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Nebraska 4-H Egg Production : Extension Circular 14-11-02

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Don K. Wiles

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Schultz, Elvin and Wiles, Don K., "Nebraska 4-H Egg Production : Extension Circular 14-11-02" (1956).
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1956

E.C. 14-11-02

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4-H EGG PRODUCTION

For
"Laying
Flock"
Project



EXTENSION SERVICE
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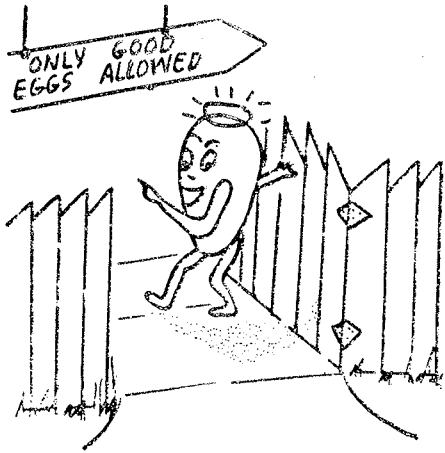
This manual is designed to help you with your 4-H Laying Flock project. You can produce eggs for commercial use or for hatching purposes. Records should be kept on the flock for a period of at least ten months.

Nebraska 4-H Egg Production

by
Elvin Schultz and Don K. Wiles*

SELECTING PULLETS

WHEN SHOULD I START MY LAYING FLOCK PROJECT? Start your Laying Flock project immediately after you have completed your Chick Rearing project. If you did not enroll in a Chick Rearing project, buy started pullets. They may be as young as eight weeks of age.



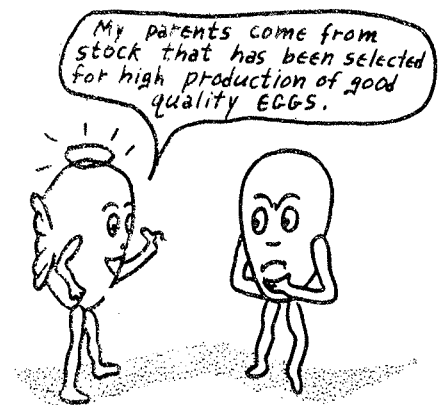
WHAT KIND SHOULD I START WITH? This will depend upon the purpose intended. For commercial egg production, select an egg producing strain or breed such as White Leghorn or any of the hybrid egg crosses. If you are planning to produce hatching eggs, consult your hatcheryman and find out what breeds and crosses are most practical in your community.

WHAT SHOULD I LOOK FOR WHEN SELECTING PULLETS FOR MY LAYING FLOCK? At the beginning of this project select the pullets individually. Keep only those birds that have the following characteristics:

1. Large, well-matured body.
2. Husky and well-fleshed body with firm, well fleshed breast.
3. Broad, flat back that carries its width throughout.
4. Vigorous head with bright, clear eyes and bright, waxy comb and wattles.
Cull out any bird that has a long, thin, narrow head with weak, dished eyes and any bird with a masculine head.
5. Soft and pliable abdomen.

For more information on how to select birds for production, see E.C. 14-05-2, "4-H Judging and Selecting Chickens for Production."

HOW MANY COCKERELS SHOULD A BREEDING FLOCK HAVE? Maintain six to eight cockerels for each 100 hens. Lightweight breeds do not require as many cockerels as do heavy ones. For example: provide 6 Leghorn roosters for each 100 Leghorn hens and 8 White Rock roosters for 100 White Rock hens.



*Assisting in the preparation of the manual were Howard L. Wiegers, E. A. Olson, Milo L. Mumgaard and Clarence H. Schmadeke; employees of the University of Nebraska College of Agriculture.

HOUSING

HOW SHOULD I PREPARE MY HOUSE FOR HOUSING? The house should be thoroughly cleaned and disinfected about two weeks before housing begins. Scrub the floor, lower part of walls and all equipment with hot lye water (1 ounce per gallon of water). Handle this solution with care. When dry, spray walls and floors with a reliable disinfectant. When preparing the solution, be sure to follow the manufacturer's instructions. If mites have been a problem, spray or paint the floor, lower walls and perches with DDT, Malathion, Lindane or some similar insecticide.

Built-up litter is generally preferred. (See "Handling Litter.")

