

A young boy with blonde hair, wearing blue and black swim trunks, is running on a sandy beach. A large, fluffy brown and white dog is running alongside him, jumping slightly. The background shows the ocean waves and a clear blue sky. The scene is captured in a circular frame.

## Gelatine products in pet food

### Gelatine products: A functional ingredient for premium pet food and pet snacks

Gelatine and its hydrolysates are highly functional molecules with a wide range of applications in many industries. Because of its purely protein content, high water binding capacity and low calorific value, gelatine can be a valuable ingredient in premium pet food. Gelatine improves texture, mouth feel and general palatability of food. It provides pet food snacks & treats with chewable hardness and mechanical elasticity. Scientific studies have proven the positive effects of gelatine hydrolysates on joint health and overall life quality of pets. Sonac markets a wide range of gelatine products from its sister company and gelatine market leader Rousselot®.



**Rousselot**



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# Gelatines



## Origin of gelatine

Gelatine is a protein polymer obtained from the irreversible hydrolyzation of collagen tissue. Collagen is a long, fibrous protein with a structural function in animals. Tough bundles of collagen are a major component of the extracellular matrix that support most tissues. Connective and joint tissue contain high concentrations of collagen. The most important gelatine raw materials are rind (pork skin), pork bones, cattle hides and cattle bones. More recently fish skin is used for gelatine production.

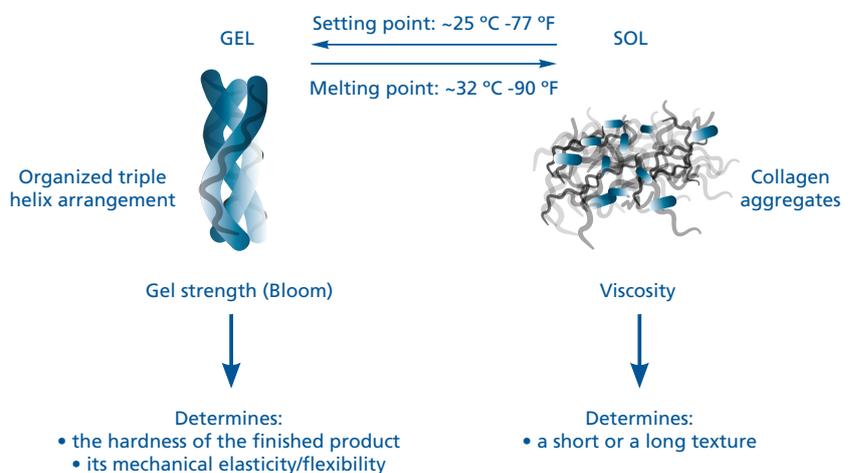
## Key functionality of gelatine

Gelatine is a hydrocolloid – a polymer with a high molecular weight of about 300.000 Da – characterized by a thermoreversible gelling power. The gelatine-based formulation gels when cooled and liquefies when reheated. This sol-gel transition occurs rapidly and can be repeated without significant changes in characteristics. The transition is characterized by a temperature hysteresis effect – the setting point does not occur at the same temperature as the melting point, but at a slightly lower temperature.

## Properties of gelatine: Bloom

Gelatine at room temperature is characterized by its gel strength or Bloom. This parameter is linked to the mechanical elasticity of the gelatine gel. It is based on the re-arrangement of individual collagen chains into an ordered network. Bloom testing uses a standardized measurement. The values for Rousselot® / Sonac gelatines range from 50 to 300 grams. Bloom may be zero for hydrolyzed gelatine.

## SOL - GEL transition



# Gelatine applications in pet food

## Nutritional value – protein fortification

Gelatine is a protein derived from animal collagen and contains more than 83% protein, less than 15% water and less than 2% minerals. Gelatine is a totally digestible ingredient of low calorific value (<4 kcal/g) and contains 18 different amino acids. It is particularly rich in glycine, proline and hydroxyproline, which together represent almost 50% of the composition of the molecule. Gelatine is an excellent option for protein fortification of a pet food.

## Excellent elasto-mechanical functionality in semi-moist snacks & treats

Low bloom gelatine at an inclusion level up to 10% results in dog snacks & treats with an enjoyable chewy hardness. As a HTST stable product, the elasto-mechanical properties of gelatine are not reduced during the extrusion process. In comparison with products with similar properties, gelatine has the advantage of being a natural product with maximum digestibility and added nutritional value.

## Improved kibble quality

The addition of gelatine during the extrusion process of dry and semi-moist kibbles improves kibble quality and stability. Pet food formulations which tend to suffer from poor kibble quality can benefit from the use of a gelatine binder. Typical inclusion levels are very low (< 1%). The advantages of gelatine over synthetic products are the nutritional value and excellent digestibility, in addition to the natural origin.

## Enhanced satiety effect

Pet obesity and related health problems are receiving a lot of attention from pet owners and veterinarians. Low-activity pet foods require a low calorific content and a quick satiety effect in combination with a low ash content. Capable of binding 5 to 10 times its own weight of water at a minimal calorific cost, gelatine perfectly fits in this important new trend in pet food.

