

Vegetarian Chickens

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Vegetarian Chickens By Jim Bauermeister Nearly all commercial poultry feeds contain something euphemistically called "animal protein products." In her book, *Food Pets Die For*, Ann Martin describes just how this stuff is made:

At the rendering plant, slaughterhouse material, restaurant and supermarket refuse, dead stock, road kill and euthanized companion animals are dumped into huge containers. A machine slowly grinds the entire mess. After it is chipped or shredded, it is cooked at temperatures of between 2200 and 2700 F. for twenty minutes to one hour. The grease or tallow rises to the top, where it is removed from the mixture. This is the source of animal fat in most pet food. The remaining material, "the raw," is then put into a press where the moisture is squeezed out. We now have meat and bone meal.¹

This meal is mixed into poultry feed along with some fat and a long list of multi-syllable preservatives to keep it from becoming rancid. In the commercial poultry industry there is a more direct connection between being fed and becoming feed. Dead broilers are picked up every morning, frozen, then shredded and fed back to their brothers and sisters, feathers, bones, guts and all.² Now I'm all in favor of recycling, but this is about as organic and natural as sewage sludge. If you are what you eat, you are also what your food eats.

Thinking about it is enough to make one become vegetarian. Yet there is an alternative: convert your chickens to vegetarianism.

Trouble is, most poultry books include meat and bone meal as one of the main ingredients of home-mixed feed formulas. This is because meat is a highly concentrated, well-balanced protein that contains all essential amino acids. But just as human vegetarians are able to balance their diets, you can make good chicken feed by combining "complementary proteins." Proteins are the basic building blocks of muscles, bones, feathers, etc. Young, rapidly growing birds need high levels of easily digestible proteins.

Table 1: General Nutrition Requirements³

Approximate age (weeks)	Crude Protein	Calcium	Available Phosphorous
Laying Chickens			
Starter (0-6) Grower (6-17)	18	.9	.45
	16	.8	.45
Pre-Lay(17-19)	17	2.0	.45
Laying (<19)	17-19	3.8-4	.45
Broilers and Roasters			
Starter (0-3 or 4)	23	1.0	.45
Grower (3-6)	20	1.0	.45
Finisher (6-8)	18	1.0	.45
Turkeys			
Starter (0-3)	28	1.20	.60
Grower 1 (3-6)	26	1.00	.50
Grower 2 (6-9)	22	.85	.42
Grower 3 (9-12)	19	.75	.42
Finisher 1(12-15)	16.5	.75	.42
Finisher 2 (15-18+)	16	.75	.42
Commercial Meat Ducks			
Starter (0-2 or 3)	19-22	.65	.40
2 or 3-7	16-17	.60	.30
Commercial Meat Geese			
Starter (0-4)	20	.65	.30
<4	15	.60	.30

As they grow protein requirements decline (See Table 1). Proteins are composed of amino acids. Creatures need the right balance of amino acids to facilitate good health and growth. An all-grain diet would be severely lacking in several essential amino acids. While most legumes are high in protein, they are low in some amino acids. Fortunately, some grains contain these missing ingredients. Unfortunately, piecing together a balanced formula can become quite complicated. Just try reading the National Research Council's Nutrient Requirements of Poultry without your eyes glazing over.

But rather than develop your own formula from scratch, you can build on the efforts of others. Below are several tried and true formulas used by poultry growers across the continent. A caveat: while corn, barley and wheat are similar in their carbohydrate values, the quality and quantity of their proteins can vary considerably. There is even considerable variation between different varieties of the same grain. Hard red wheat has a much higher protein content than soft white. And some years, due to climatic conditions, the protein content of a grain may be down several percentage points. Using a lower protein grain in a formula will require slightly more high protein legumes. Always mix feed by weight, not by volume-- a bushel of corn weighs 56 pounds, while a bushel of oats is just 35.

