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Animal products as a cause of foodborne illness in Brazil between 2015 and 2020

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Foodborne Diseases (FBD) are a major global public health problem, and contaminated animal products are one of the main sources of transmission of zoonotic pathogens to humans. In Brazil, studies on these diseases are still scarce. This descriptive analysis aimed to assess the impact of animal products on foodborne disease outbreaks in the country between 2015 and 2020. The study was based on secondary data made available by the Brazilian Ministry of Health, obtained during the investigation of outbreaks through the e-SIC platform. Data was collected and analysed on the number of FBD notifications in Brazil per year and per geographical region, number of patients, hospitalizations, deaths, food category, seasonality and the presence of factors related to transmission such as unsuitable raw materials, inadequate handling and conservation. The analyses were carried out from a descriptive and epidemiological perspective. Of the total number of notifications (n = 3389), most involved ignored foods (n = 2259; 66.66 %), possibly due to the difficulty of correlating symptoms with foodborne illnesses and the complexity and high cost of isolating the pathogen using traditional diagnostic methods. Of the notifications of declared origin, 311 (27.52 %) were associated with the consumption of animal products, which were less prevalent than food in general. However, the consumption of animal products was 0.4% more likely to be involved in cases of FBD than individuals who ate other foods (OR = 1.004; $p<0.05$). These outbreaks resulted in 7438 (32.38 %) patients, 925 hospitalizations (28.75 %) and 12 (34.29 %) deaths. Among the foods, eggs and beef (58; 18.65 %) were the most frequently incriminated (n = 131; 42.13 % and n = 58; 18.65 %, respectively), probably due to the large production of these products in the country and the pattern of animal protein consumption by Brazilians during the years analyzed. There was a significant difference in the values found for the different geographical regions and prevalence associated with seasonality. The number of notifications and patients differed between all regions ($p = 0.000$), except between the Southeast and South ($p = 0.059$), where the number of patients was higher than in the other regions (n = 2191; 29.46 % and n = 2369;190 31.85 %, respectively). The number of people hospitalized was also different between the regions, except for the North and Northeast, which had the highest numbers ($p =0.085$) and the number of deaths was similar only between the North and South. Notifications associated with animal products were more prevalent in summer and spring, respectively. When present together, the transmission factors associated with outbreaks involving animal products led to an increase in notifications (n = 104; 55.92 %), patients (n = 3036; 62.78 %) and hospitalizations (n = 333; 53.54 %). The results confirm the need to improve systems for investigating FBD in the country and highlight the risk of transmitting zoonoses through the consumption of contaminated animal products,

especially in summer and spring. Preventive actions and health education should be prioritized, since the concomitant occurrence of more than one transmission factor contributed decisively to the occurrence of FDB associated with the consumption of animal products.

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