

Dog Food

by Dea Freiheit

Ingredients - What Are They Really?

Animal Protein

Dogs are carnivores and do best on a meat based diet. When cattle, pigs, chickens or sheep are slaughtered, the lean muscle tissue and a few organs are allocated for human consumption. About 50% of every food animal does not get used for human consumption. This includes heads, feet, bones, blood, intestines, lungs, spleen, liver, ligaments, fat trimmings, unborn fetuses and any other parts not consumed by humans. All of these other parts are known as "by-products". These by products are very common in "wet" dog food.

The better brands of pet food, such as a "natural", "organic" and "holistic" varieties do not use by-products. This sounds better, but in reality the meat is still leftover scraps. You know when you buy boneless, skinless chicken breasts at the grocery store? The part you aren't buying, the ribs and skin as well as the spines, are used in these types of food.

Meat meals, poultry meals, by-product meals and meat-and-bone meal are common ingredients in dry pet foods. The term "meal" refers to any tissue that is not used fresh, but has been rendered. Rendering is the process to prepare tissues for industrial use. Rendering livestock carcasses means to extract oil from fat, blubber etc, by melting. This process involves dumping raw materials into huge vats and boiling them for several hours. This separates fat, removes water and kills bacteria, viruses, parasites and other organisms. The high temperature used for this process (270 degrees Fahrenheit) also can alter or destroy natural enzymes and proteins found in the raw ingredients.

There have been persistent rumors that rendered by-products contained dead cats and dogs. The FDA conducted a study looking for phenobarbital, the most common euthanasia drug, in pet foods. They did find it, but they also searched for cat and dog DNA in the same study and did not find it. Industry insiders did admit that road-kill and euthanized pets were once used in pet foods, but pet food companies universally deny that their products contain such sources.

Vegetable Protein

Grain and vegetable protein content in dog food has risen dramatically. Plant products now replace a considerable amount of meat that was used in dog food historically. Unfortunately, this led to severe nutritional deficiencies that have since been corrected in pet foods.

Most dry dog foods contain a large amount of grain or starchy vegetables to provide texture. They are a cheap source of "energy" in the food - and energy equals calories. Gluten meals are high protein meals that have had most of the carbohydrates removed from them. They are used to boost the protein content of a cheaper food, where they are not using the more expensive animal source proteins.

Corn gluten is the most commonly used type. Wheat gluten is used to create shapes such as "bites", "cuts", "chunks", "shreds", "flakes" or "slices". It is also a thickener for gravy in wet dog foods.

A recent fad - "low carb" foods, has some companies moving away from grains and using potatoes, green peas and other starchy vegetable as a substitute. This may be useful if your dog is allergic to grains, but other than that, there is no real benefit to these foods. In fact, these tend to be very high in fat, and dogs are more likely to become obese if free feeding this type of food.

Animal and Poultry Fat

You know that smell that you notice when you open up a new bag of dog food? That is most often rendered animal fat or other fats deemed unsuitable for human consumption. For decades, restaurant grease was used in pet foods, but now there is a more lucrative market in biodiesel production.

These fats are sprayed on extruded pellets of food, greatly enhancing its palatability. The fat also acts as a binding agent when manufacturers add other flavor enhancers such as "animal digest" made from processed by-products.

Nutrients - Are They Still Present?

Dog food manufacturers fortify food with vitamins and minerals. These replace the nutrients lost in the processing of raw materials used to create the food. Since dry dog food is basically cooked twice, once in the rendering process and once in the manufacturing, proteins are very prone to becoming "denatured" or damaged. This is just one nutrient that is compromised and compensated for with fortifiers.

Food fortifiers are also found in human food - remember the breakfast cereal that provides you with 100% of necessary vitamins and minerals a day? This has also been fortified.

Dog Food Additives

Additives are chemicals that are added to dog food to improve the taste, stability characteristics or appearance of the food. Additives provide no nutritional value and are classified as "Generally Regard As Safe (GRAS)" by the FDA.

