



FOOD

APEX

WHEY FERMENTATE POWDER

A Natural Food Preservation Solution

A cultured whey-based ingredient designed to support microbial control, product freshness, and clean-label formulation across meat, bakery, and dairy applications.

0.3%	0.15%	3
Meat and bakery application level	Yogurt application level	Application study categories

Prepared by Guangzhou FoodApex Biotechnology Co., Ltd.

PRODUCT OVERVIEW

Cultured protection for clean-label food systems

Whey Fermentate Powder is produced from glucose, whey powder, and yeast extract through controlled fermentation using *Propionibacterium freudenreichii* subsp. *shermanii* and *Lactiplantibacillus plantarum*. It is intended for use as a food ingredient in meat, dairy, bakery, and flour-based products to help reduce spoilage risk, extend the best-quality window, and support shelf-life performance.

Broad-spectrum support	Formulation compatibility	Clean-label positioning
Helps control common spoilage organisms and selected indicator microorganisms.	Designed to work alongside other functional ingredients with straightforward addition.	Fermentation-derived functionality suited to modern ingredient declarations.

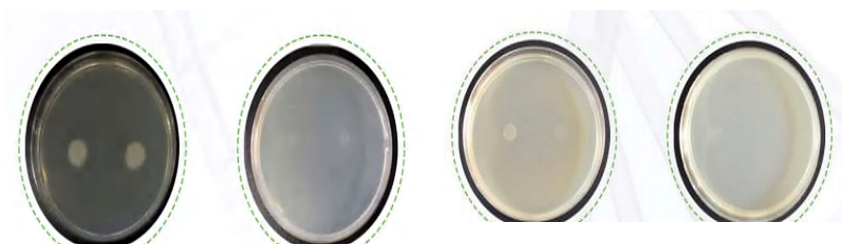
HOW IT WORKS

A multi-metabolite preservation system

Organic acids	Bioactive peptides	Other metabolites
Lactic, acetic, and propionic acids contribute to an environment less favorable to microbial growth.	Bacteriocins and fermentation-derived peptides may support targeted antimicrobial activity.	Diacetyl, fatty acids, and peroxide-related metabolites may provide complementary hurdles.

SCREENING RESULTS

Indicator-organism inhibition



Bacillus subtilis

Escherichia coli

Test conditions

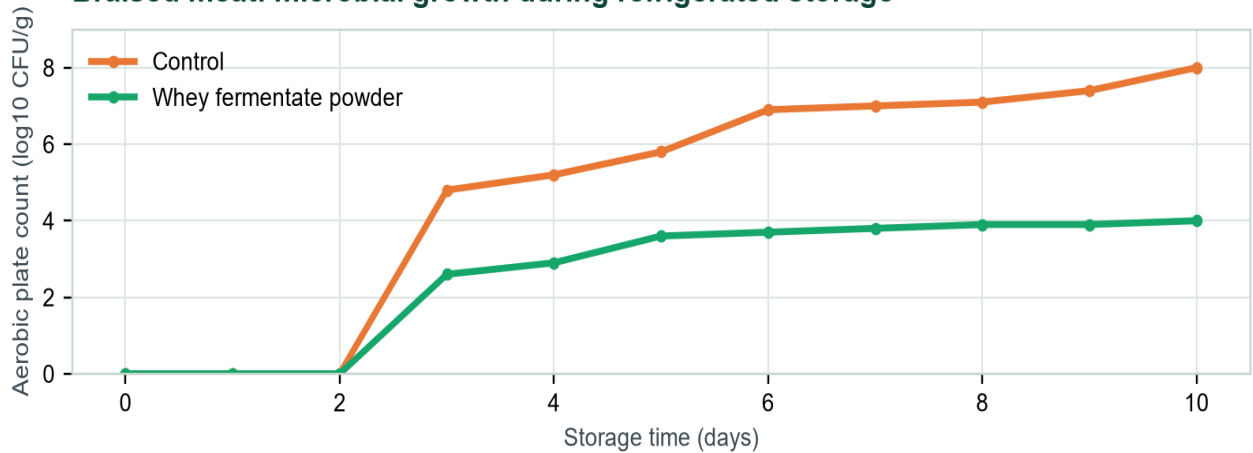
37 C incubation for 24 hours
Addition level: 0.3%
Visible inhibition was observed against both indicator organisms compared with the untreated controls.

APPLICATION STUDY 01

Refrigerated braised meat

At a 0.3% addition level, the treated braised-meat sample showed more than a 3-log reduction in microbial count versus the untreated control. The reported shelf-life extension was 7 days under the study conditions.

Braised meat: microbial growth during refrigerated storage



Test condition: 6 C for 10 days | Addition level: 0.3%

>3 log	Lower microbial count
+7 days	Reported shelf-life extension
6 C	Storage temperature
10 days	Study duration



Sensory assessment after 10 days

- Color: no obvious difference from freshly prepared braised meat.
- Aroma: no obvious difference from freshly prepared braised meat.
- Eating quality: no obvious difference from freshly prepared braised meat.

