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Situation diagnosis of poultry traders at the rural producer fair in Boa Vista, Roraima

Lévison da Costa Cipriano^{1*} , Raiane Gales Macedo² , Heloisa Pinto de Godoy Siqueira³ ,
Everton Ferreira Lima³ , Artur Carvalho Medeiros Junior³ , Ingrid Bortolin Affonso Lux
Hoppe⁴ , André Buzutti de Siqueira³

¹Aluno da graduação em Medicina Veterinária da Universidade Federal de Roraima, Departamento de Medicina Veterinária, Boa Vista – RR Brasil.

²Veterinária Autônoma, Boa Vista – RR Brasil.

³Professor(a) da Universidade Federal de Roraima, Departamento de Medicina Veterinária, Boa Vista – RR Brasil.

⁴Pós doutoranda na Faculdade de Ciências Agrárias e Veterinárias de Jaboticabal, Departamento de Medicina Veterinária Preventiva e Reprodução Animal, Jaboticabal – SP Brasil.

*Autor para correspondência, E-mail: levison_costa@hotmail.com

Abstract. The production and trade of chicken meat have occupied a prominent position in the supply of animal protein in several countries, such as Brazil. This study aimed to make a situation diagnosis of chicken traders at the rural producer fair in the municipality of Boa Vista, Roraima, to obtain information on its health, management, slaughter processes, animal welfare, and impacts on public health. The eight poultry traders at the fair were interviewed using questionnaires. From the results, it was identified that the traders had different origins, 75% of them (6/8) were male and 87.5% (7/8) had no higher education, and poultry selling was their main source of household income. The poultry trade at the rural producer fair does not have adequate hygienic-sanitary conditions of production (handling, slaughtering process, and commercialization). There is therefore a need to improve production conditions, ensure the welfare of the slaughtered animals, and implement overall sanitary control to avoid a negative impact on public health.

Keywords: poultry, public health, quality and slaughtering

Diagnóstico da situação dos comerciantes de aves na feira do produtor rural de Boa Vista, Roraima

Resumo. A produção e comercialização de carne de frango têm ocupado posição de destaque no fornecimento de proteína animal em diversos países, como o Brasil. Este estudo teve como objetivo fazer um diagnóstico da situação dos comerciantes de frango da feira de produtores rurais do município de Boa Vista, Roraima, para obter informações sobre a saúde, manejo, processos de abate, bem-estar animal e impactos na saúde pública. Os oito comerciantes de aves da feira foram entrevistados por meio de questionários. A partir dos resultados, identificou-se que os comerciantes tinham procedências distintas, 75% deles (6/8) eram do sexo masculino e 87,5% (7/8) não possuíam ensino superior, sendo a venda de aves sua principal fonte de renda familiar. A comercialização de aves na feira do produtor rural não apresenta condições higiênico-sanitárias adequadas de produção (manejo, abate e comercialização). Há, portanto, a necessidade de melhorar as condições de produção, garantir o bem-estar dos animais abatidos e implementar o controle sanitário geral para evitar um impacto negativo na saúde pública.

Palavras chave: abate, aves, qualidade e saúde pública

Introduction

The production and trade of chicken meat have occupied a prominent position in the supply of animal protein in several countries, such as Brazil ([FAPRI, 2020](#); [Schmidt & Silva, 2018](#)). Today, Brazilian

poultry represents 1.5% of GDP, generating 3.5 million direct and indirect jobs, and of the total chicken meat produced, 70% is destined for the domestic market, with consumption that is 43 kg per inhabitant/year, and the remaining 30% shipped to more than 150 countries ([ABPA, 2016](#)).

Despite this high production and export, there is still an “informal” market held in open markets, which have been present since colonization and even today are important spatial forms present in cities and prominently in some regions such as the north and northeast of Brazil ([Costa & Santos, 2015](#); [Ishikura et al., 2015](#)).

Hygienic-sanitary conditions of handling the slaughtering process and the form of commercialization can be determinant factors in the quality of the final product ([Gonçalves et al., 2014](#); [Samulak et al., 2011](#)). If these conditions are improper, they can damage the environment, generate economic losses, and cause health risks to consumers.

In the municipality of Boa Vista State of Roraima, Northern Brazil, poultry meat trade occurs in supermarket chains, visited by butchers and traders from several fairs. The trade of “hot chicken” is a cultural variant among the inhabitants of Boa Vista with the sale of poultry carcasses without any cooling process and no official inspection services disobeying the legislation, in accordance with by the Industrial Inspection Regulation and Health of Animal Products ([BRASIL, 2017](#)). In addition, the poultry meat production chain must respect animal welfare precepts from the production system until the final product is obtained. Therefore, this work aims to elaborate on a situation diagnosis of poultry traders at the producer fair in Boa Vista, Roraima.

Material and methods

Boa Vista’s rural producer fair concentrates on a group of traders who slaughter birds in the sale establishments and supply local trade with their products in addition to vegetable, fruit, and other animal products, traders.

