Exporting plant proteins for health products to Europe

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The European market for protein is growing to support consumers who wish to lead active lifestyles. Demand for plant-based protein is showing even higher growth as consumers believe them to be more healthy than traditional, animal-based proteins. This growth is supported by an uptake in vegan products. Various plant-based proteins are produced from oilcakes, a waste product in the vegetable oil industry.

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1. Product description

Proteins are essential nutrients for the human body, which can be found in food products such as meat, dairy, fish, eggs, grains, legumes, nuts and fruits. When proteins are digested, they break down into amino acids, which are needed to maintain good health. Proteins can be consumed from food products directly, while protein powders can be used to supplement a regular diet.

Protein powders are concentrated forms of protein. They can be produced from:

- animal products main products are whey (by-product of cheese production) and casein (from milk);
- plant products from a variety of plants, such as soya, pea, rice and almond.

This study focuses on plant-based protein powders and their use as food supplements. There is a wide variety of protein powders on the European market, classified by the raw materials used:

- nuts- or seed-based proteins, such as almond, soya, sacha inchi and flaxseed protein. These proteins are commonly produced from oilcake, a by-product in vegetable oil production;
- legume-based proteins, such as pea protein;
- fruit-based protein, such as cranberry protein, which is extracted from fruit seeds;
- grain-based protein, such as rice protein, which is extracted from both rice grain and bran;
- leaf-based proteins, such as moringa powder. This powder is not a concentrated protein but comes from ground moringa leaves, which are relatively high in protein;
- root-based proteins, such as maca powder. Much as moringa powder, these proteins are less common. This powder is simply ground maca, which has a relatively high protein content.

Proteins are not used in herbal medicinal products. As a result, this study does not cover that market segment.

Classification of protein

In trade data, protein powders are recorded under Harmonised System codes (Trade Helpdesk):

- 2106.1020: Protein concentrates and textured protein substances, containing no or limited milkfats, sucrose or glucose;
- 2106.1080: Other protein concentrates and textured protein substances.

Generally, plant-based proteins have a lower protein content than animal-based proteins such as whey and casein, which can contain 80–90% protein. Moreover, protein powders vary in their amino acid composition.

Table 1: Protein content of various plant-based proteins

Source of protein powder	Protein content
Soya	90%
Rice	80%
Pea	80%
Sacha inchi	55%
Almond	At least 50%
Hemp	50%
Chia	30%
Cranberry	18-25%
Coconut	Max. 20%

Sources: Pure Plants, Connoils

Based on this composition, protein is commonly marketed as a food supplement and a functional food which:

- supports an active lifestyle and general health;
- boosts recovery after exercise;
- helps muscle development.

Producers who market protein food supplements cannot make any medicinal claims. Examples of non-medicinal claims that are used in Europe are included in Table 2.

Table 2: Examples of claims on protein powder used by European brands

Supports an active lifestyle and general health	Muscle development or recovery after workout
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"...has a high protein content making it highly suitable for athletes, people with active lifestyles and those who want to use plant-based proteins."
"...rice protein powder helps prevent muscle breakdown and helps maintain mobility during ageing. It's the perfect fit for a healthy lifestyle."
"Developed by nutritionists (...) Organic Blissful Brown Rice and Raw Cacao Pure Super Protein is the super protein for pleasure seekers who want to feel blissful!"

"A great supplement for athletes and bodybuilders."

"...contains a high content of L-Glutamine, which is very important for muscle development, making it ideal as a supplement during intensive exercise or for maintaining muscle mass and mobility during ageing."

"Proteins support the development, maintenance and recovery of muscles." "Protein contributes to the growth & maintenance of muscle mass."