Panel: five assessors - two chefs, two R&D; personnel, and one quality-control specialist.

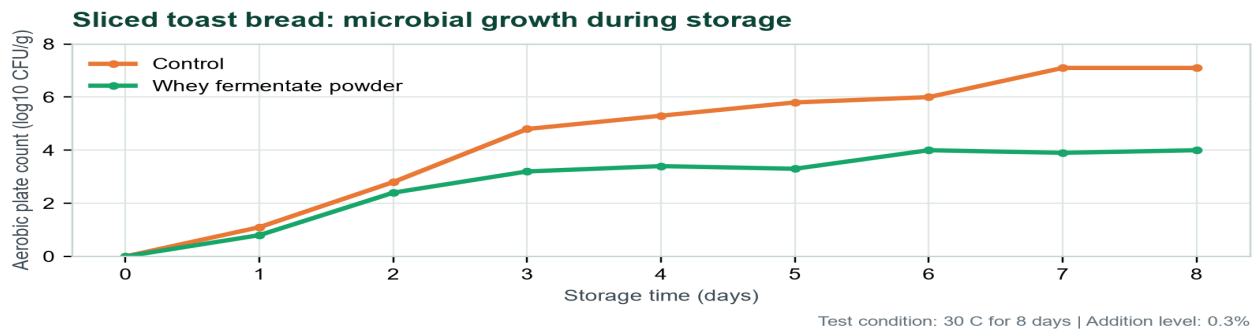
Interpretation

The study indicates strong microbial-control potential without an obvious adverse effect on the evaluated sensory attributes. Product-specific validation remains necessary before commercial shelf-life claims are established.

APPLICATION STUDY 02

Sliced toast bread

At a 0.3% addition level, treated toast bread showed more than a 2-log reduction in microbial count versus the untreated control. The reported shelf-life extension was 5 days under the study conditions.



>2 log	Lower microbial count
+5 days	Reported shelf-life extension
30 C	Storage temperature
8 days	Study duration

PENICILLIUM CHALLENGE

Delayed visible mold development



In an artificial inoculation challenge, visible mold appeared in the untreated bread on day 3 and in the treated bread on day 7. Challenge conditions: 30 C, 60% relative humidity, and a mold-spore inoculum of 10^2 to 10^3 CFU/mL.

Interpretation

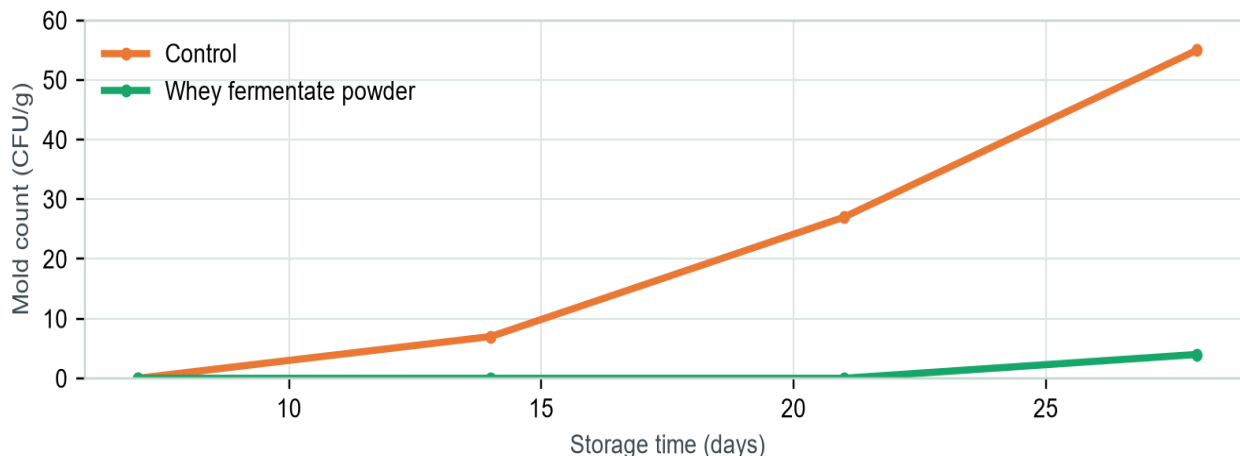
The delayed onset of visible mold supports use as one hurdle within a broader bakery preservation program that also controls sanitation, packaging, water activity, pH, and process hygiene.

APPLICATION STUDY 03

Yogurt: mold control

At a 0.15% addition level, whey fermentate powder markedly limited mold growth during 28 days of refrigerated storage.

Yogurt: mold control during refrigerated storage



Test condition: 6 C for 28 days | Addition level: 0.15%

0.15%	Addition level
6 C	Storage temperature
28 days	Study duration
4 CFU/g	Treated result at day 28



Open-container observation

After four days at room temperature in open containers, the untreated yogurt showed extensive visible mold, while the yogurt containing 0.15% whey fermentate powder remained visually clean in the source observation.

Visual result shown at left: untreated sample versus treated sample.

