



Protein Blends: Various Solutions for the Dairy Industry

A white paper of MEGGLE Food Ingredients

Milk and whey are much more than just raw materials. As a pioneer in the processing of milk and whey products, for MEGGLE research and development is the key to success. The MEGGLE Business Unit Food Ingredients develops, produces and sells optimum solutions for the processing food industry in the segments Dairy, Savoury, Bakery & Sweet, as well as special products for individual requirements. Therefore the application engineers of MEGGLE work closely with B2B customers to develop and customize solutions according to current consumer needs.



Protein blends as a solution for the dairy industry

MTM® is the brand of MEGGLE's milk protein blends, which are being produced at the German headquarter near Munich for over 40 years now.

The special products of the MTM® range are combinations of different protein sources, such as WPC (Whey Protein Concentrate), MPC (Milk Protein Concentrate), Casein and Caseinate.

The range includes various solutions with different protein contents from 30 % to 85 % and outstanding functionality.

With those protein compounds it is possible for MEGGLE to meet the complex requirements of food manufacturers in the dairy industry.

For the following features, the MEGGLE MTM® products can provide added value:

High Protein

High protein is an ongoing food trend. Also in dairy products, many consumers prefer a high protein content. By using MTM® it is possible to significantly increase the protein content in the final product and create a creamy mouthfeel at the same time. In stirred yoghurt, for example, even a protein enrichment of up to 11,5 % can be realized.

Syneresis

Syneresis is a natural phase separation. In yoghurt and cream cheese for example, whey separates from the final product during storage time. MTM® products act as an emulsifier and can

reduce syneresis in the final product to a minimum – if desired by manufacturers.

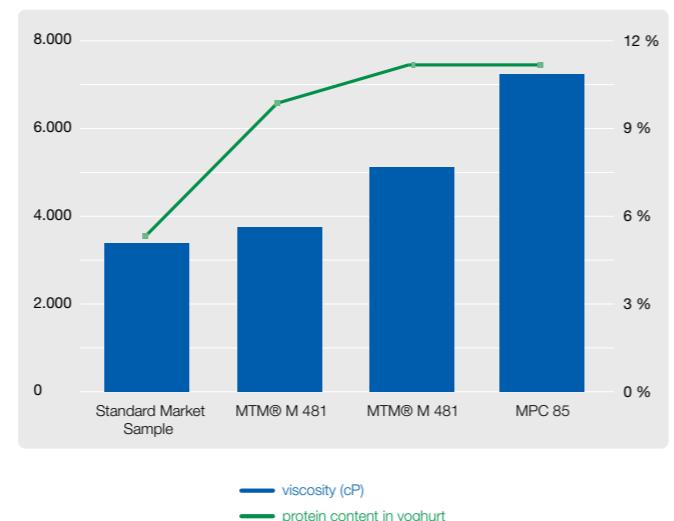
Viscosity

Depending on the final application, manufacturers request different viscosities. Special MTM® products achieve even in the high-protein segment a low viscosity in the end product. This helps to simplify processing during production and guarantees consumers a perfect creamy end product.

To demonstrate the properties of MEGGLE's MTM® M 481 it was compared to other protein powders with different protein contents in stirred yoghurt:

- Market sample for yoghurt stabilisation 80 % protein - Application: yoghurt, protein content **5,4 %**
- MTM® M 481 - Application: yoghurt, protein content **10,0 %**
- MTM® M 481 - Application: yoghurt, protein content **11,25 %**
- MPC 85 - Application: yoghurt, protein content **11,25 %**

Viscosity comparison



The results of the final product show that the protein content can be doubled by using MTM® M 481 compared to a standard market compound with only a slight increase in viscosity.

Stabilization

All MTM® products are designed to provide stability for the specific application. This can be guaranteed not only during processing and storage, but also far beyond the shelf life.

