

post biotic

Flotresis

Yeast culture + Acidifier



- Increasing the quantity and quality of milk production
- Improving the immune system and reducing the somatic cell count
- enhancing the feed conversion ratio and improving the fecal consistency score



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Introduction

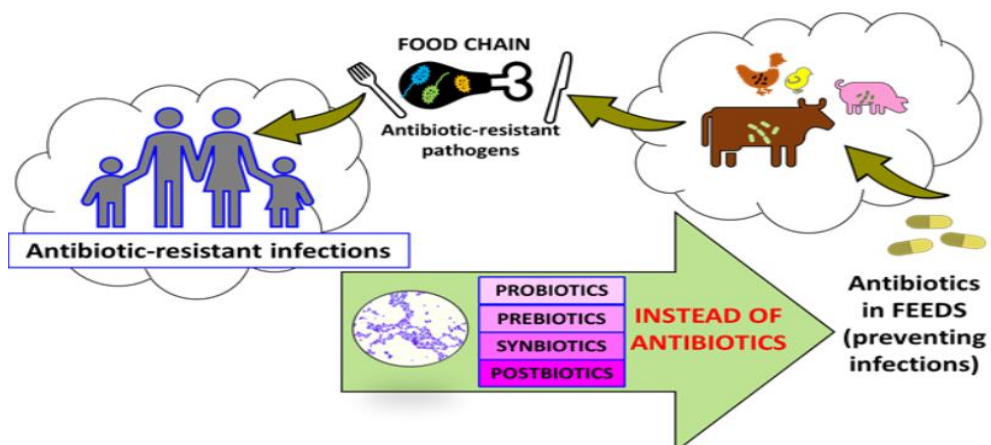
With the increasing demand for livestock products, livestock farms have moved towards industrialization. In industrial farming, high-fermentation carbohydrate sources are used to enhance productivity. However, due to the incompatibility of the ruminant digestive system with this type of diet, metabolic disorders and a reduction in the economic lifespan of the herd occur.

The high consumption of concentrates leads to an increase in volatile fatty acid production in the rumen. If these acids exceed the permissible limit, their excessive accumulation disrupts the microbial balance of the rumen. This issue results in the growth of gram-negative bacteria, the production of inflammatory agents, hypersensitivity reactions, and a decline in livestock productivity. Consequently, problems such as lameness, reduced milk production, and decreased economic efficiency in livestock farming arise.

The Floresis product, with its unique composition, can ensure rumen health. By improving feed intake, increasing energy balance in cows—especially during the transition period—and regulating the microbial balance in the rumen and intestines, this product plays a vital role in disease prevention.

Moreover, there is an increasing need for natural alternatives to protect livestock against diseases and reduce antibiotic use. The overuse of antibiotics has led to bacterial resistance, resulting in restrictions on their usage. Postbiotics serve as a suitable alternative to antibiotics, offering numerous positive effects, which will be further discussed in the following sections.

Farzanegan expert group produced this product by reverse engineering of a product called Celmanax from Vi-cor company from USA. The formulation and produce of this product take 5 years and finally in 2022 we can achieve mass production.



Floresis Postbiotic

In 2019, the International Scientific Association for Probiotics and Prebiotics (ISAPP) defined “postbiotics” as cellular components, metabolites, or byproducts of microbial fermentation that benefit host health.

Floresis postbiotic is a product that contains killed *Lactobacillus* bacteria, yeast cell wall derivatives, beta-glucans, mannan oligosaccharides, proteins, peptides, amino acids, bacterial DNA, lactic acid, minerals, and other beneficial metabolites.

The production process of Floresis occurs in two controlled stages:

1. Aerobic fermentation, where the necessary substrates, *Lactobacillus* bacteria, and yeast are cultivated.
2. Anaerobic fermentation, where further microbial metabolism occurs under controlled temperature, oxygen, and pH conditions.

Before starting the process, molasses is diluted with distilled water and sterilized. It is then enriched with nitrogen, phosphate, minerals, and vitamins. The purified yeast strain *Saccharomyces cerevisiae* is introduced into the fermentation medium. After microbial proliferation, enzymes hydrolyze the bacterial cell walls, breaking them down and making their beneficial components more bioavailable.

