# ALL ABOUT GELATINE




# Contents

# Responsibility – Across National Boundaries

## Quality is our core competence

Gelatine is an all-rounder that is used in the most diverse sectors of industry and products, and which develops its stabilising effect quite naturally. The majority of gelatine produced is edible or pharmaceutical gelatine. Thus the Gelatine Manufacturers of Europe (GME) have a very special responsibility. Since we came together to form GME in 1974 our main task has been that of ensuring gelatine of the highest quality for all of our customers and the consumer, regardless of national borders.

We gelatine manufacturers are able to boast long-established quality assurance standards for production and for the selection of raw materials. Experts consider gelatine to be safe, and the results of international studies have shown that this is so.

In this brochure we would like to show you the far-reaching potential of gelatine. In addition to traditional applications in the food, pharmaceutical and photographic industries, thanks to its diverse properties gelatine offers considerable potential for new, innovative products in all spheres of life. Securing traditional markets and conquering new markets with a natural product of guaranteed quality is our key strength. ■

### At your service

The gelatine infocenter is a special service from GME. The information service is aimed at consumers, journalists and anyone seeking information about gelatine. No matter what question you might ask us, we will be happy to help and provide you with the required information.

Gelatine infocenter

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Internet: www.gelatine.org

## High standards and transparency

The major European gelatine manufacturers are members of GME and account for around 45 per cent of gelatine production worldwide. GME was founded in 1974. As an interface between its members and the decision-makers in European politics it is based in Brussels.
In its working committees, GME constantly pursues its core task of ensuring consistently high-quality gelatine for customers and consumers. Research and the further development of technical standards, providing impetus for new statutory framework conditions for the gelatine industry, and the creation of transparency are the cornerstones of its activities.

The Gelatine Monograph especially developed by GME is a key instrument in ensuring compliance with uniform quality standards. It defines the latest analytical methods for all members and is constantly updated.

In order to ensure uniform international gelatine standards, GME also co-operates closely with international institutions, such as the United Nations Food and Agriculture Organisation (FAO) and the World Health Organisation (WHO). The health of consumers throughout the world is to be protected by the FAO's Codex Alimentarius for the retail food trade. GME has proposed extending the small number of quality criteria for gelatine that have been defined to date. GME is thus making an important contribution to assuring the quality of gelatine across the world. ■

## Gelatine in the past and present

There is no doubt that the manufacture of gelatine-like mixtures goes back as far as the ancient Egyptians. Records show that banquets many centuries ago included gelatine specialities, such as trout or fruits in gelatine, as particular delicacies.

**1682** The Frenchman Papin reports on a cooking process in which he tried to obtain a jelly-like mixture from bones.

**1700** Gelatine *(Latin: gelatus = stiff, frozen)*. The word gelatine is first used in Europe around 1700.

**1754** The first patent in the adhesives sector is granted in England in 1754 for the manufacture of a joiner's glue. The natural adhesive is manufactured on the basis of gelatine, among other things.

**1871** Profound discoveries by the English doctor Richard Leach Maddox lead to the decisive breakthrough in photography. Doctor Maddox invents a dry plate with a bromide-silver-gelatine layer that is just as sensitive as the wet plates used until this time. Following further research Charles Bennett presents a satisfactory dry plate method. One of the main advantages of this new technology is that the exposure times during photography can be reduced considerably.

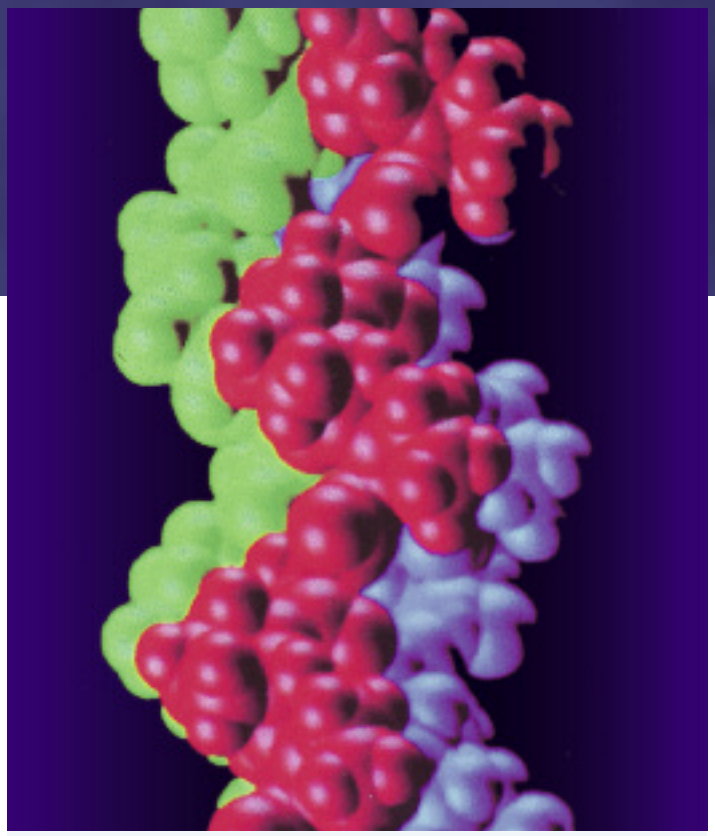
**1875** This year is considered to be a milestone in modern gelatine manufacture. Thanks to the emergence of small factories, large quantities of gelatine can now be manufactured industrially.

