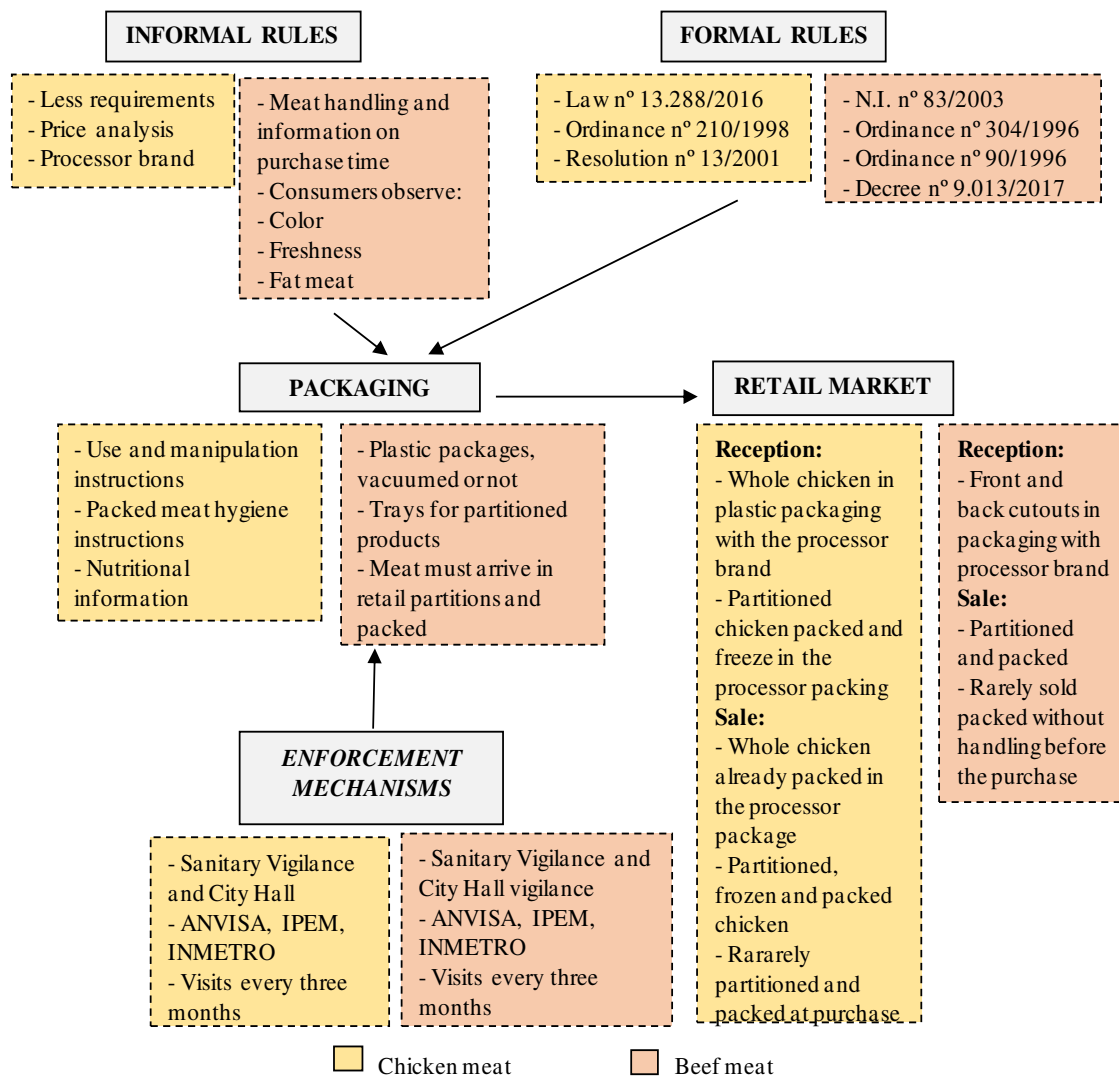
In all respondents' view, their customers always prefer the sliced and packaged beef at the time of purchase, as they think it is necessary to see the meat being handled, cleaned, sliced and packed on time. However, considering chicken meat, most said that customers are not so demanding and that a good part of them buy the meat already packaged and frozen. When they are questioned if the packaging influences or not on the meat sold quality, most believe that it can influence the quality of the final product, the main reason for it is that it keeps the meat fresh and sanitized. In addition, other factors such as meat fat capping, animal species and coloring are seen as quality in beef. In the chicken meat, the factors that are analyzed are the size and cleanliness. Regarding the client's view, the majority affirmed that their clients analyze the beef color and fat, while in chicken they do not look for specific aspects and analyze the size and brand, mainly. The majority of the respondents believe



however, that over the years the packaging has undergone changes, becoming more resistant and better showing the product inside.