Superiority of Floresis Postbiotic

Although probiotics have shown positive effects in livestock nutrition, they come with practical challenges:

- **Environmental Sensitivity:** Probiotics are highly sensitive to heat, humidity, pH, and sunlight.
- **Survivability Issues:** Maintaining live probiotic bacteria during storage and feed processing is difficult.
- **Antibiotic Resistance Risk:** Some probiotics may carry antibiotic resistance genes, which can be transferred to pathogenic bacteria.
- **Variability in Effectiveness:** The survival rate of probiotics varies under different environmental conditions, making their dosage difficult to standardize.

Postbiotics, such as Floresis, overcome these challenges. Since they do not contain live microorganisms, they:

- ✓ Are stable during storage and feed processing
- ✓ Do not pose a risk of antibiotic resistance gene transfer
- ✓ Have consistent and predictable effects
- ✓ Do not require refrigeration

Given these advantages, Floresis serves as a practical and efficient alternative to probiotics in livestock nutrition.

Composition of Floresis

1. Bacterial Cell Wall Components

Postbiotics, such as Floresis, contain beneficial bacterial cell wall components, primarily from Lactobacillus and Bifidobacterium. These components include:

- Peptidoglycans, which help maintain gut immune balance
- Teichoic acids, which act as immunomodulatory molecules
- Polysaccharides, which have prebiotic and anti-inflammatory properties

These cell wall fragments stimulate the immune system and contribute to overall gut health.

2. Polysaccharides

Polysaccharides in Floresis are divided into three main types:

1. Exopolysaccharides (EPS) – Produced by bacteria and secreted externally, EPS enhances gut microbiota, strengthens the gut barrier, and possesses antibacterial and anti-inflammatory properties.

2. Capsular polysaccharides – These are tightly attached to bacterial cells, protecting them from dehydration and environmental stress.

3. Cell wall-bound polysaccharides – These play a crucial role in bacterial adhesion and immune regulation.

Studies have shown that exopolysaccharides from *Lactobacillus rhamnosus* have significant antimicrobial effects against pathogens such as *Escherichia coli* and *Salmonella enterica* serovar Typhimurium.

3. Bacterial DNA

Bacterial DNA fragments in Floresis act as immune stimulators. Specific sequences called CpG motifs in bacterial DNA activate immune cells, leading to increased production of cytokines (such as IL-6 and TNF- α), which help defend against infections.

Additionally, bacterial DNA from *L. rhamnosus* and *B. longum* BB536 has been shown to enhance gut barrier function, reduce inflammatory responses, and prevent allergic reactions.

4. Proteins, Peptides, and Amino Acids

Floresis contains essential proteins, peptides, and amino acids, which:

- ✓ Support gut epithelial cell growth
- ✓ Enhance immune responses
- ✓ Reduce pathogen adhesion to gut cells

Specific surface proteins from *Lactobacillus* compete with pathogens like *Salmonella enteritidis* and *E. coli*, preventing them from colonizing the gut.

5. Lactic Acid

Floresis contains 10-15% lactic acid, which:

- Reduces rumen pH, promoting beneficial microbial growth
- Inhibits harmful bacteria by disrupting their DNA synthesis
- Enhances mineral solubility and absorption
- Improves feed conversion efficiency

Lactic acid in the rumen lowers methane production, making it an environmentally sustainable feed additive.

6. Yeast-Derived Metabolites

Floresis contains yeast-derived β -glucans, mannan oligosaccharides (MOS), and nucleotides, which:

- ✓ Bind and eliminate toxins from the gut
- ✓ Enhance immune function by activating white blood cells
- ✓ Improve digestion and nutrient absorption

MOS prevents pathogenic bacteria from adhering to gut cells, reducing the risk of infections.