Tips:

- If you produce new proteins, determine whether they are allowed on the European market; for example, by checking the Novel Food catalogue and the Union List of Novel Foods. Be aware that these sources are not exhaustive; you may need to do additional research in order to determine whether your protein is already consumed in Europe, such as going through retailers or discussing it with food safety authorities.
- If you produce a new protein, it may fall under Novel Food legislation, which covers foods that have not been consumed to a significant degree in Europe. To sell these foods in Europe, they need to be tested first. Discuss them with the European Food Safety Authority (EFSA) or national food safety authorities.
- Do not make any medicinal claims for your protein in your product documentation or marketing materials. Food supplements are not allowed to carry medicinal claims. See our study of Buyer requirements for natural ingredients for health products for more information on claims and Novel Food legislation.
- Allowed claims may differ between European countries; please check with national bodies or with consultants about the actual claim situation.
- Look for credible literature sources on the benefits of protein. Use these references in your product documentation and marketing materials.

2. What makes Europe an interesting market for protein? Growing market for plant-based proteins

Grandview Research expects that the global market for plant-based protein supplements will grow by almost 8% annually from 2017 to 2025, a higher growth than the 6.3% on the total protein market. Some types of protein can grow even faster. For example, a European supplier of rice protein expects the European market for rice protein powder to show double-digit growth numbers.

Europe and North America are the largest markets for proteins. In Europe, leading markets include:

• the United Kingdom;

- Italy;
- Germany.

The market research agency estimated the value of the total global market for protein supplements at \$ 12.4 billion in 2016, with the United States accounting for half of the global market. Europe is estimated to be the second-largest market. Note that protein powders accounted for 64.5% of this figure, while the remainder consists of other products such as ready-to-drink products (which can still be based on powders as their raw material).

More and more, consumers are trying to add plants to their diets. There are various studies and news articles that show a growing vegetarian and vegan population. The Guardian highlights that launches of vegan products in the United Kingdom grew by 185% between 2012 and 2016.

Consumers increasingly believe that they have a deficiency in protein, which is leading to a growing demand. Over 70% of consumers believe that plant-based proteins are healthier than animal-based proteins, according to global ingredients supplier Kerry. Plant-based protein makes up the majority of online searches and sales for plant-based products.

Manufacturers are looking at new sources of plant-based proteins to differentiate themselves on the protein supplement market. For example, microalgae such as spirulina are used as an alternative protein source. Moreover, there is increasing innovation in the manufacturing and marketing of proteins. Although this process is the most relevant for animal-based proteins, growing innovation can also expand the industry. Innovations include:

- protein powders with a broad range of amino acids;
- protein powders targeting specific functions, such as energy balance, weight loss, muscle repair and satiety.

Tips:

- Stay up to date with trends and developments on plant-based protein by checking online magazines such as Nutra Ingredients.
- For more information on the vegan trend, see websites and associations such as The Flaming Vegan, International Vegan or the Vegan Society.
- See our tips for Finding buyers and Doing business for more information on building and maintaining relationships with European buyers.

Changing perception of health

A changing understanding among consumers of what it means to be healthy is driving the demand for health products. According to Grandview Research, this aspect is one of the main drivers for growth on the protein market. European consumers use health products to prevent diseases and to feel good; for example, by adding supplements to their regular diet.

This trend is translated to a growing market for food supplements. Future Market Insights expects the European market for food supplements to increase by 7% annually from 2015 to 2025. In 2025, the market would reach over \$ 60 billion. Calculating this figure back to 2017, its value should be around \$ 37 billion.

Tip:

• For more information on research into the health benefits of protein, access scientific resources; for example, through Elsevier Science Direct (not for free), Google Scholar or Examine.com.

Growth in sports health products and nutrition

Globally, the market for sports nutrition and high-energy supplements is expected to grow by 10% annually from 2014 to 2020. In 2020, this market is expected to reach \$ 66 billion (\$ 59 billion). According to Grandview Research, sports nutrition was the largest and fastest-growing application segment for protein in 2016. Due to the health trend, more consumers are expected to work out, driving the further growth of the protein industry.

However, the main protein powders used in pure sports supplements continue to be animal-based, such as whey and casein protein.

Tip:

• Stay up to date with trends in sports nutrition and supplements by checking online magazines such as Food Navigator or Nutra Ingredients.

Interest in Organic certified protein

According to industry sources, there is a strong market for organic protein powder, especially when marketed to support an active lifestyle or improve general health. Consumers of food supplements are health-conscious. They look for products which support a healthy lifestyle and generally prefer natural or organic products, which they believe to be healthier. As a consequence, many consumers prefer to buy organic protein powder.

