



Rousselot®
Gelatine in
dairy
products



Improvement
by nature



Yogurts

Yogurt is produced by inoculating milk with two typical bacilli: *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. Symbiotic action of these two bacilli produces lactic acid and flavors the yogurt.

There is no universal "ready to use formula" for the preparation of yogurt. Each producer must establish the most favorable conditions for his equipment and bacterial cultures to achieve the final desired product in terms of acidity, flavor and viscosity.

Furthermore, the composition of yogurts can vary depending on local legislation.

Full fat yogurt

Gelatine improves the texture of the final product without modifying the taste profile. Thanks to its ability to fix water, Gelatine has an anti-syneretic effect.

Low fat yogurt*

In order to determine the influence of the Gelatine

concentration on yogurt viscosity, we added different amounts of Gelatine to skim milk with a dry extract standardized at 10%. It is clear that the concentration plays an important role in the viscosity of the yogurt. High bloom concentrations (0.2 - 0.3%) give more firmness while lower bloom (0.4 - 0.6%) generates products with a softer texture and less syneresis.

Fruit yogurts

Gelatine is particularly useful in the production of fruit yogurts where some syneresis is practically inevitable without the addition of stabilizers.

Gelatine can be incorporated in the yogurt, but also in the fruit pulp when this is not mixed with the yogurt. By binding the fruit juice, Gelatine prevents its diffusion into the mass.

The right
Gelatine,
whatever your
application



Gelatine Facts

How is Gelatine used?

Gelatine powder is first mixed with the other powdered ingredients such as sugar, milk powder, other stabilizers, etc.

The mixture is added under agitation to the milk, where Gelatine swells and absorbs up to ten times its weight of water.

During homogenization and pasteurization, Gelatine is solubilized.

Gelatine introduced into the milk before incubation does not affect the working conditions of lactic fermentation (temperature, time, acidity).

It does not react with the milk and there is no precipitation.

For quark, following curd concentration,

Gelatine can be added directly as dry powder or as a concentrated solution. To make this solution Gelatine is added directly to hot water (80 - 90°C) under vigorous agitation. After a few minutes, dissolution is complete. Solutions of 30% concentration can easily be prepared and maintained at a temperature of 50 - 60°C.

How stable is Gelatine?

Some people advance Gelatine's lack of resistance to acid pH and high temperature treatment, without any scientific basis.

Gelatine, as a protein, is susceptible to hydrolysis, which can be provoked by numerous factors: acids, alkalis, temperature,

bacteria, enzymes and irradiation.

In general, gel strength and viscosity decrease when Gelatine is subjected simultaneously to an acid pH (less than 4) and a temperature above 60°C for a relatively long time.

Gelatine is not affected by UHT sterilization at 120°C for a few seconds. A Gelatine solution can be kept at 60°C and neutral pH for several hours without degradation, and a Gelatine product containing a food acid maintains its consistency when stored at low temperature. All of these parameters are met in the manufacture of milk products where the loss of gel strength of Gelatine is not significant.

* The "yogurt" label is subject to national regulations and may not be permitted when additives have been added.

Other dairy specialties

Quark

A multitude of products based on curdled milk are available on the market. They are aerated or non-aerated, and contain flavors, glazed fruits, fruit jellies, etc.

Gelatine plays the indispensable role of binder, influences texture and prevents syneresis.

The Gelatine level varies between 0.1 and 2.0%. It can be directly added to the quark in the form of a solution at 40°C or as a powder after concentration.



Thermally-treated fermented milks

In certain countries, the tendency is to extend the shelf-life of certain types of yogurt and fermented milk by additional pasteurization after the incubation process. This operation prevents prolonged action by the fermenting agents, but does destabilize the product texture, leading to exudation. The addition of a mixture of Gelatine and starch before pasteurization produces a good texture and obviates any exudation effect. The texture of a product stabilized with Gelatine alone is sensitive to changes in storage temperature. A combination with modified starch (0.4 – 0.6%) gives a highly satisfactory formulation in which the starch stabilizes the viscosity between 5 and 20°C and the Gelatine obviates the risk of exudation.

Flavored gelled milk desserts

These dessert products have a semi-solid consistency and are prepared from flavored, sweetened milk. The stabilizing agent used must solubilize during thermal treatment of the milk, produce no increase in viscosity at high temperature, and gel when the product is cooled in the pot. Gelatine can be used alone or in combination with other gelling agents, such as carrageenan. It gives a soft, more elastic gel texture, for example when 1-2 g carrageenan is substituted with 2-3 g Gelatine. Gelatine levels of 2-10 g yield light aerated products. In every case a soft, non-granular gel is obtained which has improved anti-syneresis properties.

Dessert creams

Dessert creams have a relatively thick consistency and are made from flavored, sweetened milk. Gelatine is used to achieve a smooth gel texture and prevent exudation on freezing or as a result of major temperature variations during storage. The amount of Gelatine in these preparations is very variable and can be as high as 2% depending on the characteristics of the desired product.