Low-Fat

In dairy products, fat is a flavour carrier, taste enhancer and brings a pleasant melting mouthfeel. Due to current nutritional trends, many consumers are searching for a low fat content while keeping a full-bodied and round taste.

Selected products of the MTM® range meet this challenging requirements. They create the pleasant mouthfeel and creaminess of a typical full-fat yoghurt even with an actual fat content of only 0,4 %.

Taste & mouthfeel

All MTM® products are neutral in taste and provide a smooth, balanced mouthfeel for a wide range of applications.

Clean Label

The entire MTM® range has been designed to match the dairy industry's demand for a clean label declaration. All products are free of any E-numbers, additives and consists exclusively of natural dairy products.



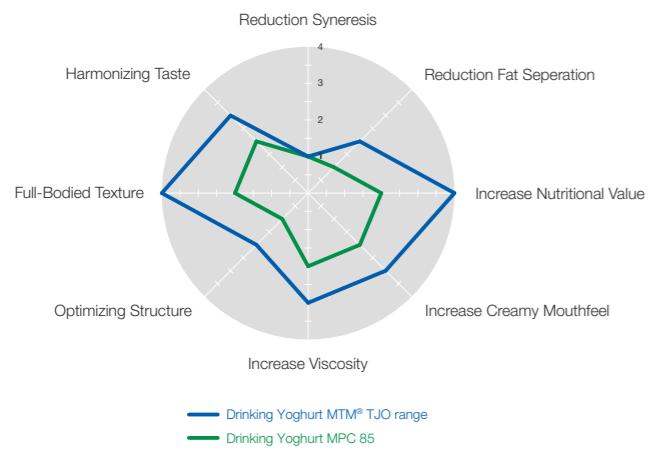
MEGGLE's MTM® range: Area of application & key features

	Application									Characteristics in final application							
	Yoghurt			Cheese		Drinks		Pudding		Stabilisation	High Protein	Low Viscosity	High Viscosity	Reduction of Syneresis	Low Fat	Enhanced Mouthfeel	Clean Label
	Stirred	Set	Drinking	Cream	White	Milk	Protein	Protein	Standard								
MTM® OL 100	x								x	v			v	v	v	v	v
MTM® W 260	x	x		x						v				v		v	v
MTM® M 105	x								x	v	v		v	v	v	v	v
MTM® TJO 700	x		x			x				v		v		v	v	v	v
MTM® YO 802		x								v			v	v		v	v
MTM® YO 80-3	x	x								v			v	v		v	v
MTM® CF 001 D	x				x					v			v	v	v	v	v
MTM® N 80	x									v			v	v	v	v	v
MTM®TJO 805	x		x			x	x	x		v	v	v		v	v	v	v
MTM T® 80	x									v			v	v	v	v	v
MTM M® 481	x							x			v	v		v	v	v	v
MTM® SPORT 5	x						x	x			v	v		v	v	v	v
MTM® M 84	x					x	x			v	v	v		v	v	v	v

Depending on the application technology, there may be differences, because the MEGGLE products are customized to individual needs. MEGGLE is happy to advise all customers individually to find suitable solutions for the respective requirements.

Illustration of the MTM® characteristics compared to single ingredients in different applications

Drinking Yoghurt

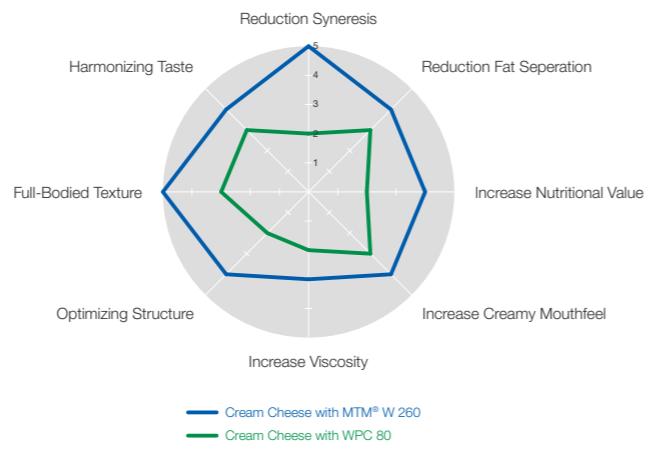


MTM® TJO range has been developed especially for the use in drinking yoghurts. Due to its special compositions, it offers even more reliable functionalities than a standard MPC 85. This product range enables a full-bodied and optimally rounded taste. Also a protein enrichment up to 11,5 % in drinking yoghurt can be achieved with a constant low viscosity.

