

Caseinate, Highly Functional Milk Proteins for Various Applications

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As one of the international leaders in the production of caseinates, we look back on a long tradition. We have a knowledge of the diverse functional properties of milk and its constituents that has been accumulated over the course of generations. Our caseinates are used in coffee creamers, delicatessen foods, meat products, whipped toppings, baked goods and confectionery, beverages, clinical nutrition, sports and lifestyle nutritional products, as well others.



LACTOPROT

functionality from milk

www.lactoprot.de

LACTONAT RANGE

Lactoprot offers a diversity of solutions that can benefit the milk and dairy industry, applications ranging from cheese and yoghurt through coffee creamers and whipped toppings. For our customers in the meat and sausage industry, as well as the convenience segment, we offer numerous advantages in the manufacture of their products, as well as cost-optimization. **LACTONAT** offers valuable and easily digestible protein for the relevant end products in the sports nutrition and lifestyle nutritional sectors. Also, beverages, such as cream liqueur and even wine can be improved by the use of our caseinates.

KEY BENEFITS

Emulsification

Stabilization

Texture enhancement
















Protein enrichment

Heat stability

Good solubility

Easy to diperse

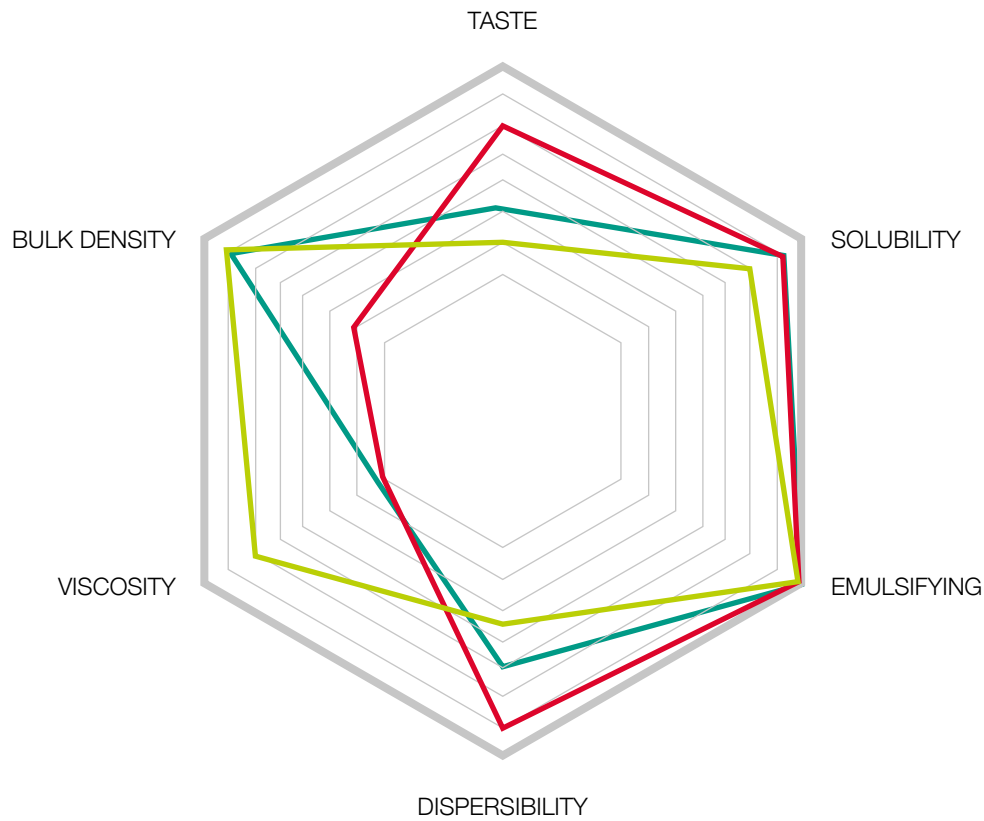
LACTONAT PRODUCT RANGE

	Product name	Product group	Properties
Sodium Caseinate		    	