Tips:

- Look for companies that trade in certified protein online or at trade fairs. For example, check the exhibitors of the organic trade fair Biofach, or search for organic importers on the website of the International Trade Centre.
- If your protein is not certified, promote the sustainable and ethical aspects of your production process. Buyers might ask you to support your claims with certification or documentation on your sourcing practices and/or your Corporate Social Responsibility (CSR) practices.
- See our study of Buyer requirements for natural ingredients for health products for more information on certification standards.

3. Which requirements must protein comply with to be allowed on the European market?

Your protein needs to be sustainably sourced. You need to make sure that you can supply a stable supply of protein to your buyers, in terms of both quality and quantity.

You can only export your protein to the European market for food supplements if you comply with the legal requirements for natural ingredients for health products. For food supplements, they include:

- European legislation for food supplements (composition and labelling requirements);
- General Food Law;
- food safety.

Protein powder must be safe for human consumption to enter the European market. Suppliers must have a food safety management system in place to become successful in Europe. Buyers demand proof of your product's

safety and proof that your product meets their quality requirements before they will buy from you. If European authorities or importers find out that the safety of your protein cannot be guaranteed, they will take the product off the market.

Specifically, food safety requirements cover:

- Maximum Residue Levels (MRLs) for pesticides and polycyclic aromatic hydrocarbons (PAH);
- contaminants in food and microbiological contamination of food. The Rapid Alert System for Food and Feed lists several issues with unauthorised or undeclared ingredients in protein powders, such as genetically modified rice protein or salmonella contamination;
- food hygiene (Hazard Analysis and Critical Control Points);
- extraction solvents;
- food irradiation;
- traceability.

Tips:

- Establish a traceability system and keep samples for each of your suppliers to trace the origin of the protein, in the event that a problem with quality occurs.
- Keep your facilities clean by setting strict operating procedures, such as cleaning schedules for your processing equipment. See the Codex Alimentarius for detailed information on food hygiene.

Additional requirements

Many buyers have additional quality requirements. These requirements can go beyond legislation and standards. They are established in buyer specifications. Examples are requirements related to:

- nutrient or active ingredient content;
- moisture content;
- contaminants;
- residues.

To show that you meet the specifications of buyers, you need to develop well-structured company and product information. These data include detailed Technical Data Sheets, as well as process and product certifications.

Tips:

- See our Tips for doing business.
- See our manual on Preparing a Technical Data Sheet for more information and tips.

European food industries increasingly demand compliance with quality and food safety management. Examples include:

- ISO 9001:2008 (required for health ingredients);
- Food Safety System Certification (FSSC 22000), mainly for suppliers of ingredients that will be processed further:
- ISO 22000 (food safety management);
- ISO 31000 (risk management);
- International Food Safety (IFS), British Retail Consortium (BRC) and Safe Quality Food (SQF), for suppliers of final products in Europe.

Requirements for niche markets

Standards and requirements for social and environmental sustainability include:

- organic production, as specified in European Union Regulation 834/2007;
- verification and/or certification of sustainable production, including FairWild, Fairtrade International, Fair for Life, UNCTAD BioTrade Initiative and Union for Ethical BioTrade;
- company and supplier codes of conduct;
- implementation in accordance with ISO 26000 guidance on social responsibility.

Tips:

- Verify with your buyer which of the above standard they require.
- See the Sustainability Map for additional information on voluntary standards.

Quality requirements

The main determinants of protein powder's quality are:

- chemical composition, mainly the amino acid composition;
- moisture content;
- protein levels of the product.

The use of protein powder is based on its composition. To this end, European buyers have specific requirements for composition and nutritional profile. Buyers will usually request a Certificate of Analysis to verify that your protein meets their quality requirements. Harvesting, processing and packaging all influence the nutritional profile of protein powder.

