

# Addressing global concerns

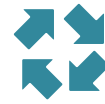




ORIGIN



CONCERN



SOLUTION

Nine  
billion people  
in 2050



# Addressing global concerns

The world is facing challenges of unprecedented dimensions. In the next 40 years, the world's population will grow from six to nine billion people. The implications of this dramatic increase are far reaching, especially in the areas of food reliability, access to reliable energy supplies and climate change complexities. Around the world we need to adopt a more sustainable way of life, and businesses need to bring new products and solutions to the market.

We must ensure that we have enough food to feed nine billion people – every day of the year. To do so requires a whole new way of thinking about food and agriculture.

At Danisco, we are already playing a part in meeting these challenges. Our products optimise the use of raw materials, allowing more food to be produced from the same amount of ingredients. For low-income consumers, our products add value, so that they can afford healthy food options instead of high-calorie foods. We also have solutions that boost the immune system, extend shelf life and increase food safety. All these products combined help to improve public health and reduce food waste, so we can meet the needs of a growing, hungry planet.

We also need to reduce our CO<sub>2</sub> emissions considerably in order to turn the tide of global warming. While it is critical that we change our attitudes and behaviour towards energy consumption and become more efficient, there is also an opportunity to develop alternatives that are less harmful to the environment.

Danisco supplies enzymes used to produce second-generation bioethanol based on renewable resources. This alternative

is expected to reduce the overall CO<sub>2</sub> emissions from the transportation sector by 85% compared with traditional petrol.

Similarly in the textiles industry, we offer enzyme solutions which allow a textile processor to optimise his energy savings by up to 40%, while in the laundry sector, our enzyme solutions enable efficient cold-water washing at 20 degrees Celcius, harvesting even more energy savings.

These are but a few of the examples where Danisco is already addressing the challenges of tomorrow, today. To us it is not a question of compromise or costs, but of product development and new business opportunities. These opportunities can generate significant earnings while at the same time addressing some of the world's most daunting sustainability problems.

As a long-standing biotechnology innovator, we have been and will continue to be at the forefront of providing solutions that maximise sustainable agricultural and raw material use, save energy, ensure nutritious food options and reduce oil dependence and CO<sub>2</sub> emissions.

Based on  
renewable  
raw materials

Rubber for car tyres or surgical gloves is made from either natural or synthetic rubber. Synthetic rubber is made from isoprene, a chemical which is petroleum-based. Its reliable supply is untenable as oil is a limited resource with fluctuating prices. In addition, the isoprene refinery capacity is limited in terms of geography and volume. We have invented an alternative with an identical molecule structure using renewable raw materials. The Biolsoprene™ alternative molecule will be produced using agriculture residue providing rubber manufacturers with a renewable and alternative source of isoprene to secure their supply.



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## Finding a replacement for oil

The world is facing a huge challenge finding a replacement for oil, which is used to manufacture a variety of products beyond car fuel and energy for heating. Oil is in rubber products and a host of other things such as plastics, numerous chemicals and materials. We therefore need to find new ways of creating industry and consumer goods made from renewable and sustainable resources. Danisco is addressing this major challenge by using modern biotechnology to create solutions such as the Biolsoprene™ technology to make multiple products. The potential is enormous, and Danisco strives to be at the forefront of providing of bio-based solutions.

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## Bio-based and sustainable products

Danisco's vision is to provide bio-based solutions to industry and to become our customers' First choice. Consequently, when our scientists see a business opportunity, they are encouraged to test that idea. This is what happened in the case of Biolsoprene™. Our scientists in the Genecor division discovered that we could produce a substance identical to the oil-derived isoprene, which resulted in a collaboration with Goodyear Tire and Rubber Company on the production of this renewable alternative to rubber for car tyres. The first concept tyre was launched at the UN COP15 Climate Conference in December 2009, and in spring 2010 Goodyear won the car tyre industry's Environmental Achievement of the Year Award for the tyre.