Table 1: Comparison between Floresis[®] and Celmanax[®] composition and nutritional properties (Dry matter basis)

	Celmanax	Floresis
Physicochemical properties (%)		
pH	3.8 - 4.2	3.8 - 4
Dry matter	-	42 ± 2
Crude Protein	25.55	34 ± 0.1
Gross Energy ¹ (Kcal/kg)	NA	4540 ± 200
Crude Fat	2.44	4.5 ± 0.3
Total Carbohydrates	NA	22
Crude Fiber	8	0.1<
Soluble Carbohydrates (NFE ² + Crude fiber)	NA	53 ± 2
Ash	4.22	8.01 ± 0.1
Alcohol	NA	2.5
Macro minerals %		
Calcium (Ca)	0.19	0.1 ± 0.05
Phosphorous (P)	0.73	2 ± 05
Sodium (Na)	0.12	0.07 ± 05
Potassium (K)	1.06	1.38 ± 05
Sulfur (S)	0.53	0.7
Magnesium (Mg)	0.21	0.35
Amino acids % (total)		
Lysine	1.28	0.8
Methionine	0.46	0.34
Cystine	0.71	0.64
Met + Cys	1.17	0.98
Threonine	1.73	1.5
Arginine	1.69	1.1
Isoleucine	0.96	0.74

¹Estimated using prediction equations
²Nitrogen free extract

Benefits of Floresis for Rumen and Intestinal Health

1. Benefits for Rumen Health

Floresis improves rumen function by:

- ✓ Enhancing microbial balance – It promotes the growth of beneficial bacteria while inhibiting harmful microbes.
- ✓ Reducing rumen acidity – Lactic acid in Floresis helps regulate rumen pH, preventing acidosis.
- ✓ Boosting fiber digestion – The presence of yeast metabolites supports the activity of fiber-digesting bacteria, increasing energy availability from feed.
- ✓ Decreasing methane production – Lactic acid bacteria in Floresis compete with methanogenic bacteria, lowering methane emissions and improving feed efficiency.

2. Benefits for Intestinal Health

Floresis strengthens the intestinal barrier and supports gut health by:

- ✓ Reducing inflammation – Polysaccharides and bacterial DNA fragments stimulate anti-inflammatory cytokine production.
- ✓ Enhancing gut microbiota – The combination of β -glucans, MOS, and lactic acid improves microbial diversity, reducing the risk of gut infections.
- ✓ Preventing pathogen adhesion – Mannan oligosaccharides block the attachment of *E. coli* and *Salmonella* to intestinal cells.
- ✓ Increasing nutrient absorption – Improved gut morphology and enhanced enzyme activity lead to better digestion and feed utilization.

