

Introduction

Calysta’s FeedKind® protein is a non-GMO single cell protein produced via natural fermentation. A complete and balanced protein for canines, FeedKind protein provides pet food manufacturers with a new nutritional alternative to existing high protein ingredients.

FeedKind protein is a novel protein that has been shown to help maintain a healthy gut in several animal species. FeedKind protein thus represents an additional ingredient in the pet food formulator’s toolkit to help address gastrointestinal issues and chronically allergic companion animals.

Furthermore, FeedKind protein displays a best-in-class sustainability footprint and does not compete with the human food chain, as it is produced in controlled industrial conditions. As many pet food manufacturers have been under pressure to reduce the environmental impacts of their production processes while maintaining a robust supply chain, FeedKind protein can help reach both sustainability and operational goals.

As a novel complete protein ingredient, FeedKind protein can form the protein basis of companion animal foods, in particular in hypoallergenic feeds or limited ingredient formulations. In addition, by incorporating FeedKind protein in food for companion animals, pet food producers can improve the quality and environmental efficiency of their supply chain.

FeedKind Protein Key Attributes

- **Complete protein source** – With over 70% crude protein, an amino acid profile comparable to other sources of high quality animal protein (FeedKind is a complete protein for dogs), FeedKind is also readily digestible and palatable to pets.
- **Novel protein** – FeedKind is a novel protein that has not yet been used in commercial pet food, thus making it an ideal novel protein source for pets with food sensitivities and allergies.
- **Clean label** – Thanks to its natural fermentation process, FeedKind is non-GMO, vegan, gluten-, grain- and soy- free, and organic compatible in the EU, with US certification to-be-determined.
- **Supply chain security** – Precise fermentation processes ensure that FeedKind composition remains constant year-round, and limit price volatility experienced by other protein sources (e.g. weather patterns). FeedKind production is highly scalable, helping to bridge future protein sourcing gaps. FeedKind is a very stable dry product with a long shelf life, with complete traceability.
- **Best-in-class sustainability** – FeedKind production uses virtually no agricultural land and very little water and does not compete with the human food chain, enabling pet food producers to achieve their sustainability goals and pre-empt criticism by NGOs (e.g. deforestation from soy cultivation).
- **Gut health** – FeedKind helps maintain a healthy gut in salmon and eliminates deleterious effects of enteritis in mouse models. The potential to improve gut health in companion animals needs to be explored further in collaboration with pet food manufacturers and veterinary specialists.
- **Approved in Europe** – FeedKind protein is listed in the Catalogue of Feed Materials within the EU and may be used as a pet food ingredient in Canada.

Typical analysis	
Crude Protein	71%
Crude Fat	8%
Crude Fiber	<1%
Moisture	5%
Ash	9%
NFE	7%

Supporting Data for use in Dog and Cat Foods

FeedKind protein has been extensively tested in cats and Arctic fox (as a reference animal for dogs). For cats, researchers included FeedKind protein at levels up to 20% of total food with no effect on growth rates or animal health. In Arctic foxes, formulations containing up to 12% FeedKind protein (30% of dietary protein) were shown not to effect palatability, digestibility or feed intake. Finally, toxicology studies were completed in rats for 2 generations showing no negative effects.

FeedKind protein has been shown to be highly digestible in carnivorous mammals. A summary of digestibility of macronutrients in foxes is shown in Figure 1. Digestibility of protein and fat have been shown to be highly correlated with the similar metrics in dogs.

Figure 1: Digestibility of macronutrients in dog model

	Control	12% FeedKind
Crude protein	83.5	83.6
Crude Fat	96.4	96.7
Carbohydrate	76.1	76.1

FeedKind protein is also an attractive alternative to land animal proteins for use as a texturing agent in wet cat foods. It has proven gelling and emulsifying properties at relevant cooking temperatures and was palatable at a 2.5% inclusion level when used for that purpose.

Data Supporting FeedKind Protein to Help Promote Gut Health

In addition to its high digestibility, FeedKind protein has been shown to help promote a healthy gut in several animal species. FeedKind was shown to prevent soy-induced enteritis in salmon, effectively shielding the gastrointestinal tract from anti-nutritional factors that would otherwise cause severe inflammation.

FeedKind protein can also prevent inflammation in mammals. In a mouse model for human inflammatory bowel disease, FeedKind reduced ulcerative colitis symptoms. FeedKind appears to increase the regeneration of epithelial cells, both helping to repair existing damage as well as improve resistance to future challenges.

More work remains to be done testing these effects in companion animals directly, but the research indicates positive effects that is differentiated from existing probiotics and beneficial to gut health.

References

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