

ANATOMY OF A FEED TAG

Example Tag	B O J A X H I N A T 33%	{1}
	Liquid Feed	{2}
	(For Ruminants Only)	{3}
	GUARANTEED ANALYSIS	{4}
	Crude Protein, not less than.....33.00%	{5}
	<i>(This includes not more than 29% equivalent crude protein from non-protein nitrogen)</i>	{6}
	Crude Fat, not less than..... 2.00%	{7}
	Crude Fiber, not more than.....0.20%	{8}
	Calcium, not less than.....0.50%	{9}
	Calcium, not more than.....1.00%	
	Phosphorus, not less than.....0.75%	{10}
	Salt, not less than1.00%	{11}
	Salt, not more than2.00%	
	Potassium, not less than.....2.00%	
	Magnesium, not less than.....0.10%	
	Sulfur, not less than.....0.30%	
	Iron, not less than.....600 ppm	
	Zinc, not less than.....100 ppm	
	Manganese, not less than.....50 ppm	
	Cobalt, not less than.....1 ppm	{12}
	Copper, not less than.....30 ppm	
	Vitamin A, IU/Lb., not less than.....20,000	
	Vitamin D, IU/Lb., not less than.....5,000	{13}
	Vitamin E, IU/Lb., not less than.....5	
	Glycine, mg/lb, not less than10	{14}
	Total Sugars (As Invert), not less than.....22.00%	{15}
	Total Lactose Sugar, not less than.....8.00%	{16}
	Moisture, not more than.....40.00%	
	Dry Matter, not less than.....60.00%	{17}
	(-----)	{18}
	INGREDIENTS	{19}
	Molasses Products, Condensed Brewers Solubles, Condensed Whey Solubles, Urea, Phosphoric Acid, Salt, Ammonium Polyphosphate, Magnesium Sulfate, Iron (Ferrous) Sulfate, Attapulgitte Clay, Zinc Oxide, Manganese Carbonate, Cupric Oxide, Cobalt Carbonate, Ethylene Diamine Dihydroiodide, Sodium Selenite, Vitamin A Acetate (stability improved), Vitamin D Supplement, Vitamin E Supplement	
	WARNING:	{20}
	THIS FEED SHALL BE USED ONLY IN ACCORDANCE WITH DIRECTIONS	
	MANUFACTURED BY:	{21}
	Bojax, Inc. Crossroads, USA 12345	

ANATOMY OF A FEED TAG

Feed tags can show a lot of information. Sometimes what is not on the tag also tells you something. We will go through the reasons for each statement that appears on a tag, and come up with some points you can use when reading and comparing tags. We'll use the attached BOJACKS 33% feed tag as the example. Each section is numbered for reference. (*Bojacks is not a real company, and this is not a real tag.*)

{1} The product name obviously appears at the top of the tag. By law, the name may not be misleading, i.e., use of the word "Natural" when some of the protein is from NPN, or "Fortified" when no significant nutritional additive is included, would not be allowed. In this case, Bojacks' use of the term "**Nat**" is misleading. Mr. Bojacks explained that he named the feed after his son, Nathan, but that isn't going to fly with feed control officials.

Whenever a product name includes a "%", the percent must refer to the total crude protein. If only a number is included as part of the name, the number does not have to be the percent protein. In this case, the Bojacks 33% does contain 33 percent crude protein, so that part is OK.

Most people assume the number in the product name indicates the amount of protein. However, if the product name was Bojacks 33, without the "%" sign, it would not have to contain 33 percent protein. It would be a sneaky thing to include a number that implied a higher protein than the product had, but it's legal if the guarantee shows the correct protein.

{2} The statement "Liquid feed" is not required in most states, but it is customary to put it on the tag.

{3} This tag says "For Ruminants Only". This is because monogastrics cannot utilize the NPN in the product, not because it would be harmful to them. The "For Ruminants Only" statement has led to the common assumption that the product would be harmful to monogastric animals like horses or hogs. The truth is that horses and hogs can tolerate a much higher dose of urea than can cattle. They just can't make use of it.

AAFCO is moving to requiring species specific statements that spell out swine, poultry, sheep, beef cattle, dairy cattle, etc. Therefore, you may see tags for products containing NPN which say something like "For Cattle Only", or "For Lactating Dairy Cattle", instead.

{4} In the Guaranteed Analysis section, most guarantees are minimums ("not less than") because they refer to a valuable component and show that there is at least a certain amount of it. Where there is a "not more than" in the guarantee, it indicates a "filler", a nutrient that is inexpensive.

{5} Crude Protein is the amount of protein that can be made from the nitrogen in the product. It is calculated by multiplying the nitrogen content by 6.25. That is because the average protein contains 16% nitrogen, and $100\% \div 16\% = \text{the factor } 6.25$. The total crude protein includes the protein that would result from complete utilization of NPN by rumen microbes.

