

STAPHYLOCOCCUS AUREUS METICILLIN RESISTANT IN GOAT MILK AND DERIVATIVES: A RISK FOR PUBLIC HEALTH

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Abstract

The productive chain of goat milk presents an important socio-economic function in the Northeast region of Brazil. According to an agricultural census made in 2017 by the Brazilian Institute of Geography and Statistics, Brazil has 8.254.561 million goats, in which more than 80% of the herd is located in the Northeast. In regards to goat milk production, in the same year, 25.346.000 million liters were produced. Despite the importance of goat milk production, this activity is marked by many development issues, mainly, sanitation, reproductive, nutrition management problems, the lack of political incentive, and long droughts. Among these, goat mastitis is considered one of the most frequent sanitary problems of herds, affecting dairy industries around the world, as well as representing a great risk to human food safety because of microbial contamination of milk and its derivatives. Methicillin-resistant *Staphylococcus aureus* (MRSA) is currently the main concern for One Health, for it can cause cases of persistent infections in humans and animals because of the presence of the genes *mecA* or *mecC* located in the *Staphylococcal Chromosomal Cassette mec* (SCCmec). When expression of the *mecA* or *mecC* genes occurs, the expression of an alternative protein, *penicillin-binding protein 2a* (PBP2a) occurs, it has 78 kDa, and low affinity to β -lactams. The PBP2a is a refractory molecule to β -lactams action, it takes the function of membrane proteins "S. aureus Typical PBP" in the presence of a β -lactam antibiotic. This way, PBP2a goes through a substantial conformational alteration in the moment of interaction with β -lactam antibiotics, and that mechanism allows a cross binding between antibiotic and the bacterial cell wall structure, without the occurrence of metabolic interference. This means that MRSA strains are resistant to almost all antimicrobials of the β -lactam class, except the last generation of cephalosporins. Around the world, various studies have recorded MRSA strains in goat milk and its derivatives. These have great economic importance, especially in human feeding/diet. Despite the technological evolution of the dairy industry to meet the norms established by the authorities, the application of sanitary measures, those which must be followed in all goat milk and derivatives productive chain, besides sanitary protection of herds. This way it is possible to fabricate a safe food for consumers.

Keywords: Goat raising, MRSA, Food poisoning, Antimicrobial resistance.

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