



# Meat Products



**Jungbunzlauer**

*From nature  
to ingredients®*



## Health trends

Consumers are increasingly looking for ways to eat healthier. Jungbunzlauer offers food manufacturers customised solutions for creating healthier meat products without compromising on taste or functionality. In order to cater to the top health trends, Jungbunzlauer provides easy-to-use ingredients for reducing the sodium and phosphate content of food products.

### Sodium reduction

The salt substitute **sub4salt®** enables manufacturers of meat products to reduce sodium content without compromising on taste. sub4salt® is a patented mineral salt blend. By using sub4salt®, the sodium content of the end product can be reduced by up to 50%. Furthermore, it delivers a salty flavour while possessing the same functionality and microbiostatic capacity as salt in food products. As sub4salt® can replace salt one to one, no adjustment of the standard recipe is required. It can be used in meat products, breading and seasoning in the meat industry as a replacement for salt. Besides sub4salt®, **sub4salt® cure** can be added to cured meat products as a substitute for curing salt, with a resulting sodium reduction of 35%.

Sodium lactate and sodium-based lactate/(di)acetate blends used for Listeria control and shelf life extension are the second biggest contributors to the sodium content of processed meat products apart from curing salt. At a typical dosage level of 2.5% of the commercial 60% solution, substituting sodium lactate with **potassium lactate** reduces the sodium content of meat products by more than 25%. The same reduction level can be achieved by exchanging a sodium lactate/sodium (di)acetate blend with a **potassium lactate/potassium (di)acetate blend**. Combining potassium lactate or blends with sub4salt® or sub4salt® cure enables a sodium reduction of even more than 50% without compromising taste.

### Phosphate reduction

Besides sodium reduction of food, phosphate reduction is becoming increasingly important to health-conscious customers. Phosphates serve several functions in the production of emulsion-type sausages, e.g. as a stabiliser, but their health impact has become a matter of controversy. **Sodium gluconate** is a good alternative to phosphates. Trials have shown that a partial replacement of phosphates with sodium gluconate (up to 60%) improves the perceived quality. For example, the mouth feel of cooked ham was described as less rubbery compared to the standard ham with only phosphates at a typical dosage of 0.3%. Furthermore, no deficiency in terms of colour or taste was perceived when phosphates were partially replaced with sodium gluconate (up to 60%).

## Conformity to food standards

Producers and customers are increasingly looking for high-quality products and credibility. The inspection by a neutral body of raw materials as to their compliance with common food standards meets these expectations by providing transparency. All our production sites are certified according to the criteria set out in ISO 9001 and have a Food Safety System Certification (FSSC) 22000:2010. This ISO-based certification scheme is internationally accepted and is recognised by the Global Food Safety Initiative (GFSI). Therefore, all producers seeking high-quality ingredients for their meat applications can rely on our products.

The information contained herein has been compiled carefully to the best of our knowledge. We do not accept any responsibility or liability for the information given in respect to the described products. Our products have to be applied under full and own responsibility of the user, especially in respect to any patent rights of others and any law or government regulation.



# Meat products

## *Jungbunzlauer's comprehensive solutions for meat applications*

Over recent decades, worldwide consumption of meat products has increased, creating new, strong-growth markets. Along with consumer expectations of safety and high-quality products, there is increasing focus on healthiness and naturalness. For the development of innovative meat products, Jungbunzlauer transforms nature's plants into outstanding solutions with a wide variety of possible applications.