These include:

Anticaking agents, lubricants, antimicrobial agents, nonnutritive sweeteners, antioxidants, nutritive sweeteners, coloring agents, oxidizing and reducing agents, curing agents
pH control agents, drying agents, processing aids, emulsifiers, sequestrants, firming agents, solvent vehicles, flavor enhancers, stabilizers, thickeners, flavoring agents, surface active agents, flour treating agents, surface finishing agents, formulation aids, synergists, humectants, texturizers, and leavening agents.

Manufacturers need to ensure that dog food has a long shelf life - 12 months. So synthetic or natural preservatives (antioxidants) are used. Synthetic preservatives include BHT, BHA, propyl glycol and ethoxyquin. The long term use of BHT, BHA and propyl glycol has not been studied thoroughly. Ethoxyquin is used in human food, for preserving spices such as cayenne pepper and chili powder.

Many manufacturers have responded to public concern over additives and now use "natural" preservatives, such as Vitamin C, Vitamin E and oils of rosemary, cloves or other spices. The downside to this is that the food only stays fresh for 6 months.

Potential Contaminants

Bacteria, bacteria endotoxins (chemicals produced by bacteria), mycotoxins (toxins from mold and fungi), chemical residues such as pesticides and fertilizers and acrylamide (a carcinogenic compound) are all potential contaminants in dog food. Unfortunately, these same substances can also potentially be found in processed human foods.

Food Requirements

Dog foods labeled as 'complete and balanced' must meet standards established by the Association of American

Feed Control Officials (AAFCO) either by meeting a nutrient profile or by passing a feeding trial.

There are now two separate nutrient profiles for dogs - one for growth (puppies) and one for adult maintenance.

Maximum levels of intake of some nutrients have been established for the first time because of concern that over-nutrition, rather than undernutrition, is a bigger problem with many pet foods today.

The standards include recommendations on *protein, fat, fat soluble vitamins, water soluble vitamins, and mineral content* of foods.

The levels of nutrients in the table below are expressed on a 'dry matter' (DM) basis. This allows us to compare the ingredients from food to food, as compared to the "as fed" numbers on most dog food labels. If you are interested, please contact me for the formula that is used. The following are the minimum and maximum requirements.

AAFCO Dog Food Nutrient Profiles

<u>Nutrient</u>	<u>Units</u>	<u>Growth & Reproduction</u>	<u>Adult Maintenance</u>	
		<u>Minimum</u>	<u>Minimum</u>	<u>Maximum</u>
<i>Protein</i>	%	22	18	-
Arginine	%	0.62	0.51	-
Histidine	%	0.22	0.18	-
Isoleucine	%	0.45	0.37	-
Leucine	%	0.72	0.59	-
Lysine	%	0.77	0.63	-
Methionine-cystine	%	0.53	0.43	-
Phenylalanine-tyrosine	%	0.89	0.73	-
Threonine	%	0.58	0.48	-
Tryptophan	%	0.2	0.16	-
Valine	%	0.48	0.39	-
<i>Fat</i>	%	8	5	-
Linoleic acid	%	1	1	-
<i>Minerals</i>				
Calcium	%	1	0.6	2.5
Phosphorous	%	0.8	0.5	1.6
Ca:P	ratio	1:01	1:01	2:01
Potassium	%	0.6	0.6	-
Sodium	%	0.3	0.06	-
Chloride (Cl)	%	0.45	0.09	-
Magnesium	%	0.04	0.04	0.3
Iron	mg/kg	80	80	3,000.00
Copper	mg/kg	7.3	7.3	250
Manganese	mg/kg	5	5	-
Zinc	mg/kg	120	120	1,000.00
Iodine	mg/kg	1.5	1.5	50
Selenium	mg/kg	0.11	0.11	2
<i>Vitamins</i>				
Vitamin A	IU/kg	5,000.00	5,000.00	250,000.00
Vitamin D	IU/kg	500	500	5,000.00
Vitamin E	IU/kg	50	50	1,000.00

Vitamin B1 (thiamin) mg/kg	1	1	-
Vitamin B2 (riboflavin) mg/kg	2.2	2.2	-
Vitamin B5 (pantothenic acid) mg/kg	10	10	-
Vitamin B3 (niacin) mg/kg	11.4	11.4	-
Vitamin B6 (pyridoxine) mg/kg	1	1	-
Folic Acid mg/kg	0.18	0.18	-
Vitamin B12 (cyanocobalamin) µg/kg	22	22	-
Choline g/kg	1.2	1.2	-

AAFCO Definitions Of Dog Food Ingredients

The following are the guidelines and definitions for animal feed, including pet foods, as set by the AAFCO (Association of American Feed Control Officials).