Because of the acidification in fermented milk products, the emulsion stability is lower. This can cause a so-called fat sedimentation in drinking yoghurts with high fat content. If desired by manufacturers, the MTM® TJO range can prevent that fat loss.



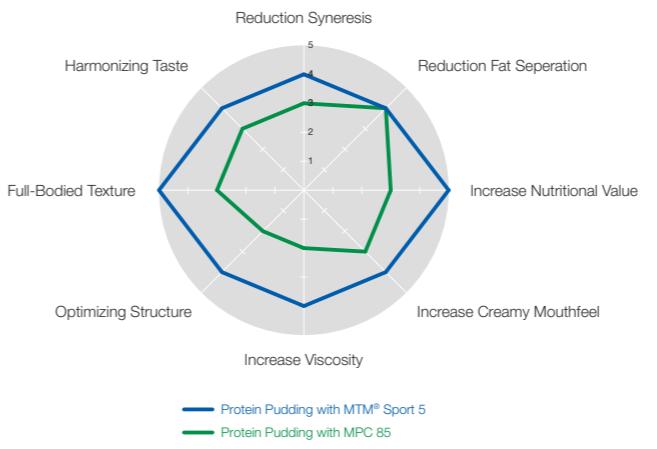
Cream Cheese



MTM® W 260 is an optimal solution for diverse whey-based cream cheese preparations and dairy spreads. This product convinces with a full-bodied, rounded taste and ensures an excellent creaminess of the final product.

At the same time, the nutritional value of the cream cheese can be significantly increased through protein enrichment. MTM® W 260 also stands out from a standard WPC 80 in terms of its highly functional properties during the storage time. By using this protein compound, it is possible to reduce syneresis and avoid a structural change of cream cheese.

Protein Pudding



The MTM® Sport 5 is ideal for high-protein applications. This product convinces with an outstanding protein enrichment and at the same time with a pleasant creaminess and fullness.

Compared to a standard MPC 85, it ensures an excellent structure during storage and beyond as well as a minimizing of syneresis.

Up to 10 % protein in the final application is possible with the MEGGLE MTM® Sport 5. This premium product was the result of intensive collaboration with a customer who was looking for the perfect solution for his new product in the refrigerated section.

The customer's highly complex requirements ensured the development of a protein blend with outstanding properties that are unique on the market.



Why is MEGGLE the right partner in the food ingredients sector?

Using innovative manufacturing technologies, state-of-the-art production facilities and stable processes, MEGGLE offers products with exceptional functionality. In addition to spray drying, blending, extrusion and crystallization also ultrafiltration is one of the company's strengths.

In addition to the versatile range of products, customer orientation is one of the most important services in the portfolio. With many years of experience, MEGGLE accompanies clients in development and production and offers customized individual solutions.

The high requirements of customers can be achieved with the implemented quality management system. This is confirmed by independent experts in comprehensive certification audits:

- EN ISO 9001:2015
- IFS (International Featured Standard Food)
- Halal (defined lines)
- Kosher (defined lines)
- VLOG (defined lines / GMO-free)
- FDA (U.S. Food & Drug administration)
- EN ISO 14001:2015
- EN ISO 45001:2018
- DIN EN ISO 50001:2018
- Sedex SMETA 4-Pillar Audit
- RSPO certification (defined lines)

**For individual requests and more information about the MTM® dairy solutions
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