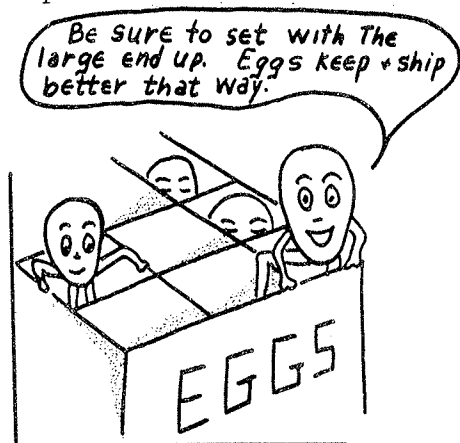
HOW MUCH SPACE SHOULD I ALLOW FOR MY LAYING FLOCK? Allow at least 3 square feet per bird. A house 20 x 30 feet will properly house 200 birds. Never crowd. Crowding tends to encourage cannibalism and feather picking and will lower your flock's egg production.

WHEN SHOULD I START HOUSING MY LAYING FLOCK? If your chicks are raised in confinement, you already have them housed. If they are raised on range or in some other building than the laying house, begin housing before 10 per cent of the birds start to lay. Because of weather conditions, all birds should be housed before October 1st.

ONCE HOUSED, SHOULD MY LAYING FLOCK REMAIN CONFINED? Yes, once housed it is best to keep the birds confined. Any sudden change in a laying flock's natural surroundings will result in lower egg production. Try to maintain the same conditions at all times.

The ideal temperature within a laying house is 55 degrees Fahrenheit with a humidity of about 70 per cent. During winter this temperature can be maintained by providing adequate space for the birds and adequate ventilation without drafts. During summer the temperature will naturally be higher.

WHAT ARE OTHER REQUIREMENTS OF A GOOD LAYING HOUSE: A good laying house provides ventilation without drafts, protection and light.



1. Ventilation without drafts can be provided by one of two methods: forced air or natural. Forced air ventilation is accomplished by the use of electric fans in the ventilation ducts. Natural or cross ventilation is attained by the use of open windows and ventilating ducts. If, when you enter the laying house, you notice the strong odor of ammonia or the presence of excessive moisture on the ceilings, the ventilating system is probably inadequate. Insulated walls and ceilings help to eliminate the accumulation of moisture.

2. Your laying flock must be protected from sudden changes in weather and from pests. The roof should not leak, the house should not have large cracks in the walls, the doors should close firmly, and the windows should be covered with 3/4-inch netting. The building should be rat-proof. Insulated walls and ceiling provide added protection against sudden weather changes.

3. Light is necessary and will be discussed in another part of this manual. (See "Using Lights for Layers.")

HANDLING LITTER

WHAT KIND OF LITTER SHOULD I USE? An ideal litter is one that is absorbent, dustless, harmless to the birds, low priced and provides good insulation. Several kinds

of litter are available; such as coarsely ground corn cobs, peat moss, wood shavings and chopped wheat straw. If wheat straw is used, chop into 3- to 4-inch lengths.

HOW DEEP SHOULD THE LITTER BE? The depth of the litter should be at least 6 inches, for a built-up litter.

HOW SHOULD I HANDLE THE LITTER? The litter should be kept loose and dry at all times. This can be done by proper ventilation, enclosed dropping pits, wire covered platforms for waterers, stirring the litter when necessary, and by not overcrowding the birds.

If the litter becomes wet, remove the very wet and replace with dry. Then correct the cause of wet litter. Hydrated lime is sometimes used to help keep the litter dry. Add hydrated lime at the rate of 1 pound per 15 square feet and stir thoroughly into the litter.

EQUIPMENT

WHAT EQUIPMENT DO I NEED? You need to provide your laying flock with feeders, waterers, roosts and nests.

WHAT KIND AND HOW MANY FEEDERS SHOULD I HAVE? Your feeders can be of the trough, round or mechanical type. Regardless of what type you use, it is better to have too many feeders than not enough. The extra feeders may save you enough feed during one year to pay for them.

If you use the trough type, provide at least 4 inches of feeder space for each small-breed hen and 5 inches for each large-breed hen. A 5-foot feeder will handle as many as 30 small or 24 large birds.

If you use round-type hanging feeders, plan to provide one feeder for 25 to 30 birds. Have the feeding space on a level with the bird's back.

If mechanical feeders are used, allow 1 foot of feeder space for every five or six birds.

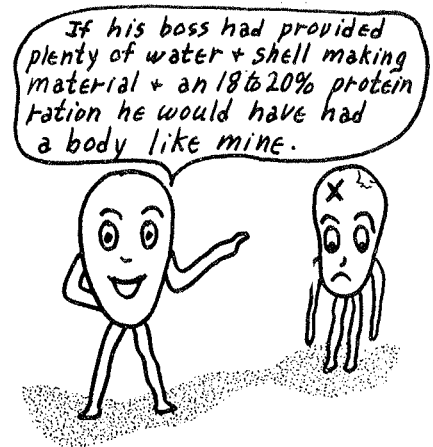
WHAT KIND AND HOW MANY WATERERS SHOULD I HAVE? Keep plenty of water available at all times. Chickens will consume about two pounds of water for each pound of feed. In other words, 100 laying hens in high production will consume 6 to 8 gallons of water a day.