Tips:

- Standardise and minimise significant variations in your protein's quality. Monitor collection and
 postcollection practices. Develop Standard Operating Procedures (SOPs) and train collectors as well as
 processing staff. Use incentives to ensure that they follow your specifications on harvesting and postharvest processes.
- Work together with a local university or laboratory to test your product. They can help to determine the chemical composition and protein content of your product. These aspects needs to be included in your product documentation.
- Inform your buyer if you add any substances to your product for preservation. Clearly indicate this fact in your product documentation. If you fail to do so, buyers may see it as adulteration of your protein.

Labelling requirements

To get your protein on the European market, you must comply with the following labelling requirements:

- Set up a registration system for individual batches of your protein, whether they are blends or not. Mark them accordingly to ensure traceability.
- Label your products in English, unless your buyer wants you to use a different language.

Your labels must include:

- product name;
- batch code;
- · place of origin;

- name and address of exporter;
- date of manufacture;
- best-before date;
- net weight;
- recommended storage conditions.

If you supply organic protein, your label needs to include the name/code of the inspection body and certification number.

You also need to give your buyer the following documentation:

- Technical Data Sheet (TDS) (check this example for pea protein concentrate);
- Chemical Abstracts Services (CAS) number;
- Certificates of Analysis (check the examples of organic pea protein powder or organic sacha inchi protein powder);
- GMO certificate (if requested);
- Certificate of Origin.

As protein powder is not classified as hazardous, no hazard symbols are required on your label.

Packaging requirements for bulk packaging

Packaging requirements may differ for each buyer. However, there are some general requirements that you have to take into account, which are included in standards.

Tips:

- Always ask your buyer for their specific packaging requirements.
- Reuse or recycle packaging materials. For example, use bags or containers of recyclable material (such as kraft paper).
- Package your protein powder in waterproof material. For example, use paper bags that are lined with plastic. Preferably use an eco-friendly lining (such as biodegradable or recyclable lining).
- Store bags or containers in a dry, cool place to prevent quality deterioration.
- If you offer Organic certified protein, physically separate it from protein that is not certified.
- See our workbook on Preparing a technical data sheet for more information.
- See our study of Buyer requirements for natural ingredients for health products for more information.

4. What competition do you face on the European market for protein?

Market entry barriers

Market entry barriers for protein powder depend on how far you process your protein powder and what the source of your protein powder is. If you produce protein powder from oilcake, market entry barriers are relatively low. This fact also means that you can expect a lot of new entrants. You may need to invest in specialised equipment, such as for protein extraction and drying.

However, protein extraction from rice grains is more complicated, involving extraction methods such as hexane extraction or enzymatic extraction.

Many European buyers in the food supplement market demand Organic certified protein. Organic certification is expensive, especially when inspectors have to travel far to visit your production site.

As the European market for protein powders for health is still small compared to food uses of protein, you need to budget for the marketing of your protein in order to educate buyers on their potential health benefits.

Tips:

- Set aside enough money for marketing. Obtain market information with desk research and interviews. Develop promotional materials and a website, or a social media presence. Look for European examples of promotional materials to find out what buyers are looking for in marketing.
- See the website of GEA for an overview of manufacturing machines for vegetable protein. Be aware that different types of protein will require different production processes. Determine which investments you need to make so as to set up production and whether you can get a return on these investments.
- Visit or participate in trade fairs to test whether the market is open to your product, get market information and find potential buyers. The most relevant trade fairs in Europe are Health Ingredients Europe, Biofach (for organic products), Vitafoods and SANA.
- See our tips for Finding buyers for additional information.

What are substitute products for protein?

Many substitute products exist for protein powder, especially products that improve general health or support active lifestyles. For muscle development or maintenance, the number of alternatives is much lower. This use is dominated by protein powders, especially animal-based proteins.

In general, there are few substitute products for protein powders. The main product competition would be between plant-based and animal-based protein powders. The table below gives an overview of substitute products that are used for the same application area as plant-based proteins: improving general health/supporting an active lifestyle or muscle development and recovery after sports.