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# From plant material to car tyres



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# Microorganisms

from milk boost the immune system

Increasing  
focus on  
health



For thousands of years people have consumed acidified milk, which is made from microorganisms grown in milk and known as dairy cultures. For many years, we have worked with dairy cultures and have been part of building a global industry with a wide range of cheeses, yoghurts and milk drinks. Research based on this work has shown that some dairy cultures have a highly beneficial effect on the human organism and strengthen our health. This knowledge benefits both consumers and the food industry.



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## Healthy food for all

With the growing number of people in the world, there is an increasing focus on health, because more people also means more sick people. How do we ensure that people eat healthy food, which might even help prevent illness? Research has shown that dairy cultures boost the human immune system, but you actually don't have to consume milk products to benefit from these cultures. Dairy cultures are not in themselves milk, but bacteria that kick-start the acidification process. In addition to classic yoghurts, you can get juices with dairy cultures or straws containing dairy cultures.

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## Convenient and healthy solutions

People want to get healthy through the food they eat, and dairy cultures can boost the immune system and improve the gastrointestinal system. We continuously develop solutions with Howaru® dairy cultures, giving people around the world easy access to tasty and healthy food, which may result in increased well-being. Dairy cultures are a major focus area for Danisco.

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Many people associate the smell of rosemary with lamb dishes. Rosemary grows wild in Mediterranean countries and has for centuries been used to treat all kinds of diseases. Today, we have scientific proof that rosemary, also known as 'dew of the sea', is one of the solutions that can help reduce food waste. Using rosemary extracts, Danisco has developed natural preservatives that reduce rancidification in meat and other food products.



CONCERN

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## 30% of all food goes to waste

Up to 30% of all food is thrown away instead of being eaten. Maybe the consumer didn't store it correctly or maybe it was past its sell-by date. That is not sustainable in a world with a rapidly growing population facing food shortages and climate change. It means that huge amounts of food go to waste. It also results in more CO<sub>2</sub> from transport and disposal of the discarded food. With Danisco's solutions food stays fresh for longer, allowing more time to eat it.

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## Unhealthy bacteria kept under control

Food safety is an important development area for Danisco. Unhealthy bacteria should be kept under control to prevent food from spoiling and turning unhealthy or even dangerous to eat. Danisco develops natural preservatives and antioxidants by means of dairy cultures and natural extracts. Pure dairy cultures are used as preservatives with the effect that healthy bacteria take up the space of unhealthy bacteria. Antioxidants like rosemary prevent fat in food from turning rancid without making it taste of rosemary.

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Facing food shortages and climate change



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# Rosemary

reduces waste



# Animal feed with enzymes

reduces volumes and pollution



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Less  
pollution



Breeding chickens and pigs is a challenge to the environment and the food industry. The animals are fed so they can end up as food on the consumer's table. But feed is expensive and animals are not able to absorb all the nutrients of the feed without a little help. They need enzymes to improve their digestion, which in turn helps them to grow and reduces pollution.



## Appetite for meat is a problem

The human appetite for putting meat on the table almost every day is a huge problem for our planet. Raw materials going into animal feed could be used to feed people. As an example, you need to feed an animal around five kilos of grain feed to produce one kilo of meat. That is a problem in a world facing food shortages. The animals 'take the food out of people's mouths' so to speak before becoming food themselves. With some of Danisco's feed solutions this problem can v be alleviated.

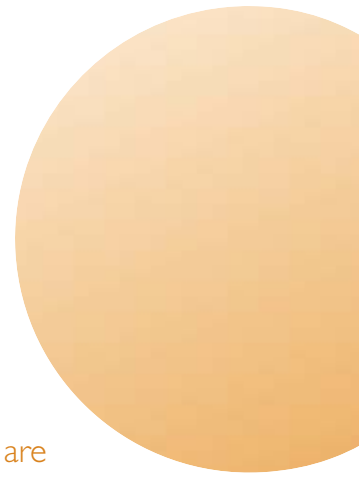
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## Improving animal digestion

Grain-based feed for food animals is not just a problem because the grain could have been used as food for humans. It is also expensive and the animals are not able to absorb all the nutrients. Danisco has developed feed enzymes such as xylanases. These enzymes enable a process that improves animal digestion and break down cell walls in the feed so the intestines can better absorb the nutrients. This allows farmers to reduce feed costs while improving animal growth with less feed required. Another benefit of improved feed intake is less animal manure. This also has the benefit that less phosphorus is discharged into the environment.

