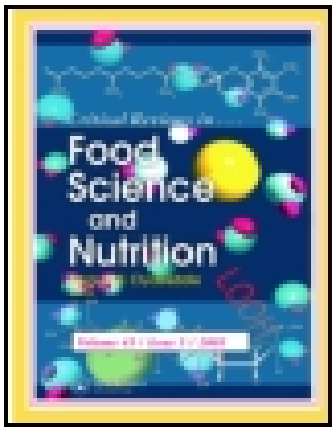

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Important Regulatory Aspects in the Receipt of Animal Products by Food Services

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IMPORTANT REGULATORY ASPECTS IN THE RECEIPT OF ANIMAL PRODUCTS BY FOOD SERVICES

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ABSTRACT

The aim of this study was to review the current legislation and rules in Brazil that involve quality assurance of animal products during food service reception. Published federal legislation and technical regulations were verified to present a broad general approach to raw material reception. Food service determinations included specifications of the criteria for evaluating and selecting suppliers, verifying the transport system, reception area requirements and inspecting raw

material. For product approval, the packaging, labeling and temperature should be evaluated. However, periodic microbiological, physicochemical and sensory support assessment analyses are not required for receiving animal products. For the safety of the raw material, it was concluded that the largest impacts came from the regulation and supervision of the food sector provider because of the challenges of food service and a lack of requirements to use more complex evaluation methods during the reception of raw materials.

Keywords: Meat; Food Legislation; Health Legislation; Food Safety; Restaurants

1 INTRODUCTION

Food services, which are formed by establishments that produce and distribute ready-to-eat food, are undergoing a large market expansion in Brazilian economy. Food produced by this sector is among the factors commonly associated with food-borne diseases. Epidemiological data in Brazil indicates that it occupies second place in the number of outbreak occurrences (Brasil, 2011). According to the World Health Organization (WHO), food-borne diseases occurring in food services are connected to the sanitary quality of practices adopted by the premises (World Health Organization & Food and Agriculture Organization of the United Nations, 2009). A lack of conformity is evidenced by studies of institutional and commercial restaurants in Brazil and other countries (Luning et al., 2013; Losito et al. 2011; Tolentino, 2007; Veiros et al., 2009; Esperança & Marchiori, 2011; Silva & Cardoso, 2011).

The safety of food that is ready for consumption is related to the quality of all production stages in food services, beginning with the receipt of raw material, which must meet sanitary criteria and established standards (Silva & Cardoso, 2011). At the receipt stage, the quality assurance of animal foods, especially meats, stand out for being very sensitive to physical-chemical and microbiological changes (Silva Junior, 2013; Tondo & Bartz, 2011).

In food services, the Good Practice procedures at raw material reception include the following: supplier selection, transport system evaluation, product inspection and approval, and an adequate physical and functional structure, as determined by the law and health regulations in force in Brazil (Brasil, 2004; Associação Brasileira de Normas Técnicas, 2008). Security

attributes that guide and supervise food production are defined in publications by the Ministry of Health (MS) and the Ministry of Agriculture, Livestock and Supply (MAPA) (Brasil, 2008a).

To this end, the aim of this study was to review the current legislation and rules of Brazil, especially in regards to the sanitary quality assurance of products of animal origin in food service reception.

2 METHODOLOGY

The guiding question underlying this review of legislative and regulatory aspects in Brazil refers to the assurance of the sanitary quality of animal products that are approved for food service and an understanding of the standards and criteria for the inspection and approval of the raw material with a focus on the meat.

Among the diversity of laws and techniques for ensuring food safety for human consumption, those relating to the production / processing and transport of products were primarily selected. The federal, state and municipal health legislation and specific normalization of food services in Brazil were also highlighted. The procedures for receiving raw materials and the technical responsibility for this segment were the focus of this work.

The location and selection of existing legislation and technical standards in Brazil were requested through the internet addresses of the official Brazilian agencies (Ministry of Health, the Ministry of Agriculture and the Brazilian Association of Technical Standards) and international bodies (the Food and Agriculture Organization of the United Nations, the World Health Organization, and the Food and Drug Administration; Codex Alimentarius Commission). Other studies were uncovered by accessing online collections. Studies published until 2013

without language restrictions and with the methodological design were selected. Searches were conducted in the following databases: Cochrane VHL, PubMed / MEDLINE, and LILACS, with the intersection of the controlled descriptors Headings (MeSH): Meat, Legislation, Health Legislation, Food Safety, and Restaurants.

