

**DEBATE** 

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# Considerations on possible irregularities in products of animal origin

## Considerações sobre possíveis irregularidades em produtos de origem animal

### **ABSTRACT**

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The commercialization of products of animal origin in Brazil, by virtue of specifi legislation, is preceded by previous industrial and sanitary inspection. Such inspection is performed by the Federal Inspection Service in establishments that carry out interstate or international commerce; by the State Inspection Services in those that carry out inter-municipal trade; and by the Municipal Inspection Services in those that carry out local trade. Independently of this obligation, it is the exclusive responsibility of the establishments to assure the quality and appropriateness for consumption of the products elaborated by them, leaving to the public authority the prerogative to authorize the regular ones and prevent irregularities from reaching consumers' table, punishing the off when it is the case. The operation started by the federal police called "weak meat", had as scope the information that abattoirs would be marketing deteriorated or otherwise unsuitable for consuming beef, constituting a criminal process and with the participation of public agents responsible for Inspection in these establishments. The objective of this debate was to evaluate the possible circumstances that motivated the fact in the interpretation of the author, as a result of his technical knowledge as Veterinarian PhD in Veterinary Hygiene and Technological Processing of Animal Products, without considering off information for which it did not have access.

KEY WORDS: Productsof Animal Origin; Beef; Operação Carne Fraca; Sanitary Surveillance

### **RESUMO**

A comercialização de produtos de origem animal no Brasil, por força de legislação específica, deve ser precedida de prévias inspeções industrial e sanitária, exercidas pelo Serviço de Inspeção Federal, nos estabelecimentos produtores que realizam comércio interestadual ou internacional, pelos Serviços de Inspeção Estaduais, naqueles que realizam comércio intermunicipal, ou pelos Serviços de Inspeção Municipais, nos que realizam comércio local. Independentemente desta obrigatoriedade, cabe exclusivamente aos estabelecimentos produtores a responsabilidade pela qualidade e propriedade para consumo dos produtos por elas elaborados, ficando o poder público com a prerrogativa de chancelar os regulares e impedir que os irregulares possam chegar a mesa dos consumidores, punindo os infratores quando for o caso. A operação deflagrada pela Polícia Federal denominada de "carne fraca" teve como escopo a informação de que frigoríficos estariam comercializando carne bovina deteriorada ou de outra forma imprópria para o consumo, o que se constitui um processo criminoso com a participação dos agentes públicos responsáveis pela inspeção nestes estabelecimentos. O objetivo deste debate foi o de avaliar, ante as notícias veiculadas pelos meios de comunicação, as possíveis circunstâncias que motivaram o fato na interpretação do autor, fruto de seu conhecimento técnico como Médico Veterinário Doutor em Higiene Veterinária e Processamento Tecnológico de Produtos de Origem Animal, sem considerar informações oficiais às quais não teve acesso.

PALAVRAS-CHAVE: Produtos de Origem Animal; Carne Bovina; Operação Carne Fraca; Vigilância Sanitária

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### **INTRODUCTION**

Since 1950, under Law n. 1.283, of December 18, 1950, industrial and sanitary inspection is mandatory in Brazil for products of animal origin offered to the consumers. This activity is of public nature and performed by the Ministry of Agriculture, Livestock and Supply (MAPA) for products destined for interstate or international trade<sup>1</sup>. Entrepreneurship, supported by modern legislation at the time, allowed a breakthrough in the agribusiness productive chain in order to meet growing domestic consumption and international demand. Brazil has become a major meat producer and exporter over the years, finishing the year 2016, according to the statistics of livestock production of the Brazilian Institute of Geography and Statistics (IBGE), with a production of 7.35 million tons of beef and exports of 1.07 million tons, making it the world's largest exporter of this product<sup>2</sup>. Law n. 1.283/1950 provided that inspection should be carried out on a permanent basis in all establishments under the responsibility of the MAPA, with appropriate teams of inspectors and assistants according to the production of each establishment. Law n. 8.444, of May 6, 2015, eliminated this obligation, which was maintained only for slaughterhouses. This law provided for inspections through periodic audits, a procedure that goes against what had been adopted for 65 years. Therefore, it completely changed the criteria used by the Federal Inspection Service (SIF)3.

It is unnecessary to say that the main responsibility for the quality and proper conditions of any foodstuff lies with its producers. The inspection has the prerogative to evaluate these conditions, approve those that are compliant and prevent the marketing of inadequate products, punishing the responsible parties as may be required.

