

LACTOMIN

Whey Protein Concentrate,
Natural Protein Enrichment and
Functionality in Food Applications



Consumer trends indicate a desire to move away from the synthetic world to a more “natural” way of life. This is nowhere more evident than with foods. Our **LACTOMIN** products fit well into these requirements of natural products. Their main functional properties are excellent emulsification ability, water binding and textural improvement while showing nutritional effects due to the balanced amino acid composition.


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LACTOMIN RANGE

Due to their different protein contents, whey protein concentrates are used in the food industry for a wide variety of applications. Whey protein concentrates are particularly suitable for dietetic products, sports beverages or prepared meal applications due to their excellent nutritional value.

































Their functional water binding and texturizing properties make them well-suited for applications like soups and sauces, bakery, meat, seafood and different dairy products (cheese, yoghurt, dairy drinks), as well as infant formula. As an economical partial replacer for skim milk powder some whey protein concentrates can even be used as whipping agent, in some special applications like ice cream and toppings.

KEY BENEFITS

- Emulsification
- Protein enrichment
- Texture enhancement through viscosity increase
- Stabilization without use of E-number additives and gelatine
- Improved creaminess and fat simulation in fat-reduced or calorie-reduced foods
- Good solubility

LACTOMIN PRODUCT RANGE

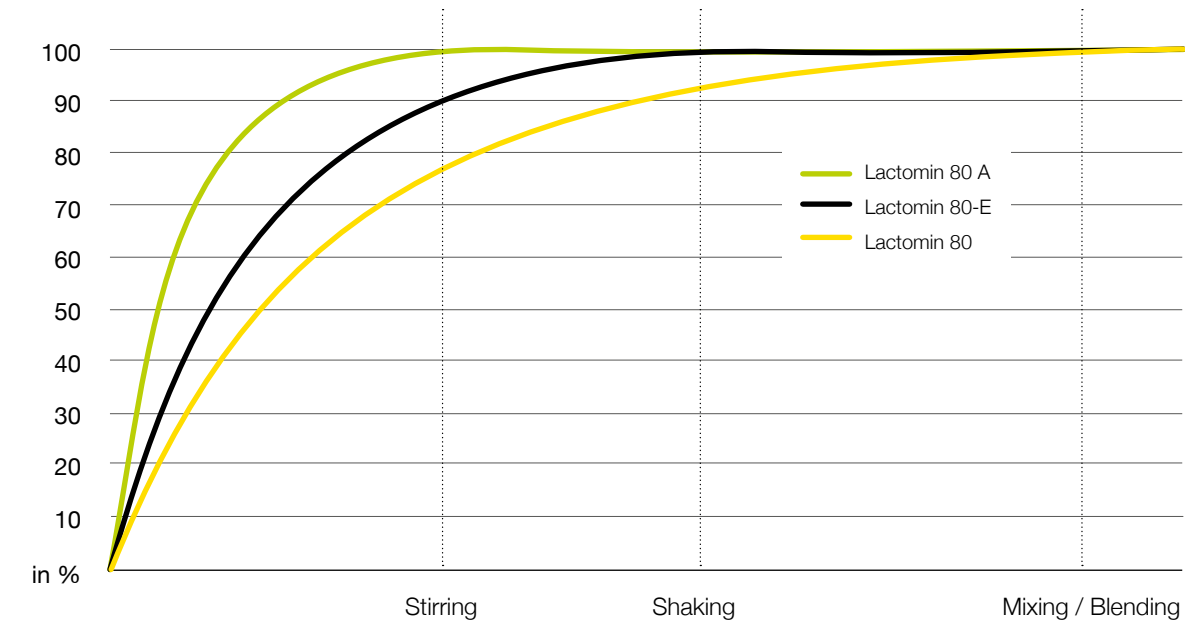
WHEY PROTEINS CONCENTRATED BY CROSS-FLOW MEMBRANE FILTRATION