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When the yellow corn kernels have been picked off the cobs for use in food, we are left with a valuable raw material. In our world the cobs are not considered waste, but plant residue that can be used for producing advanced sustainable bioethanol, a CO<sub>2</sub>-reducing fuel, which is blended into petrol. Danisco's enzymes enable grain processors to break down the corn cob into sugar molecules that are used to produce ethanol, thereby maximising the use of this raw material.



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## Reduction of CO<sub>2</sub> emissions

The massive global consumption of fuels like oil and coal is driving global warming and climate change problems. We therefore need to limit our use of these non-renewable resources, and today alternatives are in high demand. Bioethanol is one of the solutions that can replace traditional car fuel. Developed from agricultural residues, bioethanol reduces CO<sub>2</sub> emissions from the transport sector by 85% compared with petrol. Danisco develops enzymes enabling the production of ethanol from diverse raw materials.

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## Sustainable energy

A major biotech project for Danisco is the development of enzymes for second-generation bioethanol. In a joint venture with US-based DuPont, our Genencor division develops enzymes for sustainable bioethanol based on agricultural residues like corn cobs and switchgrass. In Tennessee, USA, the joint venture DuPont Danisco Cellulosic Ethanol LLC has constructed a demonstration plant producing second-generation bioethanol. This is setting the standard for similar commercial-scale plants being built around the world, the first of which are expected to be ready in the USA.

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Producing  
second-  
generation  
bioethanol



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# Turning biomass into fuel





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# Seaweed

grown as a crop

We can  
reduce the  
fat content



To many people, seaweed is merely something you see on the beach. But it is also a plant used in the food industry – and not just for sushi. Off the coast of Chile, seaweed is grown almost like an agricultural crop, which is subsequently used as a textural agent in a range of foods across the world. Seaweed ends up as carrageenan, an ingredient that lowers the calorie content and adds texture and mouthfeel.



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## Overweight is a growing problem

In 2015, three billion people are expected to be overweight. As a result, we will be seeing more cases of diabetes and cardiovascular diseases, which will have severe consequences both for the people who get sick and for the health sector. For us it is only natural to develop products that reduce the fat and calorie content of the food consumers eat. Therefore, health and nutrition and particularly overweight are key focus areas for Danisco.

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## Low-calorie solutions

Specialists in our Enablers division develop low-calorie ingredients, such as the seaweed-based carrageenan. If you replace fat in milk-based products with a small quantity of carrageenan, you maintain a pleasant mouthfeel. In other words, even in a low-calorie version you still get a creamy sensation in the chocolate mousse or blancmange. With a carrageenan blend we can reduce the fat content in desserts by up to 70%.

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To many people, enzymes probably sound like something the detergent industry invented, because they are mentioned on every box of detergent. But, actually, enzymes exist in nature and are present in all living beings. Enzymes are proteins that enable chemical processes. They make things happen, whether it is digestion of the food we eat or breaking down of plant material and transforming it into energy for our body. A special enzyme exists for each of these processes. Industry's challenge is to find the right enzyme from different organisms or to develop it by means of modern biotechnology.



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## Global warming calls for new solutions

The use of fossil fuels for energy is a growing problem for our climate. Enzyme use offers many solutions that can help reduce CO<sub>2</sub> emissions from industrial processes and lessen the impact of global warming. They are used to produce second-generation bioethanol that reduces CO<sub>2</sub> emissions by 85% compared with traditional petrol; they are used in detergents that make it possible to wash at 20 degrees Celsius, and they are used for non-chlorine textile bleaching allowing water and energy savings of up to 40%. In food production, enzymes help utilise raw materials better, leaving more food for the growing global population.