Table 3: Substitute products for protein powder

	Improve general health, support an active lifestyle	Muscle development or recovery after workout
Synthetic alternatives	 Vitamins and minerals, which are 50% of the European market for food supplements 	Drugs or hormones to stimulate muscle growth

Natural alternatives

- Probiotics and prebiotics, often consumed as yogurt (drinks)
- Fruitbased antioxidants such as blueberries, elderberries and açaí fruits
- "superfood" powders, especially if they boast high levels of antioxidant activity or a healthy nutritional profile, such as vitamins
- Supplements containing specific amino acids linked to muscle gain, such as arginine, creatine, betaalanine or branched-chained amino acids (leucine, isoleucine and valine)
- Animalbased proteins, mainly whey, casein, egg-based or meat-based. The price of these proteins is generally lower than that of plant-based proteins, especially for whey-based proteins. These products are mainly marketed for their performance, such as maintaining and building muscle mass, enhancing recovery for athletes, and building muscle strength in endurance training

Commonly used plants

Plant-based supplements that support an active lifestyle or improve general health, such as:

- mate (Yerba mate);
- rhodiola (*Rhodiola rosea*);
- raw cocoa powder.
 Other superfoods such as:
- turmeric (Curcuma longa);
- seaweeds, such as Chlorella (Chlorella vulgaris) or spirulina (Spirulina maxima or S. major);
- baobab (*Adansonia* digitata).

Plant sources for sports use are not usually marketed for muscle development. More commonly, they are used to increase energy, such as baobab, raw cocoa powder or caffeine.

There are plant sources that help athletes recover after their workout, such as products high in vitamins and nutrients; for example, superfoods such as baobab or seaweed powder.

You need to build a marketing story for your protein that shows how it is different from competing products. To do so, you can focus on the amino acid composition of your product or the food product from which it originates. Especially when a protein is used to support active lifestyles, brands are more interested in showcasing the natural origin of the protein powder.

Tips:

- Do market research into the potential substitute products mentioned above. For example, find out how your protein compares in terms of composition, price, supply security/sustainability and ease/cost of substitution. Make sure that you have these results prepared when you talk to potential buyers in order to answer their questions.
- Demonstrate that you have a good insight into developments among your competitors in your communication and promotional materials.
- See our Tips for doing business with European buyers for natural ingredients for health products.

Company competition

Where you can expect competition from mainly depends on the type of protein you supply. Examples include:

- Asian countries such as China, Thailand and India for rice protein;
- India for pea protein;
- South American countries such as Peru for sacha inchi protein and Brazil for nut protein.

According to the European Vegetable Protein Association, European producers mainly supply soya and pea protein, followed by proteins from faba beans, lupin and wheat. This association includes members such as ADM Specialty Ingredients (the Netherlands), beneo (Germany), Cosucra Groupe Warcoing (Belgium), Dupont (Switzerland) and Roquette (France). Note that these specific companies mainly operate in food and animal feed products, not specifically in protein powders for health products. European companies that supply protein powder for health products are included below.

You need to develop a Unique Selling Point (USP) for your protein, which you can do via the following aspects.

- High quality: especially when it comes to amino acid composition. For example, soya protein is marketed as the vegetable protein with the highest quality of essential amino acids.
- Marketing story: based on the source of your protein. Especially when marketed to increase general health or support active lifestyles, there is good potential for "superfood" proteins, such as sacha inchi or chia protein.
- Organic certification: in particular to support active lifestyles, European consumers and brands are interested in Organic certified protein powders.

European companies supplying protein powder include:

- All Organic Trading (Germany);
- Pulsin (the United Kingdom);
- Purasana (Belgium);
- Bulk Powders (the United Kingdom);
- Mattisson (the Netherlands);
- AbsoRice (Hungary).

Tips:

- Ensure proper collection, post-harvest and processing, combined with proper documentation in order to exploit opportunities to add value to your product.
- Ensure the traceability of your product. Be open about the quality and quantity that you can deliver, as well as at which price.
- Help manufacturers to build their story; for example, by visualising your product and its raw material. Final product manufacturers which position themselves as a sustainable business can use this aspect to market the final product in Europe.

• See our Tips for doing business for more information.

5. Through which channels can you get protein on the European market for health products?

Market channels

Figure 2: Market channels for protein powder

Source: ProFound

Many plant-based proteins are a by-product of manufacturing other products. Proteins from nuts and seeds are usually produced from the oilcake left over from vegetable oil production. Rice protein is a by-product of products such as rice starch and brown rice syrup.

