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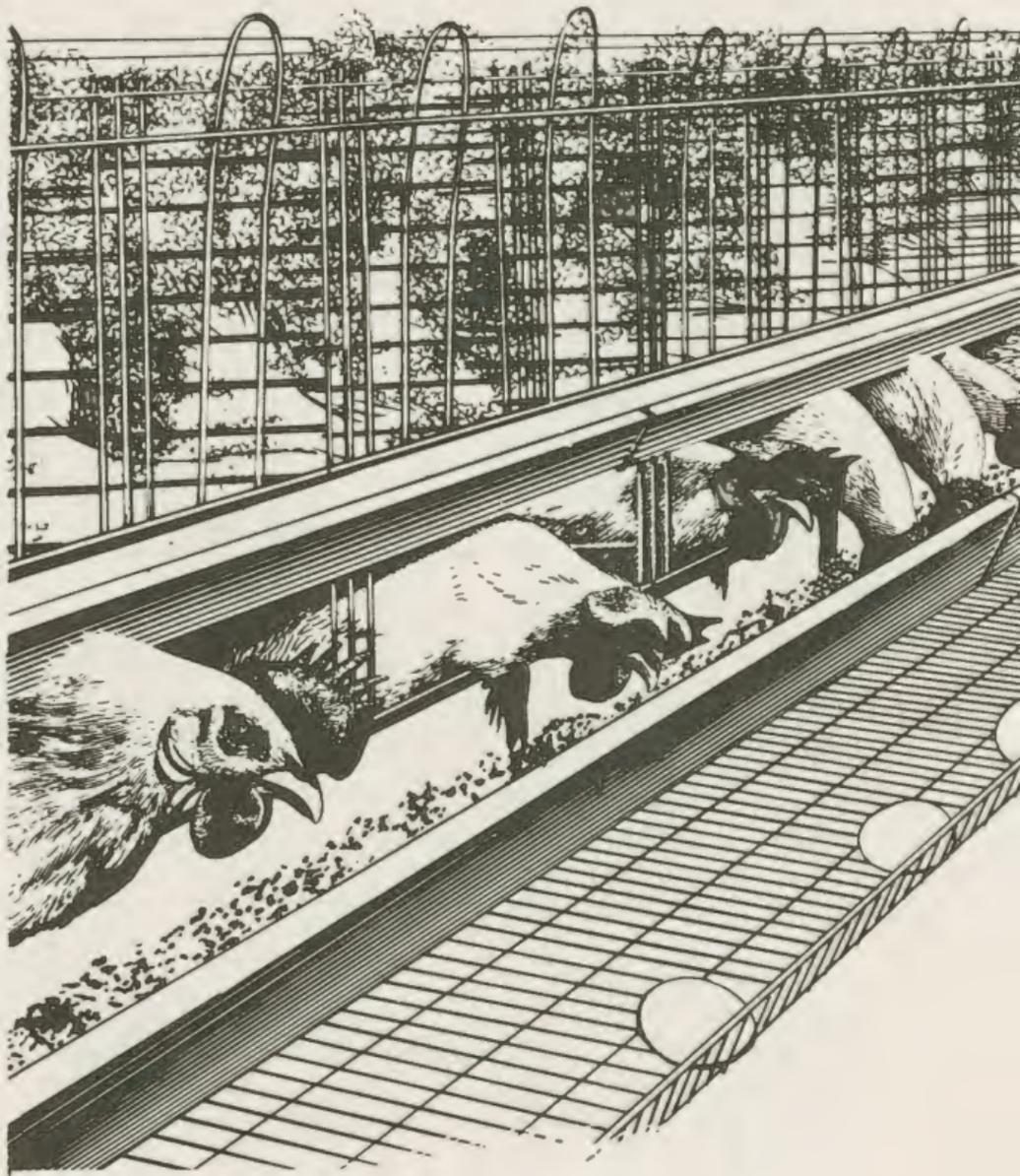
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Feeding Chickens



Cooperative Extension Service
South Dakota State University
U. S. Department of Agriculture

FEEDING CHICKENS

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In South Dakota, most of the poultry feed sold is used to raise replacement pullets and feed layers. It takes about \$5 million in feed to raise the egg production replacement flock for the state each year and an additional \$16-20 million worth to produce the egg crop.