Provide each 100 hens with two 5-gallon drinking fountains or one automatic waterer. During cold weather take the chill off the water. (Water should be about 50 degrees Fahrenheit, which is the water temperature in an average well.) The chill can be taken off by the use of an electric heating unit. Your hens should never have to travel farther than 10 feet to water.

Regardless of the type of waterer used, place it on a raised wire platform to keep the litter dry. If possible, provide a drain or a gravel-filled pit under the waterers.

WHAT KIND OF ROOSTS DO I NEED? Allow 7 inches of roost space for light breeds and up to 9 inches for heavy hens. Two-by-two-inch roosts spaced at least 14 inches apart are recommended. Locate the roosts over a dropping pit. Roosts should be 18 inches above the floor.

WHAT KIND AND HOW MANY NESTS WILL I NEED? A shortage of nests will result in dirty and broken eggs. Provide 20 nests or a community nest 2 feet by 10 feet for each 100 layers. Keep clean material in the nests at all times. Locate the nests in a dark area. Nesting material can be shavings, coarsely ground corn cobs, prairie hay or "dry bed" which is a lime stone product.



USING LIGHTS FOR LAYERS

HOW DO LIGHTS AFFECT MY FLOCK'S ABILITY TO LAY? Light stimulates the bird's pituitary gland which is located at the base of the brain. When stimulated this gland secretes a hormone into the blood stream. The hormone is then carried to the ovary and causes it to produce more ova (yolks.) This action starts or speeds up egg production.

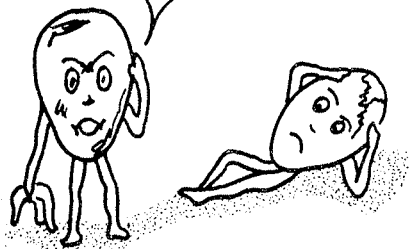
HOW MUCH WINDOW SPACE MUST MY HOUSE HAVE TO PROVIDE ENOUGH LIGHT DURING THE DAY? Laying houses should have one square foot of window space for each 12 square feet of floor space. However, with the use of artificial lighting throughout the day less window space is needed.

HOW MUCH DAYLIGHT SHOULD MY LAYERS HAVE? Layers should be provided with 13 to 14 hours of light, daily. If your birds are not receiving 13 hours of natural daylight, it will pay to provide either morning or evening lights. Continue using artificial lights throughout the winter until there are again 13 hours of daylight. As long as you use artificial lights, be sure to turn them on and off at the same time each day. Automatic time clocks are ideal for this purpose. On gloomy days or if your laying house does not provide enough window space, it is advisable to provide artificial light all day.

WHAT SIZE LIGHT BULBS AND HOW MANY BULBS SHOULD I USE? Provide one 60-watt bulb for each 200 square feet of floor space. Mount the fixtures on the ceiling. Space them 10 feet apart with the first lamp 5 feet from the end of the house. Locate the lights slightly in front of the roosts.

FEEDING

We are in this condition because the boss didn't provide the hens with enough nests + clean nesting material



WHAT SHOULD I FEED MY LAYING FLOCK? Start feeding a balanced ration containing 16 to 18 per cent protein, similar to the one you used when growing the pullets. When 50 per cent or more of the hens are laying, increase the protein content to about 20 per cent.

Most manufacturers offer a suggested feeding program for their feed. It is best to follow their suggestions. Do not attempt to mix your own feed, unless you are feeding a large number of birds and have the proper facilities for mixing.

HOW SHOULD I FEED MY LAYING FLOCK? There are three different methods of feeding laying hens which are commonly referred to as (1) Mash and Controlled Grains or 50-50 Mixture, (2) A 26 per cent Supplement Method and (3) All Mash System. Each of these methods is satisfactory, if properly applied.

1. Mash and Controlled Grains or 50-50 Mixture. This system uses both grain and mash. An 18 to 22 per cent protein mash is self-fed in feeders. Grains are hand-fed at the ratio of about 4 parts grain to 5 parts mash.

2. A 26 per cent Supplement Method. This is a free-choice feeding method of whole grains and mash. A 26 per cent protein mash is fed free-choice with one or more grains at a ratio of 1 part mash to 2 parts grain. The chief advantage of this method is that you can use more of the home-grown grains.