Applications	Product name	Product group	Properties
    	LACTOMIN 35	Whey protein concentrate 35%	Skim milk replacer, whipping agent
  	LACTOMIN 35 HEAT STABLE	Whey protein concentrate 35% heat stable	Heat stability
  	LACTOMIN 60	Whey protein concentrate 60 %	Protein supplement
    	LACTOMIN 80	Whey protein concentrate 80 %	Protein supplement, enhanced texture, emulsification, milky taste
    	LACTOMIN 80-S	Whey protein concentrate 80% from acid whey (without glycomacropeptides)	Protein supplement, enhanced texture, emulsification, milky taste
 	LACTOMIN 80-E	Instantized whey protein concentrate 80%	Protein supplement, good solubility / dispersibility
  	LACTOMIN 80 A	Agglomerated whey protein concentrate 80 %	Protein supplement, excellent solubility, highly soluble and dispersible
  	LACTOMIN 80-LR LACTOMIN 80-LF	Lactose-reduced and lactose-free (< 0,2 %) whey protein concentrate 80 %	Protein supplement, good solubility
  	LACTOMIN 80-S HG	Whey protein concentrate 80 % high gel	Protein supplement, increased gelation properties

Customized solutions and adapted protein contents are possible on request.
Products also available in organic and VLOG quality (highest standard of GMO-free products).

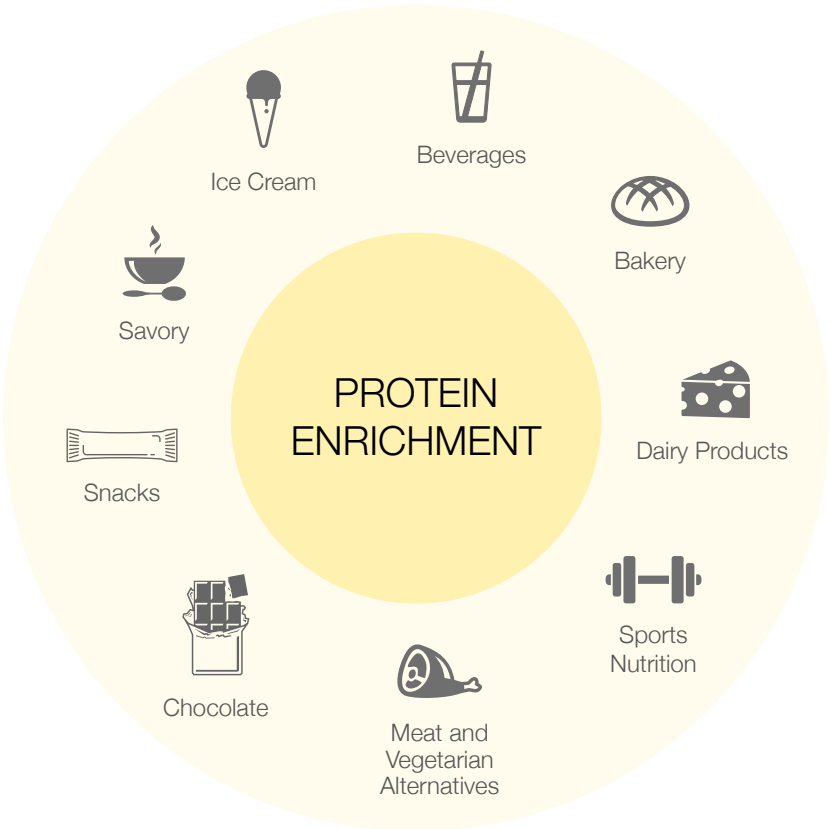
SOLUBILITY COMPARISON

Our **LACTOMIN 80** is available in 3 different solubility classes. This enables us to offer our customers the opportunity to tailor the raw materials to their own needs. Whether you need premium solubility or not, we have the right product.



ENRICHMENT WITH LACTOMIN – PROTEINS OF HIGH NUTRITIONAL VALUE

Our Lactomin articles are products with high protein content, an excellent digestibility and a milky, natural taste.



