MicroBac

Microencapsulated Probiotics

Probiotical Patented Technology

PROBIOTICAL

Patented technology

100% Alive to the intestine
No damage during gastro-duodenal transit

PROBLEM

To be effective and confer health benefits, **probiotics must be viable until consumer use**. That means that probiotic cells mut **survive during processing and under shelf-life conditions of the finished products**, as well as must **survive passage through the digestive tract**, proliferate and colonize the gut.
Only 20% of traditional, uncoated cells overcome the gastro-duodenal section alive.

SOLUTION

Probiotical has **developed a microencapsulation technology** that coats the probiotic cells in a lipidic vegetable matrix (food grade), providing **more robust probiotics with improved survivability**.
Probiotical's patented technology enables microencapsulated strains to **pass safely through the acidic environment of the stomach and reach the intestinal tract intact, where they can proliferate and express their biological activity** (1,2).
Thanks to the barrier effect provided by the coating matrix, this microencapsulation also **significantly improves the stability** of various final product applications, **extending the shelf-life** of particular sensitive dosage forms such as vials, softgels, tablets, capsules and oil suspension.
In an in vitro study, the **strong gastro-resistance** conferred by the lipidic microencapsulation to the probiotic cells was highlighted (3).

Improvement in survival rate ("in vitro" study)

Biological fluids	**Microencapsulated probiotic compared to the same strain in uncoated form**
Real human gastric juice	More than 250% improved survial
Simulated pancreatic secretion	More than 250% improved survial
Organic juices complex (gastric juice, bile and pancreatic secretions)	More than 8 times improved survial

Probiotical's microencapsulation technology has also been tested in **two different clinical studies**.

- In the first one, it was demonstrated that **colonization was achieved with both microencapsulated and uncoated forms in the same time**, although **with a dosage 5 times lower for microencapsulated strains** (2 billion CFU/day of microencapsulated bacteria compared to 10 billion CFU/day of the uncoated form) (4).
- In the second clinical study, the in vivo intestinal colonization of the two different forms was assessed, demonstrating that **the kinetics of colonization of the two forms (5 billion CFU/die of microencapsulated probiotic strain mix vs 25 billion CFU/die of the same uncoated mix) were totally comparable** (5).

The advantages of microencapsulated prodiotics in finished products:

- **Colonization efficacy with a five time lower amount of probiotic cells**
- **Extended shelf life of the finished products**
- **Possibility to use probiotics even in difficult product matrices**

References

1) Del Piano M. et al. In Vitro Sensitivity of Probiotics to Human Pancreatic Juice. J Clin Gastroenterol. 2008; 42 (3): S170-173.

2) Charteris WP. et al. Development and application of an in vitro methodology to determine the transit tolerance of potentially probiotic Lactobacillus and Bifidobacterium species in the upper human gastrointestinal tract. J Appl Microbiol. 1998; 84 (5):759-768.

3) Del Piano M. et al. Evaluation of the intestinal colonization by microencapsulated probiotic bacteria in comparison with the same uncoated strains. J Clin Gastroenterol. 2010 Sep;44 Suppl 1:S42-6.

4) Del Piano M. et al. Is microencapsulation the future of probiotic preparations? The increased efficacy of gastro-protected probiotics. Gut Microbes. 2011 Mar-Apr; (2):120-3

5) Del Piano M. et al. Comparison of the kinetics of intestinal colonization by associating 5 probiotic bacteria assumed either in a microencapsulated or in a traditional, uncoated form. J Clin Gastroenterol. 2012 Oct;46 Suppl:S85-92.

Surfing together
the Probiotic Galaxy

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