

Proteins as part of the European starch industry's value chain

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An introduction to the European starch industry

The EU starch industry manufactures over six hundred products including native starches, modified starches, liquid and solid sweeteners as well as oils, proteins and fibres that are used as ingredients and functional supplements in a vast array of food, feed and industrial applications.

In 2017, from 75 starch production facilities in 20 of the 28 EU Member States, the European starch industry processed about 24 million tonnes of agricultural raw materials, roughly split between wheat (9 million tonnes), maize (8 million tonnes), and starch potatoes (7 million tonnes) transformed into about 11 million tonnes of starch and 5 million tonnes of proteins, fibres and oils.

To valorise all the components of the raw materials, the EU starch industry transforms it in a broad range of innovative and traditional starch products and ingredients. In fact, the EU starch industry processes every part of the grain or the tuber and produces minimal waste; more than 99% is valorised¹.

The EU consumes 9,4 million tonnes of starch, of which 58% in food, 2% in feed and 40% in industrial applications. With a turnover of 7.4 billion Euros, it also invested about 429 million Euros, of which over 78 million Euros in Research & Development.

Proteins as part of the European starch industry's value chain

The EU starch industry processes mainly EU-grown maize, wheat and starch potatoes and in smaller quantities peas, rice and barley. Proteins are valuable components obtained from the processing of these agricultural raw materials.

Early in the process, the starch industry separates the components of the agricultural raw materials into starches, protein, fibres and soluble fractions. After separation further processing results in a broad portfolio of valuable proteins.

In 2017, the European starch industry produced 5.2 million tonnes of protein products. The main proteins produced by the European starch industry are the following:

- Wheat proteins such as vital wheat gluten & its derivatives
- Corn gluten meal and feed
- Potato protein
- Pea protein

¹ [Starch Europe Life Cycle Assessment](#)

The EU starch industry's many outlets for EU proteins: the food & feed markets

Today the EU starch industry provides proteins to consumers worldwide, through its food and feed outlets located in the EU or exported to third countries. The wide range of the EU starch industry's protein products contain various protein contents. If calculated in 100% pure protein equivalent, the total of proteins amount to 1.5 million tonnes, of which 18% are sold to the **food** market, while the remaining 82% goes to feed, pet food & aquaculture.

In the **food** market, innovative applications include specialised nutrition (e.g. sport nutrition, elderly people, meat replacements, hospitals' special diets) or bakery. One example of a well-known food application is vital wheat gluten. This latter has the capacity to form a continuous extensible and airtight elastic network in doughs, a property referred to as visco-elasticity in a broad range of bakery applications.

The **food** and **specialised feed** markets require products with a higher content of proteins. For instance, corn gluten meal is used in poultry, where the presence of xanthophylls contributes to the yellow colour in egg yolks. Vital wheat gluten is used in specialised feed applications such as some milk replacers and in food applications such as salmon rations. Plant proteins are used directly in pet foods.

Other outlets include **animal feed** for the production of milk, meat, eggs, fish and shrimps. The EU starch industry typically serves the ruminants and pigs markets with mixtures of proteins and fibres such as corn gluten feed with a fixed ratio of protein. As the starch market is mature and capital-intensive, the more traditional feed outlets have already been developed over the years.

Table 1: Outlets of protein products produced by Starch Europe members for EU and rest-of-the-world customers (with various protein contents)

In tonnes (2017 data)	Feed (includes feed, pet food & aquaculture)	Food
Corn gluten meal	364 500	
Corn gluten feed	1 579 500	
Wheat gluten	261 225	346 275
Wheat feed	2 592 000	
Potato protein	63 900	7 100
Total	4 861 125	353 375
Total of protein products	5 214 500	

The Commission's Food2030's independent expert group recommends increasing the intake of plant proteins in the human diet

The Commission's Food 2030 initiative's "An agenda for a climate-smart and sustainable food system for a healthy Europe" recommends "switching to more plant-based proteins has a large potential to reduce the environmental impact of the food consumption". To that end, the challenges to be addressed include to improve:

- the food nutrition knowledge on plant-based protein, through e.g. Wageningen's "Towards a European Food and Nutrition Policy" recommendations on the balance between animal-based protein and plant-based protein
- consumer perception of plant-proteins properties through education.

Starch Europe's recommendations on the EU Protein plan

The aim is to increase the EU availability in non-GMO plant proteins processed by the European starch industry such as maize, wheat, starch potatoes and peas. The more starch the EU industry produces, the more protein and fibre-rich co-products it produces, thus providing high-quality feed and helping to compensate for the EU's structural deficit in plant proteins. All outlets contribute to the overall competitiveness of the starch industry on the EU and global markets and are therefore of importance for the starch industry.

On top of the more traditional animal feed outlets, the demand for food plant-based protein is growing. The starch industry is investing in its protein potential in order to upgrade it and to sell it to the food markets. This will increase the added value of the whole starch supply chain. With this objective in mind, Starch Europe calls on the Commission to:

- support the industrial development in the EU of a sustainable and competitive supply chain for all existing plant-based proteins and potential new sources of proteins produced on the European territory
- support the innovation at each level of the plant based-value chain, from farm to fork, through research and innovation funding in e.g. :
 - o seeds to achieve better and more stable yields and greater disease resistance in protein crops
 - o the know-how on the functionality, quality and consistency of starch-protein-products in food applications
 - o the process to extract proteins and to convert plant proteins to, for example, animal protein alternatives
- integrate proteins as food ingredients into the future Horizon Europe, thereby contributing to the first of the FOOD2030's four priorities: nutrition. An increase in availability of plant protein can also help reduce the non-communicable diseases and environmental impact of food production and consumption.
- ensure a level playing field with proteins imported from third countries, where industries face less stringent environmental criteria compared to e.g. the EU Industrial Emissions Directive, Emissions Trading Scheme, while at the same time the EU production of wheat, maize, potatoes in the EU is subject to CAP cross-compliance and a decreasing trend in authorized plant protection products.