



Postbiotic BeautyBac Product Specification

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Master Core Technology in manufacturing probiotics

Food Innovation Postbiotics

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Specification

【Name】

Product Name: BeautyBac

Type: Postbiotics Dietary Supplement

【Main Ingredients】

L.johnsonii HK-LBJ45®, *L.rhamnosus* HK-LR76, *L.reuteri* HK-LR09, *L.casei* HK-LC39.

【Health Claim】

Support skin care.

【Package Specification】

·High Potency Postbiotic Powder: 1/5/10kg per bag, 500 billion cells/g

【Storage and Shelf Life】

The High Potency Postbiotic Powder can be stored in a cool and dry place, the shelf life is 24 months.

【Direction】

Recommended daily intake and use in foods: 20 billion cells/day or per serving.

Maximum recommended dosage: 100 billion cells/day or per serving.

【Key Features】

· **Safety of Probiotic Strains:** All strains in this formula were clearly sourced and identified by 16S rRNA and whole genome sequencing, free from GMOs and non-hemolytic. Acute and 28-day oral toxicity tests in mice showed no adverse effects or deaths, with no significant differences in weight, organ indices, or blood biochemistry between the test and control groups. Overall, the strains are highly safe.

· **Scientific Evidence:** the product's efficacy has been validated through multiple testing paradigms for comprehensive mechanistic verification.

【Executive Standard】

Q/ZHS0004S-2024

【Food Production License】

SC10641018200810

【Distributed by Swiss Formula】



Mechanism of Action

The utilization of microbial-derived ingredients in personal care and cosmetic products dates back to 1980, with representative examples including SK-II Facial Treatment Essence, Biotherm Life Plankton Essence, and L'Oréal Revitalift Firming Serum. Advances in biotechnology have facilitated the discovery of expanded functionalities for probiotics. Within cosmetic formulations, the primary mechanisms involve harnessing surface proteins, cell wall components, and organic acids derived from these microorganisms to achieve effects such as UV protection and skin brightening. Regulatory constraints within the cosmetics industry often necessitate the incorporation of probiotics primarily in inactivated forms, termed postbiotics. Compared to certain chemical agents like titanium dioxide, postbiotics demonstrate a favorable safety profile and offer formulation versatility, being compatible with diverse product types including liquids, creams, and sprays. At H&H, we leverage our proprietary strain library to screen for functionally stable and safe live bacterial strains. Following inactivation, we conduct systematic studies on functional alterations and employ scientific compounding strategies to optimize these postbiotics for specific cosmetic application requirements.

Efficacy Verification

1. Anti-oxidant Activity

The antioxidant activity of postbiotics (5×10^8 cells/mL) was assessed by measuring their scavenging rates against the oxidant free radicals DPPH (2,2-diphenyl-1-picrylhydrazyl) and hydroxyl radicals following heat treatment at various temperatures. As shown in the figure below, postbiotics subjected to moderate heat treatment (70–80°C) demonstrated superior antioxidant efficacy.

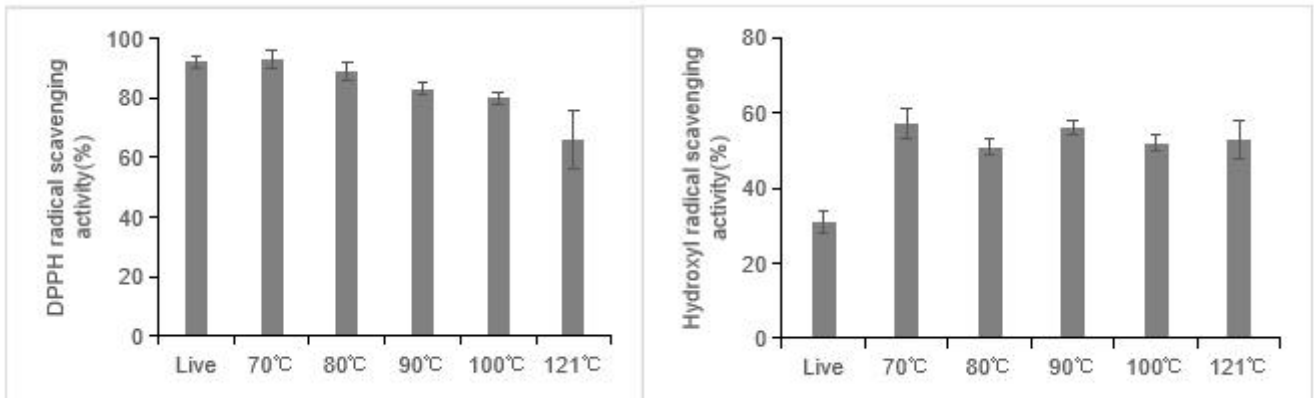


Figure 1. Antioxidant activity of BeautyBac

2. Anti-Photoaging Effect: Promotion of Collagen Production

Experiments conducted on normal human dermal fibroblasts (NHDFs) demonstrated that treatment with BeautyBac (5×10^8 cells/mL, 24 hours) attenuated the UVB irradiation (30 mJ/cm^2)-induced reduction in levels of type I collagen and its precursor, type I procollagen (COL1A1). This indicates that BeautyBac promotes the production of endogenous collagen.