3. Effects on Gut Barrier Function

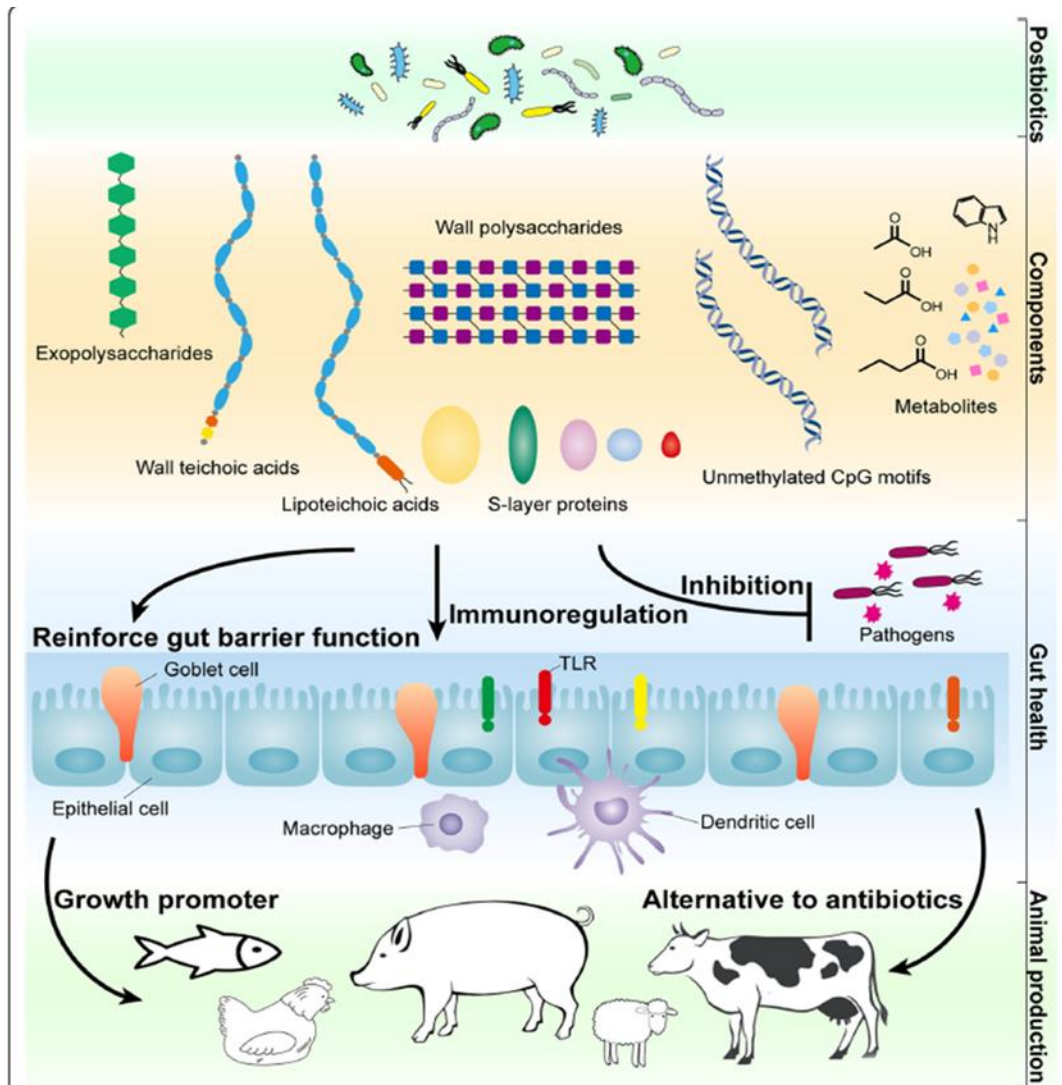
A healthy gut barrier prevents harmful bacteria and toxins from entering the bloodstream. Floresis:

- ✓ Strengthens tight junctions between intestinal cells, reducing intestinal permeability.
- ✓ Supports mucus production, which acts as a protective layer against pathogens.
- ✓ Boosts the immune system, increasing resistance to infections.

4. Immunomodulatory Effects of Floresis

Floresis enhances immune function by:

- ✓ Activating immune cells – Bacterial DNA (CpG motifs) stimulates macrophages, T-cells, and cytokine production.
- ✓ Increasing antibody production – It promotes IgA secretion, strengthening the gut's immune defense.
- ✓ Reducing oxidative stress – Antioxidants in Floresis protect gut cells from free radical damage.



Effects of Floresis on Mastitis Prevention

Mastitis, a common disease in dairy cows, is caused by bacterial infections leading to udder inflammation. Floresis helps prevent mastitis by:

- ✓ Strengthening immune response – Its immunomodulatory compounds enhance the cow's ability to fight infections.
- ✓ Reducing inflammation – Bacterial cell wall components stimulate anti-inflammatory pathways.
- ✓ Inhibiting mastitis-causing bacteria – The antimicrobial effects of yeast metabolites and lactic acid reduce pathogen load.

✓ Enhancing milk quality – Lower infection rates result in better milk composition and somatic cell count reduction.

Conclusion

Floresis postbiotic is a scientifically formulated feed additive that offers multiple benefits for ruminant health. By supporting rumen function, strengthening gut integrity, boosting immune responses, and reducing the risk of infections, Floresis serves as a natural and effective alternative to antibiotics.

Its unique combination of bacterial metabolites, yeast derivatives, lactic acid, and immune-modulating compounds makes it an ideal solution for improving livestock productivity while maintaining animal welfare and sustainability.