

# Product Range

Bio-based ingredients



**Jungbunzlauer**







# About Jungbunzlauer

Jungbunzlauer is a leading producer of high-quality, sustainable ingredients from natural sources.

Founded in 1867 and headquartered in Basel, Switzerland, Jungbunzlauer is the trusted partner for naturally derived, biodegradable ingredients. Backed by more than 150 years of fermentation expertise, our portfolio of acidulants, sweeteners, texturants, minerals and tailored solutions helps customers in food and beverage, nutrition, health, home and personal care, pharmaceuticals, and cleaners and detergents create healthier, safer, tastier and more sustainable products.

Produced from renewable raw materials through large-scale fermentation and advanced downstream technologies, every ingredient can be used, transported and disposed of in an ecologically safe way.

State-of-the-art plants in Austria, Canada, France and Germany anchor our manufacturing footprint, while a worldwide network of sales companies and distributors empowers us to serve more than 130 countries with deep market insight and responsive service.

Guided by rigorous quality management and a science-based sustainability vision, our Technical Service, Market and Application Technology teams collaborate with customers to solve commercial and technical challenges, delivering tailor-made solutions backed by up-to-date know-how.



# Products

Building on 150 years of fermentation expertise, Jungbunzlauer is your trusted partner for naturally derived, biodegradable ingredients and tailored solutions, serving a broad array of industries worldwide.

Jungbunzlauer's added value products are manufactured to the highest quality standards and are available in different grades with a wide variety of specifications and performances.





# Acidulants

## CITRICS

- Citric Acid Anhydrous
- Citric Acid Monohydrate
- LIQUINAT® (Liquid Solution)
- Trisodium Citrate Anhydrous
- Trisodium Citrate Dihydrate
- Tripotassium Citrate
- Monosodium Citrate

## GLUCONATES

- Gluconic Acid
- Glucono-delta-Lactone
- Sodium Gluconate
- Liquid Sodium Gluconate  
EMF 1240
- NAGLUSOL®

## LACTICS

- L(+)-Lactic Acid
- L(+)-Lactic Acid Buffered
- Potassium L(+)-Lactate
- Potassium L(+)-Lactate Blends
- Sodium L(+)-Lactate
- Sodium L(+)-Lactate Blends



# Texturants

- Xanthan Gum
- TayaGel® HA  
(Gellan Gum High Acyl)
- TayaGel® LA  
(Gellan Gum Low Acyl)

# Minerals & Solutions

## MINERAL SALTS

- Tricalcium Citrate
- Calcium Lactate Gluconate
- Trimagnesium Citrate
- Monomagnesium Citrate
- Magnesium Lactate
- Potassium Gluconate
- Zinc Citrate
- Zinc Gluconate
- Zinc Lactate

## CITRATE ESTERS

- CITROFOL® AI, AII
- CITROFOL® BI, BII

## COATED ACIDS

- Citric Acid DC
- Citric Acid S40
- CITROCOAT® N
- CITROCOAT® EP

## APIS & EXCIPIENTS (PHARMA GRADE)



# Sweeteners

## ERYTHRITOL

- ERYLITE®
- ERYLITE® Bronze
- ERYLITE® Stevia

## GLUCOSE

- GlucoDex® D96



# Acidulants



## Citrics

Citrics constitute the largest product group in Jungbunzlauer's portfolio. This group comprises citric acid - the most important organic fruit acid - and trisodium citrate, the most widely used salt of citric acid.

Citric acid is marketed in both dry form and solution under the trade name LIQUINAT®. Both citric acid and trisodium citrate are readily biodegradable and safe for industry and consumers alike, properties that underscore their value as food and pharmaceutical ingredients. Other citrate salts are covered by Jungbunzlauer's Minerals & Solutions Salts product group.



## Citric Acid (Anhydrous and Monohydrate)

Crystalline citric acid from Jungbunzlauer is commercially available in two forms: Citric Acid Anhydrous and Citric Acid Monohydrate.

Citric acid is a naturally occurring fruit acid produced commercially by microbial fermentation of a carbohydrate substrate. Characterised by a pleasant tart taste and easy solubility, it is the most widely used organic acid and pH-control agent in foods and beverages. Its excellent ability to form complexes with trace metals makes it a powerful antioxidant synergist. It stabilises colour, taste, flavour and vitamins in various food applications.

The unique properties of citric acid can also be applied over a broad range of industrial applications. Many industries have already taken advantage of its outstanding chelating ability and its non-toxicity to pioneer new uses.

### LIQUINAT®

Jungbunzlauer LIQUINAT® is a liquid solution of citric acid. Due to its advantages in handling, LIQUINAT® is widely used as acid and pH-control agent in foods, beverages and pharmaceuticals.

LIQUINAT® is a clear, practically colourless and odourless solution with a pure, fruit-sour flavour. It is a stable, non-volatile solution and completely miscible in water.

## Trisodium Citrate (Anhydrous and Dihydrate)

This tribasic salt of citric acid is being offered in two forms: trisodium citrate anhydrous and trisodium citrate dihydrate. The dihydrate form of trisodium citrate is commonly used in foods, beverages and various industrial applications as buffering and sequestering agent as well as an emulsifying salt. As builder in automatic dish washing detergents (ADWD) it replaces phosphates and hence substantially contributes in alleviating eutrophication (excessive growth of plants and algae in water bodies).

Its anhydrous form is manufactured from trisodium citrate dihydrate by a patented drying process. Trisodium citrate anhydrous crystals have a porous matrix that can be used as a carrier for inorganic and/or organic substances. It is not prone to caking and can be used in applications where excess water is not desired. Thus, trisodium citrate anhydrous finds its usage in water sensitive applications such as dry blends and instant beverages, detergents as well as in tablets and over-the-counter (OTC) drugs.

## Tripotassium Citrate

Tripotassium citrate displays a similar functionality to trisodium citrate and is recommended in all food products which require low sodium content. Being an excellent potassium source and systemic alkaliser, tripotassium citrate is also used in pharmaceuticals as an active ingredient, e.g. for the treatment of kidney stones, as well as in dietary supplements and functional foods to promote acid-base balance. Added to dentifrice, it is clinically proven to reduce pain for people with sensitive teeth. Moreover, it is used in several technical applications.

## Monosodium Citrate

Monosodium citrate, an anhydrous acid salt, occupies an intermediate position between citric acid and the neutral trisodium citrate. It is applied as a mild acid in effervescent tablets, dry blends and baking powder. Furthermore, monosodium citrate is also commonly used as non-toxic blowing agent, e.g. to foam food contact plastics.



# Gluconates

Jungbunzlauer Gluconates are multifunctional ingredients for food, personal care, pharmaceutical and technical applications.