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## Less energy and water consumption

Biotechnology is one of Danisco's fundamental areas of expertise, in particular when it comes to enzymes. Through our Genencor division, we deliver enzyme solutions to a wide range of industrial sectors, making us the world's second largest enzyme producer. These enzymes are used in detergents for stain removal and washing at low temperatures. Likewise, they replace chlorine in textile bleaching, and are used to convert renewable raw materials for the production of bioethanol and other biochemicals used in products like rubber. There are multiple advantages of enzymes, including that they reduce process energy consumption and often increase output and efficiency.

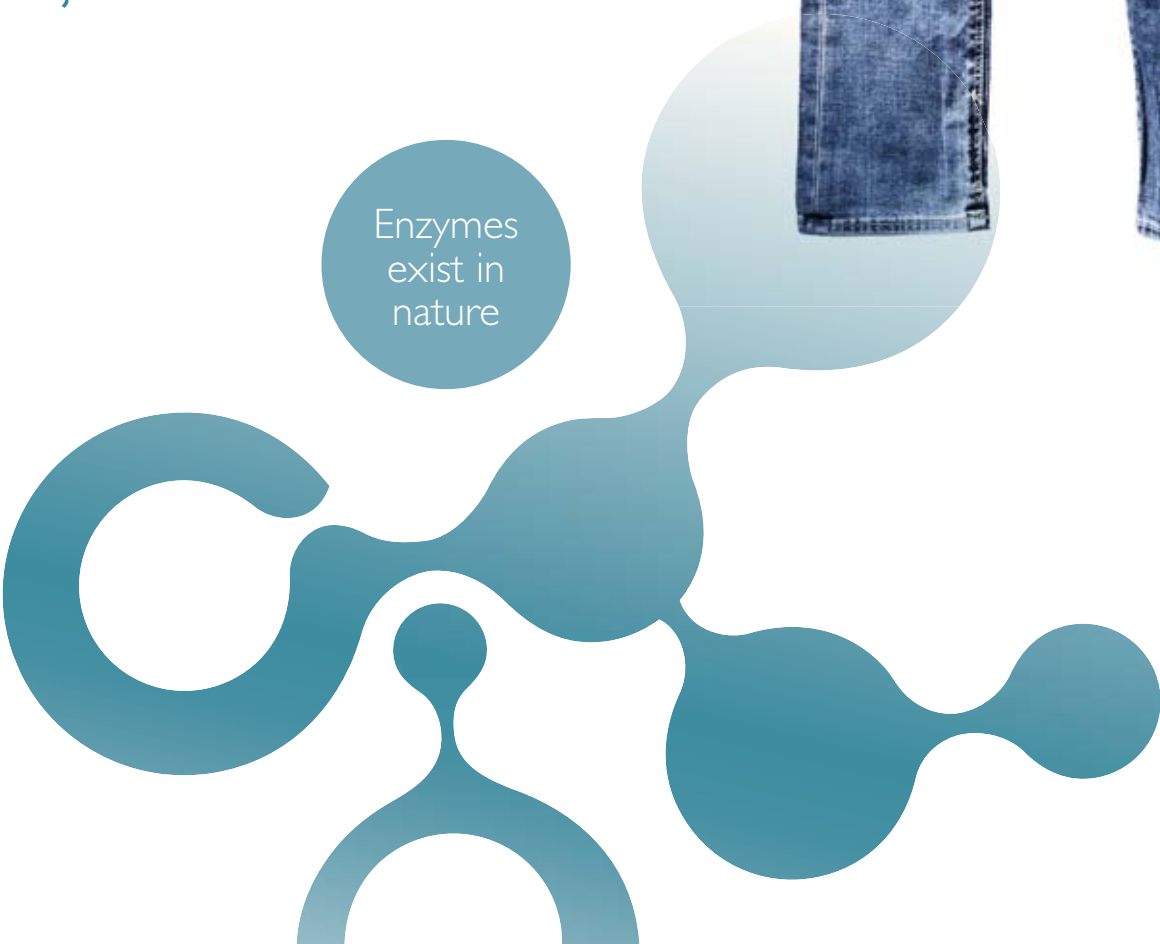
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Enzymes  
are nature's enabler