Data for this work were collected at the producer fair, which occurs regularly in Boa Vista from February to July 2017, with the application of questionnaires that contained objective and descriptive questions on poultry traders. These questionnaires included questions related to socio-economic aspects, management, facilities, slaughter process, and commercialization of poultry as well as the waste destination and the products offered at the fair. The poultry traders at the fair were interviewed, and all the data obtained were tabulated and analyzed using Microsoft Office Excel 2010 program for quantitative and qualitative analysis.

Results and discussion

The rural producer fair is a state fair and one of the primary fairs in Boa Vista, a place where many come to look for fresh products.

Eight interviews were conducted with poultry traders, responsible for the establishments, of which 75% (6/8) were men and 25% (2/8) were women. The results agree with [Patrícia et al. \(2012\)](#) when evaluating fairs in Rio Grande do Norte State, of which 92% of the 50 interviewees were male. In a similar study, [Oliveira \(2015\)](#) carried out surveys on the profile of marketers at the Alfenas Free Fair, State of Minas Gerais, identifying 72% of male and 28% female respondents.

The traders were from different Brazilian states, with 12.5% (1/8) from the South Region, 37.5% (3/8) from the North Region, and 50% (4/8) from the Northeast Region. Therefore, half of the interviewees came from the Northeast region and were active in the poultry trade in their home states. According to [Costa & Santos \(2015\)](#), in Brazil, free markets have been present since colonization and are still important spatial forms prominently in cities, and some regions, such as the northeast.

The level of education varied among the traders. Thus, 37.5% (3/8) had elementary school, 37.5% (3/8) had high school, 12.5% (1/8) completed higher education, and 12.5% (1/8) did not. [Rocha et al. \(2010\)](#) showed that at the Passo Fundo producer fair, State of Rio Grande do Sul, 9% of the marketers had completed higher education, and [Santos \(2010\)](#) also identified a lower percentage of marketers with complete or incomplete higher education, corresponding to 3% of the total respondents, in free market de Areia, State of Paraíba. None of the interviewees had a technical training or had any previous training

to perform the activities. However, when asked about the possibility of attending courses in the area, 87.5% (7/8) answered in the affirmative.

During the interview, it was found that the main categories of poultry traded were domestic chicken (*Gallus gallus domesticus*), free-range chicken, white chicken, laying hen (Rhodia), geese (*Anser domesticus*), ducks (*Anas platyrhynchos*), and Angola chicken (*Numida meleagris*), in addition to the sale of eggs by 25% (2/8) of traders, as shown in [figure 1](#). It was observed that the consumer preferred heavy animals, regardless of age, even though that older animals have relatively hard meat characteristics and may present health problems. Benez (2004) reported that the physical properties of poultry meat depend on the age of slaughter and bird species. Birds that are slaughtered at a young age, (6-13 weeks old for chickens) have typically tender meat, and their skin is smooth, supple, and delicate. Meat from discarded breeding poultry, which is usually old, has a smaller volume and is less tender.

Figure 1. Representation of birds found at the rural producer fair in the municipality of Boa Vista – RR. Source: author's collection.

The animals were transported from the property of the breeders to the fairs in vans packed in plastic boxes, as shown in [figure 2](#). This route takes about one to five hours (depending on the location of property), with no specific time set for transportation. No health certificate was provided when the birds were purchased. Bird transport was observed around noon during one of the visits to the establishments, which undermines animal welfare practices and generates stress-related mortality. When birds are subjected to thermal stress, depending on its magnitude and duration, there are high rates of prostration and mortality (Moura, 2001). According to the legislation, animals must be handled and transported well to reduce stress and avoid injury and unnecessary suffering (BRASIL, 2008).

In the establishments, the birds were kept in 1 m² cage made of galvanized metal, protected from sunlight. The cage population density ranges from 6 to 10 birds, and they receive water ad libitum. The 12-hour pre-slaughter fast (OIE, 2020) is done by 37.5% (3/8) of traders, but 62.5% (5/8) of traders do not perform fasting. When animals remained in place prior to slaughter, the birds were fed at the end of the working hours. Food fasting must be respected, emphasizing the importance of not being short or prolonged, in addition to minimizing the impact of weight loss. This period is sufficient for the gastrointestinal tract to empty itself satisfactorily, keeping the structures intact enough so that they do not rupture during evisceration.

According to traders, cleaning and sanitation of the enclosures that shelter the animals were done weekly, using water, washing powder, chlorine solution, and formaldehyde solution. The cleaning of slaughter equipment and utensils was done with the products mentioned but performed at the end of each slaughter. It is recommended that the use of waterproofed floors is resistant and easy to sanitize, built to facilitate the collection of wastewaters and to drain the sanitary effluent, besides the use of

sanitary barriers that have specific equipment and utensils in access to the production area and hand hygiene sinks in the production areas. This process is similar for all the interviewed traders.