3. All Mash System. This is a complete ration that provides all of the essential nutrients to produce eggs and meat. This method saves labor and requires less skill.

HOW CAN I PREVENT WASTE OF FEED? To avoid waste of feed, do not fill the feeders more than half full. If a round hanging type feeder is used, it should be adjusted so

as not to waste feed. More feeders should be provided, if it is necessary to fill them oftener than twice daily.

HOW IMPORTANT IS WATER? Water is necessary to help the bird utilize the feed nutrients. About two-thirds of the bird's body and about two-thirds of an egg is water. If you want healthy birds and high egg production, provide water at all times. For information on how to provide water, see the part of this manual entitled "Equipment."

HOW IMPORTANT IS LIMESTONE GRIT AND OYSTER SHELL? Growing chickens need minerals in order to develop normal bones. Laying hens require more calcium than any other mineral, because the shell of the egg is almost pure calcium carbonate. For this reason you should provide limestone grit and oyster shell, free-choice, in separate hoppers at all times.

MARKETING QUALITY EGGS

WHY SHOULD I PRODUCE HIGH QUALITY EGGS? You are selling a product -- eggs. Because you are selling a food product, you are in competition with other producers of food for the consumer's money. The product that is placed on the market in the most attractive manner at a reasonable price will usually be the most frequently bought -- and the more often eggs are bought the greater your income will be.

WHAT IS A HIGH QUALITY EGG? A high quality egg is one that meets the following requirements:

1. Clean. Free of dirt and stains.
2. Firm shell. Free of cracks and thin spots.
3. Firm white. Clear and stands up well around the yolk.
4. Small air cell. The air cell should not exceed 1/8 inch in depth.
5. Uniform colored yolk. The color of the yolk is influenced by your feeding program. If you are feeding a balanced ration and keeping the birds confined in a good laying house, your flock will produce uniformly colored yolks.
6. Free of offensive odors and tastes. This is found when the egg is broken out.
7. Free of defects. Defects such as rough areas on the shell and blood spots within the egg are not desired.

For more complete information on egg quality, see E. C. 14-04-2, "4-H Egg Judging." This can be obtained from your county agent.

HOW CAN I PRODUCE HIGH QUALITY COMMERCIAL EGGS? If you have properly fed and cared for your birds, you have already taken an important step toward the production of high quality eggs. Your next step is to properly care for the eggs until they are marketed. Because eggs are a perishable food, they must be kept at a temperature of 60 degrees Fahrenheit or cooler, without freezing. To maintain egg quality you should:

1. Gather eggs three or four times a day during extremely hot weather; and twice a day otherwise. Eggs will cool twice as fast in a wire basket as they



will in a metal pail, and about three times as fast as in a case. For this reason, it is suggested that eggs be gathered in a wire basket.

2. Keep eggs clean. Quarter-inch wire mesh bottom nests are ideal. They allow better ventilation and quicker cooling of eggs. Keep birds away from droppings and muddy areas. Use abrasive paper, sandpaper or steel wool on stained or dirty eggs. By using extreme care, eggs can be washed by placing them in hot water (110 to 125 degrees Fahrenheit) for about one-half minute. The water should contain a detergent-sanitizer. Remove and rinse with warm water. Do not use cold water. Allow the eggs to dry before placing them in a case or carton.

3. Keep eggs cool. Place them in a well-ventilated room at a temperature of 60 degrees Fahrenheit or cooler and a humidity of about 70 per cent.

4. Put the thoroughly cooled eggs in pre-cooled cases the next morning with large ends up.

5. If possible, pack eggs of similar size and color together.

6. Market eggs at least twice weekly. Every day an egg is held, it deteriorates. Fresh, high-quality eggs are the ones that command the top market price.

7. Produce infertile eggs. Egg quality is harder to maintain when eggs are fertile. This is done by not having roosters in the laying flock.

SHOULD HATCHING EGGS BE HANDLED DIFFERENTLY THAN COMMERCIAL EGGS? The same practices (except for practice number 7) should be applied to both commercial and hatching eggs.



CULLING FOR EGG PRODUCTION

WHEN SHOULD I CULL MY FLOCK? Begin culling when the chicks arrive and continue as long as the chickens are on the farm. Unprofitable, sick and unthrifty birds should be removed as soon as they are discovered.

HOW CAN I TELL A GOOD LAYER FROM A POOR LAYER? A good layer has a balanced head; large, prominent, sparkling eyes; bleached beak; deep body; broad back; late but rapid molt; bleached shanks; thin, pliable pubic bones; and a bleached, expanded vent. E. C. 14-05-2 "4-H Judging and Selecting Chickens for Production," gives a more complete discussion of these requirements.

