



Rousselot®
Gelatine in
confectionery



Improvement
by nature



Jelly Confectionery

The right
Gelatin,
whatever your
application

Gelatin jelly confectionery can be defined as a highly concentrated mixed sugar/corn syrup mass mixture that has been formed into a gel by adding Gelatin. The mass is mainly composed of saccharose, glucose syrup, other types of sugar (i.e. invert sugar, dextrose), Gelatin, acid, flavor and color.

Production of Gelatin jelly confectionery involves:

- Dissolution of the Gelatin,
- Concentration of the sugar/corn syrup solution
- Mixing of the Gelatin solution into the sugar/corn syrup solution,
- Deaeration of the mass, addition of color, flavor, acid,
- Depositing into molding starch.

Soft acid jellies may contain from 6 to 9% Gelatin of general type A (acid processed Gelatin) of various grades from 150 to 275 Bloom strength. Gelatin type A is used in these applications because of its low viscosity and high isoelectric point.

Soft jellies can be removed from the molding starch after one night and are then treated using various methods to prevent them from sticking together.

The texture of the finished product is rather chewy. The best known example is the gummy bear.

Total soluble solids at depositing is +/- 78° Brix.
Final total soluble solids varies from 80 to 83° Brix.

Most of these products are manufactured by continuous pressure-cooking manufacturing processes. In this case, the Gelatin solution is added to the sugars and glucose syrup before cooking. The cooking time is short enough not to hydrolyze the Gelatin.



Different textures and firmness characteristics can be obtained by:

- Varying the Gelatin content: the more Gelatin, the chewier the product.
- Replacing one Gelatin with another quality of differing gel strength: for the same firmness in the finished product, a less high bloom is needed to substitute for low bloom, resulting in a less chewy product.

Gelatin can be combined with other stabilizers or gelling agents to obtain particular texture characteristics:

- Gelatin + agar or pectin: short and brittle texture,
- Gelatin + modified starch: less elastic texture,
- Gelatin + gum arabic: hard, compact texture.

Key success factors for a jelly confectionery

During production and storage of Gelatin jelly confectionery, a number of rules have to be carefully respected:

- Sufficient quantity of Gelatin in the formula
- Sufficient dissolution of the Gelatin
- Careful control of the syrup temperature or the syrup/Gelatin syrup mix
- Adequate quantities of invert sugar, sorbitol, glycerin, maltodextrin...

By paying careful attention to the ingredients content and the process, defects commonly encountered in the production of gummy confectionery, such as too soft a product, tailing, stickiness will be easily avoided.

Aerated Confectionery

Aerated confectionery can be defined as an aerated gelled product containing a mixture of carbohydrates, mainly sugar, different types of corn syrup, whipping and/or stabilizing agents, flavor and color. The aeration technique enables a liquid to be transformed into a foam by incorporating a certain volume of air in the form of finely divided bubbles.

This technique causes:

- An increase in volume, together with a decrease in density,
- Modification of the viscosity and fluidity of the aerated mass, leading to improved stability,
- Modification of the texture and organoleptic characteristics of the finished products.

Aerating the product leads to a shorter texture, modification of the mouthfeel, a change in color, and decreased sweetness.

Three types of equipment can be used in the production of aerated confectionery:

- Planetary beaters have long been used in the production of aerated confectionery. They are still used in some countries for the production of aerated jellies and nougat-type products.
- Discontinuous beater under pressure or continuous beater under pressure. This equipment can be used in one step (all ingredients are beaten together) or in two steps (sugar syrup is added to a whip).

Beating under pressure has nowadays almost entirely replaced planetary beaters. This can have the following advantages:

- Shorter beating time,
- Easier transfer of the aerated mass,
- More homogeneous production.
- Better density control,
- Possibility of replacing air with an inert gas, i.e. formulations with fat.



Marshmallows

A typical example of aerated confectionery containing Gelatine is marshmallow. Marshmallow can be deposited in starch mold or extruded. This product generally contains between 3 and 4% high gel-strength Gelatine. Lower gel-strength Gelatine can be used at higher concentrations (up to 5 to 6%), but will result in chewier finished products.

Key success factors for marshmallows

In marshmallow production, the four main ingredients are corn syrup, sucrose, Gelatine solution and water. All these ingredients have to be weighed, mixed and boiled in a very precise process.

Some of the basic rules for successful marshmallows include...

- Add a sufficient quantity of Gelatine to the formula
- Carefully select the sugar composition in dextrose, sorbitol, glucose syrup
- Verify the density after beating
- Do not leave the products in the molding starch for too long
- Do not add too much water
- Avoid storage under hot conditions...

Careful application of a few rules will allow excessively tough or soft/rubbery/shrunken/sticky marshmallow to be avoided.



Rousselot® ACPE or ACID Marshmallow

Rousselot's expertise at work

Developed by its Application Laboratory, Rousselot® ACPE is a new gelling agent that enables the manufacture of stable marshmallows with intense acid fruit flavors such as citrus, grapefruit, etc.

Affording unexplored fluffiness and taste, this new confectionery fulfills the industry's ongoing quest for innovative products.

Combining Rousselot's technical expertise and its knowledge of the market, the process for acid marshmallow solves the problem of stabilization of such aerated confectioneries, which has presented itself hitherto.

Rousselot® ACPE provides the natural support for maximum flavor release and mouthfeel. This new process does not require any industrial adjustment and opens up many new perspectives for the confectionery industry.