LACTOMIN

Whey Protein Concentrates in
Sports and Lifestyle Nutrition



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There is a booming market for sports and lifestyle nutrition. Its aim is to offer athletes and other consumers a balance of macro- and micro-nutrients to assist them in their daily training, during competitive phases, with dieting and with the necessary regeneration. Our **LACTOMIN** range offers help with practically all end products in the sports and lifestyle nutrition market: we will contribute our expertise to the development of your products and help you implement your project efficiently.



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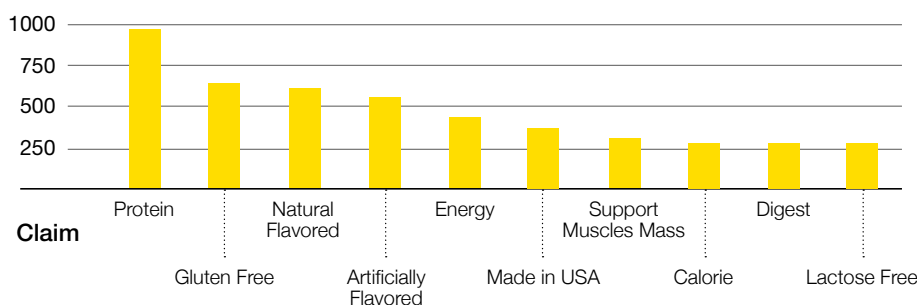
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LACTOMIN –WHEY PROTEINS IN SPORTS AND LIFESTYLE NUTRITION

In the last years, a marked increase in healthy lifestyles has been recorded, which entails a growing demand for nutritional drinks and snacks. Especially the protein claim is a considerable marketing factor and is seen more and more on healthy associated products.

MARKETING CLAIMS ATTRIBUTES

Products



Whey protein is the key component in this context and delivers crucial physiological benefits for consumers: It is both easily digestible and metabolically efficient, giving the protein a high biological value. The protein quality based on the amino acid requirements of humans can be measured by the PDCAAS (Protein Digestibility Corrected Amino Acid Score) value. This value considers the nitrogen composition, essential amino acid profile and true digestibility. A protein which meets all requirements of the human body has a value of 1.0. Whey proteins even exceed this value with a score of 1.14.

From any natural food proteins, whey protein contains the highest concentration of branched chain amino acids (leucine, isoleucine, valine). They serve the skeletal muscles as energy supplier.

Our whey protein concentrate (WPC) serves as raw material for particularly all end products in the sports nutrition market: Mixtures for fillings, protein bars, ready-to-drink products, shakes and snacks. WPC is produced by ultrafiltration of cheese whey or whey from casein production. The protein content ranges from 35 to 80 % and is the most complete and cost-effective choice for large volume standard powder products.

In addition to the standard whey protein concentrate range, we also produce WPC with special characteristics, which are particularly interesting for certain criteria which have to be met:

LACTOMIN 80 LF is our lactose-free WPC and suitable for all kinds of sports nutrition products; The product can be applied to a lactose-free product range.

LACTOMIN 80 A/E is agglomerated / instantized and has excellent dispersibility / solubility properties; These properties are especially important for shakes and beverages.

LACTOMIN 35 HS is heat stable and benefits hot ready-to-drink products or hot prepared meals.

DOSAGE RECOMMENDATION

Final product	Dosage (%)
Protein enriched hot beverages and meals LACTOMIN 35 HS	5 - 30
Protein shakes LACTOMIN 80 A/-E	80 - 97

KEY BENEFITS

High quality protein

Good energy source

Easily digestible and fast absorption

High content of essential amino acids and branched-chain amino acids (BCAA)

Low in fat and cholesterol

GMO-free

PDCAAS OF KEY PROTEINS

Protein Source	PDCAAS
Whey protein	1.14
Casein	1.00
Milk protein isolate	1.00
Soy protein isolate	1.00
Egg white powder	1.00
Ground beef	1.00
Canned lentils	0.52
Peanut meal	0.52
Wheat gluten	0.25

VANILLA FLAVORED PROTEIN DRINK

Ingredients	Dosage (%)
LACTOMIN 80, LACTOMIN 80-E, LACTOMIN 80-A	14.79
Crystalline fructose	2.00
Vanilla flavor	1.00
Salt	0.20
Artificial sweetener	0.01
Water	82.00