	LACTONAT EN	Extruded sodium caseinate	Increased yield, enhanced texture, emulsifying effect, greater whitening power, fuller flavour, stabilization, texture enhancement, enhanced mouthfeel
	LACTONAT ENC	Extruded sodium/calcium caseinate	Increased yield, enhanced texture; emulsifying effect
	LACTONAT RN-U	Roller-dried sodium caseinate	Emulsification; fat binding; texture enhancement, water binding
	LACTONAT RN-5	Roller-dried sodium caseinate	Emulsifying effect, stabilizing effect, enhanced mouthfeel
Calcium Caseinate		    	
	LACTONAT EC	Extruded calcium caseinate	Increased yield; enhanced texture; emulsifying effect, protein supplement; good solubility; source of calcium
	LACTONAT RC	Roller-dried calcium caseinate	protein enrichment, good solubility
	LACTONAT RC-E	Roller-dried calcium caseinate	Even gloss, intensified Maillard reaction, attractive browning
Potassium Caseinate		   	
	LACTONAT RP	Roller-dried potassium caseinate	Wine fining, reduction of excess polyphenols, readily dispersible
	LACTONAT EP	Extruded potassium caseinate	Protein supplement, good solubility, source of potassium
High Viscosity			
	LACTONAT RN-HV	Roller-dried caseinate, high viscosity	Emulsification, fat binding, texture enhancement, water binding

OUR CASEINATES' PROPERTIES

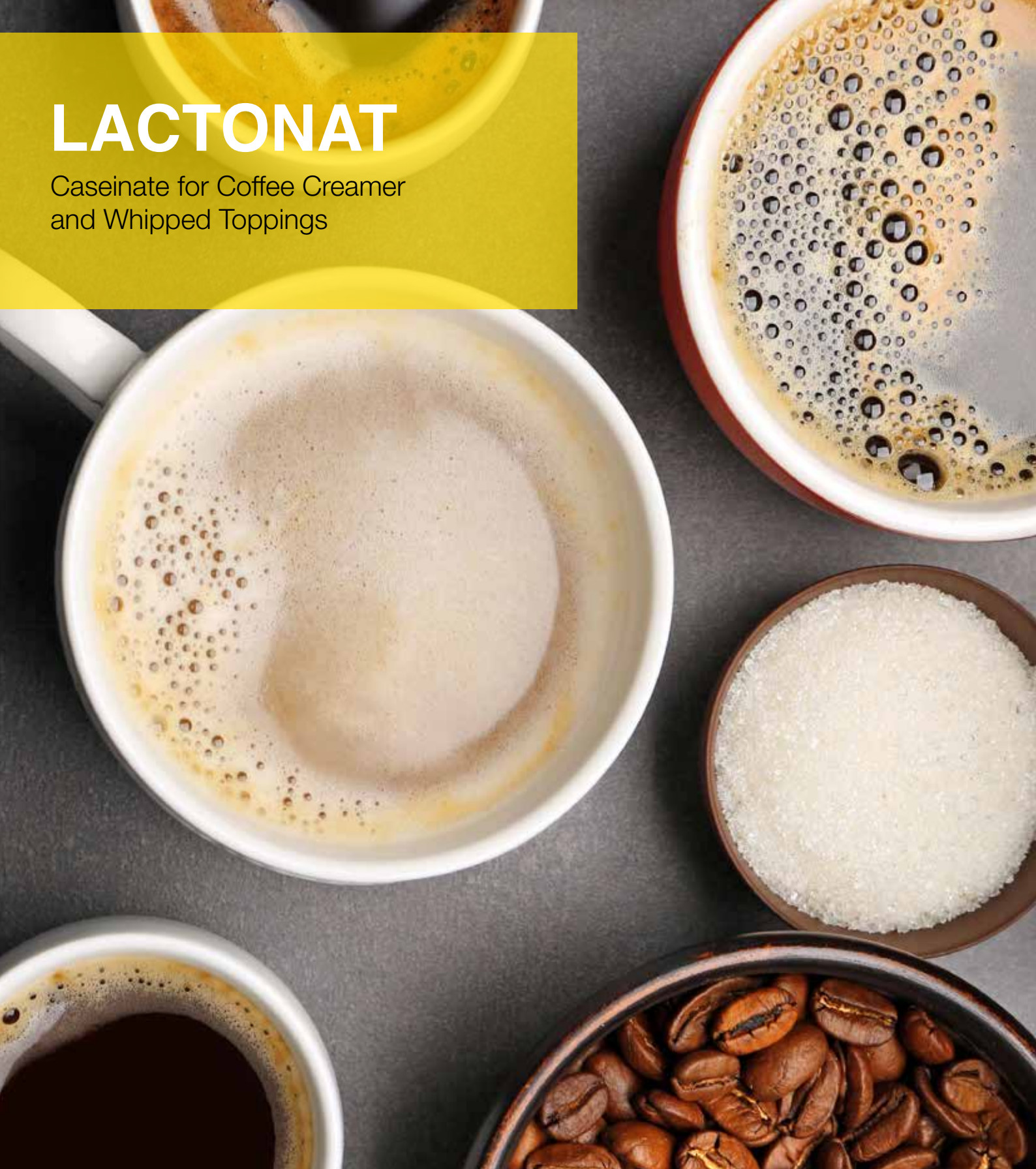
Lactoprot offers a wide range of various caseinates. Due to the different production technologies, our caseinates show unique advantages. With our roller-drying, extrusion and attrition-drying technologies we also create the right product for your application.