Ice creams and water ices

The presence of a stabilizing agent is essential for the following reasons:

- To adjust mix viscosity;
- To maintain the emulsion in a stable state until the ice cream is consumed;
- To facilitate aeration and improve expansion;
- To obviate deterioration during storage;
- To prevent the formation of ice crystals during prolonged storage.

Used in association with other stabilizing agents, Gelatine gives the finished product a remarkably

slow melting rate and a characteristic texture.

Hydrolyzed Gelatine is also recognized as preventing ice crystal formation.

Mousses

The foaming action of Gelatine is used in the preparation of a wide range of aerated products. Used in combination with other hydrocolloids, Gelatine gives excellent emulsion stability, facilitating aeration and good mix stability, avoiding separation of the ingredients and maintaining foam stability before gelation.





Rousselot Healthy Choice

Reformulation Solutions for Healthier Foods

Leveraging the powerful functionalities and properties of its Gelatine, Rousselot helps its customers create innovative and healthy foods while maintaining their taste, texture and shelf stability.

Rousselot® Gelatine: Ideal to reduce fat content in dairy products

Nowadays reformulation of food products so as to increase health benefits while maintaining taste, texture and shelf-stability is one of the biggest challenges facing food manufacturers. Formulators are required to design processed foods reduced in fat, salt and sugar while complying with consumers' demands for healthy food and indulgence. Energy intake reduction is also at stake and can be achieved by replacing calorific nutrients by using more water in the food or introducing air into the food matrix to reduce portion size.

In both cases, Gelatine helps to bind water and is a good candidate for whipping and stabilizing foam. While the reduction of fat content in foods may lower calorific value and saturated fat content, it may at the same time affect processing, texture, and taste. Even the setting and melting temperature of fats influence the texture of food products. Fats play a great role in sensory attributes and influence the interactions between taste, smell and texture of

the foods and beverages. Fats may be considered as the carrier of taste, especially in the case of fat-soluble flavors, and are involved in the release of aromatic substances in the mouth. The perception of flavor is closely related to mouthfeel properties. To give an example, fats are able to coat the tongue and palate, delaying and prolonging flavor release.

Gelatine is a good candidate for texturizing, and enhancing mouthfeel in low- or reduced-fat product. Substitution of fats with a less calorific functional protein able to bind 5 to 10 times its own weight of water is achievable with Gelatine. In addition, the viscosity of Gelatine below melting point gives a smooth consistency and a fat-like mouthfeel.

As a food ingredient, Gelatine is not subject to safety evaluation, as could be the case for a new fat substitute. Clean labeling is possible as Gelatine has no e-number.

Key benefits in reduced-fat products

As a protein, gelatine provides fewer calories (4 kCal/g) as compared to fat (9kCal/g)

Water-retention capacities: gelatine is the choice ingredient in low-fat or reduced-fat foods, where part of the fat is replaced by water.

Stabilizer: the water addition in the product is critical towards the stability of emulsions and mousses. Gelatine, even at low dosages, gives stability to the system.

Texture: gelatine characteristics are chosen to mimic the texture of fat in margarine (spreadability, firmness), dairy based products (creaminess).

Mouthfeel: the melting point of gelatine is close to body temperature, yielding a mouthfeel far superior to that of other fat substitutes and maintaining the pleasure of eating healthy foods.

Low calorie spreads

Low calorie spread products have reduced fat content and are either exclusively milk fat- based, vegetable fat-based, or a combination of the two types of fat. Preparation of a stable emulsion requires the presence of stabilizers and emulsifiers. The stabilizer must ensure good water binding and improve the structure, consistency and spreadability of the finished product. Good stabilization can be obtained with high Bloom Gelatine, added at doses varying from 1 to 2%, mainly because the melting point of that type of Gelatine (31-33°C) is very near to the melting point of the different



fats present.

Other hydrocolloids (e.g. pectin, carrageenan and xanthan) may be used in association with Gelatine in order to improve water binding.

Cheeses

Gelatine can be used in cheese production to increase water binding and thus achieve better yields and lower fat content.

Gelatine will also strengthen the texture of the product and enhance flavor release.



New

Geleese™

Rousselot Geleese™ is a fat-reduced cheese specialty for use as a dip or as spread. Reducing the fat content has positively impacted the calorific value and saturated-fat content of this food product.

Various Geleeses have been developed by Rousselot Application Lab, and recipes are available with olive, tomato or goat's cheese flavor...



Rousselot® Gelatine in dairy products

A quality food ingredient...
...with unmatched functionalities!

A natural food

Gelatine is a protein derived from animal collagen. It is composed of more than 85 % protein, less than 13 % water and less than 2% minerals.

