

Microbotanix® K8: The Postbiotic Breakthrough

What is Microbotanix® K8?

Microbotanix® K8 is a science-backed, plant-based postbiotic derived from *L. fermentum* K8, one of the key strains in our probiotic blend. Developed through a precision heat-inactivation process, it offers a stable and effective approach to supporting a healthier body composition and metabolism.

Why Microbotanix® K8?

Unlike probiotics, which require live bacteria to survive and function, Microbotanix® K8 delivers the beneficial effects of a probiotic without the instability of live cultures. This makes it an ideal solution for functional foods, beverages, dietary supplements, and other innovative applications.

Clinically-Backed Benefits

In a recent randomized, double-blind clinical trial, the efficacy of two products in managing obesity and improving health parameters was assessed. The study involved 60 participants, randomized into two groups, with one group receiving the postbiotic product and the other a placebo control. Body composition was assessed using bioimpedance, along with blood values and vital signs, as well as a combination of validated questionnaires for stress, anxiety, and eating behavior. Measurements were taken before and at the end of a 12-week intervention.

After the intervention, the primary parameter, body fat mass, was significantly reduced in the postbiotic group compared to the placebo group. Reductions in body weight and waist circumference were also observed, along with a trend toward decreased visceral fat. Despite the weight loss, muscle mass tended to increase. Liver health markers ALT, AST and γ -GT, showed a tendency to decrease. Similarly, HbA1c and eAG were close to a trend toward reduction, with eAG demonstrating a statistically significant difference among individuals with normal fasting glucose levels. Finally, participants in the postbiotic group experienced a significant improvement in their ability to concentrate compared to those in the placebo group.

Further clinical studies investigating the weight and metabolic health benefits of Microbotanix K8 are in progress.

How It Works:

With the current scientific evidence, there may be several pathways explaining the benefits of Microbotanix K8:

1. Anti-Inflammatory Effects

In contrast to the *L. fermentum* strain K1, which stimulated Th1 and Th2 response by human peripheral blood mononuclear cells (PBMC), strain K8 reduced the Th1 and Th2 response (Ghadimi et al., 2014) demonstrating its antiinflammatory property. K8 differs from K1 in various enzymes involved in the synthesis of glycans. A difference in the hydrophobicity properties of the surfaces of both strains indicated that this has impact on their surface (Ghadimi et al., 2014). Proteoglycans at the surface of bacteria were shown to act as ligands for receptors, like Toll-like receptors (TLRs) (Winkler et al., 2007) and peptidoglycan recognition proteins (PGlyRPs) (Zenhom et al., 2011 and 2012), which modulate immune response. The specific surface properties of K8, hence, explain why anti-inflammatory effects can be exerted by heat-killed K8, even though metabolites, such as SCFAs, are not produced by these inanimate cells. Low grade inflammation and LPS lead to attenuated CCK-induced satiation and dysregulation of anorexigenic and orexigenic hormones expressed in vagal afferent neurons, concomitant with hyperphagia and obesity development (Pizarroso, 2021).

2. GLP-1 Stimulation

In addition to SCFAs, fragments of the proteoglycans, so called muramyldipeptides, were shown to stimulate GLP-1. and to improve insulin resistance, metabolic tissue inflammation and glucose tolerance (Alshehri, 2020). These fragments are widely distributed, suggesting they may be present in *L. fermentum* species.

3. Appetite Regulation

L. fermentum strains contain the chaperon ClpL, which seems to operate through mechanisms similar to ClpB (Al Ebrahim et al., 2024) that mimics α -MSH, a molecule involved in controlling appetite, thereby helping to reduce food intake and induce weight loss (Legrand et al., 2020; Dechelotte et al., 2021).

4. Improved Glucose Metabolism

L. fermentum strains were shown to enhance the expression of GLUT4, a protein that facilitates glucose uptake into cells, contributing to better glucose metabolism (Archer et al., 2023). These combined effects make our Microbotanix® K8 a valuable addition to support overall health and well-being.

