

PROTEIN

MEAL

BAI CFPR #FI 490



NUTREX
CURRENT NUTRITION TECHNOLOGY EXPONENTS

COMBINATION MEAT MEAL

HIGH BIOLOGIC VALUE PROTEIN MEAL FOR DOGS & CATS

PRODUCT DESCRIPTION

Produced from 100% grocery store meat and fish trimmings

Composed of approximately 40% beef, 30% pork and 30% fish

NO blood, hair, entrails, fish heads or offals

High pressure Extruder, low temperature drying process - minimized protein denaturation impact of heat and maintained high protein biologic value

RECOMMENDED USE

As a high quality protein meal for dogs and cats of all ages

RECOMMENDED FEEDING

Cats - feed as is ad libitum/free access in a food bowl or
Mix 1 tablespoonful with 1/2 cup rice and/or
table leftovers 2 times a day

Dogs - Adult - Mix 1.5-3 tablespoonful/s with 2-4 cups of rice
and/or table leftovers 2 times a day
Puppy - mix 1 tablespoonful with 1 cup of rice
and /or table leftovers 3times a day

PRODUCT STANDARDS

CHEMICAL

Protein	55 % min
Fat	12 % min
Ash	18 % max
Moisture	6.5 % max

AMINO ACID PROFILE

Tryptophan	0.41%	Lysine	3.46%
Histidine	1.26	Arginine	3.61
Phenylalanine	2.23	Threonine	2.10
Cystine	0.59	Glutamic acid	4.60
Isoleucine	1.79	Glycine	2.29
Leucine	3.97	Valine	2.73
Methionine	1.00	Tyrosine	1.52

TRUE DIGESTIBILITY

Protein	88.0%
Fat	92.5%
Energy	90.0%
ME	3275 kcal/kg
NE	2852 kcal/kg

MINERALS

Calcium	6.0%	P avail.	3.0%
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MICROBIOLOGICAL

APPI Certified Salmonella and E. coli Negative

PACKAGING

1 kg and 5kg bags

PRODUCED BY:

PRCI

Seattle, WA, USA

FOR:

AGRIaccess

Bothell WA USA

IMPORTED & DIST. BY:

TLCP

San Juan City, M.M. Phil.

DIGESTIBILITY AND BIOLOGIC VALUE OF PROTEINS DECREASE LINEARLY WITH INCREASING HEAT AND EXPOSURE TIME

Processing protein sources for drying and preservation purposes inevitably involves heat. Although other non-heat methods are now available, like ultrafiltration and ultracentrifuges, their high operating costs render them unattractive and impractical for mainstream protein feed products.

The impact of Heat application, either thru steam, air, or heat plates, on nutrient bioavailability of organic materials is now well understood. The main effect is the disruption of the so-called **hydrogen bonds**. These are responsible in binding the chemical components of a molecule together, and determine both the physical form and functional activity of the nutrient. **The heat temperature and length of exposure determines the degree of disruption of the bonds.**

In general terms - **heat application improves carbohydrate and fat bioavailability but on the other hand, reduces protein bioavailability.**

Disruption of the hydrogen bonds by heat destroys the helical form and unfolds the protein - called **denaturation**. When this happens, unfolded/denatured amino acids, even if properly absorbed, can not be recognized by the liver cells as amino acids. They are then deaminated (nitrogen side chain removed) and the remaining carbon skeleton is used as energy material. It is well established that proteins are biologically active (meaning they can be used as proteins) only in their helical form. In fact, even a minor change in the way they are folded radically changes their biological function.

Naked proteins, i.e. proteins which come from non-cellular sources like milk, plasma and egg albumin, are also more sensitive to heat **denaturation** than those of cellular origin, i.e. meat, musculature and organs, because of the protection accorded by the cell wall. This is precisely why spray drying is the choice drying process for liquid proteins.

CATS - THE TRUE CARNIVORES

Of the domestic animals, only the cats evolved as **true carnivores** - meaning they will thrive better with animal protein/meat diet alone.

DOGS - TYPICAL OMNIVORES

Dogs evolved as omnivores, meaning they will thrive better with a diet composed of animal and plant sources.

PROTEIN DIGESTIBILITY , RELATIVE PROTEIN EFFICIENCY RATIO (RPER%) AND RELATIVE NET RATIO (NPER%) OF UNTREATED AND HEAT TREATED* PROTEINS

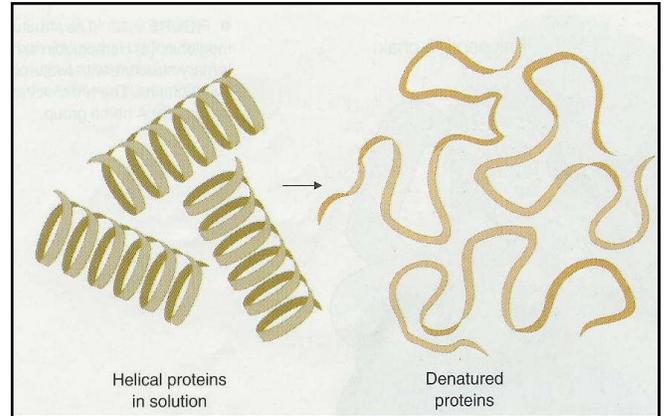
PRODUCT	PROTEIN DIG. %	RPER%	NPER %
Lactalbumin untreated	99	89	91
Lactalbumin heat treated	73	0	0
Soy protein isolate untreated	96	56	64
Soy protein isolate heat treated	68	0	0

Adapted from; Sarwar, et.al 1997

*250degF exposure for 25 minutes

RPER and NPER reflect the Biologic Value of the Protein, as a measure of actual protein usage AFTER digestion and absorption

0% RPER and NPER indicate that the proteins were NOT used as proteins, and considered denatured



Rendered proteins (min. 250degF at >25 minutes) have digestibility values at <60% and RPER values of <10%.

Low temperature processes (such as spray dry and extrusion) and flash drying (high temp. but very short exposure of <3 sec.) impart minimal denaturing effect on proteins, thus preserving inherent digestibility and biologic value.

SOURCES

1. Sarwar, G. et.al. 1999. Influence of Feeding Alkaline/Heat Treated Processed proteins. NRD, Health Canada.
2. Hendricks, W.H., et.al. 1999. Heat Processing Changes Protein Quality of Canned Cat Food as measured with Rat Bioassay. Monogastric Res. Center, Massey Univ.
3. Influence of various heat treatments on the protein quality of human food and on feed for production animals (Bender 1978; Somogyi and Muller 1989; van Barnevelde 1993; van der Poel et.al. 1993; Vorgen et.al. 1995)

PROTEINS DESIGNED FOR THE TROPICS BY:

AGRIaccess Bothell WA USA
Current Nutrition Technology Exponents

Distributed in the Philippines by:

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San Juan City, M.M., PHILIPPINES