The product group consists of gluconic acid, Glucono-delta-Lactone (GdL), NAGLUSOL® sodium gluconate, and sodium gluconate EMF.



## Gluconic Acid

In food applications, gluconic acid does not only regulate the pH of the finished product, but also provides a long-lasting and mild tasting profile that is preferred in beverages, sauces and dressings. Technical grade gluconic acid is used in cleaning products (CIP), where it dissolves mineral deposits.

Gluconic acid is a mild organic acid, neither caustic nor corrosive and with excellent sequestering power. Non-toxic and readily biodegradable (98% after 2 days), it occurs naturally in plants, fruits and other foodstuffs such as wine (up to 0.25%) and honey (up to 1%). Gluconic acid is prepared by fermentation of glucose, whereby the physiological d-form is produced.

In all recipes where gluconic acid is used together with sodium hydroxide, we recommend the direct use of sodium gluconate, the dry sodium salt of gluconic acid or the special product NAGLUSOL®.

Gluconic acid has versatile properties through being a polyhydroxycarboxylic acid, with both hydroxyl and carboxyl groups which can react.

Concentrated solutions of gluconic acid contain some lactone (GdL), the neutral cyclic ester, which is less soluble in the cold and possesses no actual acid properties. About 5% of GdL are present in the 50% gluconic acid solution at room temperature.

Gluconic acid is stable at the boiling point even of concentrated alkaline solutions. However, it is easily and totally degraded in wastewater treatment plants (98% after 2 days).

## Glucono-delta-Lactone

Glucono-delta-lactone (GdL), is a neutral cyclic ester of gluconic acid, produced with the acid by fermentation of glucose. It is separated from the acid by crystallisation.

GdL is a fine, white crystalline powder, freely soluble in water. It is practically odourless and has a slightly sweet taste. Non toxic, it is completely metabolised in the body like a carbohydrate.

When added into an aqueous solution, GdL rapidly dissolves, and subsequently slowly hydrolyses to gluconic acid, thus producing a gentle acidification in the same way as lactic acid-producing bacteria. In solution both gluconic acid and GdL are always in balance. The equivalent point and the rate of transformation are related to concentration, temperature and pH-value.

Two properties set GdL apart from other common acids and are the base of its application range: First, through its slow hydrolysis to gluconic acid, it ensures a progressive and continuous decrease of pH to equilibrium. So it is used as a slow release acidifier. Second, during its hydrolysis, the initial sweet taste of GdL becomes only slightly acidic, making the final flavour of an aqueous solution of GdL much less tart than the one of other acidifiers.



## Sodium Gluconate

Sodium gluconate, a white crystalline powder, is the sodium salt of gluconic acid. It is predominately used for technical applications as an effective set retarder and plasticizer in concrete admixtures, as well as a chelating agent for calcium and magnesium ions in industrial, institutional and household cleaning products. It is also used for the cleaning of metal surfaces in the metal plating and electronic industry, and as formulations aid in agriculture to enhance micronutrient uptake. In personal care products, sodium gluconate is used as a chelating agent (replacement of EDTA) as well as a powerful moisturising ingredient. In the past years sodium gluconate's use in food applications has become more widespread. It is used to cover bitter flavours of high intensity sweeteners, mineral salts and caffeine in beverages.

## Sodium Gluconate EMF 1240

Sodium gluconate EMF 1240 is the mother liquor of sodium gluconate and it is used as an appreciated concrete set retarding and plasticising agent. Non-corrosive, non-toxic and easily biodegradable, sodium gluconate EMF 1240 is getting more and more appreciated as concrete set retarding and plasticising agent.

Sodium gluconate EMF 1240 is a highly efficient set retarder and a good plasticiser / water reducer for concrete and mortar. Additionally, it forms stable chelates with calcium, iron, copper, aluminium and other heavy metals, especially in alkaline and concentrated alkaline solutions. Sodium gluconate EMF 1240 is easily degraded biologically, and thus presents no wastewater problem.

## NAGLUSOL®

NAGLUSOL® is a 60% solution of equal parts of gluconic acid and sodium gluconate. Like its components, NAGLUSOL® is an excellent chelating agent, non-corrosive, non-toxic and easily biodegradable (98% after 2 days). In addition, it combines the advantages of sodium gluconate and gluconic acid without their drawbacks.

Being a blend of sodium gluconate and gluconic acid, the principal property of NAGLUSOL® is obviously its excellent chelating power for calcium, iron, copper, aluminium and other heavy metals, especially in alkaline and concentrated alkaline solutions.

But it has also additional properties that set it apart from its components:

- A high concentration: NAGLUSOL® has a concentration that is 1.6 time as high as the concentration of a saturated sodium gluconate solution at room temperature. Thus, it provides less dilution of other additives at incorporation into formulations.
- A low freezing point: Indeed, gluconic acid is known for its tendency to crystallise at temperatures below +10°C. NAGLUSOL® remains stable down to -10°C although its concentration is even higher than that of gluconic acid.

Furthermore, NAGLUSOL® is easy to use because it has a low viscosity in spite of its high concentration, and it allows to economise caustic soda in applications requiring both a gluconic acid and alkali solution.



# Lactics

Jungbunzlauer's Lactics deliver cross-industry benefits by offering natural, sustainable antibacterial and pH-regulating properties, combined with safe and efficient preservation, making them ideal for applications requiring microbial stability, mild acidification, and high product safety.



## L(+)- Lactic Acid

Lactic acid is an organic acid occurring naturally in the human body and in fermented foods. It is used in a wide range of food, beverages, personal care, healthcare, home care, animal nutrition and chemical products as a mild acidity regulator with flavour enhancing and antibacterial properties. The commercial production of lactic acid is typically done by fermentation. Because the L(+) form is preferred for its better metabolism, Jungbunzlauer has chosen to produce pure L(+)-lactic acid by traditional fermentation of natural carbohydrates.

Jungbunzlauer L(+)-lactic acid is a colourless to yellowish, nearly odourless, syrupy liquid with a mild acid taste. It is commercially available as aqueous solutions of various concentrations. These solutions are stable under normal storage conditions. Lactic acid is readily biodegradable.

## L(+)- Lactic Acid Buffered

Jungbunzlauer L(+)-lactic acid buffered is a mild acidity regulator with flavour enhancing and antibacterial properties. It is especially beneficial in confectionery products to reduce sugar inversion in hard candies and gelatine degradation in soft candies.

Jungbunzlauer L(+)-lactic acid buffered is a colourless to yellowish, nearly odourless, syrupy liquid with an acid taste, consisting of a mixture of lactic acid and sodium lactate. This solution is stable under normal storage conditions.