3 DEVELOPMENT

3.1 THE DIVERSITY OF LAWS AND GUIDELINES FOR FOOD SAFETY IN BRAZIL

The search by identity, quality, integrity and hygiene foods began using Good Manufacturing Practice programs, followed by System Hazard Analysis and Critical Control Points (HACCP), which are in line with the Codex Alimentarius Commission. This Commission was created in 1961 by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), and it normalizes food service processes relating to the protection of consumer health and fair practices in trade, with an international reference (Food and Agriculture Organization and World Health Organization, 2005).

Brazilian federal health legislation started with the regulation of food quality programs through the publication of Ordinance n°. 1428/1993 of the MS, which defines the general guidelines for the adoption of Good Manufacturing Practices under technical responsibility, and it also regulates the health inspection of food and the standards of identity and quality for food products and services. This ordinance introduced HACCP implementation as a mandatory system for establishments that process and provide services in the food industry (Brasil, 1993).

This order stands out as a legal landmark for health protection in Brazil, assuring the quality of products and services in the food sector**.**

Ordinance n˚. 326/1997, also published by the MS, establishes the general requirements of hygiene and Good Manufacturing Practices for foods produced / manufactured for human consumption (Brasil, 1997a). Simultaneously, MAPA issued Ordinance n˚. 368/1997 (Brasil, 1997b), demonstrating a synergy between these actions. In 1999, the National Health Surveillance Agency (ANVISA) was created. To update the general federal law, ANVISA published RDC n˚. 275/2002, which is a normative act that is supplementary to Ordinance n˚. 326/1997. This resolution introduces the continuous control of Good Manufacturing Practices and Standard Operating Procedures, and it promotes the harmonization of sanitary inspection actions through a checklist of Good Manufacturing Practices (Brasil, 2002).

The relevant aspect of RDC n˚. 275/2002 is the presence of a support tool for evaluating Good Manufacturing Practices. This tool allows for the construction of a sanitary standard in food establishments through a classification that meets the requirements of the evaluated items. This procedure is widely used because it enables intervention strategies in establishments. It also introduces Standard Operating Procedures, one of which refers to the criteria used for raw material selection and receipt, packaging and ingredients (Brasil, 2002).

We emphasize that ANVISA only published RDC n˚. 216/2004 in 2004 as federal legislation specific to the food service sector, which defined the Technical Rules of Good Practice for food services. Previously, food services established their behavior based on publications of the Codex Alimentarius Commission and on legislation for the food production/manufacturing sector. Article n˚.02 of this resolution indicates that these publications

may be supplemented by the state, municipal and district health surveillance to cover the requirements of the local circumstances (Brasil, 2004). However, among the four Standard Operating Procedures established, the receipt of raw material is not considered.

To complement RDC n°. 216, the Health Department of the State of Rio Grande do Sul presented Ordinance n°. 78/2009 to approve the Good Practice Checklist for food services, as well as the standards for training courses and procedures inherent to those responsible for food handling activities (Rio Grande do Sul, 2009). The state of Santa Catarina, through the Directorate of Health Surveillance, published Normative Resolution n°. 03/2010, which approves the checklist of good practices for food service because of the need for a generic verification instrument (Santa Catarina, 2010). The health surveillance of these states stands is notable for specifying the items described generically by the Federal Resolution; however, they do not complement Standard Operating Procedure RDC n°. 216. Moreover, these regulations do not present objective criteria to classify an establishment.

The State of São Paulo has been a reference for safe food production since the 90s, especially the Technical Regulation of Health Surveillance Center (CVS) n°. 06/1999, which establishes the parameters and criteria for the sanitary-hygienic control of food establishments (São Paulo, 1999). This regulation was repealed by CVS n°. 05/2013, which approved the Technical Regulation and Inspection Guide, with the goal of establishing the essential requirements of Good Practice and Standard Operating Procedures in commercial establishments and food service. The Standard Operating Procedures for quality control on incoming goods stands out, as does its portion on food transport. The Inspection Guide of Good Practices presents no classification, and it is stated that the health authority should act on his/her

scientific knowledge and discretion to make health risk assessments and conclusions on the operating conditions of the inspected establishment (São Paulo, 2013).

