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ingredients

An introduction to fermented plant protein, Protéger™

By Geert van der Velden, Innovation Manager at IQI Trusted Petfood Ingredients

Acting as the building blocks of vital tissue – such as muscles and organs – in all living creatures, proteins are an essential nutrient in the diets of cats and dogs. Animal proteins currently serve as the main source of protein thanks to their palatability, digestibility, and affordability, but the need for non-animal-based proteins is growing fast due to limited availability, animal welfare concerns, and the environmental impact of livestock production. This is why IQI recently introduced Protéger™, a fermented plant-based protein product developed by Houdek, a U.S.-based partner of IQI.

PROTEINS ANALYZED

Whether they come from animal or plant-based sources, proteins in our bodies and those of cats and dogs are first broken down into amino acids. Once these amino acids have been absorbed, the bloodstream takes them to cells in parts of the body where they can start repairing tissue and building muscle. Research shows that in dogs, several plant-based proteins are as effective as animal-based proteins indicating that a dog's diet can easily be fully plant-based. Cats will always require some amount of meat in their diet as they are obligate carnivores.

MORE PLANT-BASED PROTEINS NEEDED IN PET FOOD

Embracing and targeting plant-based proteins in pet food – as more and more pet parents do – is something to be welcomed for different reasons. First of all, animal-based pet food ingredients have a far bigger CO₂ footprint. Also, scarcity is becoming an issue due to the rapidly growing global demand for protein, indicating that the pet food market will be confronted by an animal and marine protein deficiency in the future. This trend and the quest for a more sustainable pet food industry require more plant-based proteins to ensure that the nutrient requirements of all pets worldwide are met.

PROTEIN RICHNESS AND AMINO ACIDS

An important assessment when it comes to plant-based pet food is that not all plant-based proteins contain amino acids in the appropriate proportions to meet needs for optimal health. Soy, which is used in the fermentation process to make Protéger™ (75%), is a complete protein and as such offers all 9 essential amino acids (in the appropriate proportions to be considered a high-quality protein). For a more complete overview of the protein richness of different plant-based proteins, consult Table 1 in my whitepaper [‘Finding the right ingredients for hybrid animal/plant-based or vegan pet food applications’](#).

PROTÉGER™: A FERMENTED PLANT PROTEIN

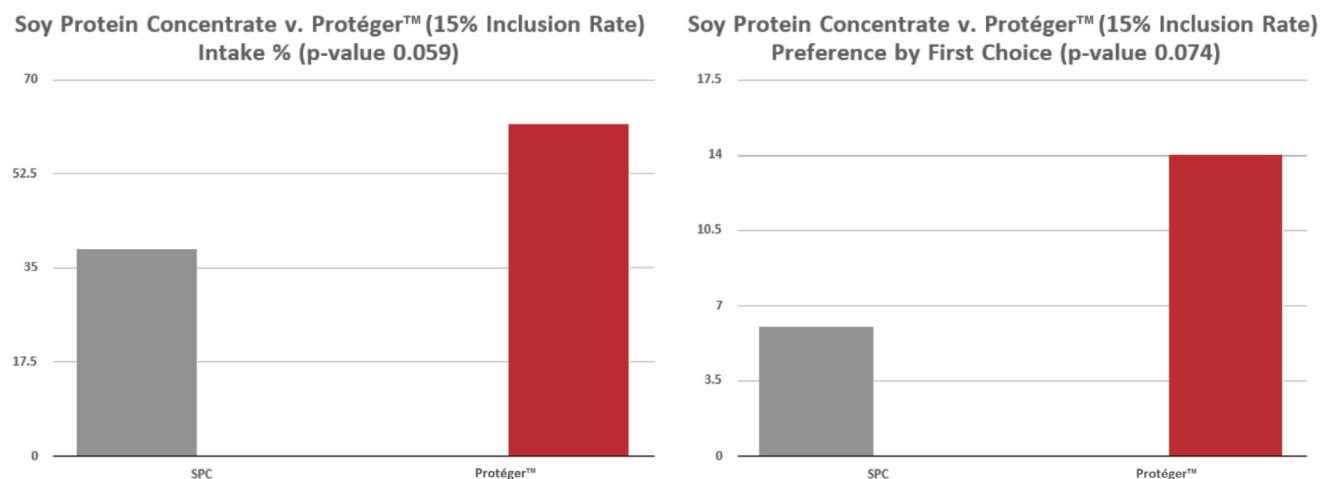
Enter Protéger™. Carefully developed and produced by our partner, Houdek, this highly valuable pet food ingredient serves pet food manufacturers who are searching for healthy, sustainable, and nutritious pet food options. Protéger™ is sourced on the U.S. prairie from Identity Preserved non-GMO soy, and contains more than 70% crude protein. The product contains a full suite of

essential nutrients, such as phosphorus made available by removing phytate and calcium, and a complete amino acid profile. Studies indicate that the presence of other nutritional factors from fermentation in Protéger™ may result in benefits such as reduced intestinal inflammation and improved metabolic processes. Renowned institutes, Kansas State University and Summit Ridge Farms, have tested Protéger extensively in cats and dogs. Palatability, digestibility, and maintenance studies have all successfully been performed according to AAFCO protocols.

