

# Plant-Based Proteins

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The Sustainable Future



# PLANT-BASED PROTEINS: THE SUSTAINABLE FUTURE

**Proteins are essential, both in human and animal diets. They are an important component of every cell in the body. Proteins contain essential amino acids which, after water, form the second-largest component of human muscles and other tissues, used to build and repair them.**

Along with fats and carbohydrates, protein is a “macronutrient,” meaning that the body needs relatively large amounts of it.

Plant-based protein products are an important complement or alternative to animal proteins in many foods, and can therefore contribute to the global effort to create a more sustainable agri-food system.

The European starch industry processes primarily EU-grown maize, wheat and starch potatoes as well as peas, rice and barley, and valorises all the components of the raw materials, to produce a broad range of innovative and traditional products and ingredients, but also fibres and plant-based proteins with a wide scope of functionalities and uses.

In the food market, innovative applications include bakery and specialised nutrition for example in sport nutrition, food for the elderly, plant-based drinks, meat alternatives, hospitals’ clinical diets.

In the specialised feed markets, proteins from the starch industry are used for example in salmon rations, but also in pet foods and calf milk replacements.

Other outlets include animal feed for cattle, pig and poultry feed, for the production of milk, meat, or eggs.



Still have questions about plant proteins or other ingredients from the starch industry used in food?

VISIT [WWW.STARCHINFOOD.EU](http://WWW.STARCHINFOOD.EU) TO LEARN MORE.



# THE DIFFERENT TYPES OF PROTEINS

Of the 5,3 million tonnes of proteins and fibres produced by the European starch industry in 2017, 1.1 million tonnes are classified as very high protein content products. These include:

- > Wheat proteins such as vital wheat gluten and derivatives
- > Maize gluten meal
- > Potato protein
- > Pea protein
- > Rice Protein



## (VITAL) WHEAT GLUTEN



Wheat gluten is used primarily in the milling & flour industry and in bakery products. The viscoelastic properties of wheat gluten significantly improve dough strength, softness and shelf-life. It also improves the elasticity and rise of the raw dough. For example, if the flour in bread does not contain enough gluten, the bread has little volume, its crumb is irregular, and it falls apart.

As a plant-based protein, wheat gluten can provide high nutritional values supplementing or partially replacing animal proteins in human nutrition. It is used in meat preparations (including fish, poultry and surimi-based products), pasta and certain cold cuts. In addition wheat gluten has texturizing properties relevant for fish and meat alternatives.

## MAIZE GLUTEN MEAL



Maize gluten meal is obtained from maize during the starch production process.

Once the maize kernel is separated into its component parts, starch producers then further separate the starch and gluten. The gluten is dried and sold as gluten meal. Gluten meal supplies essential vitamins and minerals and is considered a high-protein and high-energy feed ingredient. Poultry and pet food processors value it for its high digestibility.

## DID YOU KNOW?

Sarcopenia is the result of loss of muscle mass, quality and strength due to aging and can occur in elderly people including those who are otherwise healthy. Protein intake and physical activity are important for muscle protein synthesis. Plant-based protein supplementation to diets can contribute to the growth & maintenance of muscle mass.

## DID YOU KNOW?

A mix of sources of plant-based proteins is increasingly used in food recipes, in order to deliver balanced amino acid composition similar to animal proteins. The protein content will always be listed in the ingredients list and the total content clearly identified in the nutritional table.

## POTATO PROTEINS



Potato protein is produced together with the potato starch from starch potatoes. They contain essential amino acids similar to animal proteins, and in higher proportions than many plant-based proteins.

Potato proteins have many functional properties. They dissolve in water and form gels, absorb fat and have foaming abilities adding air bubbles in baked goods, dairy and confectionery.

They are a viable alternative to high-value animal proteins like milk or egg proteins and caseinate, in various confectionery products, meat and meat-alternatives, non-dairy cheese, toppings and ice creams, and egg-free dressings. Finally, Potato proteins are also often used in gluten-free bakery goods.

## PEA PROTEINS



Pea protein is obtained from yellow peas and are a good source of balanced protein both in terms of quality and quantity. The pea pulse delivers high quality proteins.

Pea proteins have capabilities and functionalities to serve various foods such as snacks & cereals, nutrition bars, soups, sauces, pasta, dairy products, biscuits and meat alternatives. They are also proving to be a valued ingredient for gluten-free diets, vegetarian and vegan foods and specialised nutrition for slimming, sports, hospitals and the elderly.

## RICE PROTEINS



Rice protein is obtained during rice starch production. Rice protein is gluten-free, hypo-allergenic and contains many of the essential amino acids recommended for adults. In addition, as a result of its exceptionally high content of sulphur-containing amino acids, blends of rice protein with other plant-based proteins, such as pea proteins, provide a biological value equivalent to animal-based proteins.

Rice protein is a good protein source for both mainstream and gluten-free products with uses mainly in snack bars, baked goods, cereals and nutrition mixes.

## NUTRITIONAL INFORMATION

Food recipes increasingly use a mix of sources of plant-based proteins in order to deliver balanced amino acid composition similar to animal proteins. The plant-based proteins added as ingredients will always be listed in the ingredients list and the total content clearly identified in the nutritional table.

Consumers suffering from Coeliac disease, or gluten intolerance, should avoid consuming products containing wheat gluten. For this reason, any product containing wheat gluten must be clearly labelled.



## DID YOU KNOW?

There is sometimes confusion between wheat starch and wheat gluten because they are both extracted from the same raw material: wheat. However, these are two completely different ingredients.

People suffering from coeliac disease or gluten intolerance, who are prescribed a gluten-free diet, can safely consume non-gluten-containing starch-based ingredients such as maltodextrins, glucose syrup, glucose-fructose syrups etc, provided of course there are no other gluten-containing ingredients in the final food product.

# PROTEINS: FROM FARM TO FORK



1

60.000 EU farmers cultivate the crops required (e.g. maize, wheat, potatoes, rice, peas) to produce the proteins from the EU starch industry.



2

Water is used to separate the different components of the crops. The proteins are then separated from the other components such as starch.



3

The proteins are concentrated, purified and dried, ready to provide the desired functionality and nutritional qualities as an ingredient.



4

Depending on the protein content, functional properties and amino acid profile, these proteins are then used in a wide array of products, from bakery to specialized nutrition (infant, elderly, sports nutrition, meat alternatives) also including fish- and pet-food.

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# OVERVIEW

Proteins form an essential part of a nutritious diet, both for humans and animals. Proteins are an important building block of every cell in the body.

Plant-based proteins are increasingly proving to be a vital ingredient to ensure access to a sustainable, healthy and varied protein intake for all, in the global effort to create a more sustainable food system.

The European starch industry processes EU-grown maize, wheat and starch potatoes as well as peas, rice and barley, and valorises all the components of the raw materials to produce innovative ingredients, including plant-based proteins.

Plant-based proteins from the starch industry have a wide array of uses, including both food and feed.

People suffering from coeliac disease or gluten intolerance, who are prescribed a gluten-free diet, can safely consume non-gluten-containing food with starch-based ingredients such as maltodextrins, glucose syrup, glucose-fructose syrups etc.



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