The Municipal Secretary of Health of São Paulo also has an important history of legislation in food service, and it has published specific legislation for the sector since 2003. In 2011, the Secretary published Ordinance n°. 2619 for adopting Good Practice Regulations and the control of sanitary conditions and technical activities related to food by repealing the existing legislation. In section 5.7, the criteria and standards of quality and safety provide conditions for the receipt or rejection of raw materials. This ordinance complements the federal legislation with the inclusion of Standard Operating Procedures, which determines the criteria for reception for raw material It also includes Standard Operating Procedures for quality control and the traceability of the finished product, which is an innovation to laws in this sector (São Paulo, 2011).

The Brazilian Association of Technical Standards (ABNT) translated the International Organization for Standardization (ISO) 22000:2005, which gave rise to NBR ISO 22000:2006 as directed to management systems of food safety, the standards of which are accepted worldwide. These standards advocate a system of food safety management that integrates the principles of HACCP with Prerequisite Programs (PRP) to ensure safety throughout the supply chain until reaching the end consumer. These programs include virtually the same items established by Good Practices and Standard Operating Procedures (Associação Brasileira de Normas Técnicas, 2006; Tondo & Bartz, 2011). In 2008, the publication of a specific standard for food service stands out, namely, the ABNT NBR 15635:2008. This standard recommends five essential operational controls, but there are none for the receipt of raw materials (Associação Brasileira de Normas Técnicas, 2008).

In recent decades, the government agencies responsible for food safety have failed to focus solely on controlling the hazards (HACCP), and they have focused as much as possible on risk analysis. This objective should be established as part of a national food safety system supported by a properly functioning food control system (Comisión del Codex Alimentarius, 2007; 2011). However, the application of this method will need to address the risks all along the food chain, in all sectors. The complex organizational structure involved in the sanitary control of food within the country, which consists of various institutional bodies with separate controls, tends to hinder the implementation of risk analysis (Figueiredo & Miranda, 2011).

The Food Inspection and Control of Risks Management of ANVISA, through Ordinance n˚.817/2013, approved the national guidelines for the development and implementation of a pilot project to categorize food services for the 2014 FIFA World Cup. This ordinance provides a list of assessments and a risk criteria scoring system in accordance with the RDC n˚. 216/2004, in which item n˚. 6 refers to raw material, packaging and ingredients. This pilot project includes forms of food establishment categorization with the goal of improving the health profile. The project also seeks to improve transparency, to strengthen health surveillance related to food services and to improve risk communication to consumers so that citizens know the adequacy level of food service facilities (Brasil, 2013).

3.2 SAFETY CRITERIA FOR MATERIAL RECEIPT

The actions prescribed in the legislation and technical standards for ensuring food safety will become operational in the relevant sectors through quality programs. Attendance at the Good Practice program is mandatory for food service in accordance with provisions of Brazilian

law, as a minimum requirement for food safety. The Good Practices Handbook implemented in food service, which describes legal safety requirements, confirms the implementation of the program (Stangarlin et al., 2013).

The service should also have Standard Operating Procedures, which describe the operations, the frequency of execution and those responsible for the activity, and they must be approved, signed and dated by the director of food service and available to the health authority. At this time, the HACCP system is not mandatory, according to the legislation for this sector (Brasil, 2004).

Food safety is assured by control at the point of origin (supplier), during delivery, in design, marketing and consumption. Furthermore, production quality procedures and food security are associated with the presence of a responsible technician and the implementation of staff training programs (Ebone & Cavalli, 2011; Santos et al., 2012). It is still essential to ensure the adequacy of raw material receipt in food service, the principles of Good Practice, especially in the organization of the environment (buildings and facilities), process control and handler adequacy (Tondo & Bartz, 2011).

3.2.1 Technical responsibility and personnel training

Raw material reception is performed by food service employees who are capable of properly evaluating the products. However, the implementation of Good Practice procedures at reception must be ensured by the director of food handling activities (Associação Brasileira de Normas Técnicas, 2008). Ordinance n˚.1428/1993 requires that food industry establishments that

process and provide services must rely on a technician, who shall have the authority and jurisdiction to approve or reject the received product (Brasil, 1993).