### FEDERAL INSPECTION SERVICE (SIF)

The SIF, of the Department of Inspection of Products of Animal Origin (Dipoa), is the body of the MAPA responsible for the inspection/supervision of establishments of animal products that do interstate or international trade. This activity is permanently carried out by federal agricultural auditors and veterinarians in all establishments that slaughter animals; it is periodically done through audits in other industrial establishments.

Inspection is done across Brazil with the support of the legislation that regulates the activities related to it, and the Dipoa is responsible for coordinating the enforcement of laws, regulations and criteria for quality and safety assurance of products of animal origin at a national level. Inspection/supervision activities are performed based on the Regulation of Industrial and Sanitary Inspection of Products of Animal Origin, established by Decree n. 9.013, of March 2017 and complementary legislation of the MAPA or similar applicable regulations from other federal bodies4.

Federal law n. 7.889, of November 23, 1989, rules that the competence of the three levels of municipal, state and federal inspection is to be determined according to the area where the products made by each industrial establishment are marketed. Thus, those that market their products in the geographical area

of the municipality will be inspected by the municipal body attached to the Secretariat or Department of Agriculture; those of state scope will be inspected by the State Inspection Service under the Department of Agriculture; and interstate or international trade will be inspected by the SIF5.

Nevertheless, this ruling proved inefficient because in some cases the laws at these three levels are not compatible. This directly affected the quality of the products offered to the consumers and allowed similar products to be evaluated differently by each of the inspection bodies.

In order to resolve this discrepancy, law n. 9.712, of November 20, 19986, established that the industrial and sanitary inspection of products of plant or animal origin and agricultural supplies be conducted by universalized methods and applied equally to all inspected establishments. This ruling was regulated by decree n. 5.741, of March 30, 2006, and created the Unified System of Attention to Agricultural Health (Suasa) and the Brazilian Systems of Inspection of Plant and Animal Products and Supplies (Sisbi)7.

With this, the objective of the Brazilian System of Inspection of Products of Animal Origin (Sisbi-POA) was to integrate the actions of the Official Inspection Services, standardizing and harmonizing inspection and supervision procedures aiming at ensuring food safety by sharing Public Health responsibilities in the country.

The improvement of Sisbi enabled establishments registered in Municipal Inspection Services to market their products throughout the Brazilian territory, as long as they met the requirements of equivalence determined by the SIF.

### RELEVANT FACT

As reported by the country's media, the so-called "Weak Flesh Operation", enforced by the Federal Police of Brazil on March 17, 2017, accused large producers of animal origin products, under inspection of the SIF, of adulterating beef products, including allowing rancid or even rotten meat to be marketed in the domestic retail market and even for exports, putting consumers' health at risk and breaking the law, i.e. committing a crime provided for in the Brazilian penal code. First, some companies were accused of marketing deteriorated meat, adulterating expiration dates and using chemical products to change the appearance of the meat; later, government agents were accused of colluding with this criminal practice.

### TECHNOLOGICAL MANUFACTURING PROCESSES

The mere observation of the facts presented by the media allows us to think that there was a mistake in the police action announcement, because technically the process of beef deterioration is irreversible; there is no technological procedure that can stop it or revert it to make the product fit for consumption again. In this case, it is understood that any consumer, even a



layperson, at the time of purchase or preparation, would easily detect the decay due to abnormal sensory characteristics. It is therefore conceivable that meat packers would not make such an elementary mistake.

It should be noted that many products are made from the meat of several species of livestock. Moreover, new products of this type appear every day, in an attempt to make better and full use of this noble and quality raw material, of renowned nutritious properties. Thus, together with so-called typified products with technological, physical, chemical and presentation characteristics, recognized and valued by the consumers, manufacturers dynamically diversify their production lines and develop new products, sometimes just by modifying the technology and calling these products imitations and sometimes by creating entirely different formulations.

The Regulation on Industrial and Sanitary Inspection of Products of Animal Origin defines as meat products those obtained from meat, offal and edible parts of several animal species with the original properties of the raw materials modified by physical, chemical or biological treatment, or by the combination of these methods in processes that may involve the addition of ingredients, additives or technology adjuvants4.

In Brazil, on the pretext of catering to consumers with lower purchasing power, manufacturers produce products whose formulations allow - in accordance with the technical regulations of identity and quality - the addition of meat raw materials of lower value or different from those that are traditionally used. Additionally, the use of various additives and ingredients that are also allowed by the legislation means that they can create products with flavor and characteristics that please consumers who are less familiar with differentiated quality.