{6} The Non-Protein Nitrogen statement must follow Crude Protein, and shows the amount of equivalent crude protein from NPN. In Bojack's feed, it is 29% equivalent protein from NPN. Note that this is not the % urea – it is the amount of protein that can be made from the urea. Urea contains so much nitrogen, it is the equivalent of roughly 280% crude protein. So it would take only about 10% urea ($29 \div 2.8$) to get 29% protein equivalent.

{7} Crude Fat is required in nearly all states. Fat is high in energy, and may play a positive role in reproduction, so up to a point it's a good thing to have. However, when a total diet (not just the supplement) reaches 4 – 5% fat, forage utilization can be depressed. If a fat source isn't in the ingredient listing, it can be assumed that the fat is supplied by the other ingredients.

Most dry ingredients will have a basic fat level of at least 2 to 3%, which explains why the label of a dry feed may show a significant amount of fat, but no added fat appears in the ingredient listing. However, because liquid ingredients are almost devoid of fat, our liquid tags will show less than 0.5% fat unless we are adding a concentrated fat source.

{8} Fiber components represent the less digestible portion of the feed. Most nutritive dry feed ingredients will average about 3 - 4% fiber. When the Crude Fiber in a dry feed exceeds 5%, or the Acid Detergent Fiber is more than 6%, it probably contains an added high fiber ingredient.

The fiber added to dry feeds is inexpensive, and is used as a filler. It also has very little nutritional value because it is from sources which have had the useful constituents refined out. Cottonseed hulls, peanut hulls, and rice hulls are examples of common filler ingredients with almost no nutritional value which are used in dry feeds. Look for "roughage product" in the ingredient list.

There are no liquid ingredients with any measurable amount of fiber, so liquid tags will show less than 0.5% crude fiber. Liquids are criticized for their water content because water contains no nutritional value, but the type of fiber added as a filler to dry feeds has no value either, and adds to the cost. Fiber does have a role in dairy rations, but the finely ground, highly refined fiber that is added to dry feeds doesn't do the job.

Crude Fiber must be declared on all feeds. New AAFCO standards call for Acid Detergent Fiber on the guarantee of a dairy feed. This is meaningless in a liquid feed, but it's still required.

{9} Most states require that Calcium guarantees show both a minimum and a maximum amount. Calcium is a needed nutrient up to a point, but *because limestone (calcium carbonate) is usually so cheap, it can be used as a filler in dry feeds.*

The use of limestone in this way has been controlled by requiring that the variation between minimum and maximum calcium be no more than 0.5% if total added mineral is 2.5% or less. If total added mineral is between 2.5% and 5.0%, the spread between minimum and maximum Calcium can be no more than 1%.

Minerals containing high levels of calcium are insoluble in liquids, so when we put calcium into a liquid feed, it must be stabilized with a costly suspending agent. Therefore, calcium is not used as a filler in liquid feeds, but only as a supplemental nutrient when needed.

{10} Because most (if not all) feed sources of Phosphorus are expensive, there is little chance that phosphorus will be under-guaranteed on purpose. For this reason, phosphorus is guaranteed at its minimum (not less than) amount. It is not required to guarantee the phosphorus level, nor is there a requirement to guarantee the other macro minerals such as Potassium or Magnesium.

{11} Salt (as NaCl) must be shown on the label if it is added. Salt can be in the feed without being in the ingredient listing, because state laboratories analyze only for the chloride ion, and assume that the total chloride is from sodium chloride (NaCl). Sodium chloride is the salt we use on our food, and contains roughly 60.6% Chloride. Because it is inexpensive, the minimum and the maximum must be shown. *Salt is another example of a nutrient that can be used as a "filler" in dry feeds.*

Most free-choice mineral supplements are formulated to utilize an animal's natural appetite for salt to drive appropriate levels of mineral intake. Excessive salt in a separate protein or energy supplement can discourage consumption of these important nutrients.

Salt is usually not used as a filler in liquid feeds. The reasons for using it are for nutritional requirements in feedlot or dairy feeds, to help with low temperature handling, or to help restrict intake.

{12} Trace mineral guarantees are not required, unless the feed is represented as a principal source of these minerals. If trace elements are guaranteed, they should be guaranteed as a minimum amount (not less than), and most states require them to be shown in PPM (parts per million) or in milligrams per pound.

The names of the trace minerals are long and there are a lot of them, so an ingredient list can be lengthened and made imposing looking if they are included. But if the levels are not guaranteed, there is no way to know if any useful amount of the traces was included.

{13} Vitamins must also be guaranteed as a minimum amount. Vitamin guarantees on feeds intended for ruminants are usually limited to fat soluble (A, D, E) vitamins. In special circumstances, B vitamins such as thiamin or biotin may be of value in a liquid feed, but usually they aren't needed.