Enzymes  
exist in  
nature





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# Palm oil

becomes cheap and healthy food



Healthy  
food every  
day

Palm oil is derived from oil palm trees which are mainly grown in Asia and increasingly from sustainable plantations. An ingredient in many foods, the oil is mostly associated with rich food, but is in fact often used in low-fat cooking and as part of healthy, long-life food for people who only earn a few dollars a day. Palm oil is used to make emulsifiers that have the ability to bind oil and water. Emulsifiers also ensure a good texture in food and can help replace more expensive food ingredients.



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## The challenges of a growing population

The world's population keeps growing, and estimates show that there will be around nine billion people in 2050. Many people live on very low incomes and may not be able to afford healthy food every day – or even a few times a week. But with our solutions it is possible to make good bread from flour of a lower quality – and at an affordable price. Likewise, Danisco has solutions that extend the shelf life of food, which is essential for people who don't have a fridge.

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## Making good bread from low-quality flour

In some parts of the world, flour is not always of the best quality, meaning that expensive imported flour has to be added to make good bread. This makes bread expensive for low-income consumers. However, thanks to ingredients like emulsifiers and enzymes and our employees' knowledge, it is possible to make good bread from lower quality flour while containing costs so that more people can afford to put bread on the table.

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# Sweeteners

from birch trees



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Replacing  
sugar



Who would believe that a tree could provide a low-calorie alternative to sugar? But that is exactly what birch trees do. Behind the white bark lies the secret to an entire industry manufacturing products for people all over the world. One such product is xylitol in which Danisco has a large market share globally. Xylitol is a sweetener used in chewing gum and toothpaste.



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## Oral health and calories

Cavities and overweight are major global concerns. However, it is possible to do something about it without having to constantly brush one's teeth or avoid sweets. The problem can be minimised by eating food with fewer calories and less sugar. A sweetener like xylitol can replace sugar and help reduce the development of cavities.

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## Xylitol replaces sugar

Danisco is seeing a growing interest from consumers wanting to eat their way to good health. People want to buy delicious food that doesn't compromise on taste while being kind to their teeth or figure. This is one of the reasons why we focus on health and nutrition as a business area. Xylitol can replace sugar while acting as a flavour enhancer in dairy products, ice cream and low-calorie food. Similarly, it is an important ingredient in chewing gum and toothpaste. In some parts of the world, the word xylitol is even more visible on gum packets than the word chewing gum.

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# Sustainability

in every step of our value chain



Breakthrough  
innovations in  
biotechnology

As a global bio-based company we realise the need to provide the most benefit to our business and society and to anticipate the risks and opportunities using sustainability as a compass.

We do this by balancing environmental, social and economic factors in procurement, manufacturing, customer use and consumer use. Additionally, life cycle assessment, in which we determine the full environmental impacts of our products through the value chain, informs our decision-making and helps us optimise activities to deliver innovative products with the greatest overall environmental benefits.



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## Strained capacity

By 2050, the global population is projected to reach nine billion people. The Earth's carrying capacity will be severely strained if we continue our current patterns.

Our world is characterized by inefficient and environmentally damaging agriculture along with wasteful food distribution and consumption. We also depend on non-renewable energy sources and unchecked use of petrochemicals.

In precisely these areas Danisco has an extraordinary potential to help address the world's most urgent challenges.



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## Devising alternatives

We are leveraging bioinnovation to foster sustainable food production and consumption. We are promoting health. And we are devising alternative energy and biochemical solutions.

### Looking ahead, we plan to:

- Provide an even broader range of value-added ingredients for healthier and safer foods developed through highly efficient and sustainable agricultural practices.
- Help our customers move toward renewable, bio-based resources that extend product shelf-life, eliminate waste and protect the environment.
- Develop breakthrough innovations in biotechnology that revolutionise industrial processes, replace petrochemicals and deliver abundant renewable energy.
- Accelerate the pace of progress by using sustainability as a driver for innovation and transformative collaboration.
- Protect our employees, the environment and consumers by controlling risks and delivering safe and environmentally and socially responsible products.