A patent has been registered by Rousselot for both the acid marshmallow and its production process. (N° PCT/EP2008/060627)

Chewy Confectionery



Fruit chews

These confectionery products are characterized by low aeration, a high total soluble solids content, and incorporation of fats. Gelatine is used in these products for its emulsifying properties, its foaming action, to improve chewability, and to control crystallization of the saccharose.



Toffee

Toffees are manufactured from a mixture of milk, sugar, corn syrup, fats and flavors, to which a "frappé" can be added following concentration of the sugars. A small quantity of Gelatine is used to improve emulsification and to stabilize the texture of soft toffees.



Nougat

Nougat comprises a mixture of sugars, corn syrup, in certain cases honey, invert sugar and fats, with the addition of a "frappé" following concentration. Gelatine is a component of this "frappé", and is used to stabilize the texture of the finished product.

RHC

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 for reducing sugar content in confectionery products.

For many years, the aim of the confectionery industry has been to reduce or even to totally replace sugar and corn syrup to produce products that are non cariogenic, suitable for diabetics and if possible reduced in calorie content. As a result of its unrivalled gelling properties, Gelatine is the ideal ingredient to reformulate lighter confectionery and yet give a similar texture to that of traditional candy.

From sugar confectionery to sugar free

confectionery: The substitution of sugar and corn syrup by sugar substitutes such as sugar alcohol (polyol) requires a robust gelling agent. Only Gelatine can perform this function without compromising texture and flavor release.

From sugar free confectionery to sugar

reduced confectionery: Due to the poor image of sugar alcohols / polyols, a proportion of these sugar substitutes is replaced by bulking agents with a positive image such as polydextrose, oligofructose... Once again, Gelatine is the best candidate as far as gelling and providing a similar texture to traditional sugar confectionery are concerned.

From sugar reduced confectionery to healthy and premium confectionery:

As confectionery is an indulgence consumers are not prepared to compromise on taste and/or texture so the confectionery industry returns to its original values making confectionery with a great taste, pleasant texture and now including, last but not least a healthy aspect. Introducing fruit juice, fruit pulp,

vitamins, calcium, hydrolyzed collagen... is yet another challenge for the gelling agent. Again the performance of Gelatine as gelling agent is unique giving a texture similar to traditional sugar confectionery.



Fruity Delight™ Pulp Gummies

Fruity Delight™ Pulp Gummies contain 9% less added sugar/glucose syrup than standard jelly confectionery. This sugar has been replaced to 4% with fruit.

Various Fruity Delight™ have been developed by Rousselot Application Lab, and recipes are available with Kiwi, Blackberry, and Mango flavors.

Rousselot® Gelatine in confectionery

Rousselot® Gelatine: a quality food ingredient...
...easy to dissolve and to use.

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.



The preparation of Gelatine solutions presents few difficulties at concentrations below 10%.

For Gelatine solutions of concentrations up to 33 to 40% in water, four preparation methods are used:

Conventional method:

Swelling in cold water, followed by dissolution and homogenization in a hot- water bath.

High-speed method:

Direct dissolution in hot water.

Intermediate method:

Swelling in cold water, followed by direct dissolution in other raw materials.

Mixing:

Gelatine is mixed with other ingredients before being dissolved. Dissolution occurs during pasteurization or sterilization of the finished products.

Grain size, gel strength, viscosity, concentration and dissolution time parameters determine the choice of the most appropriate method.

	GEL STRENGTH (BLOOM)	ROUSSELOT® GELATINE TYPE	VISCOSITY (. % -0°C)	OTHER IMPORTANT CHARACTERISTICS	GELATINE CONTENT %
Jelly item to be oiled or sugar sanded	200 - 275	PS, AH	medium - low	Color, clarity	6-9
Gum	150	PS, AH	low	Color	10 -15
Wine gum	125	PS, AH, LH	medium - low	Color	4 -8
Liquorice	100	PS, AH, LH	medium - low		3 -8
Marshmallow	250	PS	medium	Foaming power	3 -5
Meringues	100	PS, AH, LH	medium	Foaming power	2 -5
Extruded aerated items	125	PS, AH, LH	high - medium	Foaming power	3 -7
Chewy candy	125 - Hydrolyzed collagen	PS, AH, LH	medium	Foaming power	0.5 -2.5
Caramels	100	PS, AH, LH	medium	Foaming power	0.2 -1
Toffees	100	PS, AH, LH	medium		0.2 -1

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 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.



Ideal for
a vast range of
confectionery
applications

Rousselot® Gelatine in confectionery

Gelatine is an important texturizer in a wide range of confectionery products.

It can be used alone or in combination with other texturizers to manufacture products such as gummy bears, wine gums, pastilles, yogurt gums, deposited liquorice, fruit chews, etc.

Gelatine can be characterized in different ways and primarily by its gelling power and thermoreversibility.

As a protein, Gelatine has the unique ability to form a thermoreversible gel when the solution is cooled, but which subsequently liquefies when heated. This is the most important property of Gelatine and the key to a vast range of confectionery applications. The uses of Gelatine in confectionery can be classified according to the various functions of Gelatine. Gelatine may be considered as a:

- Gelling agent: jelly confectionery,
- Whipping agent: aerated confectionery,
- Stabilizer: anti-crystallizer,
- Emulsifier: fruit chews,
- Thickening agent: filled confectionery,
- Binder: sugar paste, liquorice,
- Coating agent: dragées, coated chewing gums...



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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