**1950** The gelatine industry sees rapid technological developments and makes tremendous progress towards achieving high standards in the production of gelatine and the quality of products.

**1974** The European gelatine association GME (Gelatine Manufacturers of Europe) is founded to represent the interests of the Western European gelatine manufacturers.

**2001** An international study initiated by GME in 1999 under the auspices of the European Commission once again confirms that raw material regulations and gelatine production processes guarantee maximum safety for consumers. ■

# Gelatine – A Thoroughly Natural and Healthy Foodstuff



## The structure of gelatine

Gelatine contains a total of 18 amino acids in varying concentrations. They link up to form polypeptide chains, with each chain containing as many as 1,000 amino acids. The entire gelatine structure is a rod-shaped molecule comprising a primary, secondary and tertiary structure. ■

| | g amino acid per 100 g pure gelatine |
|---|---|
| Alanine | 11.3 |
| Arginine* | 9.0 |
| Aspartic Acid | 6.7 |
| Glutamic Acid | 11.6 |
| Glycine | 27.2 |
| Histidine* | 0.7 |
| Proline | 15.2 |
| Hydroxyproline | 13.3 |
| Hydroxylysine | 0.8 |
| Isoleucine* | 1.6 |
| Leucine* | 3.5 |
| Lysine* | 4.4 |
| Methionine* | 0.6 |
| Phenylalanine* | 2.5 |
| Serine | 3.7 |
| Threonine* | 2.4 |
| Tryptophan* | 0 |
| Tyrosine | 0.2 |
| Valine* | 2.8 |

**Essential Amino Acid*

## A high-quality protein for humans

Without protein there would be no human life. Other nutrients, such as fats and carbohydrates, are interchangeable in the human metabolism over long periods. But people need protein every day. The natural foodstuff gelatine is therefore of inestimable value to the human organism. Gelatine is a pure protein obtained from raw materials containing collagen. Amino acids are the building blocks of proteins. The human body is capable of making all the proteins it needs from amino acids. However, there are nine amino acids that the body cannot produce itself and which have to be regularly consumed in the diet therefore. These are known as essential amino acids. Gelatine contains a total of 18 amino acids, including eight essential amino acids. ■

## Amino acids per 100 g pure Gelatine

The table (left) provides an overview of the amino acids in the collagen for a typical alkaline (base) extracted gelatine.

The amino acid glycine is present in the most concentrated form with 20.6 g per 100 g gelatine, followed by proline with 11.7 g. Both of these amino acids are important components for connective tissue, lending it firmness and elasticity.

The third important essential amino acid present in gelatine is lysine (3.4 g per 100 g gelatine). Lysine plays a major role in maintaining and forming new tissue and in cell and bone growth. ■

## Comparison with staple foods

| | Gelatine (100g) | Milk (100g) | Bread (100g) |
|---|---|---|---|
| Glycine | 20.6 g | 0.1 g | 0.3 g |
| Proline | 11.7 g | 0.4 g | 0.9 g |
| Lysine | 3.4 g | 0.3 g | 0.2 g |

*Gelatine contains 84-90% pure protein on average. The amino acid values listed in the table have been adapted accordingly to allow for an appropriate comparison with milk and bread.*

# Gelatine – A multi-faceted product

The most common form of gelatine is edible powdered gelatine. It is an ingredient in yoghurts, deliciously light creamy foods, jelly and aspics. It gives sweets such as wine gums and jelly babies their unique texture. Edible gelatine is a natural foodstuff and is therefore subject to stringent purity regulations – just like all other foodstuffs. The most important physical property of gelatine is the Bloom value, which is generally between 50 and 300. This is used to determine the firmness and gelling strength of gelatine. The higher the Bloom value, the greater the gelling strength of the gelatine. The foodstuff gelatine is unique in its reliable stabilisation, gelling and handling.