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 formulas to provide the required nutrients in the most efficient way. The feed mixer keeps abreast of 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 nutritionist's specifications. Finally, the flockowner needs to supply the right feed to the chickens in the right amounts and at the right time to do the right job.

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 to 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 adequate. 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 be fed 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 several feeding systems. These vary from the simple program of cafeteria feeding (18% to 27% protein mash, crumbles, or pellets, each fed with grain) to a complete feed containing from 10% to 15% protein.

Some prefer feeding systems which either restrict 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 depends 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 their age.

When using the low energy or high fiber grower feeds given in Table 2, the pullets 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 to the extent of the restricted high energy or the high fiber system in that the birds will lay numerous small eggs when production starts. No more than 8 hours of dim light daily should be provided during growth.

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

Any one of the systems can be used to do a good job. Follow instructions given by the feed manufacturers. It is important that pullets receive the correct amounts of the minerals and vitamins listed in Table 1.

FEEDING THE LAYING HENS

Maximum performance at minimum cost is the guiding principle for producing eggs. Up to 40 weeks of age a balanced ration must always be available and all hens must be able to eat when they are hungry. After peak production, some restriction of feed intake can optimize returns.

Various feeding systems are about equal for egg production. Four systems are: (1) A complete feed such as mash, pellets, or crumbles. (2) Mash or crumbles with pellet supplements. (3) 18% to 22% protein mixtures with restricted whole grain. (4) 26% to 27% protein concentrate fed free choice with whole grain. These are all satisfactory feeding systems when used properly.

The complete feed system is by far the most popular with the increased use of mechanical feeders and bulk handling. Quality controlled egg programs require that a complete 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 complete feed, a commercial concentrate to mix with his own grains, or attempt to mix a complete ration according to formulas in this fact sheet and those available through his county agent or Extension specialist, is largely a matter of availability, cost of ingredients or individual preference. A means of obtaining the proper feed by one poultryman may not be the most economical or desirable for another.

It is usually impractical for a poultryman with less than 50,000 hens to own facilities for mixing such ingredients as 1 gram of 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 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 use one of the 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. Do not use such a feed 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 wheat, oats, barley, proso millet, or milo. However, except for milo or wheat, no more than 500 pounds of these grains should be used per ton of feed.

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

TABLE 1. SOME COMPONENTS OF POULTRY DIETS

NUTRIENT	VALUE*	BEST SOURCES
Carbohydrates and fats	Energy, convert to body and egg fat	Cereals, by-products, animal and vegetable fats and oils
Proteins—Essential amino acids†	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)	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 (tremors)	Iodized salt
Zinc	Normal bone formation (enlarged hocks)	Zinc chloride (or sulphate)
Vitamins‡	All necessary for rapid growth	
A	Normal surface tissues (poor condition)	Alfalfa, yellow corn, synthetics
D	Normal bone formation (rickets, thin shells)	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 (death at 19-20 days)	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	Will increase growth rate and feed efficiency and possibly egg production or hatchability under stress	Fermentation by-products, microbial growth, synthetics
Tranquilizers	Anti-stress agents, e.g. layers in hot weather crowding, catching, and moving, etc.	Synthetics
Coccidiostats	Allow development of immunity with no mortality	Synthetics

*Items in parentheses are deficiency symptoms.

†Five amino acids most likely to be deficient are arginine, glycine, lysine, methionine, and tryptophane.

‡Only those of much practical importance for chickens are listed.

