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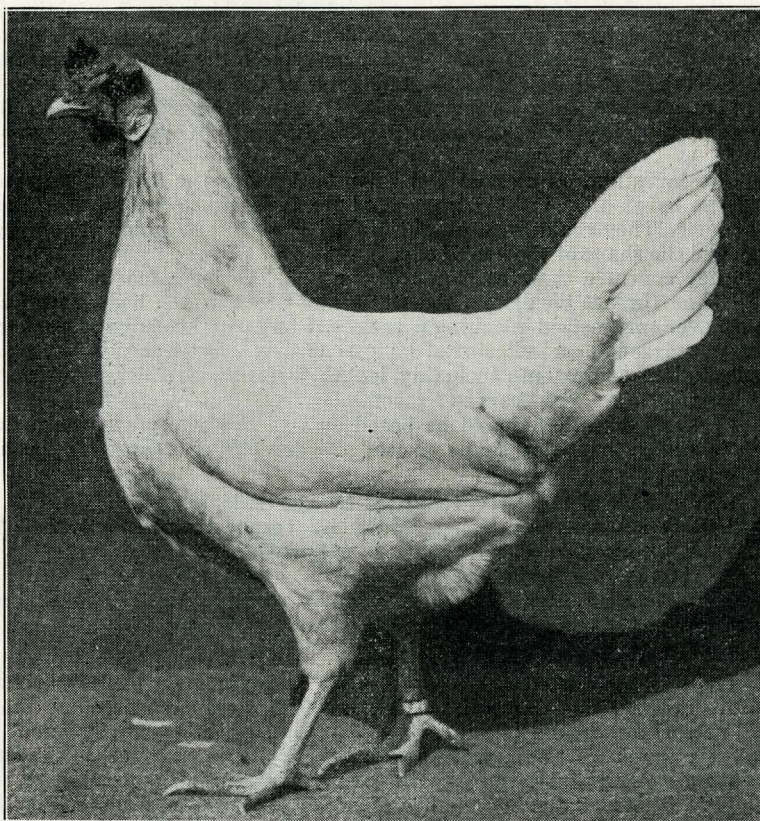
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Selecting Hens For Egg Production



**South Dakota State College
Extension Service
Brookings, S. D.**

Selecting Hens for Egg Production

By O. J. Weisner and W. C. Tully

Experiments recently conducted by poultry investigators of the United States Department of Agriculture point out that neither the shape of a hen's body nor the shape of her head bears any relation to her egg production. Apparently a hen's ability to lay depends upon egg laying ancestry. The purpose of the experimental work was to find out whether or not a hen's ability to lay could be estimated from her external appearance. The results of this work indicate that it is practically impossible to select breeding stock in poultry from the standpoint of high egg production by outward appearance, or body type. Evidence is not only lacking to support the contention that there is an egg laying type in the domestic fowl, type here being considered from the standpoint of the structure of the skeleton, but all available evidence suggests that the type of the bird as influenced by the skeleton, has no significant relationship to egg producing ability.

The investigators measured the live birds, then the dressed carcasses and the bones of about 400 trapnested White Leghorn and Rhode Island Red hens. They could find no relationship between egg production or egg size and the shape of the hen's body.

They conclude that the shape of the body, as indicated by length of keel bone (breast bone) and the width and depth of the body have been much over emphasized in culling practices. Similarly the shape of the head, often regarded as an indicator of laying capacity is not a safe guide. Head and skull measurements including length, breadth, and depth reveal no factor associated with trap nest records.

Effective selection should be based on five characteristics, which are better guides than body shape or conformation. These characteristics are as follows:

1. **Earliness of maturity, indicated by age at laying of first egg.**
2. **Rate of egg-production recorded by trapnesting or indicated by bleaching of beak and shanks in yellow skinned breeds.**
3. **Absence of broodiness.**
4. **Persistence of production, indicated by laying in August and September at the end of the first laying year.**
5. **Winter pause of short duration.**

The findings and conclusions of the U. S. Department poultry investigators indicate that accurate selection of high producing breeding stock will necessitate the use of trap nests. The value of the trap nest cannot be over estimated for the improvement of poultry. The trap nest is the only accurate method of determining the actual number of eggs a pullet or hen may lay. It is also the only method of selecting hens for breeders from the standpoint of egg size. The factor of egg size is becoming increasingly important as the buying of eggs on the graded basis becomes more popular.

It is often said that the male bird is worth half the flock. He is worth at least that much, and more, depending upon his quality and his prepotency, that is, his ability to pass his good qualities on to his progeny. It is surprising the improvement that can be made on an average or mediocre flock of poultry by the use of a good made bird. There is one main

factor which adds much value to the male bird. In the order of Aves, which is the biological classification including all feathered tribes, there is a law known as "A sex-limited factor." This law is a provision of nature whereby certain characteristics can be transmitted only from opposite sexes. Early maturity, which is so definitely associated with high egg production is partly transmitted from mother to son and in turn from father to daughter. The sex limiting factor limits the mother from transmitting the factor of early maturity directly to her daughter. The egg laying strain then must be passed on partly through the male bird. It will now be readily seen why so much value is placed upon the male bird, and also why it is very important to produce male birds from hens of known high egg production, and particularly from hens having the early maturity factor.