Processing

- Blend all dry ingredients
- Add dry ingredients to water
- Mix thoroughly by hand or blender

Benefit

- Provides 34g of high quality whey protein per serving in an easily dispersible form ideal for dry nutritional beverages

Source: <https://www.foodnavigator-usa.com/Article/2015/09/17/Protein-powders-The-heavyweight-in-the-16bn-sports-nutrition-market>

LACTOMIN

Stabilization and Protein Enrichment
in Dairy Applications



There has been a continuous increase in the production of whey protein concentrates since the introduction of ultrafiltration process in the food industry. Our **LACTOMIN** represents a protein source of excellent nutritional and functional importance. Besides being nutritional ingredients in various foods, the **LACTOMIN** products can also be used for binding, texturization, colour and aeration properties in a wide variety of food formulations.



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LACTOMIN IN DAIRY PRODUCTS

Whey protein concentrates by virtue of their high protein content and functionality are increasingly used in a great number of food products, for replacing traditional additives like milk powder, egg albumin based foods and is also applied in infant and dietetic foods, frozen beverages, meat products and many more. In dairy products, **LACTOMIN** can be used for stabilization of fermented products such as yoghurt and curd cheese. It is also a possibility to increase the protein content in milk drinks, yoghurt, cream cheese and ice cream.

LACTOMIN AS STABILIZER FOR YOGHURT

During yoghurt processing (heating), **LACTOMIN** generates highly functional properties (water binding) and thus avoids syneresis. This improves the mouthfeel and creaminess at low dosage and changes the natural ratio of casein and whey protein content of the yoghurt milk, which improves the general structure. It is a natural milk ingredient and can be used for clean labeling for all types of yoghurt.

LACTOMIN FOR PROTEIN ENRICHMENT IN MILK DRINKS AND NUTRITIONAL APPLICATIONS

LACTOMIN is able to increase the protein content in several milk drinks, it does not effect the viscosity, not even at UHT processes and gives a nice milky taste.

LACTOMIN 80 shows high bioavailability (104); it is easy and quick to digest, especially for elder people since changes in metabolism and activity levels are associated with profound changes in body composition and various physiologic functions in individuals as they age. Whey protein is one of the highest quality proteins available for commercial use. The basis for the high protein quality value of whey protein is that it contains higher concentrations of branched-chain amino acids (BCAA) and essential amino acids than other sources of protein.

COMPOSITION OF AMINO ACIDS IN LACTOMIN

(g amino acid per 100 g proteins)

Amino Acid	g / 100 g
Alanine	4.7
Arginine	3.6
Aspartic acid	11.0
Cysteine	1.8
Glutamic acid	16.9
Glycine	2.0
Histidine	1.9
Isoleucine	5.5
Leucine	12.3

Amino Acid	g / 100 g
Lysine	9.4
Methionine	2.2
Phenylalanine	3.5
Proline	5.1
Serine	5.5
Threonine	5.2
Tryptophane	2.9
Tyrosine	3.8
Valine	5.1

DOSAGE RECOMMENDATION

Application	Dosage (%)
Yoghurt	0.5 - 1.2
Milk Drinks	up to 4
Ice Cream	up to 4
Cream Cheese	0.5 - 1.2

KEY BENEFITS

Stabilization

Elimination of syneresis

Protein enrichment

Clean label

Easy to digest, high bioavailability

Improved mouthfeel



LACTOMIN

Whey Protein Concentrate in Meat
and Sausage Applications and Vegetarian
Alternatives



For our customers in the meat and sausage industry we offer different solutions for cost optimization while maintaining the desired quality of the product. This includes yield improvement, increase of viscosity, excellent gelification and high water binding. Our products enable us to meet the requirements of individual customers and specific applications.


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LACTOMIN IN MEAT AND SAUSAGE APPLICATIONS AND VEGETARIAN ALTERNATIVES

Our whey protein concentrates are being widely used in meat, sausage and vegetarian applications because of their functional properties like excellent solubility, high water binding ability and optimal emulsifying capacity. Besides, **LACTOMIN** has perfect nutritional values because of the high amount of essential amino acids.

