

Highly valued dairy ingredients

Choice for chocolate

Dairy ingredients are widely used and valued in the chocolate industry as they help to achieve the required flavour, colour and texture in chocolate products. Since many years, the dairy industry has successfully provided the chocolate industry with whey ingredients, lactose and butter products.



Extensive research at Borculo Domo Ingredients has resulted in the development of two lipase negative products with very good sensorial properties for chocolate, fillings and spreads. Both products, Domovictus 250 and Proxime 835 MP are natural ingredients made from milk.

DOMOVICTUS 250

Domovictus 250 can be used as an (economical) alternative for skim milk solids in chocolate and such chocolate products like coatings, spreads and fillings. Of course it can also be applied as a dairy ingredient when new products are developed.

For the production of Domovictus 250 a modern processing technology is used. In this process whey is partially and selectively demineralised. The undesirable salty tasting mineral ions such as sodium (Na⁺), potassium (K⁺) and chloride (Cl⁻) are removed to a large content, whereas a relatively high level of calcium (Ca²⁺) is retained. This results in a product with a very neutral and milky flavour profile, without any off-flavours.

Table 1:
Typical composition of Domovictus 250

Protein	12.0 %
Lactose	79.0 %
Minerals	5.5 %
Moisture	2.5 %
Fat	1.0 %

PROXÍME 835 MP

Another dairy ingredient for chocolate products is Proxime 835 MP. The producer uses an ultra-filtration unit to produce this whey protein product.

Table 2:
Typical composition of Proxime 835 MP

Protein	35.0 %
Lactose	50.5 %
Minerals	8.0 %
Minerals	8.0 %
Moisture	3.0 %
Fat	3.5 %

This ingredient makes it possible to produce chocolate products with a mouthfeel and flavour profile very comparable to more traditionally used ingredients such as milk powder.

BENEFITS

Besides being an (economical) alternative to skim milk solids, Domovictus 250 and Proxime 835 MP show several interesting benefits when used in chocolate or chocolate products (see Table 3).

APPLICATION IN CHOCOLATE PRODUCTS

How can the products described above, be best applied? Domovictus 250 and Proxime 835 MP are high quality ingredients, which can be used both as a single ingredient or in combination with milk powder.

Application in chocolate is restricted by EU legislation. In the present law whey ingredients are allowed to be used up to a level of 5 %. Next to this, lactose is allowed to be used to a level of 5 % as an alternative to sucrose. In August 2003 the EU legislation changes. The changes make it possible to increase the dosage levels of both whey ingredients and lactose.

For application in compound, coatings, fillings and spreads there are no restrictions in EU legislation; whey ingredients may be used unlimited.

All this provides chocolate manufacturers with numerous possibilities to introduce whey ingredients in their end products. In close co-operation the producer of these ingredients is able to develop solutions that meet your specific requirements.

Table 3: Benefits

	Domovictus 250	Proxime 835 MP
Flavour profile	Neutral milky	Creamy milky
Mouthfeel	Light fresh meltdown	Long lasting full mouthfeel
Cost savings	++	+

APPLICATION ADVISE: MILK CHOCOLATE

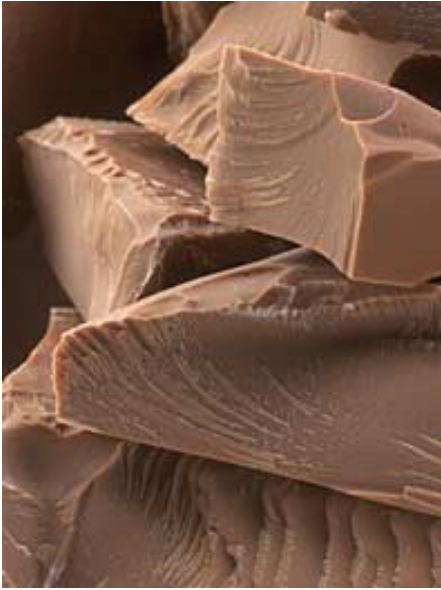
Domovictus 250 and Proxime 835 MP have both been tested in two dosages, replacing the skim milk solids (5 % on total chocolate mass) and replacing both the skim and the full cream milk solids (18.3 % on total chocolate mass). In the last case adding butter oil compensates the loss of fat. The chocolate with 18.3 % replacement demonstrates the full extent to which milk solids can be replaced but may not be called milk chocolate (extra quality). See Table 4.

The application of Domovictus 250 and Proxime 835 MP in milk chocolate has no significant effect on process characteristics and viscosity.

The sensory characteristics of the reference, Proxime 835 MP and Domovictus 250 are similar at the level of 5 % replacement. The chocolate with 18.3 % Domovictus 250 has a milky flavour, is more fresh and is somewhat more sweet than the reference. At the high replacement level, Proxime 835 MP chocolate offers you product characteristics very similar to chocolate products made with more traditional ingredients, such as skim milk powder.

APPLICATION ADVISE: COMPOUNDS, FILLINGS AND SPREADS

In the special application laboratory the company has tested Domovictus 250 and Proxime 835 MP in a basic white filling at a replacement level of 100 %. No flavour masking ingredients are used to show you the full effect of these ingredients.



Broken pieces of chocolate stacked on one another – the chocolate is produced with dairy ingredients. Photos (2): BDI

The results of the tests with white fillings are also representative for confectioners' coatings and spreads because they have comparable fat systems.

The 100 % replacement of skim milk powder has no significant influence on the process characteristics and viscosity of the fillings.

In sensory panels, the fillings made with these ingredients were appreciated more than the reference with skim milk powder. Fillings with Domovictus 250 are milky and

Ingredients	Reference [%]	5% replacement [%]	18.3% replacement [%]
Icing sugar	41.0	41.0	41.0
Cocoa butter	23.5	23.5	23.5
Cocoa mass	12.0	12.0	12.0
Full cream milk powder	18.0	18.0	
Skim milk powder	5.0		
Domovictus 250 / Proxime 835 MP		5.0	18.3
Butter oil			4.7
Lecithin	0.5	0.5	0.5
Vanillin	0.01	0.01	0.01

Table 4: Recipe milk chocolate (extra quality)

Ingredients	Reference [%]	100 % replacement [%]
Sugar	43.5	43.5
Fat system	36.0	36.0
Butter oil	2.6	2.6
Skim milk powder	17.4	
Domovictus 250 / Proxime 835 MP		17.4
Lecithin	0.5	0.5

Table 5: White filling recipe



fresher (less heavy), which makes Domovictus 250 also very suitable for fruit flavoured fillings. Proxime 835 MP makes it possible to produce fillings without alterations with respect to mouthfeel and melting properties.

CONCLUSIONS

Both Domovictus 250 and Proxime 835 MP are very attractive ingredients for chocolate products, providing significant cost reductions, whilst maintaining total product

quality. Preference for Domovictus 250 or Proxime 835 MP depends on the desired sensorial characteristics and cost savings.

For further information Borculo Domo Ingredients is willing to assist you in your product development. A well-equipped application laboratory with experienced technologists is available for customer support and joint developments. Our research technologists are also working out new concepts including milk calcium and galacto-oligosaccharides.