

Nutrient density of hydrolyzed chicken liver powders



Hydrolyzed chicken protein got a lot of attention lately for its benefits as being an easily digestible protein source with hypoallergenic benefits. Nevertheless, the source of the protein should be evaluated critically and raw materials been taken into consideration to decide whether the nutrient content contributes to the nutrition and well-being of pets.

There are mainly 3 sources of enzymatically hydrolyzed chicken proteins to be considered: Hydrolyzed offals (derived from guts, giblets,...), hydrolyzed meat (carcasses, MRM) and hydrolyzed liver. All of them have added value in a diet in terms of digestibility but can show big differences in palatability and nutrient composition.

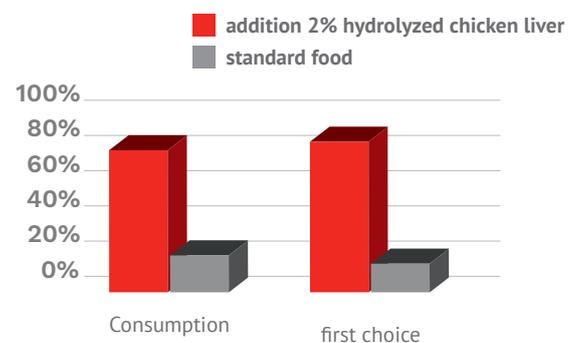


Hydrolyzed chicken liver powder is far superior above all other types of hydrolyzed proteins due to the fact that it is a **nutrient dense** protein source. It has many benefits such as **completeness** of the protein and **inherent abundance of essential vitamins and minerals**. Due to its **elevated palatability** it shows to be one of the base ingredients for the production of palatants but can as well be incorporated as a single ingredient in dry or wet pet foods, treats and snacks to boost nutrition and palatability.

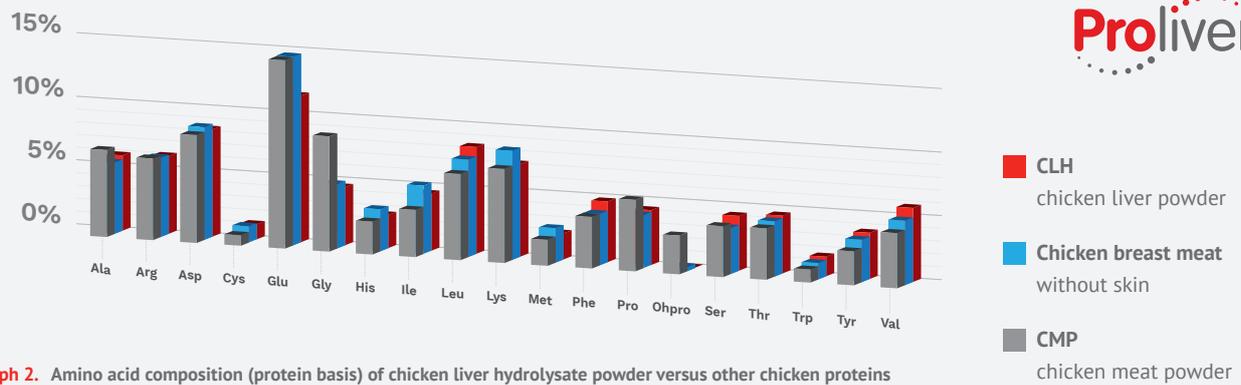
Palatability

Palatability testing of chicken liver hydrolysate (CLH) powder applied at 2% on a standard dog food shows significant results on preference and food intake where 85% of the dogs choose the CLH treated kibbles as first choice and also consumed 80% of the CLH treated kibbles versus only 20% of the standard kibbles. The powder can be applied topical on kibbles or as an ingredient in kibbles and wet pet food. It also makes it a key ingredient in appealing pet treats.

The significance in the results is only partially due to the liver component itself but mainly to the fact that the liver was hydrolyzed into smaller peptides and amino acids before spray drying.



Graph 1. Palatability results on 2% chicken liver hydrolysate inclusion (February 2021, test IQD9)



graph 2. Amino acid composition (protein basis) of chicken liver hydrolysate powder versus other chicken proteins

Nutritional composition and protein completeness

Typically chicken liver powder of a good quality shows 68% protein, 18% fat and 4% ash. This makes it a very low calcium, complete protein source for pets, meaning that all essential amino acids are included in the right proportions. In fact the amino acid composition of chicken liver powder is very close to that of chicken meat but is much higher in vitamins and minerals. The included fat is rich in mono- and polyunsaturated fatty acids which are needed for cardiac health and hormone production.

Digestibility, hypoallergenicity and safety

Next to elevated palatability and protein completeness, enzymatically hydrolyzed chicken liver powder shows increased protein digestibility over 92%. The hydrolysis procedure turns the proteins into smaller peptides and free amino acids which are easily digestible.