The Brazilian federal law and ABNT technical standards specific to food services defined that the director for food handling activity may be the property owner or an official designated for this activity. Thus, there is no technical manager requirement for food services. However, there is an exception for those with a legal provision (Brasil, 2004; Associação Brasileira de Normas Técnicas, 2008), such as industrial kitchens and nutrition/dietetic services, which can only operate under the direction of a nutritionist (São Paulo, 2011; Brasil, 1991b; Brasil, 2005b; Brasil, 2008b).

Federal law stipulates that those responsible for food handling activities (the owner or designated official) must be proven capable through a course that includes at least the following subjects: food contaminants, foodborne illness, hygienic handling of food and Good Practices (Brasil, 2004). Ordinance n°.78/2009 of Rio Grande do Sul complements the federal legislation requiring the training course to offer a minimum of 16 hours, to be held by institutions of technical or higher level education as previously listed and approved by the State Health Secretariate (Rio Grande do Sul, 2009) or by the health surveillance as CVS n°. 5/2013 in São Paulo (São Paulo, 2013).

According to ABNT NBR ISO 22000:2006, top management shall appoint a food safety team coordinator, who shall have the responsibility and authority to organize and supervise the staff and ensure training and relevant education for food handlers (Associação Brasileira de Normas Técnicas, 2006). The Codex Alimentarius emphasizes that the training should educate food handlers about their role in protecting the product from contamination and

deterioration (Comisión del Codex Alimentarius, 2009). Medeiros et al. (2011) noted that food handler training should include contents addressing food quality and personal hygiene by following the standards and guidelines for food establishments issued by international organizations.

Among the difficulties inherent to quality procedure implementation is the lack of trained/motivated personnel or the lack of access for workers (Garayoa et al., 2012). In a systematic review, studies have shown that after training, there were considerable improvements in employee degrees of knowledge, in addition to positive changes in attitudes and behaviors (Medeiros et al., 2011).

Studies in this area have already shown a positive relationship between the performance of the responsible technician and the use of operational quality and/or sanitary standards or management systems (Santos, et al. 2012; Akutsu et al., 2005). Tolentino (2007) noted that 81.7% of establishments that did not have technical experts did not adopt operational quality and/or sanitary standards and/or systems. In this respect, it is worth noting that the qualified professional supervision of reception activities is fundamental to the selection of suitable raw materials, including meats.

3.2.2 Suppliers

The Brazilian health legislation for food service determined that food service providers should specify the criteria for evaluating and selecting raw materials suppliers, ingredients and packaging (Brasil, 2004). To complement this legislation, the municipality of São Paulo indicated that the establishments should undertake the selection by audition, the evaluation of

technical specifications and of quality systems as a condition for qualifying, screening and enrolling suppliers (São Paulo, 2011). Note that the lack of minimum standards for evaluating and selecting raw materials, ingredients and packaging suppliers in food services is a weakness in the national legislation.

ABNT NBR 15635:2008 indicates that the control applied by food services to the supplier is associated with the impact that raw materials have on the safety of the final product. This standard recommends that the establishment must purchase inspected inputs, which are certified or market quality-recognized, preferably those from establishments that have implemented Good Practices (Associação Brasileira de Normas Técnicas, 2008). According to a study by Lindblad & Berking (2013) on Swedish slaughterhouses, a decrease in carcass contamination was achieved through improvements in hygiene monitoring at slaughter and an increase in employee training. These actions were important preventive measures that were deployed at all evaluated sites.

This measure makes it clear that the supplier certification of animal origin products provides assurance that food complies with safety and/or fair trade practice requirements (Comisión del Codex Alimentarius, 2001). The certification process is provided by an official agency or officially recognized certification companies. However, it is not mandatory for Brazilian industries. In beef production for exportation, it is compulsory that all the activities of the Supply Chain Traceability Service of Cattle and Buffaloes (SISBOV) by the farmer are coordinated by certified companies that are accredited by MAPA. Consequently, membership is not required for those producing for domestic supply, instead relying on producer discretion and interest (Brasil, 2006).