## Functionality is the key to success

Jungbunzlauer provides developers of the meat industry with support, expertise and a broad range of useful additives. In order to facilitate the selection of our various products, an overview of their basic functions is given below:

		Carcass	Cuts of meat and minced meat				Sausages		
		Surface	Fresh preparations	Raw cured	Cooked cured	Cooked uncured	Fresh / raw cured	Cooked cured	From cooked meat cured
Pre-treatment	Antimicrobial wash	Lactic Acid / Citric Acid							
	Acidification						Glucono-delta-Lactone		
Meat processing	Chopping aid						Trisodium Citrate / Tripotassium Citrate / Sodium Gluconate		
	Water binding and stabilisation						Sodium Gluconate / Xanthan Gum		
	Curing			sub4salt® cure / Xanthan Gum			sub4salt® cure / Xanthan Gum		
	Curing acceleration		Glucono-delta-Lactone / Citric Acid / Lactic Acid				Glucono-delta-Lactone / Citric Acid / Lactic Acid		
	Food safety and shelf life extension		Lactic Acid / Sodium Lactate / Potassium Lactate / Sodium Diacetate / Lactate/(Di)acetate Blends						
Sensory aspects	Colour stability		Trisodium Citrate					Trisodium Citrate / Lactate Blends	
	Firmness and sliceability						Glucono-delta-Lactone	Sodium Gluconate	
	Savoury taste						ESSICUM® / ESSICUM® K / Trisodium Citrate		
Health trends	Sodium reduction						sub4salt® / sub4salt® cure / Potassium Lactate Blends		
	Phosphate reduction						Sodium Gluconate		

# Antimicrobial wash

Thanks to its antibacterial properties, **lactic acid** is frequently used in antimicrobial wash. After slaughtering the animal, a lactic acid solution with a concentration of up to 5% is sprayed onto the surface of the carcass at a temperature of about 55°C. This leads to a significant reduction of pathogenic microorganisms such as *E. coli* and salmonella. **Citric acid** as well as combinations of lactic and citric acids can also be used for this purpose. The acid-based antimicrobial intervention procedure supports good hygienic slaughtering practices and improves food safety by creating an additional hurdle against microbial growth.

In many countries of the world, lactic and citric acids can be used on all types of meat carcasses. In Europe, lactic acid is currently the sole permitted treatment and has been approved for use on beef carcasses since 2013.

# Meat processing

## Acidification

Acidification is essential for the coagulation of meat proteins in the production of raw sausages. Either food acids or starter cultures can be used for this purpose. The main advantage of acidification using **glucono-delta-lactone (GdL)** is that it is a fast, reproducible and well-controlled production process, resulting in a shorter ripening time.

From a sensory point of view, the use of GdL in raw sausages produces an acidic taste. However, spices can be added to achieve a more pleasant flavour.

## Chopping aid for improved emulsification

Besides phosphates, citrates can be employed as a chopping aid in order to produce emulsified sausages. For example, the addition of **trisodium citrate** or **tripotassium citrate** to the meat leads to swelling of the protein and reduces loss of fluid. It adheres to the protein due to its ionic charge and leads to an increase in the water binding capacity. Additionally, it helps to maintain the pH within the desired range of the product.

**Sodium gluconate** can also be used as a chopping aid to improve the meat emulsion.





## Curing

Curing is one of the oldest methods of meat preservation. Today, curing salt is still an essential ingredient for processed meat products. Consisting of sodium chloride and sodium nitrite, it provides several important functionalities and is used to improve the shelf life, texture, taste and colour of a product.

The benefits particular to curing salt are countered by its high sodium content and the risk of a high-sodium diet. **sub4salt® cure** is a combination of the widely used **sub4salt®** and sodium nitrite (0.5%/0.9%). **sub4salt® cure** combines the outstanding benefit of sodium reduction with the functionalities of a traditional curing salt without changing any physical or chemical properties of the end product. By using **sub4salt® cure**, it is possible to achieve a sodium reduction of 35% in the end product. **sub4salt® cure** can be applied to any curing system.

In aqueous brine solutions used for curing, **xanthan gum** is added for rheology control and stabilisation. Pickling solutions are either injected into cuts of meats by means of multiple needle injection pumping, or stitch or artery pumping, and can be optimised by the use of xanthan gum. Xanthan gum keeps the active ingredients in the required place in brine solutions or in the meat product so that they can fulfil their specific purpose. As a consequence, brine solutions with xanthan gum bring about an overall better tenderising effect, improved colour, better flavour and less shrinkage of the meat product. Moreover, an overall better product yield can be obtained due to xanthan gum's high water binding ability. Due to these enhanced properties, not only does the producer save money, consumers also have a more enjoyable culinary experience.

