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Website: extension.sdstate.edu

Phone: 605-688-4792

Email: sdsu.extension@sdstate.edu

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Cooperative Extension Service

FEEDING CHICKENS



Feeding Chickens

In South Dakota, most of the poultry feed is used for raising replacement pullets and feeding layers. It takes about \$8 million worth of feed to raise the egg production replacement flock for the state each year and an additional \$17 million to produce the egg crop. As a result, more formula feed is used for poultry than for any other single class of livestock.

Getting the right nutrients to the birds in an efficient and practical form requires the teamwork of many people. The nutritionist must keep up to date in the research field to be able to prescribe the latest and most efficient requirements of nutrients in the formulas. The feed mixer keeps in constant contact with research to know which ingredients to use and how they should be mixed. He should have adequate equipment to build the formulas according to the specifications handed to him by the nutritionist. Finally, the flockowner needs to supply the right feed to the chickens in the right amounts.

Table 1 is a brief summary of the important components of a poultry diet. These are the building blocks the nutritionist uses in building poultry formulas.

STARTING THE PULLETS

Start young pullets on feed between 24 and 48 hours after they are hatched. The first feed can be rolled oats or cracked corn. Let them fill up on this for 5 or 6 hours. A low protein feed such as this will minimize sticky droppings or "pasting" trouble.

A balanced diet is essential after the first feeding period. A good quality chick starter is usually ade-

By **Boyd Bonzer**, Extension Poultryman, **C. W. Carlson**, Professor of Poultry Husbandry, and **R. W. Peiper**, Assistant Extension Poultryman.

quate. However, a prestarter feed fortified with high vitamin and antibiotic levels may get the chicks off to a faster start under stress conditions.

Starter feed should be available to the birds at all times until they are 8-10 weeks of age. Birds can start eating whole grains in small amounts at about 6 weeks of age where this fits into feeding system recommendations.

GROWING THE PULLETS

At 10 weeks of age, the pullets may go on one of various feeding systems. These vary from the simple program of cafeteria feeding (18% to 27% protein mash, crumbles, or pellets and grain) to an all-mash diet containing about 12% to 15% protein.

Some folks prefer restricted feeding systems which involve either restricting the amount of feed or the availability of nutrients in the feed through the use of low energy or high fiber ingredients. The system to use here is dependent upon the grower's preference. Restricting the amount of a regular high energy feed requires that attention be given to the feed consumption records. The feed should be restricted to about 70% of normal or no more than 12-14 pounds of feed per 100 pullets per day, depending on age.

When using the low energy or high fiber feeds given in table 2, the chickens should be allowed to eat all the feed they want. They may consume great amounts, and some poultrymen have objected to the increased labor requirement for handling the feed.

The low energy feeding system does not retard sexual maturity like the restricted high energy or the high fiber system, and the birds will lay small eggs when production starts.

A reduction in laying house mortality is usually experienced when either of the feed restriction systems are used.

Any one of the systems can be used to do a good job. Follow instructions given by the feed manufacturers implicitly. This is important because pullets need an abundance of certain minerals and vitamins which cannot be obtained in a haphazard manner of feeding.

FEEDING THE LAYING HENS

Maximum performance at minimum cost is the guiding principle for producing eggs. For Leghorn-type pullets, the maximum nutrient intake should produce the best returns. Thus, a balanced feed must be available at all times—and all hens must be able to eat when they are hungry.

Various feeding systems are used, which in most cases are about equal for egg production. Four systems are: all-mash as mash, pellets, or crumbles; mash with pellet supplements; 18% to 22% protein mash with whole grain; or 26% to 27% protein

mash fed with whole grain. These are all satisfactory feeding systems when used properly.

The all-mash system is rapidly becoming popular with the increased use of mechanical feeders and bulk handling. Most quality controlled egg programs require that an all-mash ration be fed.

There is evidence that up to a 10% increase in feed efficiency can be obtained from the all-mash systems compared to grain with mash systems, though egg production may not be greatly affected.

Whether a poultryman should use commercial all-mash feed, a commercial concentrate to mix with his own grains, or attempt to mix a complete ration according to formulas available through his county agent or Extension specialist, is largely a matter of availability, cost of ingredients, and the person's preference. A means of obtaining the proper feed by one poultryman may not be most economical or desirable for another.