## Sodium L(+)- Lactate

Jungbunzlauer sodium lactate is the sodium salt of L(+)- lactic acid, obtained by neutralisation of the acid of natural origin with a high purity sodium source. It is available as a 60% solution in water. Sodium lactate is a safe preservative for processed meat and fish products. It is also used as a buffering agent in confectionery and, as a result of its high water holding capacity, as a humectant and moisturiser in personal and home care products.



## Potassium L(+)- Lactate

Jungbunzlauer potassium lactate is a liquid potassium salt of L(+)-lactic acid, obtained by neutralisation of the acid of natural origin with a high purity potassium source. Used as a sodium free pathogen control agent in meat and fish products, it addresses the concerns of health organisations and consumers about reducing sodium intake. As a component of the natural moisturising factor (NMF) of the skin, it also serves as a powerful, yet smooth moisturiser in beauty care.

## Lactate Blends (Potassium and Sodium)

Jungbunzlauer offers a variety of blends of sodium or potassium lactate with sodium or potassium acetate or diacetate. Combinations of lactates and acetates create a synergistic effect for pathogen and overall microbial control, thus increasing safety and shelf life of processed meat and fish products without taste compromise. The combination of potassium lactate and organic vinegar provides the additional benefit of a cleaner label shelf life control in processed meat.



# Texturants

The texturant product group comprises the two unique hydrocolloids: Xanthan Gum and TayaGel®.

Both xanthan gum and TayaGel® are bio-based, non-GMO certified ingredients produced by fermentation from renewable carbohydrate sources. Their exceptional rheological properties make them ideally suitable as stabilisers and thickeners for food and technical applications.





## Xanthan Gum

Xanthan gum exhibits extraordinary and useful properties, for example high viscosity at low concentrations, little change in viscosity at varying temperatures, and excellent stability over a wide pH range. It also provides good freeze-thaw stability and shows remarkable suspension characteristics.

It is used as a stabiliser, thickener, suspending agent and bodying agent in food applications such as salad dressings, sauces, instant products, desserts, bakery dairy products, and fruit juices as well as in the formation of various low-calorie foods. Cosmetic and pharmaceutical applications of xanthan gum include the use in toothpastes, lotions, shampoos and formulations such as tablets. Typical industrial applications of xanthan gum is the use in cleaners, paints, ceramic glazes, inks and oil drilling fluids.

## TayaGel® HA (Gellan Gum High Acyl)

TayaGel® HA is a bio-based, naturally occurring gelling, suspending and stabilising agent with extraordinary and useful properties. At very low concentration, it exhibits high stabilising and suspending properties with high pseudoplastic solutions. Full hydration will be obtained by heating to 85°C – 95°C; upon cooling TayaGel® HA solutions will form soft, elastic and flexible gels with remarkable low tendency to syneresis. These gels do not show a thermal hysteresis, i.e. they set and melt at the same temperature between 70°C and 80°C.

TayaGel® HA is used as extremely efficient stabilising and suspending agent, providing a smooth fluid gel structure, even at concentrations between 0.02 – 0.05%. It is mainly used as stabiliser in dairy and dairy alternative beverages, but also for pulp stabilisation in fruit drinks. With its special soft gelling properties at higher concentration, additional applications are in confectionary products, jams or fruit preparations, puddings, pie fillings, icings or frostings, and dairy products such as milk drinks, ice cream and yoghurt. TayaGel® HA D with special emphasis on dairy applications offers the best choice to create excellent stabilised products.

## TayaGel® LA (Gellan Gum Low Acyl)

TayaGel® LA, Jungbunzlauer's low-acyl gellan gum, is a bio-based, naturally occurring polysaccharide produced by fermentation. With outstanding gelling and texturising performance, it forms clear, high-strength gels at extremely low concentrations.

In beverages, clarity and a smooth mouthfeel comes first: at just 0.01 %, TayaGel® LA forms a fluid-gel network that keeps insoluble mineral salts and even larger particles uniformly suspended.

Beyond drinks, bakery fillings, icings, jellies, gummies and layered desserts stay perfectly set thanks to the versatile gelling performance of TayaGel® LA, an alternative to traditional gelling agents like agar or gelatine.

Whether the challenge is suspending particulates, creating clear gels, or delivering stable, nuanced textures, TayaGel® LA empowers formulators deliver naturally better, high-quality products that satisfy the high expectations of today's quality-conscious consumers.



# Minerals & Solutions

## Mineral Salts

Jungbunzlauer's Mineral Salts product group comprises a unique range of high-purity organic sources of calcium, magnesium, potassium, and zinc derived from citric, gluconic or lactic acid.



## Trimagnesium Citrate (Anhydrous & Nonahydrate)

Trimagnesium citrates are high-purity organic salts of magnesium, characterised by superior bioavailability, good solubility and high mineral content. Jungbunzlauer offers the two commonly available forms trimagnesium citrate anhydrous and nonahydrate. Due to their neutral taste and ease of use, they are a preferred source for magnesium in food, beverages, nutritional supplements and pharmaceuticals. Agglomerated forms of trimagnesium citrate allow the direct compression of tablets. Being an excellent desiccant, it is commonly used to stabilise dry blends and to protect water sensitive ingredients.

## Calcium Lactate Gluconate

Calcium lactate gluconate is a mixture of calcium lactate and calcium gluconate. In pharmaceuticals, it is used in effervescent tablets and instant preparations as a calcium source with excellent bioavailability. In food and beverages, the outstanding characteristics of calcium lactate gluconate combining high solubility (400 g/l) and neutral taste lead to new applications in a wide range of products, such as clear, carbonated or concentrated beverages as well as dairy drinks and confectionery.

## Tricalcium Citrate

Tricalcium citrate is one of the most important calcium salts used in dairy products, processed fruits, baby foods (especially infant formula), clinical nutrition, tablets, beverages and other calcium-fortified products. Its main characteristics are high calcium content (21%), excellent bioavailability and neutral taste. Direct compressible types make tricalcium citrate the preferred choice for calcium tablets. Furthermore, tricalcium citrate displays specific functionalities as a heat-stable pH regulator or firming agent in processed foods. It is also used as an anti-caking agent due to its non-hygroscopic characteristics.

## Monomagnesium Citrate

Monomagnesium citrate is a monobasic magnesium salt of citric acid with a molar ratio of 1:1. It is used as mineral source in functional food, beverages, and food supplements.

Due to its pleasant sour taste and high solubility, it is the magnesium salt of choice for mineral fortified beverage powders. As a partly neutralised salt it can be used as mild acidifier and acts as a magnesium source at the same time.