Retail traders (butchers, supermarkets, and hypermarkets, among others) and wholesalers (wholesalers and wholesale stores of meat and meat products) are inspected by bodies linked to the MS. However, suppliers involved in slaughtering activities (refrigerators and slaughterhouses) and meat processing (warehouses, industries, boning and fractionation areas) are under the responsibility of the Agriculture, Livestock and Supply organs, which are governed at different levels, depending on the company's influence on the market (Tolentino, 2007).

According to Law n˚.7.889/1989, no industrial establishment or warehouse for products of animal origin in the country may operate without being previously registered at the competent authority to monitor its activity. Companies providing interstate or international supply are overseen by the Ministry of Agriculture. Those who provide intercity commerce are overseen by the State Departments of Agriculture and the Federal District. The Municipal Secretariates or Departments of Agriculture inspect establishments that provide products only (Brasil, 1989) at the municipal level.

However, the Unified Health Care for Agriculture System (SUASA) regulation of intercity and interstate marketing of animal products is inspected by state or municipal institutions, as performed through the Brazilian System of Animal Origin Products Inspection (SISBI / POA). In this model, the inspection must be performed according to international standards and quality systems used by MAPA, which are applied equally across all establishments (Brasil, 1991a; 2006; 2010).

Importantly, the Regulation of Industrial and Sanitary Inspection of Animal Products (RIISPOA) was recognized in 1952 by Decree n˚. 30.691, providing that the standards of industrial and sanitary ante- and post-mortem inspection, receipt, handling,

processing, elaboration and preparation in establishments carrying products of animal origin were partially modified by six decrees (Brasil, 1952). The MAPA justified the need for a complete review of RIISPOA to adapt it to the current draft of the legislation and harmonization with the Consumer Protection Code and with SUASA, besides the change in the execution of inspection activities (Brasil, 2006; Dolabela, 2012).

3.2.3 Transport System

Brazilian law has regulations for the control and supervision at all stages of the production chain (Brasil, 2008a). The food transportation system is included as one of the evaluation criteria to ensure the safety of raw materials (Brasil, 2002). The requirements for food transportation are mentioned in the general context of federal health laws and standards of hygiene and food safety.

However, because this activity is supervised by both state and local health surveillance agencies, each state or municipality has rules that apply to food sanitary control. In the context of regulation and the standardization of enforcement actions to protect vehicles transporting food for human consumption, the following documents have been published: CVS Ordinance n°. 15 of the Ministry of Health of São Paulo (São Paulo, 1991), Law n°.7.274/1997 of the municipality of Belo Horizonte (Belo Horizonte, 1997), and Resolution n°. 604/2002 of the Municipal Government of Rio de Janeiro (Rio de Janeiro, 2002). Ordinance 069-R/2007 of the state of Espírito Santo (Espírito Santo, 2007) and Ordinance n°. 32/2012 in the city of Fortaleza should be mentioned, both of which feature a sanitary inspection list with items relating to the identification of the company and the vehicle (Fortaleza, 2005).

This sector is one of the links in the production chain, and the maintenance of product quality depends on it. Thus, the transit of food under safe conditions presupposes the preservation of health and of the environment (Rio de Janeiro, 2002). In this context, these state and local health surveillance agencies stand out within the nation because it is very important to propose and regulate food transport. However, in most Brazilian municipalities, health authorities use predefined criteria from old and outdated sanitary codes. One noteworthy example was the standardization of criteria for evaluating vehicle sanity in the form of an inspection list (Espírito Santo, 2007; Fortaleza, 2005).

In addition to federal, state and municipal legislation, ABNT NBR 14701/2002 presents the standardization of chilled food product transport with procedures and criteria for the proper temperature throughout the supply chain (Associação Brasileira de Normas Técnicas, 2002). For food services, RDC n°. 216/2004 stipulates appropriate conditions of hygiene and conservation only for the transport of raw materials (Brasil, 2004). The São Paulo state and local law adds that, like vehicles, the delivery worker should present oneself in a hygienic fashion (São Paulo, 2011; 2013). However, the state of São Paulo has specific legislation to address the transport of food for human consumption (São Paulo, 1991). In addition, the Sanitary and Environmental Surveillance of Fortaleza, among several other additions, establishes that the driver must possess Good Practices skills, which must be duly proven (Fortaleza, 2005).