Heating is often one of the technologies used in these formulations; sometimes, excess condiments are also used in order to conceal poor quality raw materials, extend the final product's shelf life or both. The industry calls these products imitations, because their objective is to replace other products of recognized and established quality.

With that in mind, manufacturers may resort to new technologies, non-traditional ingredients and additives, coupled with severe conservation processes, especially heating, to make full use of all sorts of raw materials in the production of precooked cold meats, including raw materials that are not suitable for consumption, albeit it in small quantities. In these processes, the improper raw materials have their undesirable characteristics concealed by other ingredients. It is true that these adverse conditions are only possible in disreputable establishments that are an exception in the Brazilian manufacturing sector, and only active and neutral inspections - as they should always be - can identify them at once and take the necessary measures provided for in the legislation.

Therefore, considering the concepts explained so far, it is reasonable to infer that the violations of the law that gave rise to police action would tend more toward fraud or adulteration in meat products than toward the marketing of refrigerated beef in the form of carcass or cuts that are unfit for consumption, as provided for in Article 497 of the Regulation of Industrial and Sanitary Inspection of Products of Animal Origin<sup>4</sup>.

### BRAZIL IN THE INTERNATIONAL MEAT MARKET

Among the possibilities for economic growth in Brazil, the food market is certainly the biggest. It can bring real development to the country's economy and positively affect related markets, both domestically and abroad. The whole world will need a substantial amount of food and only a few countries with agricultural potential, like Brazil, will be able to meet this demand. This indicates a promising outlook for the Brazilian market, which tends to project the country's food industry in the global supply chain8.

The Brazilian share in international trade grows every year, with highlights to the production of beef, pork and chicken. The expectation is that, by 2020, domestic meat production will supply 44.5% of the world market, with estimates indicating that Brazil will maintain its position as the world's leading exporter of beef and chicken9. According to data from the Brazilian Association of Meat Exporters (ABIEC), in the first six months of this year Brazil exported 630,333 tons of unprocessed beef, or 4,0% less than in the same period of 2016, which was 654,160 tons<sup>10</sup>.

In the context of agriculture and livestock farming, the role of a sanitary policy aimed at obtaining food safety, both for Brazilian producers and consumers, as well as for food importing countries, is very significant. It can also play an important part in the country's economic and social development<sup>11</sup>. According to the World Trade Organization, the growing demands of consumers for healthy and quality food and animal and plant health have made it essential to deal with health issues and phytosanitary measures in international trade. Sanitary agreements establish actions for the protection of plants and animals and for the inspection of derived products<sup>12</sup>.

The Terrestrial Animal Health Code of the World Organization for Animal Health (OIE) defines as fundamental principles for veterinary services the professional qualification, independence, neutrality, integrity, objectivity, legislation and service organization. With regard to independence, it recommends that veterinary staff should not be subject to any commercial, hierarchical, or political pressure, nor pressure of any kind that may influence their judgment and their decisions<sup>13</sup>.

### REQUIREMENTS FOR BEEF PRODUCTION AND EXPORT

The requirements for the production of food of animal origin in Brazil initially include full sanitary controls of the animals on farms, certified at the time of their arrival in the slaughterhouse through a specific sanitary document, complemented, as demonstrated previously, by mandatory hygienic, sanitary and technological inspection at all stages of the slaughtering process



until the final product is ready. This inspection/supervision is of an official nature, performed exclusively by a professional agricultural auditor, usually a veterinarian in the exercise of a public role who, in the case of MAPA, is subordinated to the SIF of the Dipoa.

However, in the case of products destined for exports, in addition to the same mandatory requirements for establishments producing for domestic consumption, exporters also comply with the requirements imposed by the importing countries, guided by the Brazilian authorities and subject to periodic audits by foreign technicians.

Therefore, the establishments authorized to do international trade must operate under a Federal Inspection regime, be authorized to export by the Dipoa, the Agricultural Defense Secretariat (SDA), MAPA, and they must be listed in the Exporters List. The process of sanitary certification of products of animal origin for export comprises all phases of the production process in the stages of obtaining raw material, production, storage, shipping and transportation.