- High Viscosity
- Extrusion
- Roller-drying



LACTONAT

Caseinate for Coffee Creamer
and Whipped Toppings



Consumers throughout the world frequently indulge themselves with a rich cup of coffee, often using coffee creamer to add that **extra bit of mouthfeel**. When using our sodium caseinate in coffee creamers, our customers can always be sure that the end product will have the desired attributes – for example excellent emulsifying properties and the resulting improvement in whitening power, or a more intensified flavour and body.



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LACTONAT IN COFFEE CREAMER

Coffee creamers with a number of other imitation products were developed in the United States in the 1950'ies, whereby butter fat was replaced by vegetable fat. Coffee creamers are used as replacement of cream, evaporated milk or fresh milk in coffee, tea or drinking chocolate. To emulsify the fat, coffee creamers contain milk proteins (caseinate), as the quality of the final product depends strongly on the stability of the emulsion.

- The protein protects the fat during the spray-drying and serves further as an emulsifying agent, moreover lends the beverage the white colour and gives better mouthfeel. Tannins are bound by the formation of complexes, which leads to an improvement of the taste.
- Good properties are obtained with the application by 3 - 4 % **LACTONAT EN**, which should have a calcium content < 0.1 %.
- During the creation of the recipe we have to pay attention that the proportion of protein is high enough to form a hydrophilic layer around the fat molecules.

THE INGREDIENTS OF COFFEE CREAMER IN DETAIL:

- Fat
- Protein
- Sugar
- Maltodextrin
- Emulsifying agents
- Stabilizers
- Buffer salts
- Flavours and colours

LACTONAT IN WHIPPED TOPPINGS

In whipped toppings, desserts, ice cream and whipped confectionery **LACTONAT EN** and **LACTONAT RN-5** are used as whipping agent to form stable foam, even after storage. Depending on the application **LACTONAT** is processed together with the other dry ingredients, like stabilizers and sugars, and a water-oil-emulsion to a complete emulsion. This emulsion is heated, homogenized and whipped as usual afterwards.

EXAMPLE FORMULATION

Ingredient	Dosage (%)
Vegetable oil	50-60
LACTONAT EN / RN-5	5-10
Corn syrup solids	10-30
Mono-di-glyceride	6-10
Stabilizer (CMC, alginate)	0.35-0.5
Buffering salts	0.1



KEY BENEFITS

Excellent solubility

Good dispersability

High emulsifying property

Texture improvement

Optimal heat stability

Homogenous whitening effect



LACTONAT

Caseinate for Cheese Applications



Milk and dairy products are our core competence. We offer a diversity of solutions that can benefit the milk and dairy industry.