It's best that one type of grain not comprise the entire grain portion of a ration. A mixture will help to ensure a better nutrient balance. New grains should be added incrementally to the diet. Whole grain may be fed to birds after four weeks of age, provided it is gradually added to the

feed so the gizzard can adjust to the extra work. Young birds can not digest rye but a layer ration can contain up to 20% of the grain provided it is not contaminated with ergot fungus.

Most non-meat poultry formulas use soybean meal as the main protein source. It has a much higher protein level (45%) than peas (21%) or alfalfa meal (24%). However, soybeans must be heat treated to deactivate a substance that can inhibit certain amino acids. Last year nearly a third of U.S. soybeans were grown from genetically engineered seed. Since soybeans are not much grown in the Pacific Northwest, finding an organic source of the meal may be a challenge. Fava beans (25% protein), low-alkaloid lupine seed (32%), sunflower meal (33%) and flaxseed (21%) could be viable alternatives if some grain grower wanted to tap a wide open market for organic feeds. Note: fava beans contain compounds which can cause a reduction in egg size and yolk membrane fragility. Favas are safe for broilers, young pullets and other non-laying birds. The calcium source for layers and broilers may be oyster shell, limestone or bonemeal.

The formula in Table 2 is from Joel Salatin's *Pastured Poultry Profits*.⁴ Chris Wieck is a Texas farmer who raises broilers in a big old barn. Although his formula relies on just one grain, triticale is a cross between wheat and rye and exceeds both its parents in feed value. Wieck adds .06% calcium and .012% XP4 phosphorus as well as vitamins to the ration.

Table 2: Wieck Formula⁴

Triticale	70%
Soybean meal	25%
Alfalfa Pellets	05%

I can personally attest to the efficacy of Wieck's formula, although I substituted hard red winter wheat for the triticale and added sunflower seeds and cull peas. I noticed, however, that the broilers and turkeys tended to eat around the alfalfa pellets. I wasn't too concerned about this because the birds were on a pasture with a quantity of green alfalfa.

Joel Salatin himself has switched to a vegetable protein ration since the publication of the 1996 edition of *Pastured Poultry Profits*. He says the new feed has eliminated his hospital pen, the birds are "clean and white with the pinkest skin I've ever seen."

Table 3: Salatin Formulas⁵

	Broiler	Layer
Ground corn	31.5%	30%
Cracked Corn	19.4	20
Roasted soybeans	30	31
Crim edoats	11	11
Sea-lac	3.6	-
Nutri-balancer	3	3
Lime	1	5
Kelp meal	.5	.5

The Sea-lac in his formula contains low-heat fish meal. The Nutri-balancer is a mix of vitamins and minerals. Joel adds one dozen hard boiled eggs per 300 chicks/day for the first week.

Jonda Cosby has put a lot of thought into the rations she and her partner Nancy Matheson market under the "Ain't Just Chicken Feed" label in Western Montana. Jonda has carefully researched amino acid balances as well as the micro nutrient requirements of poultry to come up with the poultry grower mixes in Table 4 and the layer rations in Table 5. The "premix" in Layer

Mix #1 contains kelp meal, diatomaceous earth, calcium, and other essential minerals and vitamins. They obtain the premix from Kreamer Feed (see resources). The unique thing about the “Ain’t Just Chicken Feed” formulas is that three out of four of them are based primarily on feed grains that can be grown in the Northwest—although finding a source of flaxseed might be as challenging as coming up with organic soybean meal. Jonda—and many other poultry farmers—caution against feeding growing chicks more than 6 percent flaxseed or 5 percent of the more concentrated linseed meal (a byproduct of making linseed oil from flax). However, flaxseed can improve the nutritional composition of eggs by increasing the omega-3 content and some Canadian egg producers feed their layers 15-20 percent flaxseed (see Growing Flax page 11).