Nutritional value

Gelatine is a totally digestible protein of low calorific value (4 kcal/g). It is fully digestible and contains 18 different amino acids, including 8 out of the 9 essential amino acids with the exception of tryptophan. It is particularly rich in glycine, proline and hydroxyproline, which together represent almost 50% of the composition of the molecule. Hydroxyproline is an amino acid specific to Gelatine.

Compatible food

Gelatine is water-soluble and compatible with most other hydrocolloids, including vegetable colloids such as agar-agar, alginates, carrageenans

or pectins. It is compatible with sugars, corn syrups, edible acids and flavors. Since Gelatine is considered to be an ingredient, it has no e-number.

Pure product with a high bacteriological standard

Gelatine is a pure protein the quality of which is achieved and controlled on the production line. It conforms to the most stringent food standards and pharmacopoeias. Dry Gelatine retains its properties when stored at room temperature.

The right gelatine, whatever your application

Gelatine type or grade has to be carefully selected according to the dairy products to be manufactured. Bovine or pig skin gelatines are generally used and raw-material selection can be based on religious or technical criteria. The table below describes the most appropriate gelatines to be used. The Application Lab also provides assistance to Rousselot customers in all their developmental work.

Fixes and binds

Gelatine swells, binding 5-10 times its weight of water. It helps to obviate exudation in milk products where syneresis problems can occur.

Reinforces

Depending on the amount used, Gelatine can strengthen a creamy structure or give a firm gellified structure to liquids. Its low setting temperature gives creaminess.

Produces foam

Gelatine, as a protein, has good foaming capacity in the presence of sugar and milk. In the case of butyric or other type of fat, however, the

foaming capability may be altered and it will be necessary to employ appropriate physical methods (injection of air, CO₂ or nitrogen) to achieve a suitable volume increase in an aerated product. Otherwise Gelatine will always stabilize and give strength to the aerated structure obtained.

Is neutral

Gelatine, being odorless, does not affect flavor and even assists food-flavor release.

Protects

Gelatine has a colloidal protective capacity. The coagulation of milk or casein is finer and more

homogeneous in the presence of Gelatine.

Softens

Small additions of Gelatine always give a soft texture.

Stabilizes

It does not react with milk. It acts directly by its gelling capacity, without addition of salt and without risks of interaction with casein.

Associates easily

Gelatine is completely compatible with milk, casein, other components of milk and principal colloids used in milk products.

Ideal for
a vast range
of dairy
applications





The way of life in developed countries is evolving: concentration of the population, less time to take meals, decreasing calorific values of foods. As a consequence, food industries must respond to new demands: ready-prepared products, snacks, long conservation, and improvements in taste, texture and appearance.

The milk industry has not escaped this evolution and new, ever more elaborate products appear daily. Fruit yogurts, long-life yogurts, aerated curdled milk and low-calorie butter have taken an important place among the more traditional products such as butter, cheese and milk.

In order to respond to the demands of the market, the industry calls more and more on new technology. To thicken, stabilize or aerate, milk products are combined with other food products or additives.

Rousselot® Gelatine in dairy products

	GEL STRENGTH (BLOOM)	VISCOSITY (6,67% -60°C)	OTHER IMPORTANT CHARACTERISTICS	GELATINE CONTENT %
Creams, margarines				
Cream for long storage	150	medium	Melting point	0.2 -0.5
Whipped cream	150	medium		0.2 -0.6
Reduced-fat butter-type spreads	250	medium		0.5 -3
Home-made dessert mixes				
Custards, puddings	150	medium	Foaming power	0.2 -2
Mousses	150 / Hydrolyzed Gelatine	medium		0.2 -2
Sour Creams	150	medium		0.2 -1
Pastry custards	150	medium		0.2 -3
Industrial dairy desserts				
Flavored milk jellies	150	medium	Foaming power	0.2 -2
Mousses, aerated desserts	150 / Hydrolyzed Gelatine	medium		0.2 -3
Cream custards	150	medium		0.2 -1
Acidified milk products				
Yogurts (yogurt-based products), fermented milks	150-175	medium		0.2 -2
Desserts	150	medium		0.2 -2
Fresh cheese-based products	150	medium		0.2 -2
Ice creams and sorbets	150 / Hydrolyzed Gelatine	medium	Foaming power	0.2 -1

Rousselot®

Rousselot is the leading manufacturer of Gelatine and collagen peptides to the food, pharmaceutical and technical industries.

With a staff of 2,400 people, the company benefits from a global sales and production network of 13 plants and 10 sales offices located in Europe, North America, South America and Asia.

Rousselot is part of VION N.V., an international food company with production and sales facilities on all continents.

VION

With two international divisions Food and Ingredients, the company is active in the field of high quality foodstuffs and health products for humans and animals. Rousselot is part of the Ingredients division. VION has annual sales of EUR 9.0 billion and provides employment for 27,000 people worldwide. VION's head office is in Eindhoven, The Netherlands. www.vionfood.com

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