FERMENTATION BENEFITS

Key in the production of Protéger™ (see 'How it's made' below) is the use of patented fermentation technology, which is known to increase the nutritional value and protein richness of plant material. This process starts with a complex mixture of enzymes produced by a naturally-occurring fungi, which helps make Protéger™ easier to digest. This characteristic is especially welcome for cats and dogs, which require sufficient intake of high-quality, highly digestible protein. Fermentation of soy also generates beneficial bioactives associated with lowering cholesterol, improved weight management, and increased energy expenditure. Additionally, fermentation is known to produce ingredients that enable health benefits such as anti-oxidant, anti-microbial, anti-fungal, and anti-inflammatory activity. Another scientifically proven benefit of fermented plant protein is that it has a significantly higher palatability (see figure).

Canine Palatability vs SPC



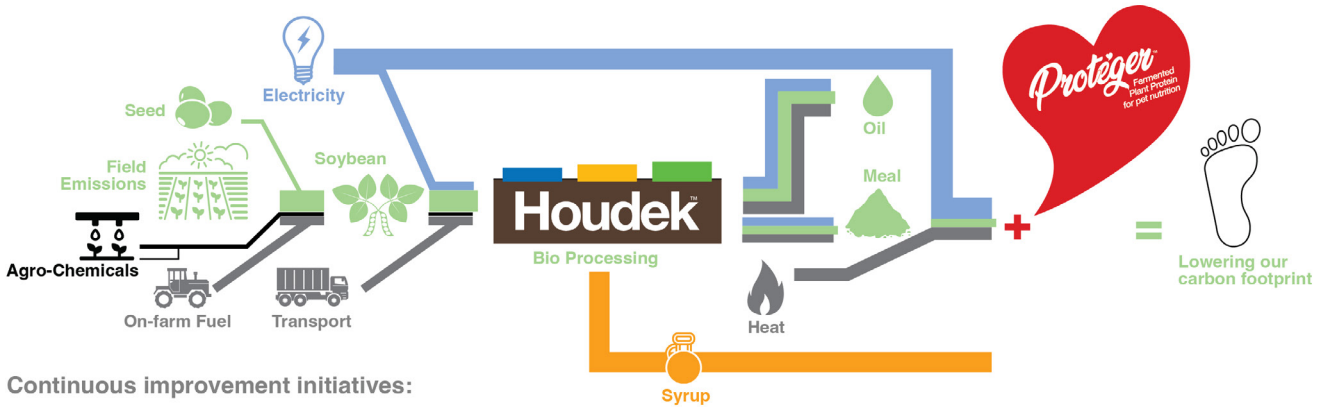
SAFE & SUSTAINABLE

But there is more to Protéger™ that makes it stand out as a premium pet food ingredient. The soybean meal that serves as the base ingredient for fermentation is only sourced in North America – one of the very few continents worldwide where soy cultivation does not involve active deforestation – where substantial volumes are produced making it a reliable and sustainable source. Soybeans are highly sustainable producers of protein due to them not being dependent on nitrogen fertilizer. Houdek has conducted a life cycle analysis (LCA) on the full production process to evaluate the overall environmental impact of Protéger™, and is continually working to reduce their carbon footprint. As an aspiration, the Company is identifying if there is a possible pathway to become net zero. Houdek has the network to source soybeans from their certified non-GMO

soybean growers or local growing region, both complying with Proterra standards. Altogether, Protéger™ can be regarded as a safe and sustainable ingredient.

Company Overview - Sustainability

Pets and Planet - attributional life-cycle analysis



Continuous improvement initiatives:

- Process R&D for increased efficiency
- Upcycling co-product stream
- Identifying the possibility of a pathway to net-zero

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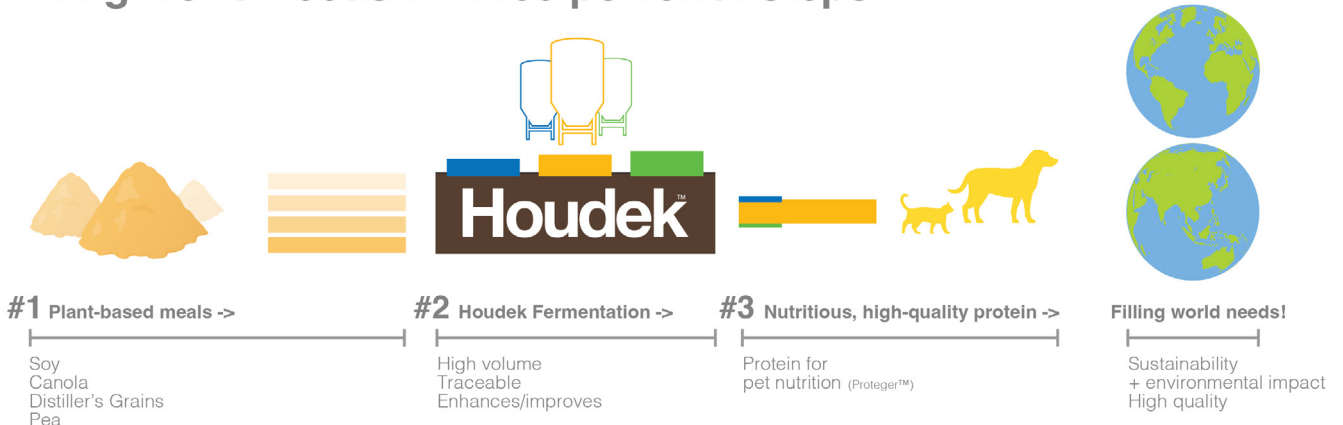
HOW IT'S MADE