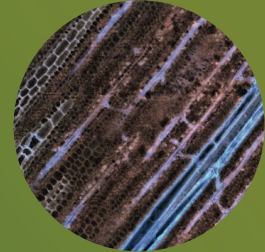
SlimBiotics®



Applications

Microbotanix® K8 is designed for seamless integration into:

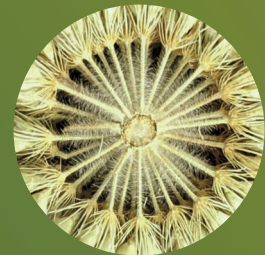
- Functional Foods & Beverages
- Dietary Supplements & Gummies
- Sports Nutrition & Metabolic Health
- Products Women's Health
- Formulations Companion Pet & Livestock Nutrition



Why Choose Microbotanix® K8?

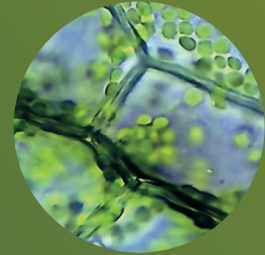
Microbotanix® K8 offers key advantages for product development:

- Backed by Scientific Research: Developed based on preclinical and human clinical studies.
- Highly Stable: No refrigeration required, making it easy to incorporate into various products.
- Versatile & Consumer-Friendly: Suitable for multiple formulations and market segments.



Partner with Us

Are you looking to incorporate a next-generation postbiotic into your formulations? Contact us to learn more about how Microbotanix® K8 can elevate your product line. For more information, reach out to us at:



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Al Ebrahim, R.N., Alekseeva, M.G., Bazhenov, S.V., Fomin, V.V., Mavletova, D.A., Nesterov, A.A., Poluektova, E.U., Dani-Ilenko, V.N., Manukhov, I.V. ClpL chaperone as a possible component of the disaggregate activity of *Limosilactobacillus fermentum* U-21. *Biology* 2024, 13: 592

Alshehri, A. The Role of Muramyl Depeptide in Glucagon-Like Peptide-1 Regulation. Thesis 2020

Archer, A.C., Muthukumar, S.P., Halami, P.M. *Lactobacillus fermentum* MCC2759 and MCC2760 alleviate inflammation and intestinal function in high-fat diet-fed and streptozotocin-induced diabetic rats. *Probiotics. Antimicrob. Proteins* 15 (5) (2023) 1078

Déchélotte, P., Breton, J., Trotin-Picolo, C. Et al. The probiotic strain *H. alvei* HA4597® improves weight loss in overweight subjects under moderate hypo caloric diet: A proof-of-concept, multi center randomized, double-blind placebo controlled study. *Nutrients* 2021, 13, 1902

Ghadimi, D., Njeru, P.N., Guigas, C., Farghaly, M.H., Fölster-Holst, R., Geis, A., de Verse, M., Schrezenmeir, J., & Heller K.J.; Molecular identification of potential Th1/Th2 responses- modulating bacterial genes using suppression subtractive DNA hybridization, *Immunobiology* 219 (2014) 208-217

Legrand, R., Lucas, N., Dominique, M. et al. Commensal *Hafnia alvei* strain reduces food intake and fat mass in obese mice—a new potential probiotic for appetite and body weight management. *International Journal of Obesity* (2020) 44:1041-1051

Pizarroso, N.A., Fuciños, P., Gonçalves, C., Pastrana, L., Amado, I.R. A Review on the Role of Food-Derived Bioactive Molecules and the Microbiota–Gut–Brain Axis in Satiety Regulation. *Nutrients* 2021, 13, 632

Winkler, P., Ghadimi, D., Schrezenmeir, J. and Kraehenbuhl, J-P. Molecular and cellular basis of microflora-host interactions. *J. Nutr.* 2007; 137: 756S-772S

Zenhom, M., Hyder, A., Kraus-Stojanovic, I., Auinger, A., roeder, T., Schrezenmeir, J. PPARγ-dependent peptidoglycan recognition protein 3 (PGlyRP3) expression regulates proinflammatory cytokines by microbial and dietary fatty acids. *Immunology* 2011; 216: 715-724

Zenhom, M., Hyder, A., de Vrese, M., Heller, K.J., Roeder, T., Schrezenmeir, J. Peptidoglycan recognition protein 3 (PglyRP3) has an anti-inflammatory role in intestinal epithelial cells. *Immunobiology* 2012; 217: 412-419