Alfalfa Meal - the aerial portion of the alfalfa plant, reasonably free from other crop plants, weeds and mold, which has been sun cured and finely ground.

Animal Digest - material which results from chemical and/or enzymatic hydrolysis of clean and un-decomposed animal tissue. The animal tissues used shall be exclusive of hair, horns, teeth, hooves and feathers, except in such trace amounts as might occur unavoidably in good factory practice and shall be suitable for animal feed.

Animal Fat - is obtained from the tissues of mammals and/or poultry in the commercial processes of rendering or extracting. It consists predominantly of glyceride esters of fatty acids and contains no additions of free fatty acids. If an antioxidant is used, the common name or names must be indicated, followed by the words "used as a preservative".

Barley - consists of at least 80 percent sound barley and must not contain more than 3 percent heat-damaged kernels, 6 percent foreign material, 20 percent other grains or 10 percent wild oats.

Barley Flour - soft, finely ground and bolted barley meal obtained from the milling of barley. It consists essentially of the starch and gluten of the endosperm.

Beef (meat) - is the clean flesh derived from slaughtered cattle, and is limited to that part of the striate muscle which is skeletal or that which is found in the tongue, in the diaphragm, in the heart, or in the esophagus; with or without the accompanying and overlying fat and the portions of the skin, sinew, nerve and blood vessels which normally accompany the flesh.

Beet Pulp ("beet pulp, dried molasses" and "beet pulp, dried, plain") - the dried residue from sugar beets.

Brewer's Rice - the dried extracted residue of rice resulting from the manufacture of wort (liquid portion of malted grain) or beer and may contain pulverized dried spent hops in an amount not to exceed 3 percent.

Brown Rice - unpolished rice after the kernels have been removed. Not a complete AAFCO definition.

Carrots - presumably carrots. No AAFCO definition.

Chicken - the clean combination of flesh and skin with or without accompanying bone, derived from the parts or whole carcasses of chicken or a combination thereof, exclusive of feathers, heads, feet and entrails.

Chicken By-Product Meal - consists of the ground, rendered, clean parts of the carcass of slaughtered chicken, such as necks, feet, undeveloped eggs and intestines, exclusive of feathers, except in such amounts as might occur unavoidable in good processing practice.

Chicken Liver Meal - chicken livers which have been ground or otherwise reduced in particle size.

Chicken Meal - chicken which has been ground or otherwise reduced in particle size.

Corn - unspecified corn product. Not a complete AAFCO definition.

Corn Bran - the outer coating of the corn kernel, with little or none of the starchy part of the germ.

Corn Germ Meal (Dry Milled) - ground corn germ which consists of corn germ with other parts of the corn kernel from which part of the oil has been removed and is the product obtained in the dry milling process of manufacture of corn meal, corn grits, hominy feed and other corn products.

Corn Gluten - that part of the commercial shelled corn that remains after the extraction of the larger portion of

the starch, gluten, and term by the processes employed in the wet milling manufacture of corn starch or syrup.
Corn Gluten Meal - the dried residue from corn after the removal of the larger part of the starch and germ, and the separation of the bran by the process employed in the wet milling manufacture of corn starch or syrup, or by enzymatic treatment of the endosperm.

Corn Syrup - concentrated juice derived from corn.

Cracked Pearl Barley - cracked pearl barley resulting from the manufacture of pearl barley from clean barley.

Dehydrated Eggs - dried whole poultry eggs freed of moisture by thermal means.

Digest of Beef - material from beef which results from chemical and/or enzymatic hydrolysis of clean and un-decomposed tissue. The tissues used shall be exclusive of hair, horns, teeth and hooves, except in such trace amounts as might occur unavoidably in good factory practice.