Protéger™ is produced through a patented fermentation process at Houdek's commercial scale production facility in Volga, South Dakota. The sustainably-sourced, non-GMO soybean meal is mixed with water and acid and then sterilized prior to inoculation and fermentation, concentrating highly digestible plant and fungal protein and removing anti-nutritional factors. Fermentation further enhances the product's composition. Following fermentation, the solid proteins are dried to reduce water activity, creating a 24-month shelf-stable product with > 70% crude protein (as fed). Sanitary conveyance systems carry the dried product, which has a neutral color, odor, and flavor, through milling and packaging systems prior to distribution.

PRODUCTION PROCESS:

Fermented Plant Protein —

Filling world needs in three powerful steps



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PRODUCT CHARACTERISTICS OF PROTÉGER™

- All Generally Regarded as Safe (GRAS) inputs
- Traceable Non-GMO soy through ProTerra Certification
- Highly palatable, highly digestible 70%+ protein (as fed)
- Hydrolyzed by fermentation using naturally-occurring fungi
- Well-balanced amino acid profile
- Removal of anti-nutritional factors
- Neutral color, odor, and flavor
- 24-month shelf stability

ABOUT OUR PARTNER, HOUDEK

IQI is partnering with industry-leading fermented plant protein ingredient developer and manufacturer, Houdek. The company was started over 10 years ago as Prairie AquaTech, a South Dakota State University spin-out based in Brookings, South Dakota and developer and manufacturer of a fermented plant protein for the aquaculture industry. The company realized quickly that the nutrition and health benefits offered by fermented plant protein were needed by all species. In 2023, Houdek was launched to serve as the flagship brand for Prairie AquaTech™, Prairie Pet Nutrition™ and Prairie Human Health™.

With Protéger™, Houdek strives to provide product and service quality that matches the pet parent's devotion, 'humanization', and desire for quality of life between pet and parent. The product offers a highly valuable ingredient for prospective pet food partners searching for correspondingly valued pet diets.

CONTINUOUS FOCUS ON SDGS

By offering fermented plant proteins as pet food ingredients, IQI anticipates the broader, ongoing trend for using sustainable, non-animal-based ingredients. For the same reason, we are continuously making improvements in this field by working towards achieving the [UN Sustainable Development Goals \(SDGs\)](#). Of those, IQI considers SDG 12 ('responsible consumption and production') and SDG 14 ('life below water') to be most relevant to the pet food industry. IQI's vision of sustainability and animal welfare in the pet food industry, supported by the development of novel, alternative ingredients, is described in the [e-paper on the possibilities for moving towards a more sustainable pet food industry](#).

Want to know more?

<https://houdeknature.com/>

[https://www.researchgate.net/publication/368699681 Domestic dogs maintain positive clinical nutritional and hematological health outcomes when fed a commercial plant-based diet for a year](https://www.researchgate.net/publication/368699681_Domestic_dogs_maintain_positive_clinical_nutritional_and_hematological_health_outcomes_when_fed_a_commercial_plant-based_diet_for_a_year)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9291198/>

ABOUT IQI TRUSTED PETFOOD INGREDIENTS

IQI Trusted Petfood Ingredients is a global provider of premium-claim ingredients to the top brands in the pet food industry. Founded in 1994 as a trading company in raw pet food materials, today IQI offers an extensive variety of services to aid and assist our customers and suppliers worldwide. IQI Trusted Petfood Ingredients employs highly skilled personnel, owns and operates a global network of logistical hubs, and relies on a global supply network to obtain the purest natural resources available.

For IQI, quality is key. IQI Trusted Petfood Ingredients goes to great lengths to ensure the quality of its products and develop innovative new products. IQI also invests a great deal in maximizing the quality of its partnerships. Since this business is all about trust, IQI needs to bond with its partners to succeed. By working closely with both its customers and suppliers, IQI creates full transparency in the supply chain. IQI oversees and controls every step in the process from source to shelf and supplies products that are pure and traceable to their source.



ABOUT GEERT VAN DER VELDEN

Geert van der Velden is IQI Trusted Petfood Ingredients' Innovation Manager responsible for Business Development, generating new products and concepts that meet the needs of existing and new customers. Geert has more than 25 years' experience in the international pet food industry and has gained knowledge and experience in many sections of IQI's business.

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