## Water binding

The ability to bind water is mostly relevant for the manufacture of high-quality meat products. **Xanthan gum** can be used for this purpose in various kinds of processed meat products, e.g. boiled ham, cooked sausages, minced meat, meat batters, etc. The water binding capacity results from the chemical structure of xanthan gum. Due to its excellent solubility in water, it forms highly viscous and stable solutions at very low concentrations. Xanthan gum exceeds most of the commonly used gums in meat applications in terms of water binding capacity. **Sodium gluconate** can also act as a stabiliser in meat products, especially in emulsion-type sausages such as frankfurters. Here, it leads to an increase in the ionic strength and causes the muscle proteins to swell and unfold. As a result, the water binding capacity increases.

## Acceleration of curing process

Jungbunzlauer ingredients can also be used to enhance colour development during meat curing. Most cooked sausages are cured to develop the characteristic red colour. **GdL** promotes the reaction of nitrite with meat haemoglobin at a dosage level of as little as 0.1 to 0.2%, creating the stable red colour characteristic of cured meat products. By lowering the pH using GdL, the formation of nitrous acid is accelerated.

Besides GdL, **citric acid** and **lactic acid** also serve as curing accelerators by decreasing the pH and thus enhancing the red colour formation.



## Food safety and shelf life extension

Jungbunzlauer offers a variety of solutions for increasing the safety and shelf life of processed meat products.

**Sodium lactate**, **potassium lactate** and **sodium diacetate** are used as preservatives in order to meet today's quality requirements in terms of food safety and stability. Their main function is to inhibit the growth of microorganisms. Combinations of lactates and diacetates produce a synergistic effect for the control of pathogens and microbes in general.

Food safety requirements are addressed, with excellent Listeria control in hot dogs or poultry and pork ham, for example. In addition, the preservative effect leads to an extended product shelf life, resulting in reduced food waste.

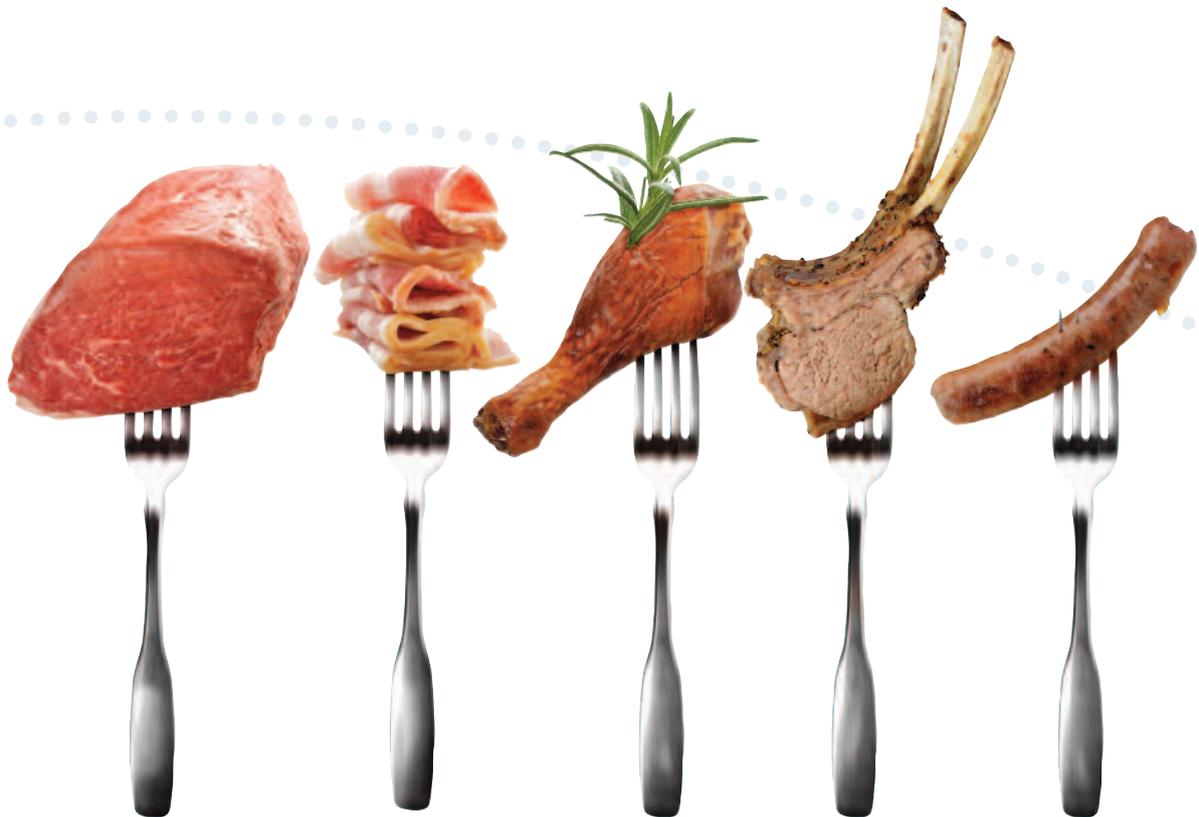
Lactate usage levels of 2 to 3% are efficient. **Lactate/(di)acetate blends** can even be used in concentrations below 2% without impairing antimicrobial performance. At the recommended usage levels there is no or even a positive influence on the sensory properties of the meat product, namely increased saltiness perception and improved overall taste acceptance with no bitterness from the potassium variants. Due to their lower incorporation rates, lactate blends are also less costly in use than pure lactates.