In a number of different processes in cheese production, use of our products not only results in optimum quality of the end products; it also permits tighter control of the costs. Protein supplementation with natural milk proteins leads to better fat utilization and thus a higher yield. Our products can compensate for unreliable availability of raw materials and also regional and seasonal fluctuations in milk quality.



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LACTONAT IN CHEESE

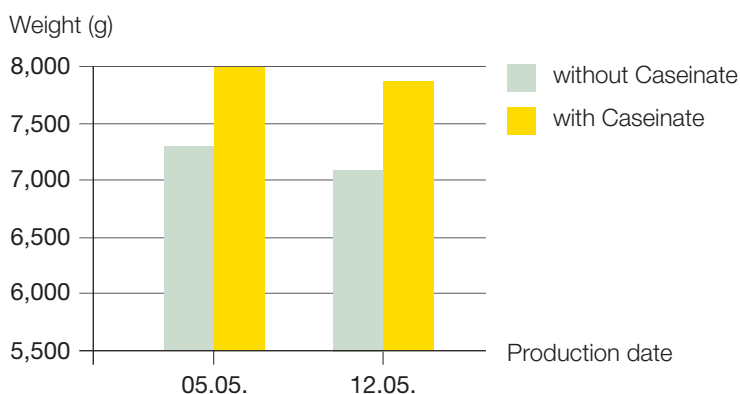
Cheese technology supports one of the most advanced food manufacturing industries in the world having to overcome most of the problems of milk variability and availability. Especially in countries with low milk production – but continuously increasing cheese consumption – the usage of calcium caseinate in the elaboration of cheese can be an interesting alternative.

National legislation in the country of sale to the final customer has to be considered when using additional milk proteins for protein enrichment in cheese or for reconstitution and recombination. Set us a challenge – Lactoprot can offer you the right solution and A to Z service. We have a knowledge of the diverse functional properties of milk and its constituents and combine it with extensive experience of the markets for the many different areas of application in the food industry. The final cheese with 0.5 % **LACTONAT EC** shows an improved consistency, a good flavour and a tasteful profile.

KEY BENEFITS

- Increased yield
- Enhanced texture and mouthfeel
- Emulsifying effect
- Protein supplement

