

Food Research in Saxony-Anhalt: Plants as Alternative Sources of Protein

Two shining examples of sustainable food for thought

What healthy and sustainable alternatives are there to protein sources such as meat, fish, eggs and milk? Apart from soya beans, now mainstream, which plants could provide us with our all-important protein? What other plants would be suitable as sources of protein? Nutritional scientists at the Martin Luther University Halle-Wittenberg and researchers at Pilot Pflanzenöltechnologie Magdeburg e. V. are providing some unexpected answers to the question of what our diets will look like in the future.

Schnitzel, minced meat or tofu: meat substitutes are no longer rarities on the supermarket shelves. The range of plant protein products could soon expand even further. Nutritional scientists at the Martin Luther University Halle-Wittenberg (MLU) tested rapeseed protein as part of a study and discovered that the substance, which has long been used as an oil, is also suitable as a valuable source of protein. "The human body needs protein for its essential amino acids, which the body can't produce itself," says Prof. Gabriele Stangl from the Institute for Agricultural and Nutritional Science at the MLU. "Soya is the most common source of plant protein because it contains a very beneficial combination of amino acids." Until now, there has been almost no research into the effectiveness of rapeseed protein. It meets all of the prerequisites. "We know that rapeseed protein also has a very beneficial combination of amino acids," says Stangl. She highlights the advantages that rapeseed has in comparison to soya beans: "It's already being grown in Germany and the basic materials for the production of rapeseed protein are generated in the manufacture of rapeseed oil anyway – it's just that they have only been reprocessed as animal feed until now."

Stay fuller for longer with rapeseed protein

During the study, which was funded by the Union for the Promotion of Oil and Protein Plants (Union zur Förderung von Oel- und Proteinpflanzen e. V.), the MLU team investigated how rapeseed protein directly affects the human metabolism in comparison to soya proteins. This involved serving test subjects pasta with tomato sauce – either on its own or fortified with rapeseed or soya protein. "After the meal, we regularly took blood samples from the subjects over a period of six hours. This gave us very detailed information about the body's metabolic response," says Prof. Stangl. The result? Rapeseed is equivalent to soya and even comes out on top over its well-known meat substitute counterpart in certain areas. Particularly surprising was the finding that rapeseed protein fills you up for longer than soya protein. Another advantage was found in the body's insulin response. "We discovered that, in comparison to soya protein, less insulin is used to reduce blood sugar levels after eating. This could bring health benefits to those with prediabetes," Stangl says.

Rapeseed protein does have a slightly bitter aftertaste, however. While soya has a neutral taste, the bitter ingredients in rapeseed are very noticeable. "The trick will be to use cultivation and technological processes to reduce the concentration so that the mustardy, bitter notes no longer taste so strong," says Stangl, who is sure that it is well worth pursuing the issue, "if only for sustainability reasons." She believes that this would allow a domestic by-product from oil production to be put to valuable use as a good source of protein in our diets.

PPM: in search of alternative proteins

The rapeseed protein used by the study in Halle has been isolated by the Pilot Pflanzenöltechnologie Magdeburg e. V. (PPM). It sees rapeseed as a very promising source of plant protein, too. The industry-based research institute operates a testing facility in Magdeburg for producing and processing oils and proteins from renewable raw materials on a small pilot scale. The facility is the only one of its kind in the whole of Germany. "We can see a trend of more and more people opting for vegetarian or vegan diets," says Dr. Frank Pudel, Managing Director of PPM. He believes this is due to a rejection of intensive livestock farming on ethical grounds and due to the enormous strain these farming methods have on the environment and the extensive farmland they take up. "That's why we are looking for alternative proteins and focusing on renewable raw materials," Pudel explains.

Broad beans show great potential

The team's areas of research include plants, biological by-products from the food industry, and even insects. The PPM team has been researching rapeseed for many years now. "Rapeseed meal, a by-product of rapeseed oil production, has a protein content of around 25%," says Pudel. "That is excellent." The PPM sees rapeseed meal, used as animal feed up until now, as a "viable alternative source of plant protein." "However, a lot still needs to be done in the industry to get production moving," says Pudel.

A great deal of progress has already been made in terms of the flavor. The PPM is one of the partners in the joint project RaPEQ, funded by the German Federal Ministry of Education and Research. "Together we were able to identify the bitter taste of rapeseed protein and develop strategies to reduce it," says Pudel.

Another source of plant protein looks set to be a goer, too. The Magdeburg-based scientists believe broad beans have a promising future. The head of PPM explains why: "They can be grown locally and organically, have a protein content of 30% and don't have a strong natural taste." This makes the beans "the perfect alternative to peas or soya in the production of foods with added protein." The researchers from Magdeburg tried out how it might look and taste, using the light yellow protein powder to produce product samples for sausages, waffles and drinks in order to whet industry partners' appetites.

The PPM team itself is convinced that broad beans have potential and that new sources of plant protein are hugely important. A new technical building is currently being built on the Ostfalen Technology Park in Barleben, near Magdeburg, with funding from "Sachsen-Anhalt FORSCHUNG AUSSTATTEN," a research investment program run by the Investment Bank of Saxony-Anhalt. "We want to establish a pilot plant there for the production of alternative proteins," says Pudel. The researchers in Saxony-Anhalt have taken their innovation one step further and, together with a firm based in Baden-Württemberg, have developed a glue from the broad bean protein. Dr. Pudel says: "Glue is often based on bone gelatin; we have shown vegan alternatives can be used in this type of product, too."

Author: Manuela Bock/IMG Saxony-Anhalt

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