**One form of gelatine is leaf gelatine.** Cut into rectangles, with a lattice pattern resulting from the manufacturing process and elastic in its movements, at first glance leaf gelatine looks more like a work of art. Leaf gelatine can be portioned especially well and easily and is mostly used in the household and catering, by bakers and butchers. In addition to leaf gelatine, granular and fine powdered gelatine are also available on the retail market.

**Gelatine hydrolysates,** like all gelatines, are pure collagen proteins, but do not have any gelling strength. They act as a source of protein, a carrier, a means of reducing the amount of salt in products, of enhancing flavour, of clarifying drinks, as well as collagen protein in dietetic nutrition.

**Instant gelatines** are also soluble in cold water and were specially developed to avoid the use of heat normally required to dissolve the gelatine. They are often used to stabilise foodstuffs such as gateaux, desserts and other sweets and cold dishes. ■

**The chemical analysis**
**84–90 % protein**
**1–2 % mineral salts**
The rest is water.
Gelatine does not contain any preservatives or other additives. It is free of cholesterol and purines (uric acid compounds).

# Top Priority for Quality and Safety

## First-Class raw materials a matter of course

The majority of gelatine produced in Europe is made from pigskin; other raw materials include cattle hides, bones from pigs and cattle, and to a lesser extent poultry bones and fish skins. All the raw materials for the manufacture of gelatine come from animals whose meat has been approved for human consumption. This is guaranteed by the conventional practice of slaughter, monitoring and approval procedures all along the supply chain.

In all European slaughterhouses, every animal is examined by a vet. In addition, BSE tests are carried out on all cattle older than 30 months. Only animals deemed fit for human consumption are handled by the meat industry. The meat goes to the butcher and the skin and the bones are used for gelatine production. The selection of the raw materials is regulated by statutory provisions. European legislation governs all stages of gelatine manufacture, starting with the selection of the raw materials right through to delivery. This means that all raw materials are subject to ongoing stringent checks on safety and origin.

Pharmaceutical gelatine must comply with the stringent requirements of the official pharmacopoeia. Edible gelatine also meets these requirements and must also comply with food safety provisions.

The gelatine manufacturing industry is thus one of the best structured and best regulated industries in Europe. ■

## GME – Always one step ahead

Gelatine has always been a healthy and safe foodstuff. However, since the advent of BSE some consumers have become sceptical about gelatine. Although this scepticism is understandable, it is unfounded. The European gelatine manufacturers have always ensured top-quality gelatine. This is reflected in the careful selection of high-quality raw materials and the multi-layered manufacturing process itself. In the face of the BSE crisis in 1999 the EU Commission laid down tougher regulations regarding the manufacture, purity and marketing of edible and pharmaceutical gelatine. The GME member companies had reacted long before these tougher regulations came into effect, already implementing the EU guidelines.

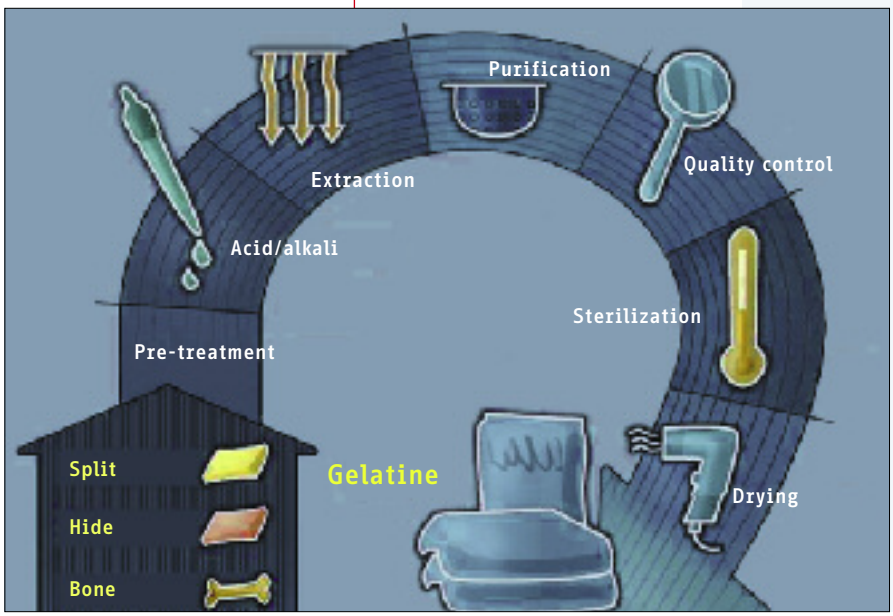
With regard to its safety, and especially with respect to BSE, gelatine is certainly one of the most widely studied foodstuffs. On the basis of international research results, the World Health Organisation (WHO) and the European Commission for Health and Consumer Protection have confirmed that gelatine is safe. ■