TABLE 2. RECOMMENDED FEED FORMULAS (LBS. PER TON)

INGREDIENTS	STARTER DIETS		GROWER (10-20 wks.)				LAYING DIETS			BREEDER
	Egg prod. pullets	Broiler	All-mash				All-mash	Egg breaker†	Free Choice*	Mash
			Regular	Low energy	High fiber	Free choice*				
Calculated % protein	20	25	16	14	12	26	16	16	26	16
Ground yellow corn‡	1,219	973	1,500			490	1,429	1,099	180	1,364
Oat hulls					600					
Ground oats				1,640	1,000	400			100	
Wheat midds				100	200	100			600	
Soybean meal (47%)	560	770	270	70	50	600	280	200	440	280
Meat scraps	100		100	40		100	100	100	300	100
Alfalfa meal (17%)	40		40	40	40	120	40		120	40
Alfalfa meal (20%)		20						400		
Fish meal (60%)		20								20
Dried whey	40	40	40	40	40	100			120	40
Dicalcium phosphate§	10	30	10	20	20	40	30	30	80	30
Salt	10	10	10	10	10	20	10	10	30	10
Limestone	10	20	20	30	30		100	100		100
Methionine	1	2					1	1		1
Yellow grease**		100						50		
Vitamin supplement††	10	15	10	10	10	30	10	10	30	15

*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 20% protein alfalfa meal is essential as is new crop yellow corn. Also marigold meal, corn gluten meal, and synthetic pigments may be used according to manufacturers' directions.

‡Other cereal grains, such as oats or barley, 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. Wheat or milo could be used pound for pound in place of corn.

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

||Salt containing 0.5% manganese, 0.2% zinc, and 0.1% iodine or a near equivalent.

**Stabilized animal fat, yellow grease preferred to tallow.

††Vitamin and antibiotic supplement.

TABLE 3. VITAMIN AND ANTIBIOTIC SUPPLEMENT

INGREDIENT	AMOUNT IN 10 POUNDS			
	Starter	Grower	Layer	Breeder
Vitamin A I.U.	2,000,000	2,000,000	4,000,000	4,000,000
Vitamin D ₃ I.C.U.	500,000	500,000	1,000,000	2,000,000
Vitamin E I.U.	5,000	5,000	5,000	10,000
Menadione (Sodium Bisulfite) gm.	1	1	1	1
*Riboflavin gm.	6	6	6	8
*Pantothenic Acid gm.	10	8	8	12
Choline gm.	150	100	100	100
*Niacin gm.	30	24	24	24
Cobalamine (B ₁₂) mg.	12	6	6	12
Santoquin (or BHT) gm.	100	100	100	100
*Antibacterial Agent ^{1,2,3}	+1,2,3	±1,2	±1,2	±1,2

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

¹This could be any one of the following, per 10 lbs. of supplement: (Check for FDA approval) 10-25 gm. Aureomycin, Terramycin, Tylosin, Bacitracin or furazolidone (nf-180), or penicillin-streptomycin or penicillin-bacitracin mixture, 2-4 gm. Oleandomycin, flavomycin, or Erythromycin, 45 gm. 3-nitro, 4-hydroxyphenylarsonic acid (30 gm. for broiler or breeder), or 40 gm. arsanilic acid (60 gm. for broiler or breeder).

²For therapeutic treatments, 50 to 200 gm. of Aureomycin, Terramycin, Tylosin, Bacitracin, furazolidone (nf-180), or penicillin mixtures could be used.

³A coccidiostat should be used in starter diets according to the manufacturer's directions.

TABLE 4. 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) Starter	Clean egg flats for 3 or 4 days and cut down chick boxes to 10 days Round hanging feeders, trough type or automatic feeders	Four egg flats or 1 box per 100 birds. Two to three 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	
	Chick size grit	Sprinkle on feed twice a week	
	Water	1-quart glass fountains first 10 days Larger or automatic fountains or drinking cups or nipples	2 per 100 birds 1 to 200 birds
Growing period 10-20 weeks	All-mash or mash and grain combination (10-16% 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 au- tomatic, according to manufacturer'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, cups or nipples	1 per 100, or automatic, according to manufacturer's directions
Laying period	All-mash or mash and grain in several 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 man- ufacturer's directions
	Hen size grit and oyster shell	Grit and shell hoppers	1 round hanging feeder of each per 500 birds
	Water	Automatic fountains, cups or nipples	According to manufacturer's direc- tions. Within 10-12 feet of feed in all areas of the house

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