## Magnesium Lactate

Magnesium lactate derives from neutralisation of lactic acid with a high purity magnesium source. Magnesium plays a vital role in the human metabolism and magnesium lactate is due to its good bioavailability used in dietary supplements and pharmaceuticals. Because of its neutral taste and high solubility magnesium lactate is also a perfect source for fortification of beverages and other liquid formulations.

## Potassium Gluconate

Potassium gluconate is used to replace sodium-containing salts in food and serves as a potassium source in supplements and food products, e.g. to maintain healthy blood pressure. In pharmaceuticals, it is used as a systemic alkaliser or to fight potassium deficiency. Potassium gluconate shows excellent compressibility and is therefore commonly used for tablets. In technical applications, it combines an outstanding chelating capacity with an excellent biodegradability and good solubility.

## Zinc Citrate

Zinc citrate is an organic zinc salt with a high mineral content (31%) and neutral taste. Due to its superior bioavailability, physiological compatibility and wide range of health benefits it is used for zinc fortification, food supplements and beauty products. In dental care products it is used due to its antimicrobial and anti-inflammatory effects and its ability to reduce the formation of dental plaque and tartar.

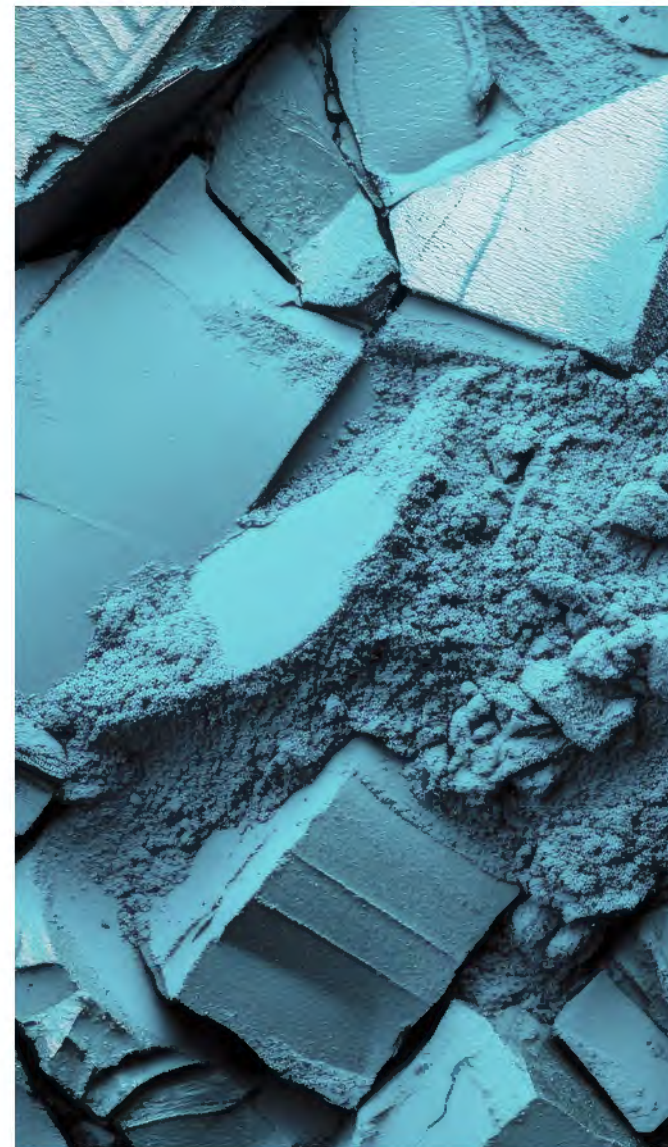
## Zinc Gluconate

Zinc Gluconate is one of the most important organic zinc sources in food supplements and fortified foods and beverages. It shows excellent solubility properties, a fast dissolution speed and a nearly neutral taste.

As an organic mineral salt it is well absorbed by the body and offers a wide range of health benefits.

## Zinc Lactate

Neutralisation of lactic acid with a high purity zinc source and subsequent crystallisation results in zinc lactate. Compared to zinc citrate it displays a higher solubility, even though the mineral content is lower (22.0 - 24.5%). Its antimicrobial properties and ability to reduce the formation of dental plaque and tartar combined with nearly neutral taste and odour makes it an ideal ingredient for dental care products like toothpaste or mouthwash.





# Esters and Coated Acids

Certain applications require more than the standard functionalities a regular grade of citric acid offers.

Unique surface modification techniques or added high-quality materials to the core product allow for the production of an interesting and exceptional range of esters and coated acids.

Esters under the brand CITROFOL® are low viscous, colourless and odourless liquids used across a broad spectrum of industries including food, personal care and technical applications.

## CITROFOL® AI, AII

CITROFOL® AI, triethyl citrate, is an approved food additive and flavour carrier used mainly in beverages and egg processing. Due to its multifunctional properties and ECOCERT approval it is a privileged additive in personal care applications including deodorants, perfumes and as solvent and emollient in skin care products.

In the pharmaceutical industry CITROFOL® AI is a standard film forming agent for acrylic and cellulosic tablet coating, as it complies with high purity and performance requirements.

CITROFOL® AII is the acetylated version of triethyl citrate and suitable for many applications where a higher molecular weight and varied polarity is appreciated.

## CITROFOL® BI, BII

These citrate esters are used for multipurpose polymer processing, mainly as plasticiser but also as processing aid and film forming agent and offer an excellent alternative to products under scrutiny. They demonstrate equal plasticiser performance when replacing phthalates and adipates in many applications such as toys, cosmetics, pharmaceutical coatings, food contact films, food closure gaskets, medical devices and other plastic products. All citrate esters are suitable additives for bio-based plastic materials which need to be compostable or biodegradable.

Besides the individual ester types, Jungbunzlauer offers CITROFOL® Systems, a range of tailor made plasticisers for technical applications which combine outstanding curing behaviour with low migration properties.

## Citric Acid DC

Citric Acid DC is a direct compressible citric acid. This functionality saves time and energy during the pre-processing steps before compression of effervescent tablets and at the same time leads to a higher tablet hardness at lower pressing force.

## Citric Acid S40

Citric acid S40 is a very fine powder with superior free-flowing abilities for easy handling. Adding citric acid S40 to concrete or gypsum improves the rheological properties and increases their mechanical strength.

## CITROCOAT® N

CITROCOAT® N is less hygroscopic and less reactive with other ingredients in crystalline form and therefore provides excellent stability for food applications like instant drinks, healthcare products or confectionery where premature reactions must be avoided. Also technical applications like laundry powders and tabs benefit from the stabilising properties of CITROCOAT® N during storage.