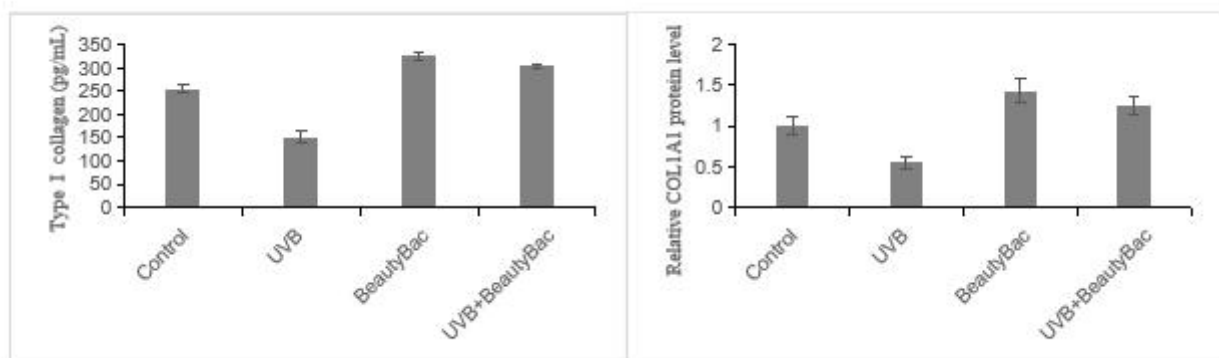


Figure 2. Effects of BeautyBac on collagen production

3. Anti-Photoaging Effect: Inhibition of Melanogenesis

Treatment with postbiotics (5×10^8 cells/mL, 24 hours) attenuated the UVB irradiation (30 mJ/cm²)-induced increase in melanin content within murine B16F10 melanoma cells. Furthermore, it significantly reduced the activity of tyrosinase, the rate-limiting enzyme regulating melanin synthesis. These results collectively indicate that postbiotics can mitigate UV radiation-induced skin pigmentation changes.

Table 1. Effect of BeautyBac on melanogenesis

Items	Control	UVB	BeautyBac	UVB+BeautyBac
Melanin content (%)	100±2.5	145.0±3.7	74.5±2.8	93.1±2.6
Tyrosinase activity (%)	100±3.3	121.5±2.2	31.8±4.7	51.4±5.2

Thermal Stability

1. Thermal Stability of BeautyBac Powder

The BeautyBac powder (5.0×10^{11} cells/g) was stored at 4°C (Refrigerated), 25°C (Room Temperature), and 40°C (Accelerated). Total cell counts were enumerated on a bi-weekly basis by flow cytometry. The product demonstrated exceptional stability across all temperature ranges. Notably, under accelerated testing conditions (40°C) for 16 weeks, the postbiotic powder maintained a high cell count retention rate with no significant degradation.

Table 2. Stability of BeautyBac powder at different temperatures (% intact cells)

Temperature	2 weeks	4 weeks	6 weeks	8 weeks	10 weeks	12 weeks	14 weeks	16 weeks
4°C	99.75	99.74	99.55	99.30	98.95	98.50	98.40	98.21
25°C	99.45	99.30	99.18	98.67	98.37	97.75	97.25	96.77
40°C	99.43	98.55	98.20	97.57	97.08	96.44	95.17	93.20

2. Thermal Stability of BeautyBac in Beverage

The BeautyBac powder (5.0×10^{11} cells/g) was formulated into a lactic acid bacteria beverage to achieve a final concentration of 5.0×10^9 cells per 200 mL bottle. Samples were stored at 4°C, 25°C, and 40°C, with cell counts enumerated bi-weekly. Results indicate that the postbiotics maintained high stability under accelerated testing conditions (40°C) over a 16-week period, demonstrating robust performance in beverage.

Table 3. Stability of BeautyBac beverage at different temperatures (% intact cells)

Temperature	2 weeks	4 weeks	6 weeks	8 weeks	10 weeks	12 weeks	14 weeks	16 weeks
4°C	98.58	98.09	97.50	96.43	95.22	94.30	93.57	93.37
25°C	98.40	96.70	96.05	95.17	94.08	93.22	92.15	90.78
40°C	97.35	95.38	95.00	93.68	91.25	89.84	88.23	86.05

3. Thermal Stability of BeautyBac in Jelly

The BeautyBac powder (5.0×10^{11} cells/g) was formulated into jelly to achieve a final concentration of 5.0×10^8 cells per gram. Samples were stored at 4°C, 25°C, and 40°C, with cell counts enumerated bi-weekly. Results indicate that the postbiotic maintained high stability under accelerated testing conditions (40°C) over a 16-week period, demonstrating robust performance in jelly.

Table 4. Stability of BeautyBac jelly at temperatures (% intact cells)

Temperature	2 weeks	4 weeks	6 weeks	8 weeks	10 weeks	12 weeks	14 weeks	16 weeks
4°C	99.60	99.28	98.90	98.01	97.55	97.25	96.80	96.19
25°C	98.33	97.70	97.22	96.75	96.20	94.71	94.06	93.37
40°C	98.04	97.41	96.27	95.44	94.59	93.01	91.78	90.66

4. Processing Stability of BeautyBac

The BeautyBac powder (5.0×10^{11} cells/g) was subjected to thermal treatment at 80 and 100°C for varying durations. Subsequently, the number of intact cells was quantified. The results, as presented below, indicate that the product retained a high degree of cellular integrity under these conditions, demonstrating excellent tolerance to thermal processing.

Table 5. Stability of BeautyBac at thermal processing (% intact cells)

Temperature	5 min	10 min	15 min	20 min	25 min	30 min
80°C	97.75	96.01	93.44	91.97	90.95	88.56
100°C	95.06	89.46	85.75	83.10	81.49	79.22

References

1. H&H Internal Laboratory Study: Skin Care Efficacy Evaluation Report of BeautyBac.
2. H&H Internal Laboratory Study: Stability of BeautyBac in Different Food application.