

Aloe barbadensis Miller (Aloe vera) combined with beta-lactam antibiotics as a therapeutic alternative to treat mastitis in dairy cattle

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Biography

Natalia Forno has obtained her PhD in Agriculture, Forestry and Veterinary Sciences from Universidad de Chile. Her main area of interest are natural compounds from plant extracts as an alternative to traditional antibiotic drugs. As a part of a team of the Laboratory of Veterinary Pharmacology (FARMAVET) from the same university, Natalia has been researching about the antibiotic effect of Aloe vera against causing-mastitis bacteria, and its combination with beta-lactam antibiotics. Currently, Natalia is managing a project to optimize pharmaceutical formulations based on the combination of an extract of Aloe vera gel and beta-lactam antibiotics to treat mastitis in dairy cattle.

Abstract

Mastitis is a common and costly disease in dairy cattle. High levels of antibiotic resistance have been reported to *Staphylococcus aureus*, one of the main causing-mastitis bacteria, therefore antibiotic therapies have loss efficiency. Antibacterial effect of Aloe barbadensis Miller (Aloe vera) against bacteria responsible for this disease has been demonstrated, mostly due to its inner gel's phenolic compounds. In order to diminish the use of traditional antibiotics and simultaneously increase the antibiotic activity of plant-derived constituents, the combination between both parts has been studied. In the case of Aloe vera, an alcoholic extract obtained from the gel of this plant presents a synergistic or additive effect against *S. aureus* when combined with some beta-lactam drugs, such as cloxacillin and ceftiofur, drugs that are commonly used to treat clinical mastitis caused by *S. aureus*. Owing to the interaction between Aloe vera and cloxacillin and ceftiofur, lower Minimum Inhibitory Concentration (MIC) values are obtained for the combinations than for each antimicrobial on its own when used against *S. aureus*. In addition, the presence of several action mechanism of Aloe vera gel extract and the combinations avoids the development of resistance of *S. aureus* against these antimicrobial agents. The evidence suggests that combinations between Aloe vera gel extract and low concentrations of cloxacillin or ceftiofur could be suitable to treat mastitis in dairy cattle via intramammary syringes. Lower doses of antibiotics could also mean a potential reduction of the withdraw period and the risk of residues violations in bulk milk tank, thus contributing in the accomplishment of safety food standards without reducing efficiency. However, further efficiency and safety studies are mandatory to develop intramammary formulations containing these combinations.



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