

Whey Permeate in Bakery Applications



Optimize performance, flavor and cost in your bakery formulations.

Key Benefits in Bakery Applications



Improve baked color

Lactose promotes Maillard browning.



Increase dairy flavor

Contributes clean, authentic dairy notes without excessive sweetness.



Improved texture

Supports tenderness and eating quality while contributing milk solids.



Reduce cost

Can partially replace higher-cost dairy ingredients while maintaining functionality.



Sodium Reduction

Native dairy minerals may allow partial salt reduction while maintaining flavor balance.



Increase total solids

Adds milk solids without increasing protein.

What it Contributes

	Lactose	Browning, mild sweetness, fermentation substrate, solids
	Dairy Minerals	Flavor enhancement, sodium reduction opportunities
	Milk Solids	Body, mouthfeel, dairy character
	Low Protein	Minimal impact on dough structure compared to milk powders

Typical Use Levels*

Application	Suggested Starting Level
Crackers	2-8%
Cookies	2-8%
Biscuits	2-6%
Muffins	1-5%
Cakes	1-4%
Sweet Doughs	2-6%
Bread	1-3%

**Optimize through bench-top formulation trials*

Common Replacement Opportunities

Instead of viewing whey permeate as replacing one ingredient, many formulators use it to optimize several ingredients simultaneously.

Evaluate Replacing	Potential Benefit
Nonfat Dry Milk	Lower ingredient cost while maintaining dairy solids
Sweet Whey Powder	Improved economics
Lactose	Similar lactose contribution plus added minerals
Skim Milk Powder	Partial replacement depending on desired protein
Salt	Support sodium reduction initiatives
Sugar	Minor sweetness contribution depending on application

Formulation Considerations

- ✓ Browning will increase because of lactose.
- ✓ Water absorption may require slight adjustment.
- ✓ Protein contribution decreases if replacing milk powders.
- ✓ Baking temperature or bake time may require optimization.
- ✓ Evaluate sweetness after replacing lactose or sugar.

Processing Benefits

- Consistent powder flowability
- Excellent dry blending characteristics
- Rapid dispersion
- Suitable for continuous production systems
- Compatible with standard bakery processing equipment

Where it Delivers the Most Value

- ✓ Crackers
- ✓ Cookies
- ✓ Sweet Biscuits
- ✓ Muffins
- ✓ Cakes
- ✓ Brownies
- ✓ Snack Bases
- ✓ Pancake & Waffle Mixes

Example Formulation Applications

Potential ingredient reduction when using whey permeate.

Crackers



Using 4% Whey Permeate

- Replace 2% Nonfat Dry Milk
- Replace 1% Sweet Whey
- Reduce Salt up to 0.2%

Result: Lower cost, maintained dairy flavor, improved color

Chocolate Chip Cookies



Using 4% Whey Permeate

- Replace 2% Skim Milk Powder
- Replace 1% Lactose
- Reduce Sugar up to 0.5%

Result: Lower cost, improved browning, maintained texture

Muffins



Using 3% Whey Permeate

- Replace 1.5% Nonfat Dry Milk
- Reduce Salt up to 0.15%

Result: Reduced cost, enhanced moisture and tenderness

Need formulation support?

The Proliant Dairy Ingredients technical team can assist with ingredient selection, formulation optimization, pilot trials and application development.



Visit our Innovation Kitchen for application ideas and technical resources.

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