

BACTERIOCINS AS NATURAL TOOLS FOR FOOD PRESERVATION AND ACTIVE PACKAGING

J. Tkáčová, A. Pavelková
Slovak University of Agriculture in Nitra

Background

- **Foodborne Pathogens:**
 - *Listeria monocytogenes*
 - *Salmonella spp.*
- **Problem:**
 - Increasing consumer resistance
 - Demand for natural preservatives

Aim

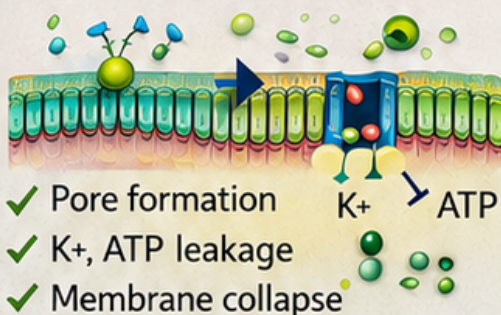
To evaluate bacteriocins as natural antimicrobial agents and their application in food packaging systems.

Core Science

Classification

I	post-translationally modified peptides
II	unmodified, heat-stable peptides
III	heat-labile peptides
IV	large proteins

Mechanism of Action



Application & Impact

- **Bacteriocins in Packaging:**
 - ✓ Active packaging
 - ✓ Controlled release
 - ✓ Shelf life extension

Types of Systems

- **Edible films**
- Biopolymers (*chitosan, PLA*)
- Nano-encapsulation

Advantages

- ✓ Natural origin
- ✓ Low toxicity
- ✓ No resistance
- ✓ Thermal stability

Limitations

- ✗ Stability in matrix
- ✗ Cost
- ✗ Regulatory issues

Future Trends



Bacteriocins represent a promising natural alternative to synthetic preservatives and offer strong potential in active and intelligent food packaging systems.