Health surveillance of the state of São Paulo, Santa Catarina and Espírito Santo, in addition to the municipality of Rio de Janeiro, indicate that the vehicle used for transporting food must possess a Certificate of Inspection (Health License) granted by the Sanitary Authority (São Paulo, 1991; Santa Catarina, 2010; Rio de Janeiro, 2002; Espírito Santo, 2007). According to

CVS n˚.15/1991 of the state of São Paulo, Law n˚.7.274/1997 of Belo Horizonte and Ordinance n˚.69/2007 of Espírito Santo, the vehicle used for meat and meat product transportation must be closed, isothermal or (São Paulo, 1991; Belo Horizonte, 1997; Espírito Santo, 2007) cooled. Health surveillance of the state and city of São Paulo define that the requirement for refrigeration equipment is dependent on the type of transport, the product characteristics and the distance traveled (São Paulo, 2011; 2013).

The conditions of meat transportation must provide adequate protection against contamination and exogenous damage, and they must minimize the proliferation of pathogenic and decomposition-causing micro-organisms, satisfying the goals for safety and health (Food and Drug Administration, 2009). Monitoring the temperature is a prerequisite for managing the cold chain and thus for the production and supply of safe products in addition to reducing losses and economic waste (Raab et al., 2011). According to the Codex Alimentarius for efficient control, equipment for continuously monitoring and recording temperatures should be installed in transportation vehicles (Comisión del Codex Alimentarius, 2005).

In a literature review, it became evident that a large number of different temperature monitoring systems are used in the meat supply chain, but the continuous temperature control of products throughout the entire supply chain is often time consuming and in many cases not practical. Research progress in recent years has shown that predictive models allow for the prediction of food quality and shelf life based on microbiological growth in a way that is dependent on the temperature of the supply chain (Raab et al., 2011).

The extinct Interministerial Commission for Health and Agriculture-issued Resolution n˚.10/1984 provided instructions for perishable food storage during the phases of transport, trade

and consumption, industrial production or packaging (Brasil, 1984). Subsequently, Ordinance n°.304/1996 by the Ministry of Agriculture, Food Supply and Agrarian Reform was the first in a series of regulations to establish guidelines for a modernization program in terms of hygiene, health and technology, aiming for food security (Brasil, 1996). It is evident that these publications determine different temperatures for the transportation of perishable food.

3.2.4 Reception Area

Inspection procedures are performed at product reception to ensure the safety of the received food (Associação Brasileira de Normas Técnicas, 2008), and they should be performed in a limited area specific for this purpose under proper hygienic and sanitary conditions (Brasil, 2004; São Paulo, 2013) and conservation. When this area is not specific for receipt, the different activities may be separated by physical means or by other efficient means (Brasil, 2004). In case of a complete inability to separate the different process areas, different times and routine cleaning should be determined to avoid cross-contamination (São Paulo, 2011).

Establishments should be located in areas free of potentially toxic substances and other contaminants (Comisión del Codex Alimentarius, 2001). The access should be direct and independent (São Paulo, 2011; Rio Grande do Sul, 2009) without communication with non-core activity dependencies (São Paulo, 2011; Rio Grande do Sul, 2009; Brasil, 2004). Openings with access to the external environment must have mechanisms to protect against the entrance of urban vectors and pests (São Paulo, 2011). The doors must automatically close and have a protector at the bottom, and the windows must be equipped with removable screens. The floor

must be durable, washable and free of fluid collection, of unused objects and of the presence of animals (São Paulo, 2011, Brasil, 2004; Rio Grande do Sul, 2009).

Considering the importance of food contamination control, federal legislation recommends the presence of sinks exclusive for hand hygiene, in sufficient numbers and in strategic positions in relation to the flow of production (Brasil, 2004). The Municipal Health Department determines the inclusion of sinks in the reception area (São Paulo, 2011). On-site signs should be posted on the correct washing and antisepsis of the hands and other hygiene habits (São Paulo, 2011; Rio Grande do Sul, 2009; Brasil, 2004).

The importance of the physical and functional structure of the reception area for the adequacy of the procedures is emphasized for the evaluation of raw materials. However, studies show structural weaknesses in food services, such as improper drainage in the floors, a lack of screens in the windows, and unconformities in hand hygiene (Veiros et al., 2009). The study highlights the need to improve the physical structure, equipment and training of employees (Ebone et al., 2011).

