









Case Report

## Poultry litter intake by cattle: epidemiological characterization and sanitation of health hazards

Ingestão de cama de aviário por bovinos: caracterização epidemiológica e saneamento do agravo sanitário

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### ABSTRACT

The aim of the current study is to report a sanitary episode of poultry litter intake by cattle, based on the epidemiological characterization of health hazards and of sanitation measures implemented in the investigated property. The sanitary episode resulted from an anonymous report about the use of poultry litter as cattle food. The rural property located in São José de Ribamar County, Maranhão State, was inspected 72 hours after the complaint. Based on the initial inspection, 119 Nelore cattle were subjected to confinement system and fed on cattle food added with poultry litter. Given such discovery, cattle food samples were collected and sent to the National Agricultural Laboratory of Santa Catarina State. Laboratory results have shown the incidence of uncalcined bones, unhydrolyzed feathers and blood in the analyzed samples, which confirmed the inclusion of animal by-products in cattle's diet. The current study is the first official report about poultry litter intake by cattle in Maranhão State, which was officially confirmed by laboratory results evidencing the presence of animal by-products in the analyzed samples. It is essential intensifying the active inspections carried out in ruminant-breeding farms in Maranhão State, as well as controlling poultry litter transit by documenting the purpose of its use.

### RESUMO

Objetivou-se com o estudo relatar o episódio sanitário da ingestão de cama de aviário por bovinos, caracterizando epidemiologicamente o agravo sanitário e as medidas de saneamento implementadas na propriedade. O episódio sanitário resultou de denúncia anônima sobre o fornecimento de cama de aviário como alimentação para bovinos. Após 72 horas da denúncia realizou-se fiscalização à propriedade rural, localizada no município de São José de Ribamar, estado do Maranhão. Na fiscalização inicial constatou-se a criação de 119 bovinos da raça nelore em sistema de confinamento, sendo verificada a inclusão de cama de aviário na alimentação dos bovinos. Diante da constatação procedeu-se a coleta de amostras de ração e envio do material coletado ao Laboratório Nacional Agropecuário de Santa Catarina. No resultado laboratorial foi detectada a presença de ossos não calcinados, penas não hidrolisadas e sangue o que comprova a inclusão de subprodutos de origem animal na alimentação dos animais. Este é o primeiro relato oficial de ingestão de cama de aviário por bovinos no estado do Maranhão com confirmação laboratorial oficial da presença de subproduto de origem animal. Sugere-se a intensificação nas fiscalizações ativas em propriedades de criação de ruminantes no estado do Maranhão e controle no trânsito da cama de aviário que conste na documentação a finalidade de uso desse material.

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## INTRODUCTION

The production, distribution and use of pig/poultry waste, such as poultry litter, to feed ruminants is forbidden in Brazil. Normative Instruction (NI) n. 08, which is the legal apparatus regulating this prohibition, was issued by the Ministry of Agriculture, Livestock and Supply (MAPA - Ministério da Agricultura, Pecuária e Abastecimento) on March 25, 2004 (BRASIL, 2004).

The use of poultry litter is routine in Brazil, although its use to feed ruminants was banned in the country and despite understanding about health hazards (Bovine Spongiform Encephalopathy (BSE), botulism and the incidence of antimicrobial agents) resulting from this practice and the sanctions expected to result from its use (DIEHL, 2010). According to Leme; Boin (2000), using this by-product as protein in the diet of ruminants (cattle, buffaloes, goats and sheep), mainly of cattle, is not a recent procedure. It basically results from two aspects, namely: ruminant's ability to use food containing non-protein nitrogen (NPN) compounds and to metabolize fibrous food; and the abundance, and reduced value, of this material.

According to Galiza et al. (2010), less than one gram of infecting material can transmit BSE (bovine neurodegenerative disease); therefore, even low meat-and-bone meal concentrations in ruminant's diet can transmit the disease.

Official sanitary measures were implemented after the global BSE crisis in order to control the disease, mainly because it is transmissible to humans through infected tissue intake (SEUBERLICH; HEIM; ZURBRIGGEN, 2010). The entire production chain has been inspected since 1996 in order to avoid BSE introduction in Brazil (DIEHL, 2010).

According to Seuberlich; Heim; Zurbriggen (2010), the number of new BSE cases has decreased after ruminants' diet supplemented with meat-and-bone meal, as well as the use of specified risk materials (SRMs), were banned. Based on Diehl (2010), animal feed industries, rendering plants and ruminant-breeding sites should be regularly inspected in order to avoid poultry litter use as animal food. These measures and actions can be simultaneously applied throughout the Brazilian territory.

Therefore, the aim of the current study was to report a sanitary episode of poultry litter intake by cattle, based on the epidemiological characterization of health hazards and of sanitation measures implemented in the investigated property.

## CASUISTRY - CASE REPORT

On September 16, 2016, an agricultural inspector who worked for Maranhão State Agency of Agricultural and Livestock Defense (AGED/MA - Agência Estadual de Defesa Agropecuária do Estado do Maranhão) received an anonymous phone call reporting about a rural producer who was supplementing cattle's diet with poultry litter. Seventy-two (72) hours later, the Official Veterinary Service (SVO - Serviço Veterinário Oficial) of Maranhão State sent its professionals to the rural property in question to investigate whether the complaint was real.

The rural property in São José de Ribamar County, Maranhão State, had 119 Nelore mongrel male bovines in the age group 24-36 months who were kept in semi-intensive production system. The animals were rented by the farmer to be used in the sport practice known as *vaquejada*. The property did not breed any other species.