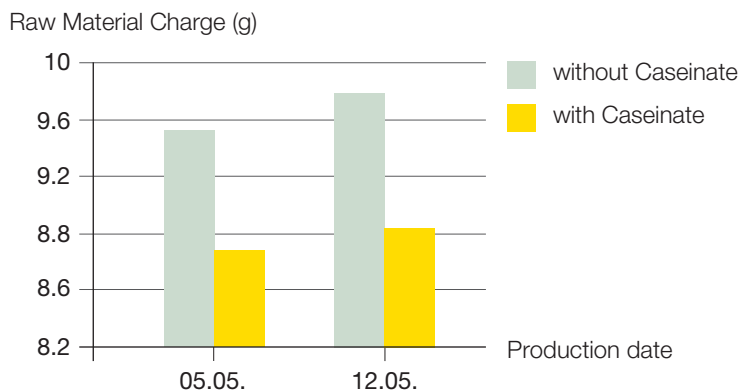
EFFECT OF **LACTONAT EC** ON THE YIELD



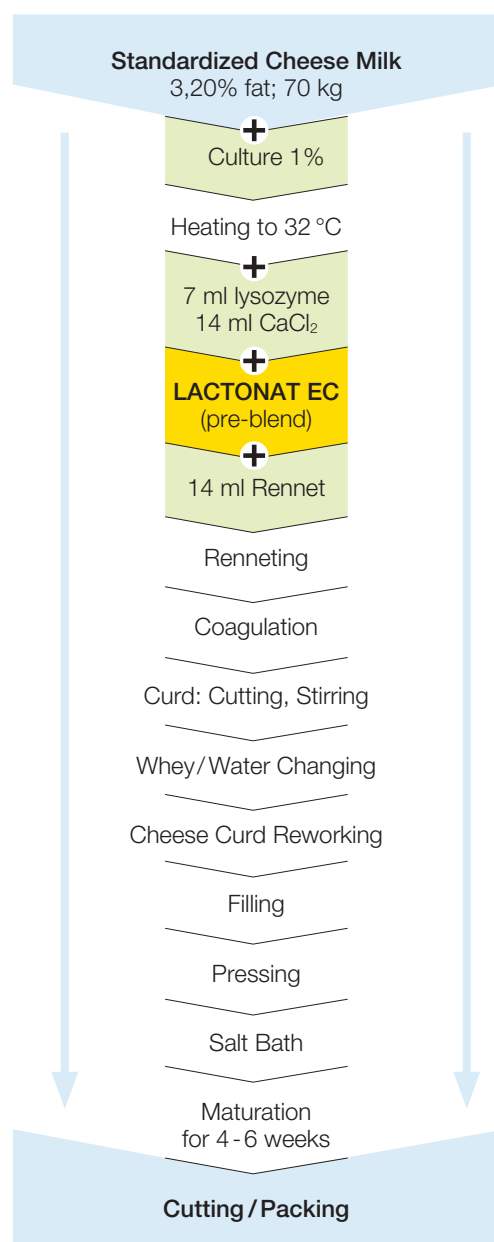
without Caseinate

with **LACTONAT EC**

RAW MATERIAL CHARGE / KG CHEESE



PROCESS OF GOUDA CHEESE MAKING



LACTONAT

Caseinate for Cream Liqueurs



An extensive market for cream liqueurs has been developed and this product is marketed successfully in most continents.

The beverages industry benefits from various Lactoprot solutions in diverse applications. Cream liqueurs continued to develop from the original Whiskey flavour to a large range of varieties.



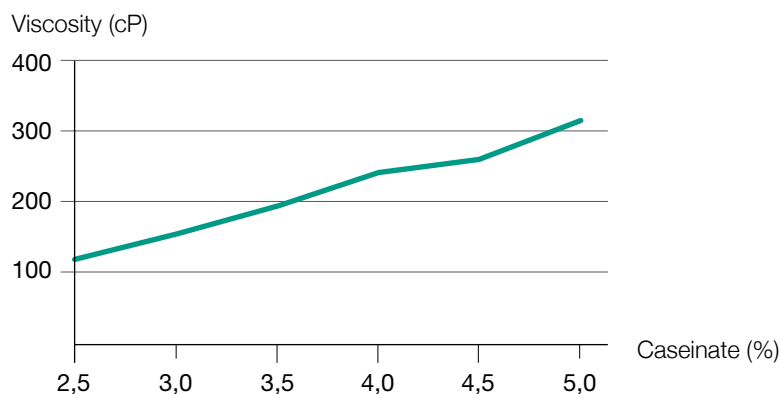
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LACTONAT FOR CREAM LIQUEURS

The alcohol content in cream liqueur plays an important role for the stabilization of the emulsion. The higher the alcohol content in cream liqueurs, the higher the caseinate addition should be. **LACTONAT** increases viscosity and leads to a better stability of the emulsion. Due to this no separation takes place. A caseinate dosage up to 3 - 4 % is possible depending on fat content.

EFFECT OF THE AMOUNT OF CASEINATE ON THE VISCOSITY



KEY BENEFITS

Emulsifying

Stabilizing

Improved mouthfeel



EXAMPLE FORMULATION OF A CREAM BASE

Component	Composition (in %)	Remarks
Cream with 40 % fat	40.0	Should be fresh and of good bacteriological quality
Sugars	24.0	Could be partly replaced by sorbitol for reduced sweetness
LACTONAT EN	4.00	With excellent emulsifying capacity and bland flavour profile
Water	31.70	Normal drinkable water, recommendable demin. water
Tri-sodium citrate	0.25	Binds free calcium, prolong shelf life
Carrageenan	0.05	Use of stabilizer is optional, serves for the adjusting of viscosity and stabilization

Flavour and colour can be added to the cream base. Add alcohol according to your recipe.

