Vegetarian and vegan foods – GDL's search for new solutions in Bremerhaven

The number of consumers who prefer plant proteins and natural and minimally processed foods at the same time is on the increase. To meet both of these requirements, producers are searching for specific solutions to enable the use of alternative protein sources such as peas, lupines or rapeseed in new products. The German Association of Food Technologists (Gesellschaft Deutscher Lebensmitteltechnologen, GDL) therefore conducted a symposium at the beginning of September in Bremerhaven. The two-day event in 'Seefisch Kochstudio', which was attended by around 100 raw material suppliers, service providers and users from the food industry was focussed on the technological challenges facing the vegetarian/vegan segment.

The GDL symposium in Bremerhaven was focussed on the technological challenges facing the vegetarian/vegan segment. (Photo: © Mareike Bähnisch)

Trend towards minimally processed foods

Consumers' most important requirement at the point of sale: today, vegetarian and vegan foods have to be as natural as possible, a point that was unanimously agreed on by the GDL symposium participants. However, this requirement cannot always be combined with a clean label. "At present, particularly with the meat alternatives, we're still seeing a lot of products that have to use a relatively high number of aromas and colourings to enhance the products' taste and appearance. And that doesn't necessarily lead to the natural character that consumers want", stated Dr Raffael Osen of the Fraunhofer Institute for Process Engineering and Packaging IVV, putting the matter in a nutshell in his presentation.

Many technology providers and raw material suppliers are therefore currently working on solutions to achieve the product profiles expected by consumers without creating a long list of

ingredients. According to Osen, however, this doesn't just involve alternatives to meat, sausage or cheese: "Consumers are very interested in vegan innovations. They don't only have to be meat alternatives. They can also include plant-based drinks."

Fermented proteins from lupines

At the Fraunhofer IVV, scientists are tackling the question of what possibilities plant proteins can offer in the beverage sector. Osen presented a method for processing sweet lupines that preserves the proteins and reduces undesired phytic acid at the same time. A two-stage mashing and fermentation process is used. This ultimately results in a lupine extract that is used as the starting point for a refreshing drink in which the protein content can be specifically adjusted by using the extract as the raw material for the beverage.

Dr Osen of the Fraunhofer Institute for Process Engineering and Packaging IVV presented a method for processing sweet lupines that preserves the proteins and reduces undesired phytic acid at the same time.
(Photo: © Mareike Bähnisch)

Proteins are not usually soluble in an acid environment. The lupine is an exception in this case "because it contains a minor protein fraction that can also be dissolved in the acid pH range", explained Osen. The seeds of the narrow-leaved sweet lupine are the raw material used to obtain the lupine protein. This lupine grows readily in Germany. Its seeds originate from non-genetically modified, conventional breeds. The high-quality protein can also be obtained from the seeds.

Rapeseed proteins at attractive prices

New approaches are needed to meet market requirements – these also extend to the use of rapeseed-based raw materials. Dr Steffen Hruschka of GEA believes this is an up-and-coming vegan protein source. Firstly, the expert does not regard rapeseed as a niche product because it is available in high quantities in comparison with other plant protein sources such as the sweet lupine. And secondly, "Rape is a native plant that contains no genetically modified organisms and has a good protein composition. The bioavailability of the rapeseed protein is similar to that of milk protein", says Hruschka.

Dr Steffen Hruschka from GEA provided an insight into a new method for obtaining rapeseed proteins at the GDL symposium. (Photo: © Mareike Bähnisch)

To date, however, no method has arisen with "which rapeseed proteins can be obtained so inexpensively that their taste and odour and/or processing characteristics are considered satisfactory." GEA intends to change this and is therefore working on new solutions. The status quo of the developments that Hruschka presented in Bremerhaven is a method that enables a rapeseed protein product to be produced at attractive prices – "and whose usage characteristics are very interesting."

Next protein generations

The choice of the proteins is crucial, not only when the development of vegetarian and vegan products is involved. "The production of proteins, both plant-based and animal-based, is currently having a negative impact on the environment in terms of greenhouse gas emissions, land and water use and the loss of biodiversity", explained Martin Schüring in his presentation. With this, the scientist from the ttz in Bremerhaven also addressed the aspect of sustainability in protein production. "To meet the needs of the growing food and feed sectors, it is crucial that we find alternative protein sources that can be produced in large quantities", stated Schüring.

"Our arable land is limited. That's why we need new approaches to supplying proteins", stated Martin Schüring of the ttz in Bremerhaven. (Photo: © Mareike Bähnisch)

Schüring believes that proteins from legumes, oilseeds and cereals are poised for more widespread use in vegan and vegetarian foods. "Besides the classics - soy, wheat and peas - rice and sunflowers have increasingly made their way into the food industry in recent years. Legume proteins, particularly from broad beans and chickpeas as well as from potatoes and oats, are increasingly being used."

However, new sources of alternative proteins are also of interest to the researcher in terms of sustainability and availability. At the ttz, Schüring is investigating the possible uses of microalgae, single proteins and insects within the EU's 'NextGenProtein' project. "These can be produced by means of innovative and ecologically sustainable bioconversion processes using industrial waste streams."

The food technologist's conclusion: "If we want to create genuinely innovative products, then we really have to think in terms of different process categories and processing methods."

Further information and contact

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