## Another guarantee for safety is the manufacturing process

In addition to the statutory guidelines governing raw materials, the gelatine production process itself has always been another fundamental safety aspect for the consumer. GME takes consumers' reservations very seriously indeed. For this reason GME conducted several studies as long ago as the early 1990s. Alongside these studies, in 1999 GME commissioned an extensive study of gelatine under the auspices of the European Commission as part of the latter's BSE Research Program. The study investigated whether BSE pathogens which were artificially added to the raw materials were removed or inactivated during the gelatine production process. The study results showed that the methods used in the production process are extremely effective in destroying the BSE agent. Even with the most sensitive measuring methods, no more infectious residues were detected. The gelatine manufacturing process thus also acts as an additional guarantee that there is no health risk.

The study, which confirmed earlier investigation results, was carried out by three internationally renowned research institutes – the Institute for Animal Health in Edinburgh (Scotland), the Baltimore Research and Education Foundation (USA) and ID-Lelystad (Netherlands).

The study results show that the consumption of gelatine has never posed any risk to human health. ■




## The manufacturing process

Gelatine is produced in a complex procedure involving several stages. The input material is the connective tissue of pigs, cattle, poultry or fish. The collagen protein present in the skins and bones of pigs and cattle is processed to form gelatine.

First of all, the fat and minerals are removed from the raw materials. Afterwards two different pre-treatment methods are used, depending on the raw material and on the final application of the gelatine: The alkaline method and the acid method.

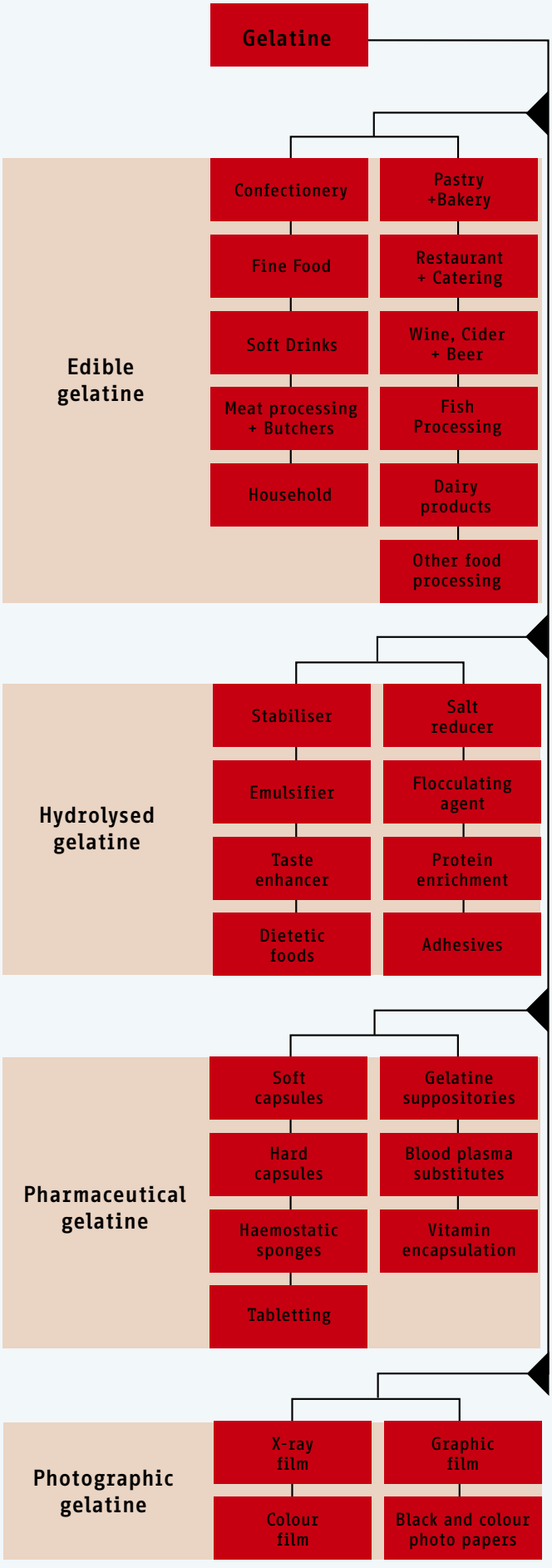
In the alkaline method the highly interconnected connective tissue of cattle is pre-treated with lime in a process lasting several weeks. After rinsing, the gelatine is extracted in warm water and separated from the other raw materials.