One of the main difficulties encountered during the process of implementing quality management systems in food service is the lack of financial and economic resources to address facility deficiencies (Garayoa et al., 2012). Another important aspect observed in some studies was a more appropriate implementation of Good Practices in larger establishments, demonstrating the relationship between establishment size and quality management (Luning et al., 2013; Losito, 2011).

3.2.5 Evaluation of raw material

At reception, all raw materials must be submitted for evaluation by the food service (Brasil, 2004; Rio Grande do Sul, 2009). The inspected products must be approved or rejected at this stage (Brasil, 2004) in compliance with the criteria and standards of quality and safety (São Paulo, 2011). Rejected lots shall be immediately returned to the supplier (São Paulo, 2013; Brasil, 2004; Comisión del Codex Alimentarius, 2007; Rio Grande do Sul, 2009; Associação Brasileira de Normas Técnicas, 2008) when non-conformities are identified at reception. However, according to the structure of the reception area, mismatches are often observed at a later stage, and then it is stated that the goods must be identified and stored separately until reaching their final destination (Brasil, 2004; Associação Brasileira de Normas Técnicas, 2008; Rio Grande do Sul, 2009; São Paulo, 2013).

Establishments shall perform quantitative, qualitative and sensory analyses on the raw material received, according to predefined criteria for each product (São Paulo, 2011; 2013). There should be integrity checking of the packaging (Brasil, 2004; Associação Brasileira de Normas Técnicas, 2008), of signs of thawing and refreezing (São Paulo, 2011), in addition to labeling legislation adequacy according to the legislation (Rio Grande do Sul, 2009; São Paulo, 2013). The food service professional who receives raw material should be guided by the law that determines the data that are required on the labels for products of animal origin.

Packed animal product labeling was regulated by Normative Instruction n˚. 22/2005 MAPA (Brasil, 2005a). ANVISA regulates nutrition labeling for packaged products by RDC n˚. 360/2003, which is mandatory. However, this technical regulation does not apply to fresh meat (Brasil, 2003d), and RDC n˚. 359/2003 regulates portions of packaged foods for nutrition labeling purposes (Brasil, 2003c). The National Institute of Metrology, Standardization and

Industrial Quality (INMETRO) normalizes the expression of the liquid content to be used on pre-measured products (Instituto Nacional de Metrologia, 2002).

The temperature of raw materials and ingredients that require special storage conditions should be checked upon receipt (Brasil, 2004; Associação Brasileira de Normas Técnicas, 2008) and the record should be dated and initialed to indicate this control has taken place (Rio Grande do Sul, 2009; São Paulo, 2011). Brazilian law advocates different temperature parameters for raw materials during transport. As shown in Table 1, there was a reduction in the temperature recommended for perishable products, particularly meat, in the laws published in recent years.

It is well-documented that the storage temperature of meat is an important parameter that influences the proliferation of pathogenic and spoiler microorganisms (Chaves, 2012) and the use of low temperatures above freezing may retard microbial growth. However, psychrotrophic microorganisms have been shown to cause spoilage in meat stored under refrigeration, with the highest counts at 7 °C temperatures in (Jay, 2005).

3.2.6 Laboratory Analysis

During the inspection of meat upon reception by food services, the Brazilian federal law does not require laboratory analyses (Brasil, 2004). The Codex Alimentarius indicates that laboratory tests may increase the chance of using appropriate raw materials under good sanitary conditions when the tests are used in the evaluation (Comisión del Codex Alimentarius, 2009). ABNT NBR ISO 15635:2008 states that periodic evaluation should be performed by using laboratory tests for critical ingredients and products whose processing does not guarantee the

elimination of hazards. These tests complement those that can be performed by a certified vendor with documented specifications, including an audit of the practice and principles of HACCP (Associação Brasileira de Normas Técnicas, 2008).

The microbiological criteria established by ANVISA provide subsidies for the rejection or approval of raw material because they classify food as fit or unfit for human consumption (Brasil, 2001). However, the peculiarities of producing food ready for consumption and the cost and time required to obtain the results of analytical methods for the microbiological control of animal products will restrict the use of more complex evaluations to ensure the safety of meat (Brasil, 2003b).