At the time, cattle food samples were collected in duplicate (inspection and confirmation test) in the presence of the farm owner (Figure 1a). Next, they were sent to the National Agricultural and Livestock Laboratory of Santa Catarina State (LANAGRO/SC - Laboratório Nacional Agropecuário de Santa Catarina) to enable the identification, or not, of animal by-products in them, based on microscopy technique, according to NI n. 69 from September 23, 2003 (BRASIL, 2003).

The farm owner was instructed about the health strategies to be adopted until the laboratory results were released and cattle transit was banned from the site. Simultaneously, 119 bovine individuals who had access to cattle food suspected of having prohibited animal by-products were identified with cold paste and acrylic water-based paint (Figure 1b). Complementary visits to the rural property were scheduled in order to follow up ruminants who had access to suspicious food (transit; robbery, theft or escape; and disease or death cases); they took place until the laboratory results were released.

Figure 1 - Procedures carried out in the rural property suspected of providing poultry litter in cattle's diet: (a) sample collection (inspection and confirmation test); (b) cattle identification with acrylic paint.



## DISCUSSION

The initial inspection in the reported rural property showed that poultry litter was added to the diet of the

investigated cattle (Figure 2). Laboratory results have shown uncalcined bones, unhydrolyzed feathers and blood in the analyzed samples, and this outcome evidences cattle feeding on animal by-products.

Figure 2 – Poultry litter provided as food (in trough) to cattle in the reported rural property.



Based on NI n. 41 from 2009 and on the Animal Health Defense (DSA) Internal Standard n. 09 from 2010 - both issued by MAPA -, as well as on laboratory results, the farm owner was notified about the need of slaughtering the infected cattle in a slaughterhouse controlled by State (SIE) or Federal Inspection Service (FIS), or in his own farm within 30 days after the notification.

The 119 infected cattle were slaughtered in a FIS-controlled slaughterhouse located in Igarapé do Meio County, Maranhão State. This slaughterhouse was located approximately 238 km away from the notified rural property. Specified risk materials (SRMs) such as the distal part of the ileum, spinal cord, tonsils, eyes and encephalon were removed from the slaughtered animals and incinerated during the slaughtering procedure (Figure 03).

Figure 03 – Sanitary slaughter of 119 cattle and removal of specified risk materials (SRMs): (a, b) slaughtering procedures; (c) professional qualified to remove SRMs; (d) spinal cord, (e) tonsils and (f) encephalon removal.



Health hazard was terminated after slaughter. However, since it involved the use of animal by-products in cattle food, the farmer was fined in R\$ 1,500.00; he also had to pay for the inter-municipal transportation and for the slaughter of the 119 infected animals. Meat deriving from the slaughtered animals was released for

consumption, because BSE (in case of infection) can only be transmitted through genetic material and SRMs. There is significant incidence of residual risk materials when SRMs are not properly removed. Therefore, SRMs should not be used to feed ruminants, or to produce meat and bone meal or fatty products used in rendering



processes, in order to avoid BSE agent transmission (BRASIL, 2008).

According to Fonseca (2015), keeping the ban on cattle diets supplemented with animal by-products, as well as SRM removal, are the main risk mitigation measures that should be kept even after the eradication of classic BSE cases. However, when it comes to SRMs, it is essential adopting a strong scientific basis at the time to decide whether these measures are appropriate to reduce tissue infectivity in bovine carcasses infected with atypical BSE prion.

According to Fonseca (2015), there have been noticeable improvements in risk mitigation measures focused on classic BSE cases. However, it is necessary implementing a continuous surveillance system if one takes into consideration the assumption that atypical strains can be sporadic and do not present geographical trends.

BSE identification in a given territory brings severe commercial implications to the image of the affected countries in the international market. Importing countries can have a negative reaction to it and fully or partially close their borders to such infected goods. Consequently, the exporting country can suffer a significant impact from BSE identification, even when the health issue is proven to be under control. In addition, BSE burdens both public and private budgets due to the investments required to control and eradicate the disease.

According to Diehl (2010), based on SVO's inspections conducted in Brazil in 2010, 405 cattle from seven properties in Paraná State were slaughtered for been fed with poultry litter. More than 1,500 cattle from a single property in Mato Grosso do Sul State were slaughtered for being fed with cattle food containing animal protein.

Brazil is in the BSE-controlled risk category. The country will have to prove, among other premises, the actual ban on ruminant diets supplemented with animal by-products – i.e., the feed ban - in order to be classified in the 'insignificant BSE-risk category' (the lowest risk category) in future evaluations (DIEHL, 2010).

According to AGED - MA, nowadays, there are 17,392,607 poultry registered in 48,179 livestock farms (MARANHÃO, 2018). According to Maranhão Association of Poultry Farmers (AVIMA, 2012), the state's geographic location favors a good poultry-farming performance. In addition, the state has excellent poultry production conditions, not only because of its favorable climate, but also because it produces most of the grain supply (corn and soybeans) in the Northeastern Region.

Moreira (2018) conducted a study from 2013 to 2016 to characterize the transit of non-edible animal by-products in Maranhão State and recorded the production of 28,615.39 tons of poultry litter. The aforementioned aspects justify the adoption of tighter surveillance on

ruminant-breeding farms, as well as the control of poultry litter production, use and trading.

## CONCLUSION

The current study was the first official report on poultry litter intake by cattle in Maranhão State, which was officially confirmed by laboratory results incidencing the presence of uncalcined bones, unhydrolyzed feathers and blood in the analyzed samples. This report drew attention to the practice of feeding cattle with poultry litter, despite a series of prohibitive measures addressed in Brazilian regulations and implemented in the country. Emphasis was given to the need of conducting active inspections on ruminant-breeding farms, as well as of controlling poultry litter transit by documenting the purpose of its use.

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