

Protein-fortified Bakery

As consumers become more health and wellbeing focussed, they look for everyday products which bring added nutritional benefits. This creates categories where regular bakery products such as cakes, breads and cookies are fortified with added protein. Consumers expect the flavour and texture of the protein fortified products to mirror that of the standard versions they are familiar with.

When extra protein is added to bakery, the formulation must be rebalanced to maintain the structural and sensory elements. Typically no single dairy protein works perfectly, but a combination delivers an optimal sensory profile. Added protein in bakery can provide a number of functions such as structural (gelling and viscosity), filler protein (non-functioning 'inert' protein) and water binding.

This product concept card is designed to show how our ingredients can be used to create products with a range of benefits for you and your consumers.

Bakery products are commonly made with the following four components:

- Flour - for structure and bulking
- Sugar - for flavour, colour and texture
- Fat - control protein development and add flavour
- Egg - for structure and aeration

Univar Solutions recommends: WPC 515

USP	BENEFITS	CHALLENGES
This functional WPC80 can be added to bakery to achieve a 'high in protein' claim with minimal impact to the taste and texture of the product. Best functional performance in combination with MPC485 or MPC4861.	<ul style="list-style-type: none"> • Ability to increase protein without adding structure • 'Non-reactive' microparticulated whey protein • Reduces dryness compared to standard dairy protein ingredients 	<ul style="list-style-type: none"> • Cannot be used to directly replace gluten flour, as doesn't add structure • Whey protein flavour still not preferable to an MPC

Method

- Pre-heat the oven to 180°C
- Whisk the dry ingredients together until homogenous
- Add milk and melted butter and mix lightly (do not over-mix)
- Pour one serving of the batter into each muffin mould
- Bake the muffins for 17 minutes or until golden



Basic recipe

Base recipe for a 23% protein muffin, which can be tailored for desired flavour and fillings such as blueberries. Ratio of protein ingredients should be changed to meet desired texture.

INGREDIENTS	%
Standard flour	21.5
Baking powder	1.1
Salted butter	2.5
Sugar	6.1
WPI895	2-4
MPC4861	5-
WPC515	10-15
Whole Milk	45.5
Citric Acid	0.05

DRINKING YOGURT

Nutrition facts

Amount per 100g

Energy Value (kcal/kj)	237 / 990
Total fat	4.7g
Total carbohydrate	24.7g
Total protein	23g

Alternative ingredients

PRODUCT	USP	BENEFITS	CHALLENGES
WPC392	<ul style="list-style-type: none"> Creates elastic/chewy properties. Texturising agent to provide structure; replace some of the functions of gluten and egg proteins 	<ul style="list-style-type: none"> Provides structure and protein fortification Can be used to replace egg or gluten Cost effective 	<ul style="list-style-type: none"> Can create a heavy 'bread-y' structure that is not desirable in many bakery applications Can create dryness
WPC356	<ul style="list-style-type: none"> Works as an emulsifier in breads and cakes, helping to capture air due to phospholipids and replace egg yolk. 	<ul style="list-style-type: none"> Cost effective High in phospholipids so can capture air in the dough matrix Can be used as an egg yolk replacer" 	<ul style="list-style-type: none"> Flavour can be a challenge at high addition rates
MPC4861	<ul style="list-style-type: none"> Great in bakery applications, works well in combination with a caseinate or a functional WPC 	<ul style="list-style-type: none"> Cold soluble Can be whipped to create a light texture Builds structure in the dough Water retention and absorption properties to increase dough yield Good source of calcium Provides a darker colour than regular MPC 	<ul style="list-style-type: none"> Cost can be a challenge compared to non-functional ingredients Flavour is less 'dairy' like compared to regular MPC If used as the sole protein source, it can collapse after baking
MPC485	<ul style="list-style-type: none"> Water absorption properties – increases yield and improves moisture retention and shelf life 	<ul style="list-style-type: none"> Nice dairy flavour Cost effective protein source Water retention and absorption properties to increase dough yield Good source of calcium 	<ul style="list-style-type: none"> Less cold soluble If used as the sole protein source in a 'sponge' type of dough it can collapse after baking
Calcium and Sodium Caseinates	<ul style="list-style-type: none"> Caseinates act as emulsifiers and capture air well in the dough structure. 	<ul style="list-style-type: none"> Highly nutritious with high protein, low lactose and a good source of calcium (CaC) Emulsifier which can capture air in the dough structure NaC is film forming and can decrease fat absorption and increase moisture retention 	<ul style="list-style-type: none"> Can create a soapy flavour in high addition rates Can cause toughness to develop in the dough



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