RESUMEN: ANTIBIOTIC RESISTANT COLIFORMS IN A PAMPA RURAL WATERSHED LOCATED IN BUENOS AIRES ARGENTINA.

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Resumo:

The increase in antimicrobial resistance of microbial populations is an issue of global concern. Antibiotics are extensively used in livestock to prevent and treat disease, as well as to promote growth. Consequently, animal waste produced in agricultural settings can contain resistant bacteria, resistance determinant present in gene-transfer units, or combinations of both. Understanding the distribution of antibiotic resistant bacteria in water sources in an agricultural watershed is important since water is the link between the four major reservoirs – human, animal, soil, and aquatic. Cattle production in the Pampas has undergone changes with increasing feedlots. The present study was conducted to increase our knowledge of the distribution of antibiotic resistant coliforms in an agricultural watershed. The prevalence of resistant coliforms β-lactam antibiotics in the system of natural watercourses which connects a feedlot with Burgos Arroyo was determined. Water and sediment-water samples, in the feedlot (point 1) and 5 km from feedlot (point 2) were taken during seasonally 2012-2014. Antibiotics were added to the culture media (Gelose VRBL) to evaluate the percentage of resistant bacteria by comparison with plating experiments without any antibiotics. Resistance to ampicillin, cephalothin, ceftazidime and ceftriaxone was tested. All samples were detected coliform resistant to ampicillin and cephalothin. The mean percentages of ampicillin-resistant coliforms were found to be 14,73% (point 1), 44,39% (point 2) for water with sediment. The percentage of resistance showed by cephalothin were 17,04% and 48,69% for point 1 and point 2 respectively. Resistant bacteria to cephalosporins of third generation as ceftazidime and ceftriaxone were detected. Based on analysis of regression between the percentages of resistance to the different antibiotics, 95 % of the resistant bacteria to ampicillin, in the point 1 were also resistant to cephalothin. The selection and dissemination in the nature of antibiotic-resistant strains is a practice that must be controlled in order to maintain an ecological balance that favors the prevalence of susceptible bacteria and ensure the effective treatment of human infectious diseases.

Key words: antimicrobial resistance, coliforms, feedlot