## CITROCOAT® EP

CITROCOAT® EP is an agglomerated effervescent compound, bringing citric acid and sodium bicarbonate together in the right composition to create a highly reactive but storage-stable effervescent powder with a target pH of 5.5.

Due to the excess acidity, a rapid effervescent reaction is to be expected, and the slightly acidic pH value ensures a fresh flavour. In order to prevent premature reactions, the citric acid used in CITROCOAT® EP is coated with a thin layer of monosodium citrate.

The two effervescent components are agglomerated using a binder, reducing the potential for segregation and improving compressibility. This leads to significantly harder tablets than with a formula based on regular citric acid and sodium bicarbonate.





# APIs and Excipients

Jungbunzlauer serves a broad range of industries with its natural and sustainable ingredients, including the pharmaceutical industry.

Committed to our rigorous quality standards, our active pharmaceutical ingredient and excipient portfolio meets highest quality standards. Jungbunzlauer's products can be used in various applications and provide a comprehensive solution for the entire pharmaceutical industry.

## Active Pharmaceutical Ingredients

Jungbunzlauer's manufacturing site in Ladenburg, Germany, is specialised in the manufacture of active pharmaceutical ingredients (APIs). This site is registered as an API manufacturer according to §67 German Drug Law. We have acquired Good Manufacturing Practice (GMP) certificates issued by the District Government Tuebingen (Regierungspräsidium Tuebingen) as the competent authority for control of compliance with GMP-regulations for our range of APIs. Jungbunzlauer's API manufacturing plant in Germany has been confirmed to be compliant with current GMP regulations set out in the FDA and EU GMP Guide since 2001. Our current API portfolio contains four different products, which can be provided with a US DMF and/or CEP to facilitate finished drug registrations in USA, Europe and beyond. All APIs comply with the respective monograph in the United States Pharmacopoeia (USP) and/or European Pharmacopoeia (Ph. Eur.).

## Excipients

Jungbunzlauer's products support the development of drugs and supplements in the pharmaceutical industry and play an important role in the composition of a variety of prescription drugs and over-the-counter products. Our pharmaceutical products cover APIs as well as excipients of which the functionalities of the excipients and mineral salts are widespread. We support our customers by providing required documents and data like elemental impurities according to ICH Q3D, statements on residual solvents, nitrosamines, BSE/TSE, GMO, allergens and others.



# Sweeteners

## Erythritol

The Erythritol product group contains ERYLITE<sup>®</sup>, ERYLITE<sup>®</sup> Bronze, and ERYLITE<sup>®</sup> Stevia. ERYLITE<sup>®</sup> based sweetening systems relate to a number of today's dietary topics, such as natural sweetening, sugar reduction/replacement, glycemic index based diets or tooth- friendliness.



# Glucose

## ERYLITE®

ERYLITE® is the first natural polyol, a fermentation based bulk sweetener. Besides being considered natural its main benefit is a caloric value of zero which makes it an excellent sweetener to formulate mid, low and zero calorie foods and beverages. ERYLITE® has a glycemic index of zero, a clean sweet taste, a 60 - 70% sweetness level of sugar and shows much better digestive tolerance than other polyols.

Furthermore, it is tooth-friendly and works as cariostatic agent which makes it also suitable for dental care products. It is approved in a large number of countries around the world, including the main food markets in Europe, North America and Asia. In personal care products, ERYLITE® is used as a moisturiser and humectant in skin care formulations and hair care products.

## ERYLITE® Bronze

ERYLITE® Bronze is Jungbunzlauer's version of brown or raw sugar. It is a low calorie sweetener of mild sweetness with a bronze colour and the pleasant flavour of malt and caramel. Its functionalities are the same as regular ERYLITE® and it has the same favourable physiological benefits: zero glycemic index, high digestive tolerance and tooth-friendliness.

## ERYLITE® Stevia

ERYLITE® Stevia is a unique blend of ERYLITE® and Rebaudioside A, a highly pure stevia plant extract. This blend unites the taste quality, the digestive tolerance and the bulking functionality of ERYLITE® with the sweetening capacity of stevia plant extracts. The result, eligible for the 'natural' shelf, is a zero calorie sweetening system with excellent taste and full bulk sweetener functionality. ERYLITE® Stevia is available in a range of different sweetness levels with individual suitability to food and beverage applications.

## GlucoDex® D96

Our glucose syrup, known as GlucoDex® D96, has a minimum dextrose equivalent (DE value) of 96 and a concentration of 74.5% – 75.5%.

With its high dextrose content, GlucoDex® D96 provides intense sweetness, a high degree of freezing point depression and excellent fermentability. This makes it an ideal ingredient for enhancing sweetness in beverages, baked goods, and ice cream, as well as for various fermentation applications, isoglucose, fructose production, and feedstock to produce ethanol.

At Jungbunzlauer, we prioritise sustainability. GlucoDex® D96 is made from the renewable raw material corn, with most of the corn being locally cultivated. It is non-GMO project verified and an integral part of our carbon footprint reduction targets.



# Applications

Jungbunzlauer's know-how and experience in ingredients guarantees innovative solutions for a broad range of applications.

In order to respond to changing consumer preferences and market trends, we are continuously monitoring scientific discoveries to apply in the development of new products, as well as the improvement of existing ones.



For more information about our solutions, please visit our website and our product finder.







## Food

- Food safety
- Superior stabilisation
- Sugar replacement
- Sodium reduction
- Mineral fortification



## Beverage

- Excellent acidification
- Improved mouthfeel
- Taste optimisation
- Mineral fortification
- Calorie reduction



## Nutrition

- Mineral fortification
- Calorie reduction
- Superior stabilisation
- Taste optimisation
- Label friendly formulation



## Animal Nutrition

- Gut-safe acidification
- Mineral fortification
- Palatability enhancement
- Electrolyte balance
- Pellet binding



## Personal Care

- Anti-bacterial
- Natural perfume fixation
- Smooth moisturising
- Natural deodorising
- Viscosity control



## Home Care

- Eco-friendly chelation
- Safe descaling
- Anti-bacterial cleaning
- Rheology control
- Surface protection



## Industrial

- Drilling fluids
- Concrete set retardation
- Safe polymer softening
- Heavy metal chelation