The birds were slaughtered inside the establishments, in domestic kitchens, containing small equipment such as a bleed funnel, plucking, and other utensils used to perform the activity. Overall, the facilities and utensils did not meet the hygienic-sanitary quality requirements, increasing the possibility of cross-contamination ([BRASIL, 1999](#)). For slaughter, the birds were placed in inverted cone-shaped structures, aimed to contain the animal, but no stunning method for slaughter was performed. The great vessels were cut in the ventral region of the neck. Normative Instruction No. 03 ([BRASIL, 2000](#)) states that the slaughter of animals is only permitted with the use of humanitarian methods based on scientific principles. In this case, stunning can be performed as described by [BRASIL \(1999\)](#). The blood was collected in plastic containers and then packed in plastic bags at room temperature until the product was sold. Ordinance no. 210 ([BRASIL, 1999](#)) describes that the collected blood should be destined for industrialization, as inedible, or other convenient destinations, at the discretion of the inspection service.

The scalding of the animals shortly after death presented grave deficiencies, as they were carried out in large pots containing hot water without water renewal, which can become a major cross-contamination point between carcasses. The scalding temperature should be controlled, indicating 53 °C for three min, as this process aims to facilitate the removal of feathers. However, when this process is not controlled, it can result in technological damage, such as red areas on the skin, which is unattractive to the consumer, a primary concern, since it was carried out by all the traders who performed the slaughter on the spot. The removal of the feathers was performed mechanically with rubber fingers, but difficult to affirm, whether they were in ideal condition resulting in inefficient removal of the feathers, or even carcass abrasions.

Evisceration was performed manually, starting with an opening in the abdominal region, with subsequent removal of the viscera, which were placed erroneously on the surface of the sinks. This process must be performed carefully, since the gastrointestinal tract can be disrupted and come in contact with the entire carcass, interfering with the quality of the product, shortening its useful life, and becoming a public health problem ([BRASIL, 1999](#)). The use of Personal Protective Equipment (PPE) was not observed, in any stage of the slaughter of birds, in the eight trades visited. Ante - and postmortem inspections were not performed.

From the described processes, the carcasses should be wrapped whole or in cuts in suitable packaging for marketing. Consumers' purchase of hot carcasses is a cultural issue over the years in Boa Vista, and the fact that you can choose the bird to be slaughtered seems to add value to this type of marketing. The hot carcass is the preferred form of purchase for customers, and there is no need to refrigerate the product. This report is similar to that reported by [Santos et al. \(2014\)](#). During the interviews, 70% of the fairgrounds of Campina Grande Central Fair (State of Paraíba) stated that inadequate refrigeration of poultry meat does not cause any harm to the health of consumers, and only 5% believe otherwise. According to [Correia & Roncada \(1997\)](#), the marketing of animal foods in free markets, exhibited in stalls without refrigeration and protection, and in the presence of dust and insects can change the quality of the product.

In addition to the sale of "hot chicken," there was also the sale of chicken with blood. On average, for every 10 birds slaughtered, 5 were sold with blood. Traders reported that this number has been falling. The carcasses could be sold whole or in cuts, according to customer demand, with the majority of consumers being male, as shown in [figure 3](#). Each piece of chicken was sold in plastic packaging (purchased from commercial packing houses, Styrofoam trays, film paper, bags), containing the heart, liver, gizzard, and sometimes the blood of the respective bird. There was no carcass weighing system, and the sale was characterized per piece.

From Monday to Friday, an average of 154.6 birds was sold each day, totaling 773 animals. On Saturdays and Sundays, consumer demand increased considerably, as the average slaughter was 435 animals on each day, resulting in 870 animals per weekend. Thus, on average, 6,572 birds are slaughtered and sold monthly, considering the activity of all traders.

The water used in the activities of each establishment and slaughtering process was acquired by the piped water distribution system of the Roraima Water and Sewerage Company. No other treatment was performed by the traders. Thus, the lack of control of chlorination or even microbiological quality of the

water used and its direct contact with the carcasses of birds at the end of the slaughter stage, may compromise the final quality of the product. The water quality and use in the establishments are outlined in Ordinance no 210 ([BRASIL, 1999](#)).

Figure 2. Poultry transport carried out close to 12 hours, during a visit to the poultry sale facilities of the Producer's fair in the Municipality of Boa Vista-RR. Source: author's collection.

Figure 3. Whole carcasses and poultry cuts sold in the establishments of the producer's fair in the municipality of Boa Vista-RR. Source: author's collection.

Waste generated from the slaughter process was disposed of in domestic waste collected by the municipal government's waste collection system at the end of each day, resulting in the accumulation of mixed waste (organic and non-organic). This causes an inconvenience to people who live near the producer fair and to those who periodically transit the locality, including the consumers themselves. In addition, an inadequate way of disposing of organic waste through the sinks of the slaughterhouse kitchens was observed. When asked about some form of alternative uses for waste, only one trader reported the use of poultry litter in his composting process for use in a home garden.

Conclusion

The poultry trade at the rural producer fair did not have adequate hygienic-sanitary conditions of production (handling, slaughtering process, and commercialization), needing to improve them, as well as the implementation of welfare and sanitary control of the slaughtered animals to avoid damage to public health. It is necessary to control the purchase, sale, and slaughter activities of animals, recording the possible economic losses as well as the regularization of their activities in accordance with the legal requirements of the inspection agencies.

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