LACTONAT FOR CREAM LIQUEURS

Product name	Product group	Properties
LACTONAT EN	Extruded sodium caseinate	Emulsifying effect; stabilizing effect; enhanced mouthfeel
LACTONAT RN-5	Roller-dried sodium caseinate	

Customized solutions are possible on request.

LACTONAT

Caseinate for Scalded Sausages,
Cooked Ham and
other Meat Applications



Our product solutions enable us to meet the requirements of individual customers and specific applications. They include longer shelf life, higher firmness, prevention of gel precipitation in scalded sausage, temperature resistance in the cutter and during preparation, browning capacity and other attributes. For our customers in the meat and sausage industry we offer different solutions for cost optimization.



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LACTONAT IN MEAT AND SAUSAGE APPLICATIONS

Our caseinates consist of a highly functional and fully soluble milk protein with a neutral taste and excellent emulsifying and water binding properties. Used in processed meat products, **LACTONAT** leads to a remarkable improvement of structure and consistency. Due to their technological advantages, most of our sodium caseinates are highly recommendable for all types of scalded sausages and patés.

APPLICATION

There are three possible application methods for the usage in scalded sausages:

Jelly

5 parts of water
+ 1 part sodium caseinate
+ 2% salt

Added to the sausage meat at the final stage of the chopping process.

Emulsion

5 parts of boiled fat
+ 1 part sodium caseinate
+ 5 parts of hot water
+ 2% salt

Added to the sausage meat at the final stage of the chopping process.

Dry addition

Sodium caseinate is added in dry form directly to the meat at the beginning of the chopping process. Then the ice or water is added.

DOSAGE

max. 20 g caseinate/kg in the final application.



KEY BENEFITS

Excellent solubility

Optimal emulsifying capacity

Improves the structure

High heat stability during pasteurization and sterilization process

Prevents fat and jelly separation

Prevents fat separation during smoking and scalding

Reduces cooking loss

Prevents excessive binding between sausage emulsion and casing

Supports the formation of the sausage's own smooth skin

LACTONAT FOR SCALDED SAUSAGE

Product name	Product group	Properties
LACTONAT EN	Extruded sodium caseinate	Emulsification, fat binding, texture enhancement
LACTONAT RN-5	Roller-dried sodium caseinate	
LACTONAT RN-HV	Roller-dried caseinate, high viscosity	

LACTONAT FOR BOILED HAM

Product name	Product group	Properties
LACTONAT RN-5	Roller-dried sodium caseinate	Water binding, emulsification
LACTONIN 80 S HG	Whey protein concentrate	
LACTONAT RN-HV	Roller-dried caseinate, high viscosity	

Customized solutions are possible on request.



LACTONAT

Caseinate for the Sports and Lifestyle Nutrition Sector



There is a booming market for sports and lifestyle nutrition.

Lactoprot offers the help needed with the different product groups – whether proteins for functional bars, muesli, snacks or drinks. Our products serve as a raw material for mixtures for filling protein bars, ready-to-drink products or other snacks: we provide our technical expertise for the development of your products and help you implement your project efficiently.



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LACTONAT IN SPORTS AND LIFESTYLE NUTRITION

The global sports and lifestyle nutrition market is set to project a significant growth rate in the near future. The rapid increase of childhood obesity and the healthy lifestyle trend opens up a key leverage point for these nutritional approaches. This fact increases the surge in demand for convenient snack options low in fat and sugar while being high in protein, vitamins and minerals.

LIFESTYLE NUTRITION in particular is defined as a lifestyle choice with the primary objective of optimizing both physical and mental performance. It positions products which are specifically formulated to support consumers of all ages in leading a healthy way of life.

SPORTS NUTRITION focuses on providing the energy for physical activity, facilitating the repair and rebuilding process after physical work and optimizing athletic performance, while also promoting overall health and wellness.