Digest of Beef By-Products - material from beef which results from chemical and/or enzymatic hydrolysis of clean and un-decomposed tissue from non-rendered clean parts, other than meat, from cattle which includes, but is not limited to, lungs, spleen, kidneys, brain, livers, blood, bone, partially defatted low-temperature fatty tissue, and stomachs and intestines freed of their contents. It does not include hair, horns, teeth and hoofs.

Digest of Poultry By-Products - material which results from chemical and/or enzymatic hydrolysis of clean and un-decomposed tissue from non-rendered clean parts of carcasses of slaughtered poultry such as heads, feet, viscera, free from fecal content and foreign matter except in such trace amounts as might occur unavoidably in good factory practice.

Dried Animal Digest - dried material resulting from chemical and/or enzymatic hydrolysis of clean and un-decomposed animal tissue. The animal tissue used shall be exclusive of hair, horns, teeth, hooves and feathers, except in such trace amounts as might occur unavoidably in good factory practice and shall be suitable for animal feed. If it bears a name descriptive of its kind or flavor(s), it must correspond thereto.

Dried Kelp - dried seaweed of the families Laminaricae and Fu-caeae. If the product is prepared by artificial drying, it may be called "dehydrated kelp".

Dried Milk Protein - obtained by drying the coagulated protein residue resulting from the controlled co-precipitation of casein, lactalbumin and minor mild proteins from defatted milk.

Dried Reduced Lactose Whey - no AAFCO definition available.

Dried Whey - the product obtained by removing water from the whey. It contains not less than 11 percent protein nor less than 61 percent lactose.

Feeding Oatmeal - obtained in the manufacture of rolled oat groats or rolled oats and consists of broken oat groats, oat groat chips, and floury portions of the oat groats, with only such quantity of finely ground oat hulls as is unavoidable in the usual process of commercial milling. It must not contain more than 4 percent crude fiber.

Fish Meal - the clean, dried, ground tissue of un-decomposed whole fish or fish cuttings, either or both, with or without the extraction of part of the oil.

Ground Corn (ground ear corn) - the entire ear of corn ground, without husks, with no greater portion of cob than occurs in the ear corn in its natural state.

Ground De-hulled Oats - presumably ground cleaned oats with hulls removed (ground oat groats). Not an AAFCO definition.

Ground Wheat - presumably a coarser grind of wheat flour. Not an AAFCO definition.

Ground Whole Brown Rice (Ground Brown Rice) - the entire product obtained by grinding the rice kernels after the hulls have been removed.

Ground Whole Wheat - ground whole kernel, presumably equivalent to AAFCO's Wheat Mill Run, Wheat Middlings, Wheat Shorts or Wheat Red Dog, whose principal differences are in the percentage of crude fiber.

Ground Yellow Corn - same as ground corn, except that the corn used is yellow in color.

Kibbled Corn - obtained by cooking cracked corn under steam pressure and extruding from an expeller or other mechanical pressure device.

Lamb Bone Meal - (steamed) dried & ground product sterilized by cooking un-decomposed bones with steam under pressure. Grease, gelatin and meat fiber may or may not be removed.

Lamb Digest - material resulting from chemical and/or enzymatic hydrolysis of clean and un-decomposed lamb.

The tissue used shall be exclusive of hair, horns, teeth and hooves, except in such trace amounts as might occur unavoidably in good factory practice and shall be suitable for animal feed.

Lamb Fat - obtained from the tissues of lamb in the commercial processes of rendering or extracting. It consists predominantly of glyceride esters of fatty acids and contains no additions of free fatty acids. If an antioxidant is used, the common name or names must be indicated, followed by the words "used as a preservative".

Lamb Meal - the rendered product from lamb tissues, exclusive of blood, hair, hoof, horn, hide trimmings, manure, stomach and rumen contents except in such amounts as may occur unavoidably in good processing practices.

Linseed Meal - the product obtained by grinding the cake or chips which remain after removal of most of the oil from flaxseed by a mechanical extraction process. It must contain no more than 10 percent fiber. The words "mechanical extracted" are not required when listing as an ingredient in the manufactured food.

Liver - the hepatic gland (of whatever species is listed).