Interpretation

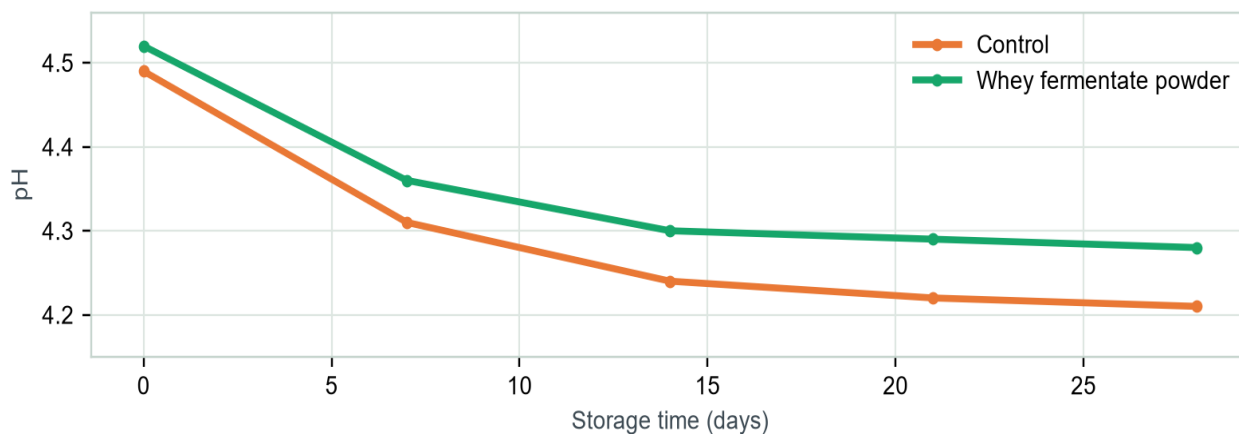
The results support further formulation trials for refrigerated cultured-dairy systems. Commercial use levels should be optimized against starter culture activity, target pH, packaging, cold-chain conditions, and the required sensory profile.

DAIRY QUALITY

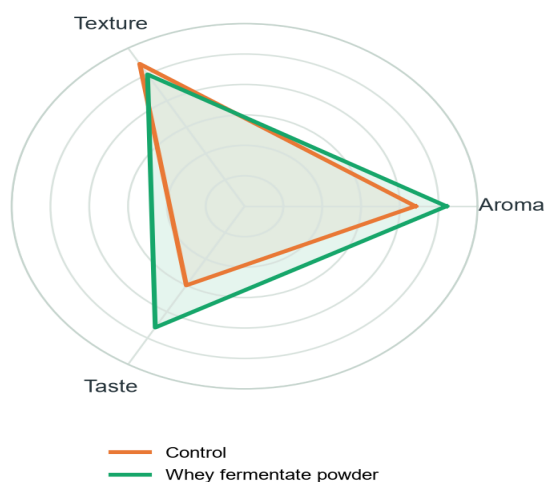
Acidification and sensory profile

The source study reported that yogurt containing 0.15% whey fermentate powder maintained a slightly higher pH during refrigerated storage and was described as having a fine body, more pronounced yogurt aroma, and a milder sour taste.

Yogurt: pH development during refrigerated storage



Test condition: 6 C for 28 days | Addition level: 0.15%



Sensory assessment

- Evaluation condition: 6 C after 14 days.
- Treated yogurt showed a more balanced aroma, taste, and texture profile in the source evaluation.
- Scores are comparative study outputs and should not be treated as a consumer preference claim.

The chart reproduces the directional profile of the original graphical source.

Formulation perspective

A slower pH decline may help maintain a milder acidity profile during shelf life. The final sensory result will depend on culture selection, fermentation endpoint, sugar and solids content, stabilizer system, flavoring, and storage temperature.

TECHNICAL USE GUIDANCE

From bench validation to commercial production

01	Define the challenge	Identify target organisms, baseline counts, process lethality, packaging format, storage temperature, desired shelf life, and applicable regulatory limits.
02	Run a dosage series	Evaluate the reported application levels as starting references, not universal specifications. Confirm dispersion, timing of addition, and interaction with other hurdles.
03	Validate microbiology	Use replicated shelf-life and challenge studies with validated analytical methods. Include untreated controls and appropriate positive controls where relevant.
04	Confirm product quality	Monitor flavor, aroma, texture, color, pH, water activity, package integrity, and product-specific quality metrics throughout the intended shelf life.

IMPORTANT TECHNICAL NOTES

- All addition levels and application outcomes in this brief are reproduced from the supplied source study. They are not universal product specifications or guaranteed commercial results.
- Graphical values were redrawn from the original charts for legibility. Where raw data were not supplied, plotted points reflect the graphical source and should be treated as representative rather than independently audited raw data.
- Microbial efficacy and shelf life depend on formulation, initial contamination, processing, sanitation, packaging, storage, distribution, and analytical method.
- Regulatory status, ingredient naming, permitted use, labeling, and claim substantiation must be confirmed for each destination market and finished-food category.

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Custom formulation support | Application testing | B2B documentation