The collagen connective tissue in pigskin is not so heavily interconnected. Here, a one-day acid treatment with subsequent neutralisation and intensive rinsing out of the salts is used before the gelatine is extracted in warm water.

The pre-treated raw materials are then processed with hot water and extracted in several stages. The extracted solutions are freed of traces of fat and fine fibres in high-performance separators. The finest impurities are removed using filters. In a final purification stage, calcium, sodium, as well as residual acids and other salts, are removed from the gelatine. The gelatine solution is thickened in vacuum evaporators to form a honey-like solution. During this process, the typical "gel noodles" are formed and then ground into grains.

Extensive quality controls throughout this complex manufacturing process ensure the quality and purity of the gelatine. ■

# Gelatine – Used Almost Everywhere




## The invisible helper

Gelatine is a natural product that is important in the food industry and in nutrition. Gelatine is also successfully used in other sectors of industry, such as in the pharmaceutical and photographic industries. Did you know, for example, that papers for inkjet printers are of the highest quality precisely because gelatine lends them their specific surface properties, or that blood substitutes are made using gelatine? In some quality wines, fruit juices and beer varieties, gelatine is used to clarify the drinks. In short, gelatine is to be found wherever gelling agents, stabilisers, binding agents, emulsifiers, foaming agents and thickening agents are needed. ■

## ... in the pharmaceutical industry

In the pharmaceutical industry gelatine is used to manufacture hard and soft capsules. It protects the medicines against harmful influences, such as light and oxygen. Soft capsules are mainly used for liquid fillings, and hard capsules for powders. Gelatine helps to bind the active pharmaceutical agents and extend their shelf lives. Thanks to careful selection and dosage, even the release speed of active medical agents can be impacted with the use of capsules. Gelatine-coated tablets (caplets) are a new technological development, with the gelatine coating ensuring that patients can swallow the caplets easily. In emergency treatment plasma expanders (blood volume replacements) based on gelatine are often used to replace lost blood, hence restoring the patient's blood volume balance. ■

## ... in food manufacture

There are many diverse uses for gelatine in modern food production. The main reason for this is the unique ability of gelatine to melt when heated to body temperature and to become firm again on cooling. Its pleasant eating properties make it irreplaceable for the foodstuffs industry.

Dairy products are very popular – and gelatine plays an extremely important role in their preparation and in the development of ever newer varieties. The correct dosage and the right type of gelatine ensure creamy, light yoghurts and more solid dairy products, such as curd cheese and kefir.

With candies gelatine lends products such as jelly babies and wine gums that pleasant mouth feeling. The correct choice of gelatine gives marshmallows their foamy texture and stability.

With pâtés and aspics it ensures a delightful appearance. Many salami and pepper sausage varieties are protected from drying out with a protective coating of gelatine. In the manufacture of fish products gelatine is mainly used for decorative purposes. Here, gelatine protects against the effects of light and oxygen, as well serving to enhance appearance. Its property of melting at body temperature makes gelatine an indispensable substitute for fats in low-fat foods. ■

## ... in the modern photographic industry

Silver salt photographic materials comprise as many as 15 gelatine layers that are coated onto film or paper. Photographic developing chemicals can easily penetrate the gelatine layers and then be removed by rinsing in the later stages of the developing process. The important factor for the complicated layer technique is the capacity of gelatine to form a solution when heated, to turn back to a gel as it cools down, and to remain durable after water has been removed. The properties of gelatine are also required for specialist photographic films, such as colour and X-ray films. Gelatine is also indispensable for digital photography. Inkjet papers coated with gelatine guarantee brilliant colours and clear outlines, resulting in prints of the highest quality. ■

## ... here too gelatine is practically irreplaceable

■ Collagen hydrolysates and collagen tensides based on gelatine are fully biodegradable as active agents in detergents. In their capacity as fibre-protecting proteins, they have a tangible effect in special detergents for wool, silk and other delicate textiles. As an additive in washing-up liquids, they develop their dermatological benefits, protecting the skin against aggressive tensides and other surfactants.

■ In the manufacture of matches, the binding properties of gelatine are indispensable for the match-heads.