In addition, with the emergence of bovine spongiform encephalopathy in England, the importance of the traceability system in the meat production chain has increased, with importing countries requiring the Brazilian government to adopt the suitable measures. This was done through the Brazilian System of Identification and Certification of Bovines and Buffaloes (Sisbov), used for the individual identification of bovine cattle and buffaloes, in farms that are interested in selling animals that will be used for meat production to serve markets that require this control.

Because of the strict control required for the international trade of animal products and the economic importance of this activity for the industries involved and for Brazil, it is to be assumed that it was not the intention of the investigated establishments to attempt to export meat in disagreement with the law, since this could generate loss of market share and significant economic losses.

This would have been an elementary mistake, unacceptable in an area that is so competitive and of great economic relevance.

### FRAUDS IN MEAT

The report of the European Parliament's Committee on the Environment, Public Health and Food Safety of December, 4, 2013, on food crises, food chain fraud and controls shows that the risk of fraud is higher when the risk of detection of the infraction is low and the possibility of profit is high. It also mentions the complexity and the nature of the food chain, together with emphasis on food safety, and that the national scope of controls and enforcement are generally cited as factors contributing to the reduced risk of effective fraud detection in the food sector<sup>14</sup>.

It adds that the profit obtained from fraud is further reinforced by frequent ineffectiveness of relatively soft sanctions. Other factors contributing to food fraud include the current economic crisis, the austerity measures affecting control bodies, and the pressure exerted by the retail sector and others to keep the costs of food production ever smaller. It is also necessary to analyze the role of traders, the legislative framework applicable to cross-border sales and, finally, evidence of the growing involvement of criminal organizations in food fraud14.

A Food Fraud Network (FFN) activity report shows that meat products are at the top of food fraud rankings. It lists sixty cases, of which 25% were frauds related to labeling (in relation to expiration dates, addition of water and ingredients), 22% were related to certification and/or falsified documents, 17% to the substitution of the animal species, 10% to the presence of banned substances, 8% to inadequate production processes, 7% to inadequacy for human consumption, 5% to counter-faction and 3% to adulteration<sup>14</sup>.

In an article called "Types of Fraud in Meat and Meat-based Products - A Review," Espinoza et al. 15 reported that the main types of food fraud are related to the substitution of ingredients, addition of unauthorized substances, health aspects and bioterrorism and legal and religious aspects, emphasizing that the methods of production and processing of food have led to the need to update food legislation. The safety and harmlessness of food from primary production, through the production of feed to the sale of the product to the consumer, have the potential to influence food safety.

### **GOVERNMENT ACTION**

In view of the importance of Brazil in the world scenario of meat production and exports, it is certain that the uproar caused by the police forces in such an important matter would be followed, as it was, by international repercussion among importers and, above all, among the players of this highly selective and competitive market.

Brazilian authorities promptly reacted to the threats or effective suspensions of imports and took measures to convince the international community that the issue was not related to beef for exports nor to fresh meat in general. It was an isolated episode and not the generalized problem that was initially announced.

A joint note from the MAPA and the Federal Police, of March 21, 2017, stated that, although Federal Police investigations aimed at finding specific irregularities identified in the SIF, such facts were directly related to deviations of professional conduct of a few civil servants. It did not represent any general malfunctioning of the Brazilian health integrity system. The Brazilian SIF had previously been audited by several countries that attested its quality, guaranteeing quality products to the Brazilian consumer.

Of course some measures were taken. The main initiative was Decree n. 9.013/2017, which approved the new Regulation of the Industrial and Sanitary Inspection of Products of Animal Origin, replacing the legal ruling of 1952, with important modifications. Among them, the official certification by audits for all establishments, except for slaughtering, and the regulation of Law n. 7.889/1989, defining the competencies of the Federal, State



and Municipal Inspection Services for the inspection regarding marketing area of each producing establishment4.

The international market promptly understood the measures to be efficient to resolve any questions about the subject, rescuing the credibility of Brazilian meat, regardless of the domestic market. Although there has been a decrease in consumption, this tends to normalize over time.

Because of the considerations of this article, we understand that all the actions that govern the activity of inspection of products of animal origin are perfectly defined by general and specific legislation, to be followed by federal agricultural and livestock auditors. These auditors are subject to administrative and civil penalties in cases of violation of legal dictates.

In the specific case of the police operation known as "weak flesh", if the participation of auditors in the criminal action is confirmed, the required legal sanctions must be enforced.