As there are various ways to process oilcakes into proteins, much research has been done on which process results in the highest yield and the highest protein content. Proteins are commonly extracted from oilcake by decreasing the acidity of the oilcake. This process usually covers the following steps:

- defatting the oilcake;
- mixing ground oilcake with water and components such as salt or sodium hydroxide to decrease acidity;
- centrifuging or shaking the mixture to separate liquids from solids;
- treating solids to increase the acidity of the mixture, which separates proteins from other components, letting the mixture rest;
- centrifuging or shaking the mixture again, resulting in protein concentrates.

Pea protein follows a similar process: peas are ground or milled and treated in a similar way as the process above. Protein can also be processed into concentrates or isolates with enzyme treatment of the protein powder.

Protein powders are commonly produced in the country of origin. Further processing usually takes place in Europe. In addition, North American and particular US companies play a role on the European protein market. Various companies such as Myprotein (brand), AIDP and Axiom Foods (processors) market their products in Europe as well.

Protein powders are further processed and refined to improve taste and stability. Moreover, processors often add flavourings to proteins such as rice and peas, since consumers do not much enjoy the taste of the pure protein powder.

European manufacturers of final products produce specialised proteins or mixes; for example, marketed as "active women revitalising superfood blend", "whole fuel" or "amazing grass protein superfood".

Importers and distributors are your most important entry point onto the European protein market. They may trade in up to 500 natural ingredients, together with other, synthetic ingredients. These parties focus on:

- global sourcing;
- analysis and quality control;
- standardisation;
- packing;
- product documentation and sales to processors and food supplement manufacturers.

It is uncommon for developing countries to supply protein powders as final products to the European market, since the market is dominated by European processors and brands. European processors play a strong role in the value chain with regard to further processing the protein powder itself, or in terms of producing specialised protein products such as mixes for a targeted application.

Tips:

- Do you produce vegetable oils? Determine the feasibility of adding value to your oilcake by processing it into protein powders. Find out whether you can do so yourself, or look for partners.
- Do literature research into extraction methods for protein powder. Many studies can be found through Google Scholar.
- Invest in the quality of your products before entering the market. You must have at least an HACCP system in place for food safety management. In addition, you need to show the compliance of your product with international standards, supported by a Certificate of Analysis. Many European buyers lose their interest when a new supplier delivers a low-quality product; you have one chance to convince these buyers of your company and product.
- Benefit from the experience and knowledge of specialised European importers and agents, instead of approaching food supplement manufacturers directly.
- See our study on Tips for finding buyers for more information.

6. What are the end-market prices for protein powders?

According to industry sources, the price of protein powders largely depends on their protein levels. In addition, some products are relatively low in protein. As a result, rice protein powder extracted from grains has a higher price than other proteins. According to a rice protein buyer, rice protein has the highest potential in health products, whereas lower-priced proteins such as soya, wheat and pea protein are also used as food ingredients.

See the table below for an overview of retail prices for protein powders on the European market. Please note that retailers, processors and final product manufacturers all add a margin to the protein powder that they use.

Table 4: Retail prices for protein powders

Product	Brand	Price	Price per 100 g
Pea protein powder, 1000 g	Pulsin	€ 25.76	€ 2.58
Soya protein powder, 1000 g	Pulsin	€ 25.76	€ 2.58
Hemp protein powder, 1000 g	Pulsin	€ 33.61	€ 3.36
Organic hemp protein powder, 300 g	Naturya	€ 12.32	€ 4.11
Organic brown rice and raw cacao protein, 250 g	That Protein	€ 14.56	€ 5.83

Vegan superfood blend, 500 g
(mix of pea and brown rice protein)

Myprotein

€ 16.80

€ 3.36

Source: Holland and Barrett

Tips:

- Ensure that your price reflects the quality levels and delivery conditions.
- Monitor harvests in major production countries. This approach will help you to anticipate price developments for your protein. You can request such information from importers.
- Check whether the prices that you can offer reflect your cost calculation, including a decent price to your suppliers.

Please review our market information disclaimer.		