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Suggestive Points on Hatching and Feeding Chicks*

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SELECTION AND CARE OF EGGS FOR INCUBATION

Dark, clean nests should be provided in the breeding houses in order to reduce to a minimum the number of cracked and dirty eggs. Strong, fertile eggs are necessary in hatching strong, vigorous chicks. It should not be expected that strong, healthy chicks will be hatched from breeding stock which is underfed, overfat, of low vitality, or unhealthy, any more than it should be expected to hatch vigorous chicks from breeding stock that has been forced for high egg production. Free range is an important factor in producing hatching eggs, but if through necessity the breeders are confined to a small area, it is imperative that they be given a variety of feeds and be compelled to exercise.

It is desirable to gather the eggs for hatching purposes two or three times daily to prevent chilling. Eggs for hatching should be kept in a temperature between 50° and 60° F. Eggs should be set when fresh. Though stale eggs frequently will hatch, it is not advisable to use for hatching eggs that are older than 10 days. The breeding pen should be mated about three weeks before eggs are to be incubated. During the first three or four days it is not necessary to turn eggs intended for hatching, but after that time they should be turned daily. Hatching eggs should be placed in a regular market egg-case and the case turned on a different side daily after the first week. Eggs that are purchased for hatching should rest 24 hours before being incubated.

Size, shape, and color of eggs are breeding problems just as much as the number of eggs produced by an individual is a breeding problem. All eggs incubated should be uniformly large and of a color characteristic of the breed. Each egg incubated should weigh at least two ounces. More uniformity in eggs selected for hatching means a more uniform flock and product.

INCUBATORS AND INCUBATION

The various kinds of incubators made are classified into three types: hot water, hot air, and mammoth. Moisture and non-moisture incubators are made in different styles of hot air and hot water machines.

* Revision of Extension Bulletin 346.

Position. It is advisable to see that the incubator is perfectly level. Use a spirit level in several positions on the incubator to determine accurately that it is level.

Thermometers. Each thermometer should be tested occasionally with an accurate clinical thermometer. Put both thermometers in water heated to 100° to 105° F. and check the readings.

Location. An incubator usually gives better results if operated in a well ventilated cellar. A cellar retains a more uniform temperature, has a more constant degree of humidity, and is free from vibrations.

Disinfecting. Before and after each hatch it is important that the incubator be thoroughly scrubbed and disinfected so as to avoid possible danger of contagious diseases. A few hours before the eggs are placed in the machine it should be sprayed thoroughly with zenoleum, creolin, or 3-percent solution of cresol soap mixed with water.

Operation. The incubator should be set up and operated exactly as recommended in the instructions of the manufacturer. It is not advisable to disobey the instructions in any detail unless sufficient reason and experience warrant the variation.

The lamp. The machine should be operated for three or four days before any eggs are placed in it. The lamp should be furnished with a new wick for every hatch. Clean the wick each morning but do not cut the wick. Run the flame high enough to supply plenty of heat. The flame should be uniform in height every day so that the regulator may work accurately in maintaining an even temperature. The lamp should not be left in its position when it is not burning.

Turning. The eggs should be turned on the morning of the third day and at least twice each day thereafter until the eggs start to pip.

Temperature. The correct temperature depends upon the position of the thermometer used. The directions of the manufacturer should be followed carefully because different machines vary in temperature required, due to the different positions of the thermometers. The controlling temperature should be taken from a standing thermometer, the bulb being on a level with the tops of the eggs but not touching them. If the temperature has been regular up to time of hatching it is usually not advisable to change the regulator at that time. Poor hatches and weak chicks are more often the result of too much heat than too little.

Moisture. The addition of moisture to the egg chamber depends largely upon the type of incubator used, the place in which it is operated, and the climatic conditions. Better results are usually secured when a medium amount of moisture is used.

Cooling. There is a diversity of opinion relative to the necessity of cooling the eggs during the incubation period. In machines where eggs are turned by hand it is generally agreed that the eggs get sufficient cooling during the turning process. Others advocate that eggs should be cooled once each day after the seventh and up to the nineteenth day. The length of time the eggs should be cooled depends upon the temperature of the room and the length of time the eggs have been incubated.

Testing. It is advisable to test the eggs twice during the period of incubation. If a good light is available the eggs should be tested on the seventh and fourteenth days. In the seven-day test separate all absolutely clear eggs; these may be used for cooking or for feeding chicks.

Hatching time. The eggs usually start to pip on the evening of the nineteenth day and the hatch will be completed on the morning of the twenty-first day. A high temperature during the incubation period may hatch the eggs earlier and a low temperature will delay the hatch. Both

too early and too late hatches will be made at the expense of the vitality of the chicks.

As soon as the eggs start to pip, the door of the incubator should be darkened and kept closed until the hatch is completed. When the hatch is over open the ventilator. In case the hatch is a heavy one it is advisable to wedge open the door slightly. The tray or nursery should be kept dark and at a temperature of 98° to 100° F. After the chicks have been "hardened off" in the incubator for 24 to 36 hours after hatching, they should be placed under the brooder.