CONTROLLING DISEASE, PARASITES AND CANNIBALISM

HOW CAN I PREVENT DISEASE WITHIN MY FLOCK? Good management practices are important. Plenty of room, good feed and water, lots of fresh air, good litter management and just plain good housekeeping will keep your birds healthy.

In addition, follow these rules:

1. Buy chicks from pullorum-free stock.
2. House hens and pullets separately.

3. Sell all chickens that have left the premises for any reason -- do not let them return to the flock. For example, sell chickens that have been taken to a fair or poultry show.

4. Vaccinate all birds for diseases known to be in your area; such as Newcastle, bronchitis and fowl pox. Vaccination can be done by the individual injection method, by the group method of putting the vaccine in the drinking water, or by dusting. For more information on vaccination consult your club leader, county agent, veterinarian or local hatcheryman.

5. Properly dispose of sick and dead birds by burning or deep burial (bury 24 inches or deeper).

6. Control all pests; such as rats, mice and birds.

WHAT SHOULD I DO IF A DISEASE STRIKES MY FLOCK? Contact your club leader, county agent, veterinarian or hatcheryman. They will help you determine the trouble and how to correct it.

HOW CAN I CONTROL LICE, MITES AND WORMS IN MY FLOCK? Good management practices will keep them under control.

If your chickens become infested with worms, practice a good worming program. There are three common methods of worming chickens: (1) using an individual worm capsule, (2) using worm powder in the feed, and (3) putting a liquid wormer in the drinking water. For more information on worming methods, consult your club leader, county agent, veterinarian or hatcheryman.

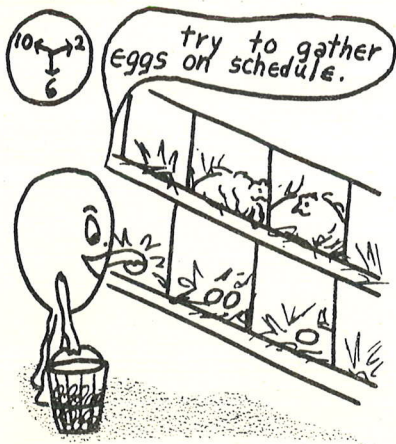
If your flock becomes infested with lice or mites, spray the roosts with "Black Leaf 40" (nicotine sulphate), "Lindane," "Malathion" or similar insecticides. For best results, follow the manufacturer's directions.

HOW CAN I PREVENT CANNIBALISM? Good management practices and balanced rations will help prevent cannibalism. Many poultrymen debeak their birds when they house them. This is the only sure cure.

Debeaking is the practice of taking off a part of the upper beak. This removes the part with which the birds pinch and tear flesh. Debeaking can be accomplished with an electric debeaker. Use a hot debeaking blade to stop the bleeding. Debeaking can be done at any age and is not considered harmful to the birds.

EXHIBITING EGGS

HOW CAN I MAKE A GOOD EXHIBIT? If you expect to make a good exhibit in a poultry and egg show, you must properly select and prepare the eggs. The following points are considered when exhibit eggs are judged. Try to have your exhibit as nearly perfect as possible.



1. Size. The ideal egg size is 24 to 26 ounces.
2. Shape. The ideal egg is 1.3 times as long as broad at the greatest diameter.
3. Color. White eggs should be chalk white; brown eggs should be a uniform brown throughout.
4. Uniformity. All eggs should be as uniform in size, shape, and color as possible.

5. Cleanliness of Shell. The shell should be clean and free of dirty spots and stains.
6. Shell Texture. The shell should be smooth and strong, free of cracks, and free of mottling and checks when candled.

For more information on egg judging see E. C. 14-04-2, "4-H Egg Judging."

GIVING A DEMONSTRATION

WHAT SHALL I DEMONSTRATE? You can demonstrate many different practices about poultry and egg production. Be sure to select a topic that you are willing to learn a great deal about. Listed below are some suggested demonstrations. Your club leader and county agent will be able to give you the information needed about each subject.

Care of Eggs	Egg Candling
Washing Dirty Eggs	Grading Eggs
Treatment for Lice	Control of Mites
Worming Birds	Care of Litter
Care of Waterers and Feeders	Preparing Eggs for Exhibit
Debeaking	Preparing Eggs for Eating

HOW SHALL I GIVE A DEMONSTRATION? The answer to your question can be found in E. C. 0-05-2, "4-H Demonstrations." Ask your county agent for a copy.