

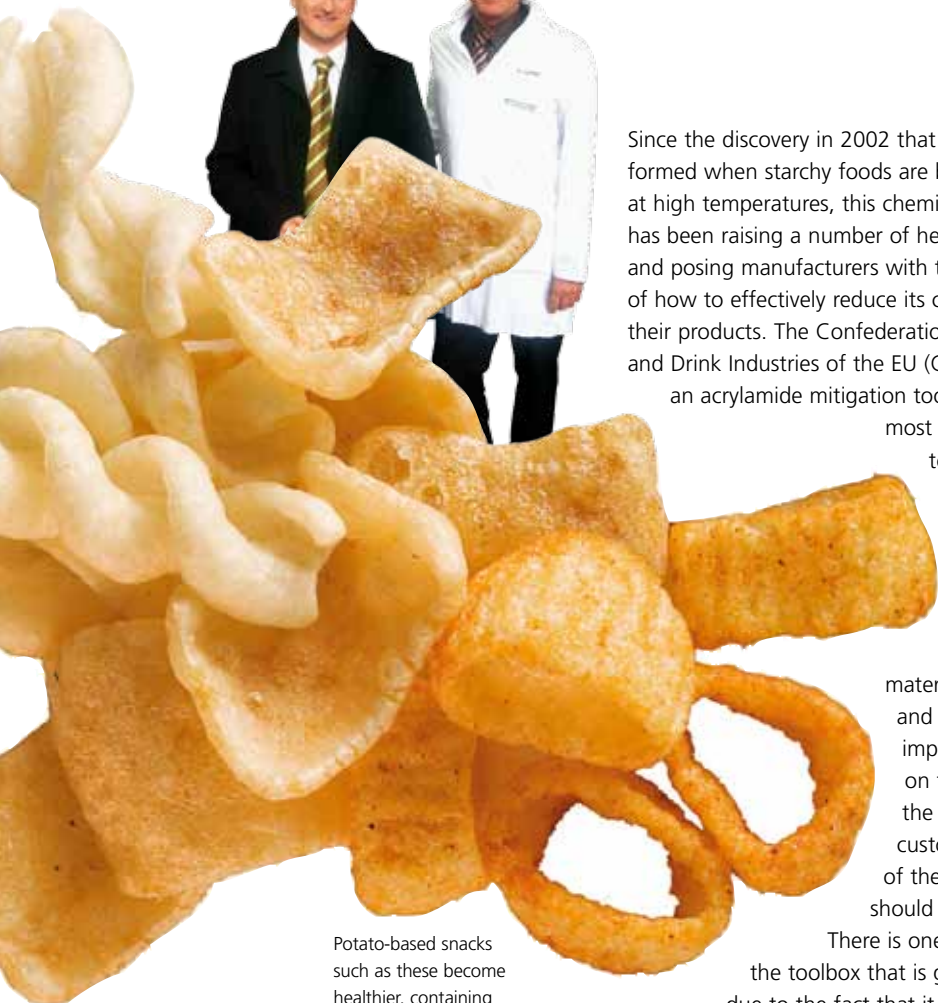
# INNOVATION AND ENZYMES AT EMSLAND GROUP



Sylvain Laperche, Account Manager at Novozymes (left), with Emsland Group's Wolfgang Lippke, head of Emsland Group's Food R&D department.



Emsland Group, the largest potato starch producer in Germany and global leader in the production of starch-finishing products, potato protein, flakes, and granules, adds value to its products and offers a new level of support to customers by using enzymatic innovation to reduce the level of asparagine, a precursor of acrylamide, in its potato granules.



Potato-based snacks such as these become healthier, containing approximately 60% less acrylamide, when produced using Acrylaway®.

Since the discovery in 2002 that acrylamide is formed when starchy foods are baked or fried at high temperatures, this chemical substance has been raising a number of health concerns and posing manufacturers with the challenge of how to effectively reduce its concentration in their products. The Confederation of the Food and Drink Industries of the EU (CIAA) launched an acrylamide mitigation toolbox to offer the most efficient solutions to assist the affected industries.

The toolbox is a combination of suggestions for changes in raw materials, processes, and recipes, with importance placed on the fact that the brand-specific customer acceptance of the final products should not be impacted.

There is one option within the toolbox that is growing in appeal due to the fact that it does not influence the final product's taste or appearance. This innovative enzymatic technology is offered by asparaginases such as Novozymes' Acrylaway®. And Emsland Group, with its corporate slogan being "using nature to create," was the perfect collaboration partner to help bring Acrylaway to commercial success in the production of potato granules.

## Health and taste appeal

Although Acrylaway was launched in 2007 to customers manufacturing dough-based products due to the initial ease of application, recent trials have shown that reductions in acrylamide content of up to 80% are possible in the production of French fries, with additional impressive results demonstrated in the field of potato-based snacks. Emsland Group's pioneering industrial trials resulted in a 60% asparagine reduction in potato granules and above 60% acrylamide reduction in snacks produced from its treated potato granules – and this impressive result has the potential to be further improved if the snack producers also implement an acrylamide-reducing technology before baking or frying their snacks. What is truly appealing about Acrylaway is that the reduction of acrylamide in these food types is achieved without altering the tempting flavor or visual aspect of potato-based snacks – a sizable bonus for food manufacturers that are searching for acrylamide-reducing solutions and worry about the continued allure of their products for consumers.