Table 4: Grower Mixes

23% Protein Mix	#1	#2
Wheat	30%	55%
Barley	30%	13%
Soybean meal		16%
Peas	21%	-
Alfalfa Meal	10%	7%
Flaxseed	6%	5%
Limestone	1%	1%
Kel Meal	2%	2%
Diatomaceous Earth	1%	1%

Table 5: Layer Mixes

Mix	#1	#2
Wheat	25%	30%
Barley	22%	33%
Premix	10%	-
Peas	21%	21%
Flaxseed	6%	6%
Alfalfa Meal	10%	10%
Limestone	1.5%	

The layer mixes in Table 5 contain everything hens need to produce lovely brown eggs. Jonda says the alfalfa meal “is especially nice for dark yellow egg yolks.” They make the meal by grinding alfalfa pellets. The barley used in these rations was unusually high in protein (16.6%). Most feed tables list barley at 8-10% so a farmer may need to add a bit more wheat, peas or soybean meal to make up the difference. Layers on good

grass-legume pastures will do well on the basic layer mix (#2), although they will need to have free-choice access to ground oyster shell.

Poultry on pasture, or running around loose, may self-select a third or more of their diet. There is no way for the farmer to know, exactly, what her birds are eating. While this might drive a poultry nutrition specialist nuts, an observant farmer will be able to tell how the poultry are doing based on their appearance and behavior.

Although one Washington hatchery severely warns its customers against feeding Cornish-cross anything other than a commercial broiler ration, many small farmers have had success with the breed by supplementing its feed with lactobacillus (probiotic), brewers yeast, alfalfa meal, kelp meal and vitamins. The first four weeks are especially crucial for any breed, chicken or turkey. Confined poultry need a supplemental source of Vitamin D if they are unable to receive it directly from the sun. (It wasn’t until vitamin D was discovered in the 1920s that poultry could be raised in confinement).

Chickens are very omnivorous creatures that seem to survive on anything (I don’t think I’d want to pass out near a hungry flock of ‘em). However, producing quality eggs and meat requires quality feed. It is the ration, probably more than anything else, that is responsible for the incomparable flavor of small farm raised poultry and eggs.

Jonda Cosby, co-owner of Two Chicks Scratching, Helena, MT, provided considerable assistance for this article. Thanks also to Karen Gilbert of Middle Farm, Lopez Island.

Resources: *The best source for information on the nutritional composition of feeds has been, since 1898, Morrison ‘s Feeds and Feeding, frequently revised and available in dozens of editions. A very technical description of chicken feeding is Nutrient Requirements of Poultry by the National Research Council, National Academy Press, 1994. www.nap.edu. Nutri-balancer and Sea-lac are available from The Fertrell Company; Box 265; Bainbridge, PA 17502; 717-367-1566; www.fertrell.com. “Premix” is available from Kreamer Feed; Box 38; Kreamer, PA 17833; 800-767-4537. Probiotic is available from Twenka Daves; 21353 S Fishers Mill Rd. Oregon City, OR 97045; 1-800-437-8872. Organic poultry feed can be obtained from In Seasons Farms;*

27831 Hunnington Rd, Abbotsford, BC V4XJB6; 604-857-5781 and Ocean Sky Farm, 5191 Taylor Ave NE; Bainbridge Island, WA 98110; 206-842-7431; scook21809@aol.com

1 Ann N. Martin, Food Pets Die For, New Sage Press, Troutdale, OR 1997.

2 Lisa Moore LaRoc, "Ozarks Harmony," National Geographic, Vol. 193, No. 4, April 1998, p. 91.

3 Wendy Clark, POULTRY FACTSHEETS #2 GENERAL NUTRITION, Dept of Animal & Poultry Science University of Saskatchewan 72 Campus Drive Saskatoon, Saskatchewan, S7N 5B5
www.agr.gov.sk.ca

4 Joel Salatin, Pastured Poultry Profits, Polyface, Inc. Swoope, VA© 1993

5 Joel Salatin, On-farm Research and Snake Oil! APPPA Grit!, Vol. 1, Issue 2, Summer 1997; American Pastured Poultry Producers Association 5207 70th St; Chippewa Falls, WI 54729; 715-723-2293; dkaufman@discovernet.net