Furthermore, the short peptides are beneficial to minimize allergenic reaction in pets with food sensitivities. A fully automated process guarantees the repeatability of the target molecular weight distribution of the peptides upon customer's request. This while respecting stable palatability by avoiding the formation of bitter hydrophobic di- and tripeptides.

Chicken liver can be included in pet foods in several ways: as a fresh ingredient, a dry powder or a hydrolyzed spray dried powder. Inclusion of fresh or frozen liver however can be a risk for food borne illnesses, deterioration and cross contamination in a pet food manufacturing plant. Liver powders are shelf stable and safe in use. Agglomerated spray dried powders have the advantages to be non-bulking, free flowing ingredients which are easy to dose.

Minerals and vitamins

Extraordinary for chicken liver, compared to other meat products, is the content of essential minerals and vitamins: rich in selenium, iron, zinc and copper as well as abundant in vitamin A for vision and immune health and vitamin B for energy production and the nervous system.

Addition of the hydrolyzed chicken liver powder can exclude the need of several additives needed to make a pet diet formulation complete and shorten the ingredient list significantly.

However precautions should be taken in pet recipes if chicken liver is included in daily meals at high ratios to avoid hypervitaminosis. As chicken liver powder contains more than 250.000 IU/kg readily absorbable vitamin A, literature recommends to limit inclusion of chicken liver powder in pet food to 10% in case this would concern a daily diet.

Processing techniques

The base for the Proliver hydrolyzed chicken proteins are fresh food grade livers from EU approved slaughterhouses.

Chilled storage and processing in a food grade facility guarantee the lowest biogenic amine index (BAI) by avoiding formation of histamine, putrescine and cadaverine. Where an optimal BAI for good quality meat and bone meal would be 10, the chicken liver hydrolysate guarantees a BAI less than 1 with typical values of 0,1.

But still, even the best raw materials can be ruined during processing. Drying technique is a key factor in preserving the nutrients. The low temperature spray drying ensures that dehydration occurs with a minimum of heat in less than a minute conserving the valuable benefits and bioactivities of the protein and vitamins.

Due to the food grade status of raw materials and food grade processing, the Proliver chicken liver hydrolysate is nominated human grade.

Fig 1. Low temperature spray drying ensures conservation of the valuable benefits and bioactivities



Meet Proliver

Proliver was founded in 2010 by a family owned leading chicken processor. 3 generations experience in chicken processing and rendering led to this new activity turning edible chicken into protein, broth, meat and liver powders. Initially solely developed for food applications, soon demand increased for pet food applications where humanization and the need for highest quality chicken proteins grew over the years. Our food grade facility based in Belgium provides worldwide distribution and warehousing services.

Our principles:

Today Proliver still sticks to its base principles:

- Only use of edible raw materials, fresh and straight from nearby slaughterhouses, fully traceable.
- Food grade processing, producing the highest quality chicken products suitable for man and pet.
- Low temperature processing and gentle spray drying to preserve the nutritious and savory benefits.

These principles have proven their benefits for pet nutrition in lowest biogenic amine levels and highest protein nutritional value, digestibility and palatability. Enzymatic hydrolysis of the protein into peptides can play an important role in enhancing the above benefits inducing even higher digestibility and palatability and create hypoallergenic protein sources for sensitive pets. These techniques have already proven their benefits in human food, fish and husbandry.

We provide:

Chicken broth powders

- Appetizing replacement of water in your recipes.
- Fully soluble, no fat, golden clear broth without salt or taste enhancers.
- Highest digestibility and protein level up to 92%, source of essential electrolytes.
- From nutritious meat broths up to healing bone broths.

Chicken protein powders

- Spray dried cooked chicken meat and broth, concentrated after removal of bones and fat.
- At least 75% protein, minimal calcium and source of essential electrolytes.
- Enzymatically hydrolyzed to benefit the functionalities of bioactive peptides.
- The powerful powder is ideal for balancing protein levels in pet diets, increasing digestibility and reducing allergenicity.

Chicken hydrolyzed liver powders

- Produced by enzymatic hydrolysis of fresh food grade chicken liver.
- Delivering a 68% protein content full of hypoallergenic low molecular weight peptides and amino acids.
- Boosting digestibility and palatability.
- Base to create your personal pet nutrition flavor if combined with other ingredients to induce maillard reactions and palatability.



01

Only edible chicken

We use only fresh and food grade chicken. That way we ensure the best protein composition. This means no guts, no viscera, no feathers, no heads, no off spec.

- ✓ **Balanced protein composition**
- ✓ **Lowest biogenic amine level**
- ✓ **Traceability**

02

Food grade processing

Installations are completely emptied and cleaned in between batches. So no unnecessary additives, salt or carriers.

- ✓ **Lowest biogenic amine level**
- ✓ **Increased palatability**
- ✓ **Hypoallergenic**

03

Low temperature processing

No rendering and no scorching temperatures that degrade the protein. We spray dry at low temperature to preserve the protein.

- ✓ **Increased digestibility**
- ✓ **Hypoallergenic**