## Healthcare

- Active ingredients
- Mineral sources
- Excipients
- Natural sweetening

# Food

	Citric Acid Anhydrous	Citric Acid Monohydrate	LIQUINAT®	Trisodium Citrate Anhydrous	Trisodium Citrate Dihydrate	Tripotassium Citrate	Monosodium Citrate	Gluconic Acid	Glucono-delta-Lactone	NAGLUSOL®	Sodium Gluconate	Sodium Gluconate EMF 1240	Xanthan Gum	TayaGel® HA (Gellan Gum High Acyl)	TayaGel® LA (Gellan Gum Low Acyl)	L(+)-Lactic Acid	L(+)-Lactic Acid Buffered	Potassium L(+)-Lactate	Potassium L(+)-Lactate Blends	Sodium L(+)-Lactate	Sodium L(+)-Lactate Blends	Monomagnesium Citrate	Tricalcium Citrate	Trimagnesium Citrate	Zinc Citrate	Calcium Lactate Gluconate	Potassium Gluconate	Zinc Gluconate	Magnesium Lactate	Zinc Lactate	CITROFOL® Al Triethyl citrate	CITROFOL® All Triethyl O-acetyl/citrate	CITROFOL® BI Tributyl citrate	CITROFOL® BII Tributyl O-acetyl/citrate	Citric Acid DC	Citric Acid S40	CITROCOAT®N	CITROCOAT®EP	ERYLITE®	ERYLITE® Bronze	ERYLITE® Stevia	GlucoDex® D96				
Bakery	■	■			■	■	■		■				■	■	■	■	■	■		■		■	■	■	■				■	■	■		■	■	■	■	■					■	■	■	■	
Cereals   Snacks	■	■		■	■	■	■		■		■		■	■		■	■	■		■		■	■	■	■	■	■	■	■	■	■															
Confectionary   Sweets   Desserts	■	■	■	■	■	■	■	■	■		■		■	■	■	■	■	■		■		■	■	■	■	■	■	■	■	■	■															
Dairy	■	■	■		■	■		■	■				■		■	■	■	■		■			■	■	■	■	■	■	■	■	■															
Fruits   Vegetables (preparations)	■	■	■		■	■			■				■		■	■	■			■			■			■		■	■	■	■															
Meat   Seafood	■	■			■	■			■		■		■	■	■	■	■	■	■	■	■																									
Plant-based	■	■	■	■	■	■	■		■				■	■	■	■	■	■		■		■	■	■	■	■	■	■	■	■	■															
Ready Meals   Instant Food	■	■	■	■	■	■	■	■	■		■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■															
Sauces   Dressings   Seasonings	■	■	■	■	■	■	■	■	■		■		■	■		■	■	■	■	■	■	■		■	■	■			■	■	■	■														



# Beverage

	Alcoholic Beverages	Dairy	Juice Drinks   Instant Drinks   Syrups   RTD	Plant-Based	Soft Drinks   Energy Drinks   Waters
Acids & Buffers	Citric Acid Anhydrous	■	■	■	■
	Citric Acid Monohydrate	■	■	■	■
	LIQUINAT®	■	■	■	■
	Trisodium Citrate Anhydrous		■	■	■
	Trisodium Citrate Dihydrate	■	■	■	■
	Tripotassium Citrate	■	■	■	■
Gums & Stabilizers	Monosodium Citrate		■	■	■
	Gluconic Acid		■		■
	Glucono-delta-Lactone		■	■	■
	NAGLUSOL®				■
	Sodium Gluconate			■	■
	Sodium Gluconate EMF 1240				
	Xanthan Gum	■	■	■	■
Thickeners & Gelling Agents	TayaGel® HA (Gellan Gum High Acyl)	■	■	■	■
	TayaGel® LA (Gellan Gum Low Acyl)	■	■	■	■
	L(+)-Lactic Acid	■	■	■	■
	L(+)-Lactic Acid Buffered	■	■	■	■
	Potassium L(+)-Lactate	■	■	■	■
	Potassium L(+)-Lactate Blends			■	■
	Sodium L(+)-Lactate	■	■		
	Sodium L(+)-Lactate Blends				
Minerals & Electrolytes	Monomagnesium Citrate		■	■	■
	Tricalcium Citrate		■	■	■
	Trimagnesium Citrate		■	■	■
	Zinc Citrate		■	■	■
	Calcium Lactate Gluconate		■	■	■
	Potassium Gluconate		■	■	■
	Zinc Gluconate		■	■	■
	Magnesium Lactate		■	■	■
	Zinc Lactate		■	■	■
	CITROFOL® Al Triethyl citrate	■			
Flavors & Sweeteners	CITROFOL® All Triethyl O-acetyl/citrate				
	CITROFOL® BI Tributyl citrate				
	CITROFOL® BII Tributyl O-acetyl/citrate				
	Citric Acid DC		■		
	Citric Acid S40				
	CITROCOAT®N		■		
	CITROCOAT®EP		■	■	■
	ERYLITE®	■	■	■	■
	ERYLITE® Bronze	■	■	■	■
Natural Extracts	ERYLITE® Stevia	■	■	■	■
	GlucoDex® D96	■			

# Nutrition

	Citric Acid Anhydrous	Citric Acid Monohydrate	LIQUINAT®	Trisodium Citrate Anhydrous	Trisodium Citrate Dihydrate	Tripotassium Citrate	Monosodium Citrate	Gluconic Acid	Glucono-delta-Lactone	NAGLUSOL®	Sodium Gluconate	Sodium Gluconate EMF 1240	Xanthan Gum	TayaGel® HA (Gellan Gum High Acyl)	TayaGel® LA (Gellan Gum Low Acyl)	L(+)-Lactic Acid	L(+)-Lactic Acid Buffered	Potassium L(+)-Lactate	Potassium L(+)-Lactate Blends	Sodium L(+)-Lactate	Sodium L(+)-Lactate Blends	Monomagnesium Citrate	Tricalcium Citrate	Trimagnesium Citrate	Zinc Citrate	Calcium Lactate Gluconate	Potassium Gluconate	Zinc Gluconate	Magnesium Lactate	Zinc Lactate	X	Acid Sanding	CITROFOL® AI Triethyl citrate	CITROFOL® AII Triethyl O-acetyl/citrate	CITROFOL® BII Tributyl citrate	CITROFOL® BIII Tributyl O-acetyl/citrate	Citric Acid DC	Citric Acid S40	CITROCOAT®N	CITROCOAT®EP	ERYLITE®	ERYLITE® Bronze	ERYLITE® Stevia	GlucuDex® D96			
Baby Food   Infant Formula	■	■	■	■	■	■					■		■			■	■	■		■			■	■	■	■	■	■	■	■	■																
Clinical Nutrition	■	■	■	■	■	■							■	■		■	■	■		■			■	■	■	■	■	■	■	■	■						■		■	■	■	■	■	■	■		
Dietetic Food   Meal Replacement	■	■	■	■	■	■							■	■	■							■	■	■	■	■	■	■	■	■	■						■		■	■	■	■	■	■	■		
Dysphagia													■	■																								■		■	■	■	■	■	■		
Sports Nutrition	■	■	■	■	■	■		■	■		■		■	■	■	■	■	■		■		■	■	■	■	■	■	■	■	■	■						■		■	■	■	■	■	■	■	■	
Supplements	■	■	■	■	■	■	■	■	■		■		■	■	■	■	■	■		■		■	■	■	■	■	■	■	■	■	■	■	■					■		■	■	■	■	■	■	■	■