Meat and Bone Meal - the rendered product from mammal tissues, including bone, exclusive of blood, hair, hoof, horn, hide trimmings, manure, stomach and rumen contents, except in such amounts as may occur unavoidably in good processing practices.

Meat By-Products - the non rendered, clean parts, other than meat, derived from slaughtered mammals. It includes, but is not limited to, lungs, spleen, kidneys, brain, livers, blood, bone, partially defatted low-temperature fatty tissue and stomachs and intestines freed of their contents. It does not include hair, horns, teeth and hooves.

Meat Meal - the rendered product from mammal tissues, exclusive of blood, hair, hoof, horn, hide trimmings, manure, stomach and rumen contents except in such amounts as may occur unavoidably in good processing practices.

Peas - peas.

Potatoes - potatoes.

Poultry By-Product Meal - consists of the ground, rendered, clean parts of the carcass of slaughtered poultry, such as necks, feet, undeveloped eggs, intestines, exclusive of feathers, except in such amounts as might occur unavoidably in good processing practices.

Poultry Digest - material which results from chemical and/or enzymatic hydrolysis of clean and un-decomposed poultry tissue.

Poultry Fat (feed grade) - primarily obtained from the tissue of poultry in the commercial process of rendering or extracting. It shall contain only the fatty matter natural to the product produced under good manufacturing practices and shall contain no added free fatty acids or other materials obtained from fat. It must contain not less than 90 percent total fatty acids and not more than 3 percent of un-saponifiables and impurities. It shall have a minimum titer of 33 degrees Celsius. If an antioxidant is used, the common name or names must be indicated, followed by the word "preservative(s)".

Powdered Cellulose - purified, mechanically disintegrated cellulose prepared by processing alpha cellulose obtained as a pulp from fibrous plant materials.

Rice Bran - the pericarp or bran layer and germ of the rice, with only such quantity of hull fragments, chipped, broken, or brewer's rice, and calcium carbonate as is unavoidable in the regular milling of edible rice.

Rice Flour

Soy Flour

Soybean Hulls - consist primarily of the outer covering of the soybean.

Soybean Meal (De-hulled, solvent Extracted) - obtained by grinding the flakes remaining after removal of most of the oil from de-hulled soybeans by a solvent extraction process.

Soybean Meal (Mechanical Extracted) - obtained by grinding the cake or chips which remain after removal of most of the oil from the soybeans by a mechanical extraction process.

Soybean Mill Run - composed of soybean hulls and such bean meats that adhere to the hulls and such bean meats that adhere to the hulls which results from normal milling operations in the production of de-hulled soybean meal.

Tallow - animal fats with titer above 40 degrees Celsius.

Turkey - unspecified turkey. Not a complete AAFCO description.

Turkey Meal - the ground clean combination of flesh and skin with or without accompanying bone, derived from the parts or whole carcasses of turkey or a combination thereof, exclusive of feathers, heads, feet and entrails.

Wheat Bran - the coarse outer covering of the wheat kernel as separated from cleaned and scoured wheat in the usual process of commercial milling.

Wheat Flour - wheat flour together with fine particles of wheat bran, wheat germ and the offal from the "tail of the mill". This product must be obtained in the usual process of commercial milling and must not contain more than 1.5 percent crude fiber.

Wheat Germ Meal - consists chiefly of wheat germ together with some bran and middlings or short. It must contain not less than 25 percent crude protein and 7 percent crude fat.

Wheat Mill Run - coarse wheat bran, fine particles of wheat bran, wheat shorts, wheat germ, wheat flour and the offal from the "tail of the mill". This product must be obtained in the usual process of commercial milling and must contain not more than 9.5 percent crude fiber.

Whey - the product obtained as a fluid by separating the coagulum from milk, cream or skimmed milk and from which a portion of the milk fat may have been removed.

I know this article may be a bit daunting, but, if you excuse the pun, it is hard to deliver the "meat and potatoes" about dog food in an exciting format! If you want to do something interesting, take the lists of the above nutritional requirements and ingredients and compare them to those listed on your dog food bag. You may be surprised.

References

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3. <http://www.bornfreeusa.org/facts.php?more=1&p=359>
4. www.aafco.org