It is usually impractical for a flockowner to own facilities for mixing such ingredients as 1 gram of

Table 1. Some Components of Poultry Diets

NUTRIENT	VALUE*	SOURCES
Carbohydrates and fats	Energy, convert to body and egg fat	Cereals, by-products, animal and vegetable fats and oils
Proteins—Essential amino acid†	Muscle, egg yolk and white, blood constituents, etc.	Soybean meal, meat scraps, fish meal
Water	55-70% of egg and body weight	Fresh water
Minerals‡—		
Calcium	Skeleton, egg shells, body fluids (rickets)	Oyster shell, limestones
Phosphorus	Skeleton, body fluids (rickets)	Bonemeal, various phosphates (rock or dicalcium)
Manganese	Normal bone formation (perosis)	Manganese sulfate
Iodine	Normal thyroid function (goiter)	Iodized salt
Sodium	Ionic balance of body fluids	Iodized salt
Chlorine	Ionic balance of body fluids	Iodized salt
Zinc	Normal bone formation (enlarged hocks)	Zinc chloride (or sulphate)
Vitamins‡—	All necessary for rapid growth	
A	Normal surface tissues, general condition	Fish oils, alfalfa, yellow corn, synthetics
D	Normal bone formation (rickets, thin shells)	Fish oils, synthetics
E	Anti-oxidant—nervous tissue (crazy chick)	Whole cereals, green feeds, synthetics
K	Normal blood clotting (hemorrhage)	Green feeds, synthetics
Riboflavin	Good hatchability (curled toes)	Milk or fermentation by-products, synthetics
Cobalamine (B ₁₂)	Good hatchability	Animal proteins and fermentation by-products
Niacin	General condition (broken feathers—perosis)	Wheat by-products, synthetics
Pantothenic acid	General condition (dermatitis)	Cereal grains, synthetics
Choline	General condition (perosis—fatty liver)	Soybean meal, synthetics
Drugs—(Not essential)		
Antibacterial agents	May increase growth rate, feed efficiency, egg production or hatchability	Fermentation by-products Microbial growth, synthetics
Tranquilizers	Anti-stress agents, e.g. layers in hot weather, crowding, etc.	Synthetics
Coccidiostats	Allow development of immunity with no mortality	Synthetics

*Items in parentheses are deficiency symptoms.

†Five amino acids may at times be deficient—arginine, glycine, lysine, methionine and tryptophane.

‡Only those of much practical importance are listed.

Table 2. Recommended Feed Formulas (Lbs. per Ton)

INGREDIENTS	STARTER DIETS (0-10 wks.)		GROWER (10-20 wks.)				LAYING DIETS		BREEDER	
	Replace- ment	Broiler	All-mash				All- mash	Egg breaker†	Free choice*	Mash
			Regular	Low energy	High fiber	Free choice*				
Ground yellow corn‡	1,229	993	1,490	—	—	420	1,449	1,109	240	1,424
Oat hulls	—	—	—	—	550	—	—	—	—	—
Ground oats	—	—	—	1,610	1,000	400	—	—	60	—
Wheat midds	—	—	—	100	100	100	—	—	600	—
Soybean meal (50%)	—	740	—	—	—	—	—	—	—	—
Soybean meal (44%)	500	—	240	40	100	600	260	200	300	220
Meat scraps	100	—	100	40	40	100	100	100	300	100
Alfalfa meal (17%)	40	—	40	40	40	120	40	—	120	40
Alfalfa meal (20%)	—	20	—	—	—	—	—	400	—	—
Fish meal	40	40	20	20	20	30	—	—	120	20
Dried whey	40	40	40	40	40	100	—	—	120	40
Dicalcium phosphate§	30	40	30	60	60	80	30	30	80	30
Salt	10	10	10	10	10	20	10	10	30	10
Limestone	—	—	20	30	30	—	100	100	—	100
Methionine	1	2	—	—	—	—	1	1	—	1
Yellow grease¶	—	100	—	—	—	—	—	—	—	—
Vitamin supplement/	10	15	10	10	10	30	10	10	30	15
Calculated % protein	20	25	16	14	12	26	16	16	26	16

*To be used free-choice with grain such as corn (2 parts) and oats (1 part). Oyster shells and granite grit should be available at all times, granite grit also with all-mash rations.

†To be used only for production of dark-yolked eggs. Fresh high quality alfalfa meal is essential as is new crop yellow corn. Also algae meal, xanthophyll concentrates, corn gluten, and synthetic pigments may be used according to manufacturers' directions.

‡Other cereal grains, such as oats, could replace corn in these diets, except for 0-4 weeks. Lower feed efficiency would result, but such low energy diets may be desirable for replacement stock.

§Any high grade phosphorus containing product can be used. Availability and content of phosphorus must be considered.

||Salt containing 0.5% manganese, 0.5% zinc, and 0.1% iodine or a near equivalent.

¶Stabilized animal fat—yellow grease preferred to tallow.