# Animal Nutrition

	Feed	Pet Food	Veterinary	
		■	■	Citric Acid Anhydrous
		■	■	Citric Acid Monohydrate
		■	■	LIQUINAT®
		■	■	Trisodium Citrate Anhydrous
		■	■	Trisodium Citrate Dihydrate
			■	Tripotassium Citrate
				Monosodium Citrate
	■			Gluconic Acid
				Glucono-delta-Lactone
				NAGLUSOL®
		■		Sodium Gluconate
		■		Sodium Gluconate EMF 1240
		■		Xanthan Gum
				TayaGel® HA (Gellan Gum High Acyl)
				TayaGel® LA (Gellan Gum Low Acyl)
	■	■		L(+)-Lactic Acid
				L(+)-Lactic Acid Buffered
				Potassium L(+)-Lactate
				Potassium L(+)-Lactate Blends
				Sodium L(+)-Lactate
				Sodium L(+)-Lactate Blends
				Monomagnesium Citrate
	■	■		Tricalcium Citrate
		■		Trimagnesium Citrate
				Zinc Citrate
			■	Calcium Lactate Gluconate
				Potassium Gluconate
				Zinc Gluconate
				Magnesium Lactate
				Zinc Lactate
	■	■		CITROFOL® AI Triethyl citrate
				CITROFOL® AII Triethyl O-acetyl citrate
				CITROFOL® BII Triethyl citrate
				CITROFOL® BII Tributyl O-acetyl citrate
				Citric Acid DC
				Citric Acid S40
		■		CITROCOAT®N
		■		CITROCOAT®EP
	■			ERYLITE®
				ERYLITE® Bronze
				ERYLITE® Stevia
				GlucuDex® D96
	■			Corn Gluten Meal
		■		Corn Gluten Feed
		■		Corn Germs
		■		Citrofeed

# Personal Care

	Citric Acid Anhydrous	Citric Acid Monohydrate	LIQUINAT®	Trisodium Citrate Anhydrous	Trisodium Citrate Dihydrate	Tripotassium Citrate	Monosodium Citrate	Gluconic Acid	Glucono-delta-Lactone	NAGLUSOL®	Sodium Gluconate	Sodium Gluconate EMF 1240	Xanthan Gum	TayaGel® HA (Gellan Gum High Acyl)	TayaGel® LA (Gellan Gum Low Acyl)	L(+)-Lactic Acid	L(+)-Lactic Acid Buffered	Potassium L(+)-Lactate	Potassium L(+)-Lactate Blends	Sodium L(+)-Lactate	Sodium L(+)-Lactate Blends	Monomagnesium Citrate	Tricalcium Citrate	Trimagnesium Citrate	Zinc Citrate	Calcium Lactate Gluconate	Potassium Gluconate	Zinc Gluconate	Magnesium Lactate	Zinc Lactate	X	Acid Sanding	CITROFOL® AI Triethyl citrate	CITROFOL® AII Triethyl O-acetyl/citrate	CITROFOL® BII Tributyl citrate	CITROFOL® BIII Tributyl O-acetyl/citrate	Citric Acid DC	Citric Acid S40	CITROCOAT® N	CITROCOAT® EP	ERYLITE®	ERYLITE® Bronze	ERYLITE® Stevia	GlucoDex® D96					
Deodorants	■	■	■			■			■				■	■	■	■	■				■				■								■																
Fragrances	■	■	■	■	■	■							■	■	■	■	■				■												■																
Hair	■	■	■		■	■	■	■	■		■		■	■	■	■	■	■		■			■								■		■	■	■	■	■												
Oral Care	■	■	■	■	■	■	■	■	■		■		■	■	■	■	■	■		■			■								■	■														■			
Skin   Body   Face   Cosmetics	■	■	■		■	■	■	■	■		■		■	■	■	■	■	■		■			■								■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Soap   Bath Products	■	■	■		■	■	■	■			■		■	■	■	■	■	■		■											■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■



# Home Care

[illegible]

# Industrial

	Citric Acid Anhydrous	Citric Acid Monohydrate	LIQUINAT®	Trisodium Citrate Anhydrous	Trisodium Citrate Dihydrate	Tripotassium Citrate	Monosodium Citrate	Gluconic Acid	Glucono-delta-Lactone	NAGLUSOL®	Sodium Gluconate	Sodium Gluconate EMF 1240	Xanthan Gum	TayaGel® HA (Gellan Gum High Acyl)	TayaGel® LA (Gellan Gum Low Acyl)	L(+)-Lactic Acid	L(+)-Lactic Acid Buffered	Potassium L(+)-Lactate	Potassium L(+)-Lactate Blends	Sodium L(+)-Lactate	Sodium L(+)-Lactate Blends	Monomagnesium Citrate	Tricalcium Citrate	Trimagnesium Citrate	Zinc Citrate	Calcium Lactate Gluconate	Potassium Gluconate	Zinc Gluconate	Magnesium Lactate	Zinc Lactate	CITROFOL® AI Triethyl citrate	CITROFOL® AII Triethyl O-acetyl citrate	CITROFOL® BII Tributyl citrate	CITROFOL® BII Tributyl O-acetyl citrate	Citric Acid DC	Citric Acid S40	CITROCOAT® N	CITROCOAT® EP	ERYLITE®	ERYLITE® Bronze	ERYLITE® Stevia	GlucuDex® D96				
Adhesives   Sealants	■	■	■	■									■																			■	■	■	■											
Agriculture	■	■	■	■	■	■		■			■		■			■							■				■					■			■										■	
Carcass Wash	■	■	■		■											■	■																													
Construction	■	■	■		■				■	■	■	■	■	■																			■		■			■						■		
Fermentation																																														
Fire Protection						■							■																										■							
Inks   Paints   Coatings   Fine Chemicals	■	■	■	■			■	■	■		■		■			■																■	■	■	■											
Metal Surface Treatment	■	■	■			■		■		■	■					■											■						■	■	■	■										
Oil Drilling   Ore Mining   Refining	■	■	■										■			■																														
Plastics   Polymers	■	■	■	■			■					■	■			■				■			■										■	■	■	■										
Textile   Leather   Paper	■	■	■	■				■		■	■		■			■																■	■	■	■											