## Danisco snapshots 2009/10

GROUP REVENUE DKK billion	GROUP EBIT* DKK million	GROUP PROFIT DKK million
13.7	1,745	481
ORGANIC REVENUE GROWTH	EMPLOYEES	R&D SPEND DKK million
6%	6,800	884
RONOA**	DIVIDEND/SHARE*** DKK	SHARE PRICE **** DKK
19.0%	17.00	404

\* EBIT before share-based payments and special items

\*\* Return on net operating assets

\*\*\* Board of Directors' proposal to the Annual General Meeting on 19 August 2010 (ordinary dividend of DKK 8.50 plus extraordinary dividend of DKK 8.50)

\*\*\*\* Share price at financial year-end 30 April 2010

### Financial ambitions

Our ambition for organic growth is at the level of 5-7% over a business cycle and a long-term EBIT margin (before Bio Chemicals Projects) of at least 13.5% and to have a capital structure, which over time will correspond to debt

defined as a net interest-bearing debt/EBITDA (including Bio Chemicals Projects) ratio at the level of 1.5-2.5. A reduction of the capital base will be in the form of dividends and/or share buybacks.

## Picnic with Danisco



Danisco's ingredients are part of consumers' everyday life in their food, clothes and other products. Egg-laying hens have been fed our enzymes through their feed, bread and margarine contain emulsifiers from palm oil, and dairy cultures are part of cheese and other dairy products. Jeans may be bleached by our enzymes, and in just a few years' time rubber tires could be based on Biolsoprene™. Fresh fruit and raw fish are almost the only areas where consumers will not meet Danisco's ingredients.

### VISION

To be the First choice provider of bio-based ingredients to industry globally.

### MISSION

To help our customers increase their competitiveness through innovative, sustainable and bio-based ingredient solutions that meet market demand for healthier and safer products

### STRATEGY

To create value through:

- organic and acquisitive growth by leveraging and strengthening our market access, applications and technology platforms
- talented and engaged people

# Danisco in brief

## Meet Danisco

### May 2010

Vitafoods 2010, Switzerland  
[www.vitafoods.eu.com](http://www.vitafoods.eu.com)

### June 2010

Fuel Ethanol Workshop & Expo, USA  
[www.fuelethanolworkshop.com/default.aspx](http://www.fuelethanolworkshop.com/default.aspx)

### July 2010

The World Congress on Industrial Biotechnology and Bioprocessing, USA  
[www.bio.org/worldcongress/](http://www.bio.org/worldcongress/)

### September 2010

International Baking Industry Expo, USA  
[www.ibie2010.com](http://www.ibie2010.com)

China Brew & Beverage 2010  
<http://www.chinabrew-beverage.com/en/show.asp?id=381>

### October 2010

Supply Side West, USA  
[www.supplysideshow.com/2010/west/](http://www.supplysideshow.com/2010/west/)

7th World Conference on Detergents, Switzerland  
[www.kaochemicals.de/7-th-world-conference-detergents](http://www.kaochemicals.de/7-th-world-conference-detergents)

### November 2010

Health Ingredients Europe 2010, Spain  
[www.hieurope.ingredientsnetwork.com](http://www.hieurope.ingredientsnetwork.com)

### January 2011

SDA Annual Meeting and Industry Convention, USA  
[www.cleaning101.com/about/index.cfm](http://www.cleaning101.com/about/index.cfm)

### May 2011

Vitafoods 2011

## Websites

Apart from our main website, Danisco also has a number of product websites. In addition, Genencor has its own website, as does our joint venture with DuPont.

