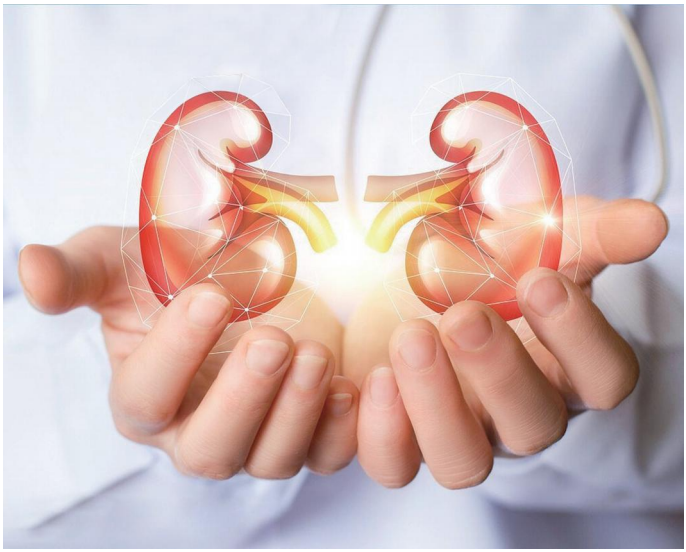
Probioway® × H&H和合 生物工程

PROBIOTICS R&D
RESEARCH AND DEVELOPMENT

L. plantarum N-1



- Urogenital Health
- Cardiovascular Health
- Improve SCFAs Production

Probioway Co., Ltd
Zhengzhou H&H Bioengineering Co., Ltd

Lactiplantibacillus plantarum N-1

Origin: Yak cheese in Qinghai-Tibet Plateau
China Culture Deposit No.: CGMCC No.15463

Acid and Bile Salt Tolerance

Acid and bile tolerance are the most crucial properties for probiotic bacteria, as it determines its ability to survive in the small intestine, and consequently its capacity to play its functional role as a probiotic. N-1 exhibited a very good survival at low pH and high concentration of bile salt.

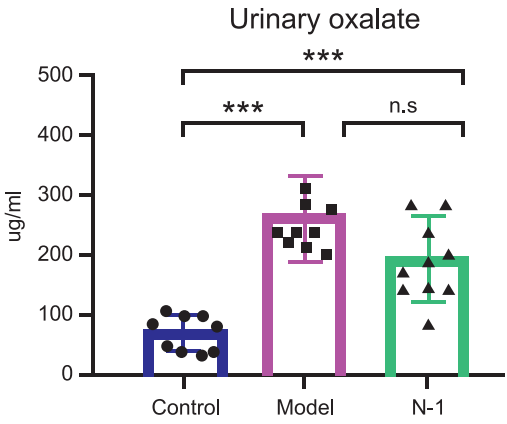
Strain	Survival Rate(%)			
	pH 3.5	pH 2.5	0.1% Bile Salt	0.2% Bile Salt
N-1	98.0	60.6	99.1	73.9

Adhesion Property

Adhesion ability to the host is a classical selection criterion for potential probiotic bacteria. It is considered to be associated with colonization, pathogen inhibition, immune interations, and barrier function enhancement. Adhesion test result showed that the adhesion number of N-1 to Caco-2 cells was 6.04×10^6 CFU/mL, and the adhesion rate was 4.03%

Urogenital Health

- N-1 could reduce renal calcium oxalate stones by regulating arginine metabolism
- N-1 could prevent ethylene glycol-induced kidney stones by regulating gut microbiota and enhancing intestinal barrier function
- N-1 could prevent bladder outlet obstruction



Cardiovascular Health

The results in animal study showed that the total cholesterol (TC) and low-density lipoprotein cholesterol (LDL-C) levels in serum declined significantly in both N-1 treatment(HFD+N-1) group and simvastatin treatment group(HFD+Sta) compared to the high-fat diet(HFD) group, showing that N-1 maybe affect the absorption and metabolism of fat and cholesterol from food.