Transferring chicks to brooder. Chicks should not get chilled in incubator or in moving them to the brooder. Move them in a flat-bottom cloth-lined box or basket, or in a commercial baby-chick box. It is best to move them from the incubator to the brooder at night.

BROODER PREPARATION

The brooder house should be thoroughly disinfected and cleaned a few days before the hatch is expected. The brooder should be set up, cleaned, and the regulating device carefully tested. The brooder should be operated two or three days to be certain that it is dependable.

The brooder house floor should be covered with a layer of sand from one-half to one inch deep. Cut straw or alfalfa litter may be scattered over the roosting area if desired. Do not put chicks under any brooder until confident that the brooder is working accurately.

There is such a variety of brooders in general use that it is impossible to give any specific statement relative to the correct temperature. It is advisable to regulate the temperature to the degree designated by the manufacturer of the machine being operated.

For the first day or two it is advisable to form a circle around the outer edge of the hover using one-foot fine-mesh chicken wire.

CHIEF CAUSE OF CHICK LOSSES

Chicks may die as a result of poor care of eggs before they are set, unhealthy breeding stock, forcing breeders for heavy egg production, improper incubation, improper brooding, poor equipment, uncomfortable quarters, neglect, improper feeding, and contaminated yards.

Giving "dope" to sick and weakly chicks is wasted effort. Vigor is the foundation of the poultry business. Neither sentiment, pity, nor purchase price should prevent the owner from killing every weak, deformed, and diseased chick.

A FEW FEEDING PRINCIPLES

A cull may be made of any chick not properly fed and cared for. Chicks must have a good start if they are to develop into vigorous stock. Just before the chick is hatched the yolk of the egg is absorbed into the body of the chick and it supplies the natural food for the first few days. The first requirement of the chick after hatching is heat. The chick must be given a ration, the food elements of which supply heat and energy as well as the elements needed for bone and muscle.

No grain or mixture of grains supplies the various elements of food necessary for normal chick development. The chick grains must be supplemented with muscle-forming foods derived from an animal source, such as milk, eggs, or meat scraps.

Neither the grains nor the ground feeds supply a sufficient amount of phosphoric acid necessary in building the bones. It is advisable to add 1 percent or 2 percent of bone-meal to the mash, or provide before them at all times fine granulated bone in shallow hoppers.

Vitamines have been found necessary to growth. These elements of growth are chiefly found in milk, eggs, and the leafy parts of plants.

A TENTATIVE FEEDING SCHEDULE

Feed Frequently in Small Amounts—Do Not Overfeed				
AGE	GRAINS	MASH	DRINK	OTHER FACTORS
First 48 hours	None	None	Question	
First feed to 7 days	Chick food 3 lbs. cracked wheat 3 lbs. cracked corn 3-lbs. pin-head oatmeal or steel-cut oats 1 lb. fine grit 3 Times Daily (10 minutes)	Mash Equal parts of bran, shorts and corn-meal mixed with eggs or rolled oats mixed with eggs 2 Times Daily (10 minutes)	Sour milk or but- termilk No water	Supply grit and charcoal in hoppers. Feed green feed once daily. Add litter on third day and compel chicks to scratch for all grain. Brood chicks on clean disease-free soil.
7 days to 21 days	Chick food 2 or 3 times daily in litter (All they clean up at night)	Mash Keep above dry mash in hopper before chicks $\frac{3}{4}$ of the time	Milk Keep vessels clean	Add 10% sifted meat scrap to mash if milk is not fed. Get chicks on ground part of the time. Increase depth of litter. Keep brooder floor clean. Feed green feed, charcoal, and grit. Keep mash hoppers sanitary.
21 days to 10 weeks	Feed coarser grains when chicks are 4 to 6 weeks old (2 or 3 times daily) (Just what they will clean up)	Keep dry mash in hop- pers before chicks all the time after the fourth week	Milk and fresh water	Add 2% bone-meal to mash. Separate the cockerels. Give growing stock free range. Supply green feed, charcoal, and grit.
10 weeks to maturity	Provide colony houses on the range. Keep them supplied with a growing ration. Too early-hatched and early-maturing pullets may go into a partial moult in early winter. Holding pullets back results in stunting them in a majority of cases. Leghorn pullets should be brought into production as a flock at six months of age rather than earlier.			Keep houses free from mites and fowls free from lice. Supply green feed, charcoal, and grit. Move colony houses every two or three weeks.

FREE REFERENCES, OREGON AGRICULTURAL COLLEGE, CORVALLIS, OREGON

- Station Circular 51. Building Plans for O. A. C. 400-Hen Laying House.
 Station Circular 52. The O. A. C. Portable Colony and Brooder House.
 Station Circular 33. Oregon Experiment Station Trap-nest.
 Station Circular 54. Open Air Range House.
 Extension Bulletin 347. Suggestive Points on Culling the Poultry Flock.
 Extension Bulletin 348. Suggestive Points on Feeding for Egg Production.