**danisco**  
[www.danisco.com](http://www.danisco.com)

**genencor**  
[www.genencor.com](http://www.genencor.com)

**fruisana**  
[www.fruisana.com](http://www.fruisana.com)

**HOWARU™**  
[www.howaru.com](http://www.howaru.com)

**litesse®**  
[www.litesse.com](http://www.litesse.com)

**xylitolinfo**  
[www.xylitolinfo.com](http://www.xylitolinfo.com)

**dietarysupplements**  
[www.daniscodietarysupplements.com](http://www.daniscodietarysupplements.com)

**ddce**  
[www.ddce.com](http://www.ddce.com)

**daniscocare4U™**  
[www.daniscocare4u.com](http://www.daniscocare4u.com)

# Facts about ingredients

Ingredients	Raw materials	Use
<b>Cultures</b> (also known as dairy cultures or bio-ingredients)	Pure cultures of microorganisms isolated from raw milk grown on milk	Acidify milk in the production of cheese, set milk and yoghurt
<b>Emulsifiers</b> (also known as textural agents)	Vegetable oil, animal fats and/or organic acids such as citric, lactic or tartaric acids	Used e.g. to bind oil and water. Often used in bread, cakes, margarine and ice cream
<b>Enzymes</b> (also known as bioingredients)	Microorganisms	Used in bread, juices, beer and wine to promote natural processes, improving, for instance, dough and bread qualities. Also used in detergents, textile bleaching and bioethanol
<b>Functional systems</b> (also known as functional blends)	Tailor-made blends of stabilisers and emulsifiers and/or other ingredients	Bread, ice cream, yoghurt and other dairy products
<b>Natural protectants and antioxidants</b> (also known as food safety products)	Fats, ascorbic acid and rosemary for antioxidants and pure cultures from e.g. raw milk for natural protectants	Prevent the rancidity of fat and growing of harmful microorganisms
<b>Stabilisers</b> (also known as thickening, gelling and stabilising agents)	Citrus fruits, apples, seaweed and pods from the carob tree and the guar plant	Bind water, making it viscous or gel-like. Used in e.g. chocolate milk, drinking yoghurt and jam
<b>Sweeteners</b>	Sap from birch and beech trees, fruits, lactose, starch and dextrose	Replace sugar and add or enhance the taste of dairy products, ice cream and low-calorie products. Danisco is particularly known for xylitol

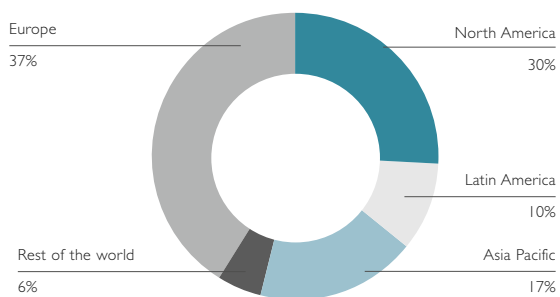


The world map shows Danisco's R&D sites, major production sites and the head office in Copenhagen, Denmark.

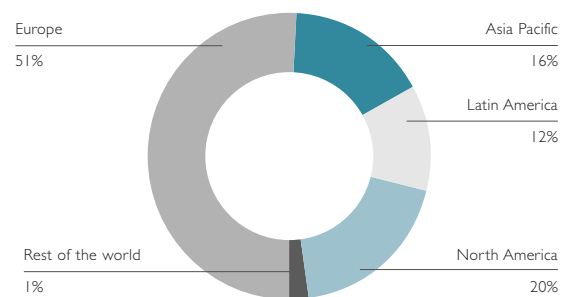
-  R&D centres
-  Major production sites
-  Head office



### Sales by region



### Employees by region



## About Danisco

With a rich and innovative portfolio, Danisco is a world leader in food ingredients, enzymes and bio-based solutions. Using nature's own materials, science and the knowledge of our 6,800 people, we design and deliver bio-based ingredients that meet market demand for healthier and safer products. Danisco's ingredients are used globally in a wide range of industries from bakery, dairy and beverages to animal feed, laundry detergents and bioethanol – to enable functional, economic and sustainable solutions. Headquartered in Denmark and operating from more than 80 locations, Danisco's key focus is to become our customers' First choice and a truly market-driven global business. Find out more at [www.danisco.com](http://www.danisco.com).