In both diets protein makes up a core dietary component. Not only whey proteins but also caseinates – as a long-term protein delivery – based on its various functions. It is used as carrier for vitamins, minerals and trace elements and as well for basic protein enrichment and improved nutritional values. Major application fields of caseinate in the sports and lifestyle nutrition field are protein-enriched bars and drinks as well as energy bars.

DOSAGE RECOMMENDATION OF CASEINATE FOR DIFFERENT APPLICATIONS

Application	Caseinate (%)
Protein bars, Cereal bars, Energy bars	10-20
Powders	10-20
“Müsli” cereal breakfast	5-15

EXAMPLE FORMULATION - ENERGY BAR

Ingredient	Dosage (%)
Total Protein	20-25
LACTONAT RC	10-20
LACTOMIN 35	20-30
Fat	10-15
Sugars / Sweeteners	30-40
Fresh Agents (e.g. Nuts)	5-10
Minerals and Vitamins	2-3

Processing (manual production)

Weigh the dry ingredients and blend them. Weigh liquid ingredients and blend them; the fat can be better processed liquified. Knead all components in a homogeneous mass and spread it into a baking tray. If needed, coat with chocolate or add other ingredients. For influencing the texture collagen or other additives can be used.



KEY BENEFITS

Provides energy for an active life

No added sugar and sodium, low in fat, high in protein

Slow digestion rate; long-term protein delivery (over-night protein)

Content essential amino acids (BCAA) is close to 2:1:1

No allergenic potential

Free of additives and preservatives

Free of hazardous substances

Free of unsuitable ingredients as protease inhibitor, anti-vitamins, anti-mineral factors, balanced amino acid composition, cholesterol, pesticide

Very good functionality, emulsification, stabilization, water binding



LACTONAT

Caseinates for Versatile Applications



Our product solutions enable us to meet the requirements of individual customers and specific applications. The utilization of our products allows winemakers throughout the world to optimize their fining. Also, with our stabilizing systems for delicatessen foods we offer our customers from the Convenience segment numerous advantages in the manufacture of their products.



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LACTONAT FOR WINE AND JUICE

Fining (clarification) has been an important step in wine production for centuries. It serves to stabilize and improve the wine by removing undesirable substances such as proteins, odourants, tannins and pigments, and also excess acid. In the case of grape varieties with a naturally high phenol content, especially, the use of fining agents is advisable.

For wines with a high tannin content we recommend using potassium caseinates, which are especially effective in removing tannins from the wine. They help to harmonize the taste and reduce the bitter notes. Potassium caseinates also help to prevent and treat any pink colouring of white wines.

LACTONAT RP is based on potassium caseinate with a protein content of at least 88 %. Due to the special manufacturing conditions it is an ideal ecological and traditional auxiliary agent for the fining of wines and juices. **LACTONAT RP** is easy to disperse in water. Due to its wettability it is neutral in taste and odour, and has low foaming capacity.

APPLICATION

LACTONAT RP is usually used for the fining of wines and juices. It can be added before, during and after fermentation. To get good results it is indispensable to use the correct technique during the preparation and usage.

LACTONAT RP should be solved in medium warm water under stirring with a proportion of 1:10 to 1:15 before usage. The suspension should be stirred in order to have a good dispersion.

To get optimized results it is important to add the suspension under heavy stirring in a thin jet into the wine.

DOSAGE

0,2 - 1% – depending on the necessary correction.

The application is recommended especially for white must because of the high content of tannins in red must is able to reduce the effectiveness.

LACTONAT FOR CONVENIENCE FOOD

Whether for soups, sauces, dressings or mayonnaises: the outstanding attributes of **LACTONAT EN** and **LACTONAT RN-5** for use in convenience foods include their ability to ensure emulsion stability, heat stability and freeze-thaw resistance as well as standardized viscosity and optimal colour of the end product.

DOSAGE

Up to 1% – depending on the application.



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KEY BENEFITS

Easy to disperse

Neutral in taste

Low foaming capacity

Good auxiliary properties



KEY BENEFITS

Emulsification

Stabilization

Texture enhancement



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LACTOPROT

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