

## XIX CONGRESO DE LA SOCIEDAD ARGENTINA DE MICROBIOLOGÍA GENERAL

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**ONE HEALTH APPROACH IN CAPRINE PRODUCTION USING THE PROBIOTIC STRAIN *Lactobacillus johnsonii* CRL 2240 CULTURED USING BEER INDUSTRY RESIDUE**

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One Health is a global strategy that promotes multidisciplinary partnerships related to animal, human, and environmental health care. Due to the strategic importance of animal health, not only concerning public health and food safety but also in the environment and the rural economy, there is a need to promote research, technological development, and innovation to improve the existing production models by focusing on the needs faced by the different species. In the last years, research on the use of probiotics to promote animal health has boomed. Lactic acid bacteria (LAB) are microorganisms present in different ecosystems and have been used for the production of fermented foods for centuries. Some have been recognized as probiotics, both for humans and animals, and used in the production of functional foods and feed. The objective of this work was to develop a technological platform in which selected LAB can be applied to small goat farms in Tucumán to improve the health and productivity of the animals with a positive impact on humans and the environment. *Lactobacillus* (L.) *johnsonii* CRL 2240 was previously isolated and selected because of its high ferulic acid esterase activity and probiotic properties in vitro. The biomass production of this strain was evaluated in animal protein-free medium using beer bagasse (7.6% carbohydrates, 16.4% crude protein, 4.4% fat matter, 34.1% dietary fiber, 33.8% insoluble dietary fiber, 0.3% soluble dietary fiber, and 3.12% humidity). Different growth conditions and ingredients were used to optimize biomass production. Biomass was concentrated, suspended in an encapsulating matrix previously defined, and spray-dried. The obtained powder was used to supplement the diets of young goats. It was shown that our optimized low-cost, animal protein-free medium containing beer bagasse residue was able to increase the growth of *L. johnsonii* CRL 2240 fivefold ( $2 \times 10^8$  vs  $1 \times 10^9$  CFU/mL) and in a shorter incubation period compared to conventionally used growth medium (LAPTg). Optimized spray-drying conditions were used to obtain

powdered biomass (0.15 Aw, 3.4% humidity, 90% survival,  $4 \times 10^8$  CFU/g dry matter) that was resuspended and sprayed over the feed administered daily to young goats. Control animal's diets were supplemented with bacterial free spray-dried medium. Preliminary results obtained in this study showed that the probiotic strain had positive effects on the production parameters of the animals. In conclusion, we were able to optimize the production of a probiotic strain using a waste product, which can contribute to the circular economy of beer industry by reducing its environmental impact. This strain will be evaluated in future studies including a higher number of animals in order to explore its effect on growth and health parameters in order to reduce the use of antibiotics for treatments and as a growth promoting compound.

Palabras clave: livestock production – probiotics – animal welfare– industrial by-products