In addition, for most respondents, laws and regulations have a great influence on these systems growth. This is because they prevent the clandestine meat sale, guarantee greater security and consumer confidence in the stores and provide these establishments continuous to improve in the market. Again, the fact that most of the respondents consider and recognize the importance of laws in the growth and organization of the system highlights the importance and veracity of Coase (1937), North (1991), Williamson (1993), and other studies. Thus, based on the data obtained, it was possible to prove the following proposition that the study sought to observe: "the packaging presence contributes to quality being able to favor and improve the beef and chicken chain distribution performance." This proposition is represented in figure 2, which seeks to demonstrate the influence of the categories analyzed in those chains (chicken and beef).

Figure 2 - Macro-institutional environment influences on packaging in beef and chicken meat distribution in the retail market.



Source: Authors.

Therefore, it was possible to analyze that formal and informal rulemaking is present in all the respondents work routine. According to their speech, it may be inferred that they are establishments that seek to comply with what is required by law and that, although not knowing specifically what the laws and norms define, they work with mechanisms, which

guarantee their meat quality and safety. In addition, it can be concluded that the packaging influences these meats distribution to both final distributors and consumers, directly influencing the product sold quality.

When questioning differences in terms of the product sales in these two chains, there was no total convergence in the respondents' speeches when it was sought to analyze packaging influence on the performance in the retail distribution. What can be inferred from the interviews, however, is that even though it is inconclusive, there is a position on part of the respondents that the packaging is capable to guarantee the chicken meat confidence – showed in figure 1 – since its clients buy it easily already packed, partitioned and cooled. While in beef, the customer still lacks more information and chooses to buy the sliced and packaged meat at the purchase time, only.

As can be seen in this figure, the institutional environment influences the two meat chains dynamics. The proposition is valid in beef and chicken systems, however, their responses are not similar. The laws and norms defined by formal and informal rules, combined with their enforcement mechanisms, have a direct influence on the packaging definition and, finally, on these meats distribution in the retail market. Informal restrictions, on the other hand, seem to present greater force in the bovine chain, defining distribution forms, restricting the packaging role in the process, and valuing the butchers function. In chicken chains, the packaging presents itself directly in the distribution, since the consumer demands almost no product manipulation, which defines a greater packaging prominence in retail distribution, indicating the product and its origin.

## **6. CONCLUSIONS**

Analyzing beef and chicken agribusiness systems in Brazil, the results identified that the packaging regulation exists, but it is not yet specific to beef and chicken chains. Nevertheless, were found and analyzed data, which demonstrate the safety and hygiene concern with food produced in the country and its relation with packaging, reinforcing the packaging segment importance in the department. These identified rules, although not yet specific to the systems studied, are effective in controlling and influencing distribution to the final consumer in Paraná, as an important source of information. In addition, it was observed that, when considered the beef system, the laws and norms also differ. When compared to chicken meat system, they are less complex. The biggest difference found between the two analyzed systems is the product distribution to the final consumer. In this case, it should be given attention to the differences in the retail format between these two chains, since chicken meat is concentrated in supermarkets, and the beef involves other establishments.

Through the interviews speech, it was possible to identify that customers choose to buy the sliced and packaged beef at the purchase time and this fact may be linked to customer custom and preferences. When considering the poultry purchase, customers are more confident in products already packaged and frozen, in its different cuts, in the processors packaging. In this case, it is noted that the laws guarantee the minimum requirements to be observed, for both beef and chicken, associated with food safety. Finally, the processor and distributor segment seeks to save the product value and also the brand, indicating that in addition to food safety, the packaging acts, notably in chicken meat, as a differentiation requirement strengthening the brand of processors.

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