# **Titre d’article**: Epidemiological study of sausage in Algeria: Prevalence, quality assessment, and antibiotic resistance of Staphylococcus aureus isolates and the risk factors associated with consumer habits affecting foodborne poisoning

**Abstract :**

Aim: The first aim was to assess the quality and determine the prevalence and antibiotic susceptibility of Staphylococcus aureus contamination of raw sausage sold in ten municipalities in the Northeast of Algeria. Second, a consumer sausage purchasing survey was designed to investigate potential risk factors that have a significant association with the occurrence of foodborne poisoning among sausage consumers’ behavior and its relationship with independent variables. Materials and Methods: A total of 230 butcheries from ten departments (Daira) of Algiers with more than 40 municipalities were included randomly in these studies to collect raw sausage samples and to distribute 700 structured questionnaires to meat consumers. Our two studies were conducted at the same time, between June 2016 and April 2018. Sausage samples were taken once per butchery to estimate the prevalence of S. aureus contamination and therefore deduct the quality assessment of raw sausage (Merguez) sold in Algiers, Algeria. All isolated strains were tested for their antimicrobial resistance. Furthermore, questionnaires were distributed and used to collect information on various aspects of sausage consumption and foodborne disease. The data collected were analyzed with different statistical approaches, such as the Chi-square test and the odds ratio (OR) univariable logistic model. All the risk factors were analyzed by studying their association with the occurrence of consumers who claimed to have food poisoning after consuming sausage. Results: The overall prevalence of S. aureus contamination from sausages was 25.22% (n=58/230). Over 83.33% of strains showed resistance to at least one of the antibiotics tested. The most important was for tetracycline (58%) followed by fosfomycin (33%), penicillin G (25%), and oxacillin (36%). Moreover, the multiple antibiotic resistance (MAR) index include 20 profiles with MAR >0.2. Out of the 440 meat consumers, 22.16% revealed having food poisoning after sausage consumption. The risk factors recorded were: Consumption outside of home (24.30%, OR=1.769, p=0.040), during the summer season (24.30%, OR=1.159) and during lunch (26.50%, OR=1.421). Conclusion: Our study highlights a high prevalence of S. aureus contamination in Merguez, especially in some departments of Algiers, and the high multidrug resistance of S. aureus isolates against tetracycline and oxacillin; thus, S. aureus contamination in sausage is considered a potential risk to public health. Therefore, to reduce and prevent the spread of resistant strains, robust management and monitoring of antibiotic use should be established. Therefore, it is necessary to improve the sanitation conditions and education regarding personal hygiene and change certain consumption habits of Algerian consumers to ensure food safety. Finally, it can be concluded that the application of the HACCP system is essential either in butcheries producing sausage and/or slaughterhouses. From this perspective, studies might be performed to characterize Staphylococcus spp. and S. aureus to investigate their virulence factors.