/Vitamin and antibiotic supplement:

Ingredient	Amt. in 10 lbs.	will supply
Vitamin A	4,800,000 I.U.	(per lb. of total feed) 2,400 I.U.
Vitamin D ₃	1,250,000 I.C.U.	625 I.C.U.
Vitamin E	10,000 I.U.	5 I.U.
Menadione (Sodium Bisulfite)	1 gm.	0.5 mg.
*Riboflavin	4 gm.	2.0 mg.
*Pantothenic Acid	8 gm.	4.0 mg.
Choline	100 gm.	50.0 mg.
*Niacin	24 gm.	12.0 mg.
Cobalamine (B ₁₂)	8 mg.	4.0 mcg.
Santoquin (or BHT)	100 gm.	50.0 mg.
*Antibacterial Agent ^{1,2,3}	+	+

¹Only ingredients needed in grower rations if outside range and ample green forage are provided.

²This could be any one of the following, per 10 lbs. of supplement: (Check for F.D.A. approval)

10-25 gm. Aureomycin, Terramycin, Tylosin or furazolidone (nf-180), or penicillin-streptomycin or penicillin-bacitracin mixture

2-4 gm. zinc bacitracin, Oleandomycin, or Erythromycin.

45 gm. 3-nitro, 4-hydroxyphenylarsonic acid (30 gm. for broiler or breeder).

90 gm. arsenic acid (60 gm. for broiler or breeder).

³For therapeutic treatments, 50 to 200 gm. of Aureomycin, Terramycin, Tylosin, furazolidone (nf-180), or the penicillin mixtures could be used.

*A coccidiostat should be used in starter diets according to the manufacturer's directions.

riboflavin or 5 grams of an antibiotic in a ton of feed. Some find it economical to mix commercial concentrates with home grown grains. Some farmers own the mixing equipment; others rely on portable mills or local commercial mixers.

Those who do not have their own grains can often purchase the complete feed for less than it would cost for the ingredients, charges for mixing, and the value of time involved in hauling and mixing.

RECOMMENDED FEED FORMULAS

Table 2 shows one set of recommended formulas for the South Dakota area.

If you decide to mix formulas, be certain to use the exact ingredients in the specified amounts. A change in any formula, no matter how minor it may seem, should be cleared with its originator.

An egg breaker mash is included in the formula

table for flocks producing eggs for a special breaker market. Such a feed should not be used to produce eggs for the table egg market, since the yolks will be dark and downgrading may result. It will take about 10 days to 2 weeks on this feed for the maximum dark yolk color to be produced, and dark yolked eggs will be produced for 3-4 weeks after the hens are returned to a more normal feed.

Some table egg markets may object to the color of yolks produced with 72% corn, as the regular all-mash feed contains. If so, it is permissible to replace part of the corn with oats, barley, proso millet, or milo. However, except for milo, no more than 500 pounds of these grains should be used per ton.

Substituting high fiber feeds such as oats, barley, and proso millet will lower feed efficiency, increase water consumption, and increase the volume of droppings.

Table 3. Feeding Suggestions and Equipment

	FEED	KIND OF EQUIPMENT	AMOUNT OF EQUIPMENT
Starting period 0-10 weeks	Oat meal or cracked corn (5 to 6 hours)	Clean egg flats for 3 or 4 days and cut down chick boxes to 10 days.	Four egg flats or 1 box per 100.
	Starter	Round hanging feeders, trough type or automatic feeders.	2-3 round hanging feeders or 5 feet of automatic trough or two 5-foot trough type per 100 birds.
	Grain (if fed, from 6-10 weeks)	Place in mash feeders or in litter.	
Growing period 10-20 weeks	Chick size grit	Sprinkle on feed twice a week.	
	Water	1-quart glass fountains first 10 days. Larger or automatic fountains after 10 days.	2 per 100. 1 to 200 birds.
	All-mash or mash and grain combination (12-16% protein in total ration)	Range—Feeders that will protect the feed from wind and rain. Confinement—Round hanging feed- ers, trough type or automatic feeders.	Four 5-foot trough feeders or 4 round hanging feeders per 100 or automatic, according to manufac- turer's directions.
	Medium size grit and oyster shell	Grit and shell hoppers.	1 round hanging feeder per 500 birds.
	Water	Large fountains or automatic water- ers.	1 per 100, or automatic, according to manufacturer's directions.
Laying period	All-mash or mash and grain in sev- eral combinations (about 16% protein in total ration)	Round hanging feeders, trough type or automatic feeders.	4 round hanging or four 5-foot per 100, or automatic, according to manufacturer's directions.
	Hen size grit and oyster shell	Grit and shell hoppers.	1 round hanging feeder of each per 500 birds.
	Water	Automatic fountains.	According to manufacturer's direc- tions. Within 10-12 feet of feed in all areas of the house.