■ Gelatine is also used in the paper industry. Here, it improves resistance to moisture and the stiffness of the paper (with bank notes for example).

■ Zinc and cadmium can be cleaned through the addition of gelatine to electrolytic baths. Gelatine enables the sedimentation of dirt and thus creates the basis for the production of metals of high purity.

By the way: In the restoration of buildings, such as the Semper Opera House in Dresden, one of the most beautiful music theatres in Europe, or the Pont Alexandre III, the largest bridge in Paris, gelatine is used as an elastic adhesive. ■

# Stay Mobile with Gelatine

## Osteoarthritis – the "silent" epidemic

In the year 2000, the World Health Organisation (WHO) declared the present decade to be the Bone and Joint Decade. For a very good reason: Several hundred million people around the world are suffering long-term pain and physical handicaps due to diseases of and injuries to the locomotor system.

In particular, osteoarthritis is among the most well-known diseases of this kind in Europe.

Sports injuries, extreme sporting activities, heavy manual labour and wrongly stressing the joints and bones lead to changes in the joints. This can lead to stiff fingers, cold feelings and swellings in the extremities. These changes are often accompanied by extreme physical pain. Medical treatment frequently entails strong painkillers. These include morphine, a medicine that reduces sensitivity to pain and loosens cramps. ■

### Osteoarthritis

- Osteoarthritis is one of the most common diseases in the world, affecting more than half of all those over the age of 65. In the USA nearly 40 million people suffer from the disease. It is estimated that some 103 million people in Europe suffer from osteoarthritis.
- Sports injuries, manual labour and the wrong kind of stress for joints and bones lead to changes in the joints, even among very young people.
- Osteoarthritis is understood to be wear and tear of the joints, and, to be more precise, the degeneration of the protective layer of cartilage. Typical forms of osteoarthritis pain are so-called start-up pain, as well as pain on weight bearing and pain at rest.
  Start-up pain: This occurs with the first movements, usually after longer periods of rest, and gradually eases off with movement.
  Pain on weight bearing: This is triggered by physical activity. Pain at rest: Occurs regularly, also during periods of rest, and increases in intensity as the disease progresses.
- An X-ray can make osteoarthritis visible. The osteoarthritis is seen on an X-ray as a reduction in the size of the joint cavity, a compression of bone close to joints, and through the formation of additional bone material at the edge of the joint.
- With arthroscopy it is possible to examine the inside of the joint. This provides the best possible view and allows for a precise diagnosis of the extent of the damage to cartilage. ■

***Did you know...?***

... that the cartilage in a healthy joint has sliding properties around five times better than those of ice.

... that the joint cartilage in the large joints is only around three to five millimetres thick. It is important to protect it – and the best way to do that is with gelatine. ■

## Help for diseases of the bones and joints

In spite of a so-called luxury diet in western cultural groups, many people suffer from a deficiency of amino acids without being aware of it. The amino acids glycine and proline perform an important function for building up fibrous tissues. An insufficient supply of these amino acids can make itself known in the form of painful joints as well as brittle fingernails and hair.

The natural protein gelatine performs an important function in supplying the human body with these amino acids. It differs greatly from other proteins because it contains the amino acids glycine and proline in a concentration that is around 10 to 20 times higher than others. International studies confirm that gelatine has a preventive and regenerative effect on the skeleton and locomotor system – especially bones, cartilage, tendons and ligaments. In examinations with patients who suffered from arthritic complaints of the locomotor system and treated with gelatine, the positive effect of the natural foodstuff on bones and joints was confirmed. A double blind study was carried out, where neither the doctor nor the patient knew whether gelatine or a placebo treatment was given. Among those patients who were treated with gelatine for a period of two months, the pain diminished greatly. Patients who were given the placebo treatment felt no improvement in their complaint *(Source: Therapie Woche, No. 41, September 1991, page 2456 onwards)*. Further trials studied how the peptides in gelatine (compounds made up of amino acids that form when the protein molecule is split) reach the target organs in the connective tissue. In these studies, deposits of protein peptides could be detected in the cartilage after as few as six hours. The result indicates that gelatine can have a preventive effect with cartilage wear and explains the positive effect of the gelatine. *(Source: The journal of nutrition, Vol. 129, No. 10, October 1999, page 1891 onwards)*.

