

**TITLE:** Soy flour utilization for bacteriocin production by *Enterococcus durans*

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**ABSTRACT:**

Bacteriocins are antimicrobial peptides ribosomally synthesized by the group of lactic acid bacteria (LAB) and have GRAS (Generally Recognized As Safe) status. It has wide use in the food industry as a natural preservative, against both Gram positive and Gram negative bacteria. Despite these qualities, bacteriocin is typically produced in complex and expensive culture media, making large-scale production unfeasible. Components and residues from the agribusiness have been a cheap alternative for the production of these metabolites. In this scenario, we propose culture media for the production of enterocin by the isolate *E. durans* MF5 using soybean flour as the main protein source. Four formulations were prepared, containing between 10% and 16% of soy flour, namely M1, M2, M3, and M4. The first M1 and M2 formulations containing dextrose. The control medium was the ManRogosa Sharpe (MRS). The bacterial was  $1.5 \times 10^6$  CFU, and incubation at 37 °C/24h. The PCR detection revealed the presence of *entA*, *entX*, and *entP* genes in the MF5 isolate. The antagonistic action and the arbitrary unity of the enterocins against the target bacteria *Listeria monocytogenes* and *Listeria innocua* were used well diffusion method. We evaluated the target bacteria cell lysis using scanning electron microscopy (SEM). We also confirmed the protein constitution of the produced enterocin using proteolytic enzymes. The enterocin produced in soy flour formulations showed antimicrobial activity against the foodborne bacteria. The formulations M1 and M2 did not differ significantly from the MRS. Moreover, the SEM revealed changes in the morphology and protuberances in the cell wall of the target bacteria, highlighting cell leakage. After enzymatic treatment, enterocin lost its activity, confirming the peptidic constitution. The results are promising, as we developed low-cost culture media for the growth and the production of enterocin by *E. durans* MF5.

**Keyword:** Bacteriocins, whey soy, lactic acid bacteria

**Development Agency:** CNPq; Fundação Araucária.