Among the viable assessments to be performed, food service sensory examinations of the product are of great importance because the sensory attributes are the ones that change at the beginning of meat deterioration (Instituto Adolfo Lutz, 2008). Evaluations can be performed through the use of official methodologies with proven efficacy, such as a sensory evaluation by a selected panel of evaluators or experts, which is an important tool for assessing the attributes that cannot always be measured objectively through readily available instrumental analyses (Nassu et al., 2010).

Some physical-chemical analyses for evaluating the conservation status of animal products described in Official Analytical Methods are simple to implement, have a low cost and provide quick results. According to the food service structure, the following measurements may be included: filtration proof, cooking proof, pH determination, Nessler reaction, and hydrogen sulfide and ammonia reactions, all of which support the approval of meat at reception (Brasil, 1999).

Evaluating the raw materials through direct observation and/or with the aid of optical instruments is still recommended (Brasil, 2003a; Silva Junior, 2013). In many cases, the physical hazards present in the raw material cannot be detected at reception, but can later show up in pre-preparation. This observation is alarming because the presence of foreign materials in the product indicates inadequate sanitary conditions and/or harm to human health (Brasil, 2003a).

4 CONCLUSIONS

On the basis of this review, it can be concluded that Brazil has a vast legal reach within the different spheres of government to regulate the production of safe food. The state of São Paulo stands out as a pioneer in the field of sanitary-hygienic control in food service. However, federal legislation and technical standard publications for this sector are generally recent.

Federal legislation addresses the receipt of raw material in a broad and general form, with emphasis on Good Practices procedures. Evidence shows that some states and cities complement federal regulations, including Standard Operating Procedures, for the receipt of raw materials. Moreover, they have specific laws for transporting food for human consumption.

Based on this evidence, it is important to emphasize the importance of government regulation and the supervision of the entire production chain, including the supplier industry, production, processing and transportation of food. We conclude that the greatest impacts on the safety of food of animal origin used in food service originate from the early stages of the raw material supply chain. Thus, this conclusion confirms the importance of qualified supplier selection as recommended by the legislation and regulations for food service.

Despite the controls performed in previous steps, food service legislation determines the assessment of raw material at reception, with the subsequent approval or rejection of the product. However, there is no requirement for a technical manager to perform this evaluation, which can be performed by the owner or qualified employee. Furthermore, the analyses recommended for this step have insufficient data to ensure the safety of the meat because the microbiological, physicochemical and sensory features are not evaluated by official methods.

The receipt of quality raw materials, when delivered under appropriate conditions by qualified suppliers, must be one of the goals of food services. For this purpose, the oversight of quality parameters in other segments of the food chain is a challenge for professionals engaged in food safety because of the reality of food service and the lack of requirements to apply methodologies that are more complex to evaluate raw materials.

CONTRIBUTORS

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Table 1 - Temperature criteria for transport established by Brazilian law for fresh meat, meat products and other perishable raw foods.

Legislation	*** Temperature (^{o}C)**		
	Cooled	**Refrigerated**	**Frozen**
Resolução n^{o}. 10, of July 31, 1984. Brasília, DF	To 10°C	-	To -8°C
Resolução n^{o}. 304, of april 22, 1996. Brasília, DF	7°C	-	-
Ordinance CVS - n° 15, of November 7, 1991. São Paulo, SP	6ºC, not exceeding 10°C or as specified by the manufacturer	4°C, not exceeding 6ºC	-18°C and never exceeding -15ºC
Ordinance CVS n° 05, of April 09, 2013. São Paulo, SP.		4°C, with a tolerance up to 7ºC	With a tolerance up to -12ºC
Ordinance n^{o} 69-R, of September 26, 2007. Vitória, ES.	4ºC - 6ºC	-	-12 ºC -18ºC
Ordinance n° 78, of January 28, 2009. Porto Alegre, RS.	-	7°C or less or as labeled	-12°C or less or as labeled
Ordinance 2.619, of December 6, 2011. São Paulo.	Chilled raw meat and meat products: a maximum of 7°C; Other products cold: maximum 10°C	-	Maximum at -12ºC

*The criteria of temperature are set for products and not for vehicles