## The advantages of gelatine

- natural ingredient – clean labeling
- no legal restrictions on the use of gelatine in pet foods
- almost pure protein with 100% digestibility
- elasto-mechanical functionality
- different origin species available: bovine, porcine, fish
- wide range in Bloom strength (50 - 300)
- different mesh sizes (8 - 100)
- HTST stable and fit for extruded products

# Gelatine hydrolysates

Gelatine hydrolysates are generated by the enzymatic hydrolysis of a concentrated gelatine solution. After subsequent sterilization and spray drying, a mixture of small peptides is obtained. Hydrolyzed gelatine can be characterized as a type I collagen. Gelatine hydrolysates have no elasto-mechanical properties (Bloom = zero) but gain important new functionalities.

## Gelatine hydrolysates applications in pet food

### Hypo-allergenic ingredient – protein fortification

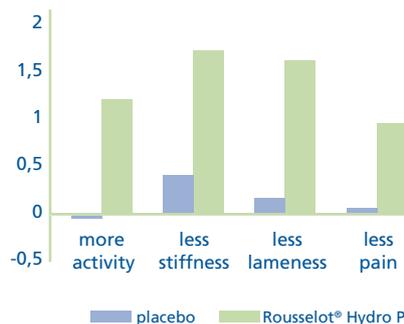
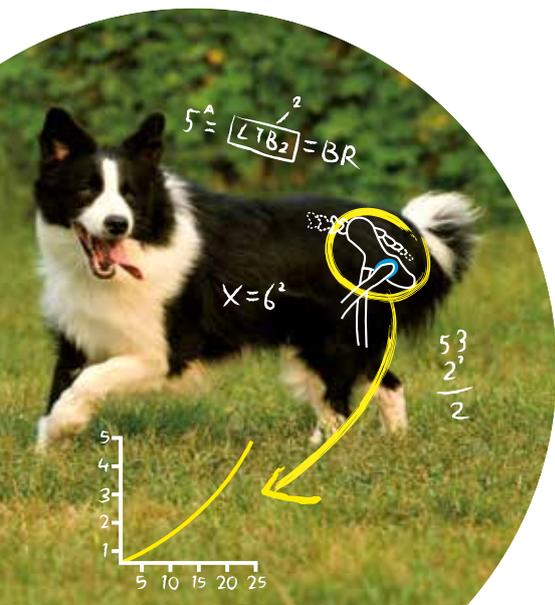
The enzymatic hydrolysis of the gelatine downsizes the molecular weight of hydrolysates to 3.000 – 5.000 Da. In contrast to bigger polypeptides and proteins, these small molecules do not trigger any response from the auto-immune system which can lead to allergic reactions. Because of its reduced size, the nutrients in the hydrolysate are easily absorbed by the developing digestive tract of even young or weak pets.

### Positive results in soothing the effects of Osteoarthritis

Osteoarthritis (OA) causes degeneration, loss of cartilage matrix, and inflammation with a release of pro-inflammatory cytokines. This may lead to chronic pain, lameness and disability. More than 90% of dogs over 5 years of age may be affected by OA (Servet et al., 2006). Research has shown that orally administered radio-labeled gelatine hydrolysate is absorbed by the intestine and accumulated in cartilage tissue (Bello and Oesser, 2006).

### Field studies

Weide (2004) reported a positive effect of gelatine hydrolysate in dogs with OA. Recently Beynen et al. (2009) carried out a double blind placebo-controlled trial with privately owned osteoarthritic dogs (N=30). During 8 weeks dogs received daily either 10 g of a placebo (soy protein hydrolysate) or 10 g of hydrolyzed gelatine (Rousselot® Hydro P) as a top dressing over their meal. This would reflect approximately a 2.5% inclusion level in a dog food. Dog owners were asked to score their dogs every week on a scale from 0 to 10 for different aspects. Comparison of the score on week 8 with that at the start showed a significant improvement in the scores for activity, stiffness and lameness for those dogs receiving daily Rousselot® Hydro P. The improvement in pain reduction tended to reach statistical significance ( $p=0,13$ ).



Improvement in score after 8 weeks of feeding gelatin hydrolysate (Beynen et al., 2009) A higher score means positive improvement: less stiffness, more activity, less lameness, less pain.



## Product overview

Roussetot® / Sonac produces a wide variety of gelatines and their hydrolysates.

Our organization employs several experienced application scientists who can assist the customer in the selection of the optimal gelatine product for specific applications.

Gelatine	Mesh	Bloom	Applications
	8 - 100*	50 - 300*	<ul style="list-style-type: none"> <li>• snacks &amp; treats</li> <li>• protein fortification</li> <li>• satiety enhancement</li> <li>• kibble quality improvement</li> </ul>
			
			

\* depending on application, formulation and required texture

Gelatine hydrolysate	Pet food inclusion level	Applications
	2,5 - 10%**	<ul style="list-style-type: none"> <li>• joint health</li> <li>• hypo-allergenic ingredient</li> <li>• protein fortification</li> </ul>
		
		

\*\* based on a functional dosing of 10g of hydrolysate / day



## No compromise with Quality

Rousselot® / Sonac gelatines are safe and fully traceable. Our products meet most international, local and regional quality and environmental standards. They are manufactured on ISO 9001 – 2000 certified sites, in conjunction with strong hygiene and safety programmes, i.e. HACCP and GMP procedures.



**sonac** Rousselot

SONAC is a leading manufacturer of reliable ingredients of animal origin. With an active R&D program, reliable processes and sustainable end products Sonac continuously adjusts to market needs. A good geographical spread of locations and a broad portfolio of fats, proteins, minerals and specialties make Sonac a trusted partner for many international producers in food, pet food, feed and fertilizers, worldwide. Sonac is part of Darling Ingredients International.

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