# Sensory aspects

## Colour stability

The colour of the meat is probably the most decisive criterion in the purchase decision of customers, as a bright colour is a presumed sign of freshness. Colour stability depends on the oxidation status of myoglobin and it is also sensitive to temperature. **Trisodium citrate** can be used to preserve the fresh colour during storage. It is added to fresh cuts of beef, lamb and pork, for example.

Other meat products, such as sliced bologna-type sausages, require good colour retention properties over longer storage periods. Studies have shown that certain **lactate blends** aid with colour retention during storage in bright conditions.



## Firmness and sliceability

**Sodium gluconate** improves the sliceability of emulsion-type sausages such as frankfurters. Divalent cations such as iron, magnesium and calcium (from untreated water) have an impact on sliceability as they interact with the protein structure of sausages. Sodium gluconate can be used as a chelating agent to inhibit this phenomenon, thus improving the meat's structure.

In raw sausages that are acidified using **GdL**, the uniform coagulation of the meat proteins improves firmness and sliceability.

## Savoury taste

**ESSICCUM®** combines the flavour and function of vinegar in a powdered form and can be used as a flavouring component in seasoning blends or marinades for the meat industry. With its characteristic acidic flavour, it is beneficial to the savoury taste of processed meat.

**ESSICCUM® K** can be used as a lactose-free option while achieving the same results. **Trisodium citrate** can help to preserve the savoury flavour of the product.

# Jungbunzlauer Group

Jungbunzlauer is represented in all major markets. Our global network of sales companies and distributors covers more than 130 countries.

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## *From nature to ingredients®*

Jungbunzlauer is one of the world's leading producers of biodegradable ingredients of natural origin. The Swiss-based, international company's roots date back to 1867. Today, Jungbunzlauer specialises in citric acid, xanthan gum, gluconates, lactics, specialties, special salts and sweeteners for the food, beverage, pharmaceutical and cosmetic industry as well as for various other industrial applications.

Jungbunzlauer's products are manufactured utilising fermentation technology, a natural process. All its products can be used, transported and disposed of in a secure and ecologically safe way. The Group operates manufacturing plants in Austria, Canada, France and Germany.

A worldwide network of sales companies and distributors with a thorough understanding of target markets and client requirements underlie Jungbunzlauer's high level of market and customer proximity. Committed to its rigorous quality standards, Jungbunzlauer guarantees for the excellence and sustainability of its products and services.

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