{14} Other nutrients such as amino acids can be guaranteed. Mr. Bojacks is guaranteeing glycine. Glycine is an amino acid, and most people realize that proteins are made of amino acids, so it might seem to be a good thing. However, glycine can be synthesized by the animal so there is no requirement. This guarantee is meaningless tag dressing.

{15} Sugar - Total Sugar as Invert (TSAI), - must be guaranteed on liquid feed labels in many states, generally those states in which sugar cane or sugar beets are grown. This may make products containing ingredients resulting from the partial desugaring of molasses, or from fermentation reactions, seem inferior to products in which the primary liquid ingredient is molasses. However, invert sugar is only one form of carbohydrate (source of energy) in liquid feed products. Other carbohydrates cannot be guaranteed because they cannot be assayed for. Dry feeds contain almost no sugar, but certainly do contain energy. A more complete indication of the energy content of a liquid feed is the dry matter content less the ash. Westway has a spreadsheet which can help estimate energy in any feed – liquids, pellets, cubes, and blocks. It helps show that liquids contain more energy than that which comes from the sugars alone, and it shows the drop in energy when fillers are used in dry feeds.

{16} Note that in the example, Lactose is shown in addition to the invert sugar. Lactose is milk sugar and can be found in condensed whey. About half the sugar content of lactose will be picked up in the assay for Total Sugar as Invert. The true sugar content of this example is about 26% (22% TSAI + 4% of the lactose). One liquid feed company uses this statement on its tags, expecting people to add all the lactose to the TSAI and get 30%.

{17} Dry Matter and/or Moisture must be shown on liquid feeds in many states. This shows what percentage of the feed contains nutrients, and gives information to buyers about the nutrient density of the product. However, *this requirement discriminates against liquids in favor of dry feeds, because dry feeds also contain moisture - usually at least 12%. Some "dry" blocks contain 25% water.*

{18} Not guaranteed are items for which no chemical analysis can be performed. This excludes all references to energy, which can only be fairly determined by extensive, well-controlled feeding trials. For example, a TDN guarantee is illegal.

Some feed tags guarantee only what is required, and nothing more. This frees them from the scrutiny of state feed controls and allows them to put in little or none of a nutrient. The ingredient list may show a nutrient source, but without a guaranteed amount, almost none has to be present.

{19} The Ingredients listing may be even more informative than guarantees regarding quality. All feed label regulations require an ingredient listing. It is commonly believed that the ingredients must be listed in order of amount used in the formula. This is true in pet food and human food labeling, *but not in livestock feeds*. It is customary to list ingredients in that order, but it isn't required.

Collective Terms allows grouping ingredients derived from similar sources under one name. This lets a manufacturer change ingredients within the group without changing the tag. For example, 45 ingredients are in the Animal Protein Products group. Included are hair, leather, feathers and the more ordinary feeds such as blood meal and fish meal. None of these need to be identified individually. The manufacturer can switch from Fish Meal to Hydrolyzed Leather Meal without changing the tag because both are under the Animal Protein Products group. Besides Animal Protein Products, there are six other groups under which an ingredient may be included. They are Forage Products, Grain Products, Plant Protein Products, Processed Grain Byproducts, Roughage Products, and Molasses Products.

In this example tag, we see the group "Molasses Products". This is the only group that can effectively be used in liquid feeds because it is the only group with more than one liquid ingredient. All other groups have one or no liquid ingredients, and are therefore useless for liquid feed labeling. *Group labeling is an aid to dry feed manufacturers, but of very little use for liquid feeds.*

While 'molasses products' may represent cane or beet molasses, it can also cover multiple byproducts of molasses processing and fermentation. When this is seen on a tag, the sugar guarantee can help determine how much, if any, actual molasses is present.

Mineral form is important because of differences in bioavailability between different sources. *Oxides and carbonates are less available than sulfates but are approved feed ingredients*. Liquid supplements typically use sulfate forms of trace minerals because they are soluble, and are therefore more available to the animal.

Non-nutritive ingredients may include suspension agents, handling aids, or preservatives. Attapulgitic clay is a suspending agent used at from 1 to 1.5% of the mix. It has no nutritional value. Mr. Bojax may be using it because his dry matter is so low he needs it make his product look thicker.

{20} Labels must also show Warnings and Directions for Use which are appropriate. Except for the required statements for medicated feeds, these directions are up to the feed manufacturer.

Directions for use are required on mixed feed labels. These can be printed on the back of the label, if the front of the label contains a notice that the directions are on the back. Printing directions for use on a label is a good practice to help minimize liability claims. It's sad but true that any feed company may be held liable for the mistakes and poor management of any of its customers, so even if there were no regulation for printed directions for use, it would be a good idea to add them to the label. This is why it is important for the end user to have a tag.

Medicated feed labels must show the amount (percent, grams per ton, etc.) of the medication, the purpose of the medication and directions for use and withdrawal period, if any. If there is any doubt as to the proper application of such feeds, the drug company supplying the medication should be contacted.

{21} The name and address of the Manufacturer must be shown.