#### **SOME CONSIDERATIONS**

As an indirect consideration under the scope of this article, we find the new methodology adopted by MAPA for the inspection of products of animal origin debatable, since it replaced established permanent inspections with periodic audit inspections. These periodic audits, when carried out by unreliable technical procedures on the part of companies less concerned with the health of the consumers and more concerned with profit, can provide examples such as those described herein. There is much evidence of the efficient work of the SIF in its 102 years of existence to warrant the so-called permanent inspection model. One of the most iconic cases happened in the 1970s, with the so-called "federalization of inspection". On that occasion, at the initiative of the Federal Government, it was decided that only the Ministry of Agriculture would be responsible for inspecting animal products in Brazil, a fact that professor Ruy Brandão Caldas, according to professor Miguel Cione Pardi, considered in his thesis at Universidade Federal Fluminense as the "largest sanitation campaign ever done in the field of food in Brazil", with consequences that can still be noticed today, even after so much time of revocation16.

On the other hand, recent attempts without any preliminary study or reasonable criterion to change the current inspection system already made it possible to anticipate what disastrous consequences might ensue, as is the case of some states that, in violation of the law, instituted private inspection, unprecedented and of questionable reach, for the quality of the food produced under this system.

The private sector cannot perform a task that is of exclusive competence of public authorities. In a 2014 publication, the OIE already determined the fundamental principles of veterinary services<sup>13</sup>.

For Santos<sup>17</sup>, the violations of individual and collective rights of users by private companies providing public services are well known. The relationship of state regulation, intervention and

economic development has always been a challenge in Brazil, so it is up to governments and their officials to make efforts to formulate policies using the State's instruments of action in the economic domain in an intelligent manner.

Adequate regulation prevents large corporations, oligopolies, and monopolies from transferring negative externalities to the most vulnerable sectors of society. Because of this, there must be strong and well-equipped municipalities, from the point of view of human and material resources, with stable rules and capable of ensuring the improvement of the performance of public services, thus making them more efficient and reliable. This is the only way to achieve fair economic development<sup>17</sup>.

To ratify these considerations, Decree n. 5,741/2006, organized by Suasa, determines that the activities of the Sisbi, which are up to the states, the Federal District and the municipalities, be carried out by public institutions and recognized by the MAPA, with teams responsible for inspections and audits composed of civil servants that can ensure the impartiality, quality and consistency of these controls7.

#### CONCLUSIONS

In view of the above, I understand that the news on the topic that generated the police operation fails to address the use of meats not suitable for consumption as raw materials. That would be a more reasonable explanation than the sales of this type of meat for direct consumption or even for exports, as it was announced. At any rate, both are violations of the Brazilian legislation and liable to the same penalties. Of course these irregularities, in principle, can only thrive due to the shortcomings of inspection control checks and as a consequence of the small number of inspectors for the large number of establishments to be inspected, or due to the negligence or acquiescence of the federal agricultural auditors responsible for the inspection of the accused establishments, whose legal attributions do not include covering up illegalities and swindle.

Likewise, the reported participation of public agents who were supposed to fulfill their obligations instead of joining forces with the infringing companies was a fundamental factor for the process that was shown in the media, as an attempt to circumvent the legal dictates about food with possibly harmful consequences to the health of Brazilian consumers.

It is unreasonable to imagine that, in view of the foregoing considerations on the requirements for the export of meat and meat-based products, market competition and rigid controls by importers, the companies accused of the irregularities mentioned in the police operation had the objective of proceeding to international trade of the purportedly fraudulent meat. This could jeopardize their plans to gain and expand their international market share, as well as affect the entire governmental structure and other national establishments geared towards foreign trade, where there is no room for irresponsible fraud and deceit.



#### Author's note

I would like to highlight that the observations presented here were the exclusive result of reports in the press about the police operation known as "weak flesh", associated with MAPA public demonstrations and my training as a veterinarian, a

PhD in Veterinary Hygiene and Technological Processing of Products of Animal Origin, and a retired federal agricultural auditor. I had no access to any official information whatsoever; therefore here there is no association with the true causes and consequences of the police facts, due to my own lack of knowledge.