Serum lipid levels of rats after 4-week experimental period

Group	serum		
	TC（mmol/L）	TG（mmol/L）	LDL-C（mmol/L）
HFD	2.58 ± 0.13^{a}	1.14 ± 0.22^{a}	1.72 ± 0.32^{a}
HFD+Sta	2.22 ± 0.09^{b}	0.73 ± 0.18^{a}	1.42 ± 0.38^{b}
HFD+N-1	2.29 ± 0.07^{b}	0.89 ± 0.18^{a}	1.27 ± 0.37^{b}
ND	1.89 ± 0.15^{c}	0.64 ± 0.15^{a}	1.30 ± 0.37^{b}

Improve SCFAs Production

The supplementation of N-1 increased the cecal levels of total SCFAs compared to the HFD-fed rats. Especially, in the production of butyrate and valerate, N-1 was signifcantly higher than the other groups.

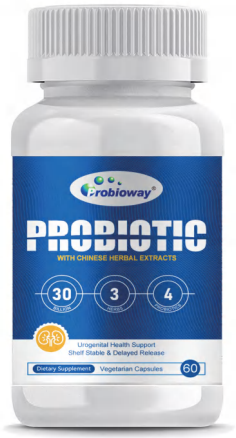
SCFA（mmol/g）	HFD	HFD+Sta	HFD+N-1
Acetate	15.66±2.98^{a}	26.07±4.40^{a}	29.98±1.36^{a}
Propionate	11.89±3.90^{a}	19.02±2.60^{a}	17.89±2.21^{a}
Isobutyrate	1.30±0.38^{a}	2.03±0.27^{a}	2.21±0.28^{a}
Butyrate	8.37±2.83^{a}	12.23±1.83^{a}	18.83±1.79^{b}
Isovalerate	1.60±0.44^{a}	2.66±0.25^{b}	2.92±0.13^{ab}
Valerate	1.67±0.44^{a}	2.35±0.32^{b}	3.10±0.14^{c}

Publications & Patents

- Liu Y, et al. (2021) *Lactiplantibacillus plantarum* Reduced Renal Calcium Oxalate Stones by Regulating Arginine Metabolism in Gut Microbiota. Front. Microbiol. 12:743097.
- Wei Z, et al. Probiotic *Lactiplantibacillus plantarum* N-1 could prevent ethylene glycol-induced kidney stones by regulating gut microbiota and enhancing intestinal barrier function. FASEB J. 2021;35(11):e21937.
- Tian L, et al. Probiotic Characteristics of *Lactiplantibacillus* plantarum N-1 and Its Cholesterol-Lowering Effect in Hypercholesterolemic Rats. Probiotics Antimicrob Proteins. 2022;14(2):337-348.

- **Patent No.:ZL202011503896.7**
- **Patent No.:ZL201810581137.9**
- **Patent No.:ZL202110820572.4**

Urogenital Health Probiotics



Supplement Facts		
Serving Size: 1 vegetarian capsule Servings Per Container: 60		
Amount Per Serving		%DV*
Probiotic Blend *L.plantarum* N-1, *L.johnsonii* LBJ456®, *L.acidophilus* HH-LA26, B.longum HH-BL18	30 Billion CFU	†
*Daily Value(DV) not established		

Other Ingredients: Fructus mume, lemon, fructooligosaccharide, isomaltooligosaccharide, dandelion, herba lophatheri, microcrystalline cellulose, magnesium stearate, silica.

Probioway Urogenital Health Probiotics is specially formulated for optimal kidney and urogenital health. This probiotic formula contains patented and scientifically-proven probiotic strain, *L.plantarum* N-1 shown to:

- ✓ Maintain urogenital health
- ✓ Improves digestive system

Directions: For best results, take one capsule per day for at least two weeks.

Consumer Study

In the consumer study, 18 men between the age 45 to 55 years were recruited to the study and asked to consume the Urogenital Health Probiotic capsule once daily for 14 days and send the filled questionnaire. The table below demonstrates the improvement of discomfort in the participants.

Discomfort	%men who felt improvement
Fatigue	72%
Back pain	50%
Urinary urgency	38%

Probioway® × H&H和合 生物工程

25 Years of expertise in probiotics

The Service Creates Value

Probioway Co., Ltd
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