Many doctors and nutritionists are familiar with the positive effect of gelatine. When gelatine is taken at the same time as medicines for rheumatic complaints and painkillers, for example when a patient is suffering from chronic osteoarthritis, the pain-relieving effect can be achieved with around a quarter of the usual daily doses of medicines. The greater pain-relieving effect of this combination leads to greater mobility in the joints and to an improvement in general physical abilities. ■

# Gelatine – The Right Choice for a Balanced Diet

## The light source of protein

Hardly any other food combines as many positive properties for the diet as gelatine. It is a source of high-quality protein, free of cholesterol, sugar and fat. Gelatine is officially recognised as a foodstuff. It is easy to digest, is completely broken down in the human body, and has scarcely any potential for allergic reactions.

Thanks to its special qualities, this foodstuff occupies a very prominent position in the human diet. Gelatine is used to enrich proteins, reduce carbohydrates and as a carrier for vitamins. Moreover, it can be used to reduce the amount of salt in foods. Many meat and sausage products, as well as ready-to-eat meals, have very high concentrations of salt. Thanks to the use of gelatine hydrolysate, the proportion of salt can be greatly reduced without the products having to make any compromises in terms of flavour.

Gelatine can also play an important role in weight loss. Due to its ability to gel, it can to some extent replace the high fat content in many products. The half-fat and low-fat products such as half-fat margarine, low-fat cheese and yoghurt varieties – all to be found on the shelves as 'light products' – remain full of flavour and look tasty thanks to the addition of gelatine. Delicious low-calorie dishes can also be prepared at home with gelatine. They are low in fat, but still have the full flavour. ■

## Healthy pleasure

The idea that healthy eating and pleasure are mutually exclusive is still prevalent. Food, even when it is balanced and 'light', should taste good but not overload the stomach. It is important for meals to provide enough energy for the whole day. At least one meal a day should contain sufficient carbohydrates, high-quality protein, essential fatty acids, vitamins, minerals, trace elements and fibre. The wrong eating and drinking habits impair personal performance and reduce the feeling of personal well-being. ■

*Tip: With gelatine you can enjoy light and healthy food. Recipes are available from the Gelatine Information Centre.*

### "You are giving your body just the right thing with gelatine"

"Gelatine is also important for nutrition because of its relatively high concentration of the essential amino acid lysine. Lysine is indispensable for the human diet because it is not produced by the body itself. The amino acid assumes an important role in maintaining and forming new tissue, and also in cell and bone growth.

In combination with other sources of protein gelatine also develops its full potential for the metabolism of the muscles and cartilage. Gelatine hydrolysate is used as a supplementary protein in energy bars. In addition to carbohydrates, fibre and vitamins, the bars provide just the right source of protein for snacks between meals. Especially refreshing are gelatine drinks, which can be prepared to suit individual tastes." ■

Ursula Girresser, Dietician and owner of ESG Neuss Dietary Advice

## 10 grams of gelatine a day

Protein is important for the regeneration of the body. Gelatine is different from other proteins as, in addition to lysine, it contains concentrated forms of the amino acids glycine and proline. This means that gelatine has a positive effect on the bones, cartilage, tendons and ligaments. Reputable dieticians and doctors recommend a dose of 10 g of gelatine a day as an optimum intake.
Scientific studies show that gelatine fortifies hair if taken regularly. Gelatine also strengthens the connective tissue, thus ensuring firm skin, shiny hair and strong fingernails. It has been proved that hydration of the skin is boosted by consuming gelatine. This has the positive consequence that wrinkles become less deep and the skin looks firmer and fresher. ■

*Tip: You can buy gelatine as drinking gelatine or gelatine hydrolysate in pharmacies, health food stores and drugstores.*

## Drink yourself fit and healthy "Peking Wellness"

| | |
|---|---|
| 100 ml | fruit tea |
| 100 ml | peppermint tea (or green tea with mint) |
| 50 ml | cherry juice |
| 2 tsp. | passion fruit juice |
| 10 g | drinkable gelatine |

Make 100 ml fruit tea and 100 ml peppermint tea (alternatively: green tea with mint) and let both varieties of tea cool in the fridge for a few hours. After cooling mix the two varieties of tea, then add 50 ml cherry juice and 2 tsp. passion fruit juice. This is all rounded off with 10 g of drinking gelatine.

The wellness drink is ready!

This drink is suitable both before and after sporting activities. Or you can enjoy it as a wellness drink, for example after a sauna. The drink contains protein (gelatine for the skin, hair and nails), energy that can be processed quickly, potassium and vitamin C. ■

# Identifying Trends, Developing Strategies, Shaping the Future

## Developing new markets

The development of new markets and further development of the natural product gelatine rank among the core tasks of the European gelatine association and its members. Gelatine is a totally natural product. This also explains the special responsibility of the member companies to protect human health, nature and the environment. The binding properties of gelatine and its ability to transform liquids into gels upon cooling which become liquid again when heated play a major role in this respect.