# Healthcare

API's and their applications				
	Citric Acid Anhydrous	Tripotassium Citrate Monohydrate	Trimagnesium Citrate Anhydrous	Trisodium Citrate Dihydrate
Bowel and colon cleaning	■			
Anti-Heartburn	■			
Acidifying agent	■			■
Blood treatment	■			
Citrate source	■			
Constipation			■	
Cystitis		■		
Electrolyte replenishment		■		■
Kidney-stone management		■		
Laxative			■	■
Mineral deficiency		■	■	
Muscle function normalisation			■	
Rehydration solution				■
Renal tubular acidosis		■		
Systemic alkaliser	■			

Excipients and their functions														
	Citric Acid Anhydrous	Trisodium Citrate Anhydrous	Glucono-delta-Lactone	Sodium Gluconate	Calcium Lactate Gluconate	Monosodium Citrate	Potassium Gluconate	Tricalcium Citrate	Trimagnesium Citrate	Tripotassium Citrate	Zinc Citrate	CITROFOL® Al Triethyl citrate	CITROFOL® All Triethyl O-acetyl citrate	ERYLITE®
Acidifying agent	■		■			■								
Bitterness masking agent				■										■
Buffering agent	■	■	■	■		■		■	■	■				
Bulking agent or carrier													■	
Chelating agent	■	■	■	■	■		■	■		■				
Desiccant		■							■					
Emollient												■	■	
Mineral source					■		■	■	■	■	■			
Plasticiser												■	■	
Release control agent														■
Stabiliser								■						■
Sweetener													■	
Tablet binder								■						■
Tablet disintegrant	■												■	
Tablet or capsule diluent								■					■	

# Committed to sustainability and quality

Partnering with Jungbunzlauer for high-quality ingredients means securing a reliable, responsible supply chain that supports your sustainability goals today and anticipates tomorrow's regulatory and market demands.





# Our three pillars of sustainability commitment



## ENVIRONMENTAL

We tackle climate change, improve water efficiency, reduce waste and preserve biodiversity to protect the environment.



## SOCIAL

We create a safe, diverse and equal work environment where all employees can develop to their full potential.



## GOVERNANCE

We offer safe and sustainable products, and promote responsible business conduct and resource use together with our business partners.

# Our commitment to quality



## Vegan Offering

A continuously growing number of people choose a vegetarian or vegan lifestyle.

Veganism does not stop at the edge of a plate, but covers all articles of daily use. Producers world-wide consequently adapt their range to broaden the offerings of animal-free products. Jungbunzlauer offers naturally sourced ingredients which are fully suitable for vegetarians and vegans.



\*Selected Products

## Non-GMO Positioning

Jungbunzlauer's non-GMO portfolio is produced from raw materials sourced under strict non-GMO specifications (except in Canada) and verified through regular testing. Our fermentation microbes are developed solely by traditional breeding technologies.

Most products made in Austria, France and Germany carry Non-GMO Project Verification, ensuring sustainable ingredients for food makers.

\*Not valid for Citric Acid DC, CITROCOAT® N, CITROFOL® BII, CITROFOL® BII, 6Ed, ERYLITE® Blends, sub4salt®, Xanthan Gum Blends, Zinc Gluconate, Monomagnesium Citrate



## ECOCERT and COSMOS Approval

The bulk of Jungbunzlauer range of personal care and cosmetic ingredients are approved by ECOCERT COSMOS and several of our cleaning and detergent ingredients are approved by ECOCERT as ingredients of 100% natural origin.

## NATRUE Approved

Most Jungbunzlauer products used in personal care and cosmetic applications are NATRUE approved as natural or derived natural ingredients.

# Jungbunzlauer Group

Jungbunzlauer is represented in all major markets. Our regionalised setup of the sales organisations and respective local distribution partners enable us to provide optimal and efficient service to customers in more than 130 countries.





## North America

## Europe

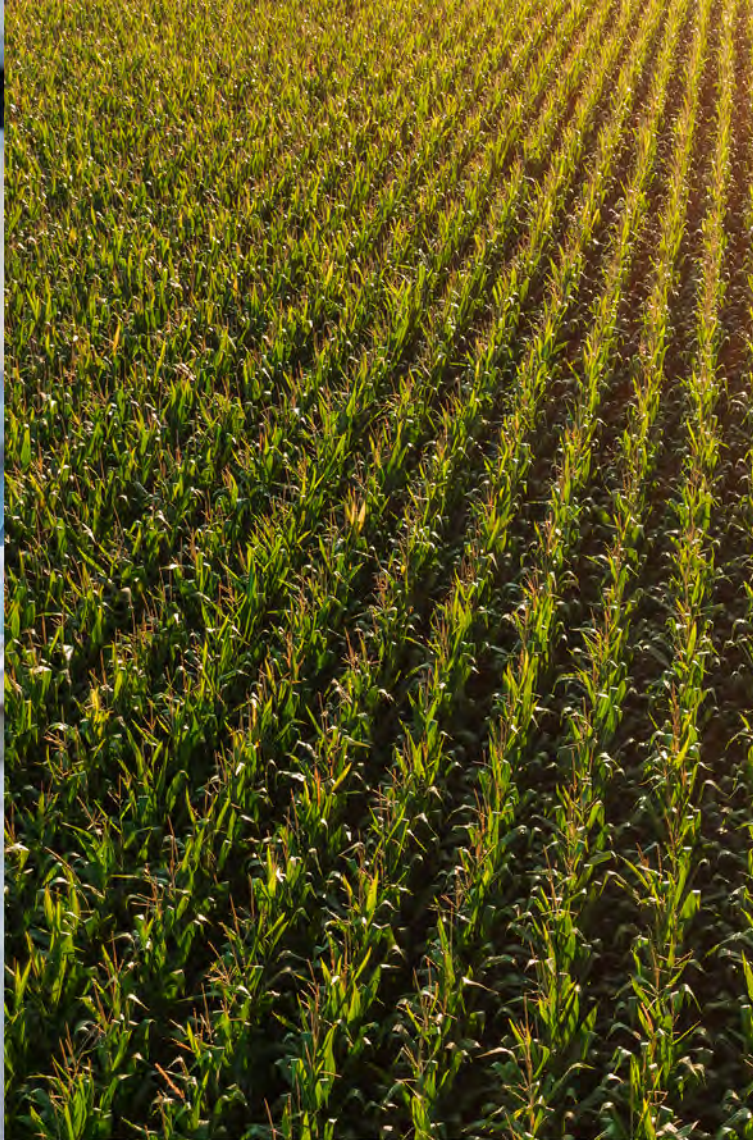
(incl. Russia, Africa and Middle East)



## Latin America

## Asia & Pacific

■ Sales office    □ Production site    ● Production site / Sales office    ○ Application development centre



# Jungbunzlauer

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