### **REFERENCES**

- 1. Brasil. Lei N° 1.283, de 18 de dezembro de 1950. Dispõe sobre a Inspeção Industrial e Sanitária dos Produtos de Origem Animal. Diário Oficial União. 19 dez 1950.
- 2. Instituto Brasileiro de Geografia e Estatística IBGE. Indicadores IBGE. Estatística da produção pecuária 2016. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística; 2017[acesso 1 mar 2017]. Disponível em: ftp:// ftp.ibge.gov.br/Producao\_Pecuaria/Fasciculo\_Indicadores\_ IBGE/2016/abate-leite-couro-ovos\_201602caderno.pdf
- 3. Brasil. Lei  $N^{\circ}$  8.444, de 6 de maio de 2015. Altera o Regulamento da Inspeção Industrial e Sanitária de Produtos de Origem Animal, aprovado pelo Decreto N° 30.691, de 29 de março de 1952. Diário Oficial União. 7 maio 2015.
- 4. Brasil. Decreto N° 9.013, de 29 de março de 2017. Regulamenta a Lei N° 1.283, de 18 de dezembro de 1950, e a Lei N° 7.889, de 23 de novembro de 1989, que dispõem sobre a inspeção industrial e sanitária de produtos de origem animal. Diário Oficial União. 30 mar 2017.
- 5. Brasil. Lei N° 7.889, de 23 de novembro de 1989. Dispõe sobre inspeção sanitária e industrial dos produtos de origem animal, e dá outras providências. Diário Oficial União. 24 nov 1989.
- 6. Brasil. Lei  $N^{\circ}$  9.712, de 20 de novembro de 1998. Altera a Lei N° 8.171, de 17 de janeiro de 1991, acrescentando-lhe dispositivos referentes à defesa agropecuária. Diário Oficial União. 23 nov 1998.
- 7. Brasil. Decreto N° 5.741, de 30 de março de 2006. Regulamenta os arts. 27-A, 28-A e 29-A da Lei Nº 8.171, de 17 de janeiro de 1991, organiza o Sistema Unificado de Atenção à Sanidade Agropecuária, e dá outras providências. Diário Oficial União. 31 marco 2006.
- 8. Macedo EFS, Nishiazaki NJ. A importância do planejamento logístico com foco no crescimento da demanda da cadeia produtiva de alimentos até 2050. Revista Fatec. 2017;3(3):31-45.
- 9. Ministério da Agricultura, Pecuária e Abastecimento (BR). Animal. Estatística de exportação. Brasília, DF: Ministério

- da Agrigultura, Pecuária e Abastecimento; 2015[acesso 1 mar 2017]. Disponível em: http://www.agricultura.gov.br/ animal/exportacao
- 10. Associação Brasileira das Indústrias Exportadoras de Carne - Abiec. Exportações brasileiras de carne bovina. SECEX-MDIC; 2017[acesso 11 set 2017]. Disponível em: http://www.abiec.com.br/download/estatisticas-030817.pdf
- 11. Soares. FM, Santos LC. Resultado, diagnóstico e análise do sistema normativo de defesa agropecuária brasileira: projeto de pesquisa. Rev Fac Direito UFMG. 2010;(57):321-434.
- 12. Organização Mundial do Comércio OMC. Acordo de medidas sanitária e fitossanitária, 2014[acesso 10 ago 2017]. Disponível em: http://www.wto.org/indexsp.htm
- 13. Organización Mundial de Sanidad Animal. Código sanitário para los animales terrestres. Paris: Organización Mundial de Sanidad Animal; 2014[acesso 9 maio 2017]. Disponível em: http://www.oie.int/es/normas-internacionales/codigo terrestre/accesoen-linea/
- 14. Whitwhorth JJ. Meat products top food fraud network activity report. Food. Quality News.com. 2015[acesso 12 set 2017]; May 7. Disponível em: http://www.foodqualitynews. com/Industry-news/FFN-finds-violations-mostly-related-tolabelling-non-compliances
- 15. Espinoza T, Mesa FR, Valencia E, Quevedo R. Tipos de frauds en carnes y productos cárnicos: una revisión. Scientia Agropecuária. 2015;6(3):223-33. https://doi.org/10.17268/sci.agropecu.2015.03.09
- 16. Pardi MC. Memória da Inspeção sanitária e industrial de produtos de origem animal no Brasil: o Serviço de Inspeção Federal - SIF. Brasília, DF. Columbia; 1996.
- 17. Santos LDP, Fortes DMA. Uma perspectiva jurídica para o protagonismo das agências reguladoras na fiscalização de condutas ilícitas praticadas por empresas de grande porte do setor agropecuário. Judicare. 2017;11(1):127-45.

### Conflict of Interest

Authors have no potential conflict of interest to declare, related to this study's political or financial peers and institutions.



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