In many respects asbestos is an invisible and unpredictable hazard. If handled incorrectly, the contamination in the air can rise to several million carcinogenic fibres per cubic metre of air. When buildings contaminated by asbestos are being renovated, the contaminated areas can be sprayed with a gelatine solution, thus creating an elastic network. The asbestos fibres are not released when the asbestos is moved. The advantage of using gelatine as a binding agent is that the bound asbestos mixture can be combined with cement in a subsequent process. So hard is the resulting block that asbestos fibres remain permanently bound and can be disposed of in landfills.

The implantation of stem cells in the human body is an opportunity to overcome the causes of disease and to restore health. To breed stem cells, however, it is necessary to have a surface to which they can adhere. Frequently, latex, polystyrene and even glass particles are used for this. The stem cells are then implanted together with the substrate. As these materials are not biodegradable, there may be undesirable side effects. Gelatine can also be used as an important aid in the development of stem cell therapy. It is especially well suited to this thanks to its excellent biological compatibility and biodegradability. This new method using gelatine is considered to be a major step forward in stem cell therapy. There have already been initial successes in the treatment of patients with Parkinson's disease.

GME and its members take their responsibilities very seriously and are continuously working on new applications for the natural product gelatine. The intention is to improve the general quality of life. ■

## Functional foods with gelatine

Today's consumers are more educated and better informed than earlier generations. They have a strong desire for perfect quality and natural foodstuffs. On the one hand they have difficulty choosing from a plethora of foods, yet, on the other hand, they can choose the very products they want. Ultimately it is the consumer who determines the trends in nutrition.

What does the modern consumer consider important? Taste, ease of preparation, the naturalness and the freshness of the product, as well as the purchase price, determine whether a food ends up in the shopping basket. Health aspects are also playing an increasingly important role, resulting in the expansion of the functional food market.
The advantages of such functional foods lie in the optimum provision of vitamins, proteins and carbohydrates. Key health topics include energy, the maintenance of bones and joints, intestinal relief and relaxation. The functional foods market is a totally new brand segment with tremendous growth opportunities.

The natural foodstuff gelatine can play a major role in functional foods. With gelatine it is possible to create new and innovative products – products that are wanted by consumers. Such foods are convenient, and at the same time enhance fitness, well-being and health. Foods with gelatine, whether sweet or savoury, have additional health benefits. These foods are an optimum source of protein thanks to gelatine. They contain the amino acids glycine and proline in high concentrations, and thus have a positive impact on bones and joints. Gelatine is also free of fat and carbohydrates. In addition gelatine strengthens the connective tissue, improves the shine of hair, and promotes the growth of strong fingernails. It also improves the hydration of the skin and helps to reduce the development of deep wrinkles. Functional foods with gelatine are thus a great opportunity for consumers to make their diet healthier. ■

## Europe's changing culinary culture

■ **White bread, sourdough bread, casserole and flash frying.** The popularity of white bread in some regions (France, Belgium and Italy) and sourdough bread (Germany, Poland and Scandinavia) developed in Europe over the course of culinary history. In addition, there were regions in which greater preference was given to simmering dishes and casseroles, and others in which flash fried meat was popular.

■ **Wartime: Everything is scarce**
The First and Second World Wars led to widespread scarcity and deprivation, especially in terms of food. The restaurant, beer, wine and spirits industries suffered most. However, jam was developed and soon established itself as a sandwich spread. This was one of the few innovations of the time. Food substitutes also brought about change, e.g. vitamin supplements replaced cod-liver oil in the diets of the masses.

■ **Refrigeration, more travel and snack culture.** In the mid-1960s domestic refrigeration started to establish itself in central Europe. With these new methods of cooling, it became possible to prepare dishes irrespective of the season. The trend shifted towards frozen ready-to-eat meals. Greater mobility opened the eyes of travellers to different cultures and foreign food. People had their first contact with pizza, spaghetti, sauerkraut, paella and gyros. The snack culture and a trend towards eating while standing up took hold in Europe, especially in Germany, Belgium and the Netherlands.

■ **Organic is "in"!** The plethora of innovations in agriculture, nutrition and foods brought the consumers into the arena. The old idea of healthy food found increasing acceptance among the public. The first retailers exclusively selling organic foods and products appear on the market. ■

Gunther Hirschfelder, Europäische Esskultur. Eine Geschichte von der Steinzeit bis heute. Frankfurt am Main, 2001

# Masthead

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