## Consistent collaboration leads to results

"Stable quality is a key requirement for our customers," says Wolfgang Lippke, head of Emsland Group's Food R&D department. "As an innovative company we wanted to work closely with our customers and react quickly to concerns about acrylamide while at the same time providing them with the reliable supply of high-quality potato granules they expect from us. And our relationship with Novozymes and the use of Acrylaway enabled us to do exactly that."



Potatoes – the key ingredient in Emsland Group’s production plant.

## BACK TO BASICS

The main mechanisms that cause the formation of acrylamide are commonly found in starchy foods – reducing sugars and the amino acid asparagine. During the baking or frying stage, a process called the Maillard reaction or nonenzymatic browning occurs – essential for important color and flavor developments in baked, fried, and toasted foods. Through a cascade of reactions, the side chain of asparagine is converted into acrylamide. As Emsland Group does not expose its potato granules to extreme heat, these do not contain acrylamide. By treating the granules, Emsland Group offers its customers a product that contains a reduced level of asparagine, a precursor of acrylamide, when it uses heat to transform the granules into potato snacks.

The Novozymes/Emsland Group collaboration began in 2005, starting with discussions that evolved into early lab trials. “Both Hanne Vang Hendriksen, Senior Scientist at Novozymes, and Peter Müller, Application Manager for the Food and Nutrition division at Novozymes, have been exceptional resources for us,” continues Wolfgang Lippke. “We enjoy an excellent exchange of information, and although we never disclose customer information, we always ensure our communication is aligned with Novozymes.” The close interaction between both companies continued, experimenting with factory trials using both Acrylaway-treated and untreated potato granules until a satisfactory reduction in the level of acrylamide was achieved in final snack products.

With enhanced results, Emsland Group was ready to reveal its improved potato granules to its customers and this led to the inclusion of Acrylaway into its production plan in 2008. “We’re extremely satisfied with our relationship with Emsland,” says Emmanuel Michelot, Regional Marketing Manager for Novozymes’ Food and Nutrition unit. “Together we can help the potato-processing industry to solve the problem of acrylamide. Our aim is to eventually cover all product areas that are affected by acrylamide, and similar collaborations with major players in these markets will be key to continuing toward our goal of making food safer and healthy.”

### Concern invites innovation

Although the potential risk to humans by dietary exposure to acrylamide is not yet fully known, an increasing number of studies is currently in progress at an international level to collect the data needed to make an informed evaluation. Until more results are available, JECFA, the Joint FAO/WHO Expert Committee on Food Additives, has recommended that appropriate efforts should be made to reduce the concentration of acryl-

amide in food. In Germany, a strategy to minimize the acrylamide content in foodstuffs was agreed among the Federal Office of Consumer Protection and Food Safety (Bundesamt für Verbraucherschutz und Lebensmittelsicherheit – BVL), the German federal states, the industry, and the Federal Ministry of Consumer Protection, Food and Agriculture. This involves the BVL collecting analytic results on the acrylamide contents in foodstuffs and assigning a signal value for each food group based on these data.

Food control authorities contact the producers of foodstuffs that exceed the signal value and help assess whether their processes or ingredients can be altered to reduce the level of acrylamide. “Acrylamide reduction is a big issue in Germany at the moment,” confirms Wolfgang Lippke. “Customers actually approached us, asking us if we were doing anything that could help them reduce the acrylamide content of their snacks. Some had even started to develop solutions for themselves based on the CIAA toolbox.”

As Emsland Group’s products do not contain acrylamide, they are not under any obligation to invest in this change. But a company with a conscience such as Emsland Group has a goal to produce healthy products from healthy raw materials and wants to support its customers through adding unique value to its granules.

### The perfect fit

The Emsland Group/Novozymes collaboration is a carefully considered one, combining a solution that truly works with a receptive company that wants to add value to its products and enhance its recognition as a supplier. “Although there are other technologies to reduce acrylamide, asparaginases such as Acrylaway are the only solution that doesn’t alter the quality of the final product,” says Sylvain Laperche, Account Manager, Novozymes Food and Nutrition. “It’s also afford-

able – while adding significant value to the final product.”

“Acrylaway really works for us,” explains Wolfgang Lippke. “The enzyme technology matches our process perfectly – the temperature and holding time that are optimal for Acrylaway were already part of our process. We do the work, so our customers don’t have to change their equipment, processes, or worry about dosage.”

### A low-acrylamide future beckons

Today’s consumers are conscious and cautious about what they eat. Health and food quality are major drivers for the market right now, and food safety is a key consumer concern. It is a request from the society that our food is not only tasty and of high quality, but also safe and healthy – and in countries such as Germany, this requirement is supported by the government. Innovative enzymatic solutions such as Acrylaway and progressive companies such as Emsland Group ensure that acrylamide levels are reduced in potato-based snacks, without altering the taste and appearance of these products. By achieving this, they help to produce safe and healthy food that benefits consumers, society, and food manufacturers. ■



**FOR MORE INFORMATION**  
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