APPLICATION

COOKED HAM WITH LACTOMIN 80-S HG – 60 % brine injection

Ingredients	Dosage (kg)
Part of leg (pork), top round, lean	100 kg
Brine	60 kg
Total	160 kg

FORMULATION OF THE BRINE

Ingredients	Dosage (%)
Water	53.12
Sodium chloride	3.3
LACTOMIN 80-S HG	2.88
Sodium triphosphate	0.63
Sodium nitrite	0.02
Sodium ascorbate	0.05

Brine preparation

- Dissolve all ingredients excepting the sodium ascorbate first
- Add and dissolve sodium ascorbate shortly before the brine will be injected

Processing

- Inject the meat parts with 60 % brine with a multi needle injector
- Tumble the meat until the brine is properly absorbed (process time depends on the equipment, temperature and meat quality used)
- Fill the brined meat into moulds or bags

DOSAGE RECOMMENDATION *to optimize cost*

Final product	Dosage (%)
50 % Extended ham	1-1.5
Smoked sausage	1.0
Hot dog	1-1.5
Surimi seafood	1.0-1.5
Vegetarian meat replacer	3.0 – 5.0



LACTOMIN

Product name	Product group	Properties
LACTOMIN 80 (from sweet whey)	Whey protein concentrate	Water binding, emulsification, optimal gelification
LACTOMIN 80 S (from acid whey)	Whey protein concentrate	
LACTOMIN 80 S-HG (from acid whey)	Whey protein concentrate (with extraordinary gelling properties)	

KEY BENEFITS

- Excellent solubility
- High water binding
- Optimal emulsifying capacity
- Excellent gelification
- Increase of viscosity
- Supporting flavour
- Reduces cooking losses, yield improvement
- Improved structure
- Improved juiciness
- Better sliceability



LACTOMIN

in Infant Formula



Babies need a diet rich in energy and nutrients to ensure healthy development. Lactoprot offers suitable solutions for the production of high-quality baby food – also in organic quality on request.


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LACTOMIN IN INFANT FORMULA

The World Health Organisation (WHO) recommends feeding babies around the globe solely on breast milk for the first six months. But alternatives are important, because there is not always enough breast milk available. Since breast milk contains less protein than cows' milk, products like lactose, demineralized whey powder and whey protein concentrates are necessary for standardizing baby food. We offer these products to our customers after careful testing – also in organic quality in view of the considerable demand from the organic market.

INFANT FORMULA

The majority of infant milks are produced from cows' milk with mostly added lactose, vegetable and other oils, vitamins and minerals. Powdered infant formula is manufactured using two general types of processes: dry blending process and a wet-mixing/spray-drying process. The biggest challenge for the infant formula development is to reproduce the composition and health benefits of human milk.

Bovine milk contains more protein than human milk and the ratio of casein and whey differs from human milk.

First infant formula has a whey : casein ratio (60 : 40) which is more similar to the breast milk. The infant formula industry is paying more attention to protein quality, protein functionality and a low protein content in the formula.

DOSAGE

Depending on your individual recipe the ideal dosage of **LACTOMIN** ranges from 2%, 5% to 20%.

LACTOMIN

Product name	Product group	Properties
LACTOMIN 35	Whey protein concentrate	Perfect nutritional value, good solubility, compliant for wet mixes, high lactose content
LACTOMIN 35 HEAT STABLE	Whey protein concentrate	
LACTOMIN 80 S	Whey Protein Concentrate 80%	Perfect nutritional value; from acid whey (without glycomacropeptides, thus slightly higher in alpha-lactalbumin content than whey protein concentrate from sweet whey); compliant for wet mixes
DEMILAC 70 & 90 BIO DEMILAC 70 & 90	Demineralized whey powder	High nutrient content, high lactose content, for standardization
LACTOSE BIO LACTOSE	Lactose	For standardization; reduced Vitamin B2 content

KEY BENEFITS

Excellent solubility

Perfect nutritional value

Compliant for wet mixes

High lactose content





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LACTOPROT

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