Professor J. P. Lippincott, when with Kansas State College, bought 10 mongrel hens to try out a high-production bred male of the Tancred strain. Here are the results:

| | | |
|--------------|--------------|---------------|
| 1914 | 1915 | 1916 |
| Mongrel hens | Half Tancred | Three-quarter |
| Av. 72 eggs, | Av. 156 eggs | Tancred |
| mated to | mated to | Av. 189 eggs |
| Tancred male | Tancred male | |

Thus the average egg production was raised 117 eggs per hen per year in a period of three years by the use of a male bird from a high producing strain. Not all birds of either sex possess prepotency and the ability to produce well is not always transmitted. For this reason it is necessary to trap nest the progeny of a mating to determine the improvement of such mating. This is known as the progeny test and is essential in the development of a high producing strain.

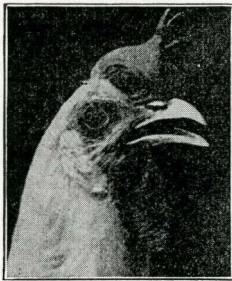
Winter pause in egg production is a characteristic that exists in fowls and which is an inherited factor. This winter pause in egg production is not necessarily connected with low temperatures, poor housing conditions, lack of balanced feed or other management factors. The trap nest records of pens show that certain individuals cease egg production at some time or other between November 1 and March 1, while their pen mates continue to lay throughout the winter. The period of non-production may last from 10 days to 3 months. The pullet having a winter pause exceeding 30 days is considered undesirable as a breeder. The trap nest is the only method of detecting these individuals and in determining the exact number of days that they are out of production.

The trap nest is the only method of producing male birds of known ancestry from the standpoint of both number, and size of eggs produced. South Dakota now has an egg laying contest located at State college, Brookings. This contest affords poultry breeders of the state an opportunity of getting an official trap nest record on a pen of 10 pullets per year. This is a sufficient number for a special breeding pen to produce male birds for a large flock and possibly some for sale. The trap nest has long been considered the best and most reliable method of selection, but farmers and many others who raise poultry do not have time to attend to trap nests. This fact will make it more important than ever to purchase hatching eggs, baby chicks or breeding stock from specialized poultry breeders who make that work their business and who have time to attend trap nests.

For those who do not have the time and equipment to do trap nesting the following culling practices will aid materially in keeping loafers out of the flock. While the poultry investigators of the U. S. Department found that an egg laying type did not exist, they also found evidence to strengthen the points indicating present production such as **bleaching of pigment, condition of vent, soft pliable condition of skin and body muscles in the abdominal region below the vent.** Profitable production is shown in a flock by the following points:

1. **Early maturity.**
2. **Winter production.**
3. **Fast laying.**
4. **Persistence in laying in August and September.**
5. **Late molt.**

How to Tell a Good Layer From a Poor One by Head Points



Good

Face—thin, lean.
 Comb and Wattles—large, red,
 full, waxy, warm.
 Beak—white.
 Eye Ring—white.
 Ear Lobe—full, white.



Poor

Face—coarse, fat.
 Comb and Wattles—small, pale,
 dry, hard, scaly.
 Beak—yellow.
 Eye Ring—yellow.
 Ear Lobe—shrunk, wrinkled,
 yellow.

Culling for early maturity.—Early maturity is an important factor, first because it is an inherited characteristic, and second because fall and winter eggs are profit eggs and early maturity is required to produce them. The lighter or egg breeds should be mature and come into production at the age of 180 days and the general purpose breeds at 210 days. A period of 3 weeks to a month should elapse between the date at which the birds should be mature and in production and the date of the first culling. The purpose of this way is to allow the majority of pullets to come into production and be in production long enough for the conditions indicating present production to develop and show up. At seven months of age on light breeds and eight months of age on heavy breeds, go through the flock of pullets that have been well cared for including especially proper feeding, and cull out all pullets that have not begun to lay.

Points to observe:

1. On the laying pullet the vent will be large, dilated and moist and in the yellow skin birds bleached to a bluish-white. On the non-laying pullets the vent will be small, round, puckered and of a deep orange yellow color.
2. The skin and body muscles in the abdominal region below the vent will be soft and pliable in the laying hens. In the non-laying hens the skin and body substance in this region will be firm and tight and the breast bone apparently somewhat drawn up at the lower extremity, giving an indication of less body depth.
3. While there is apparently no relationship between the shape of a pullet's head and past or present production, the hen or pullet in production will show characteristic development of head parts. In such a bird the comb, and to a lesser extent the wattles, are fairly large, red in color and full in appearance. On the other hand the non-layer has a shrivelled dried-up comb, often covered with a scale-like deposit. There is a very definite relationship between comb appearance particularly and egg production. A good poultryman can tell, with a fair degree of accuracy, whether a bird is laying or about ready to lay in a few days, simply by comb appearance. However, the appearance of the comb or wattles tells nothing about past or future production.

This examination for early maturity must be made in the fall when the pullets are seven to eight months of age, and is the only time when distinction can be made between high and low producers, based on the early maturity factor.

Winter Egg Production.—Of course it will be necessary to keep an accurate record of the date of hatching of each lot of chicks, so that the date of maturity can be calculated. While early maturity is an important factor, much harm can be done by over doing it and forcing pullets into production before they develop good sized frames and sufficient surplus body weight and substance to enable them to lay well and produce large sized eggs. Pullets coming into production before being fully developed will always produce small sized eggs. In order to detect the difference between hens that have laid well in the winter and those that have not, go through the flock sometime late in February or before heavy spring production starts, and mark with a colored leg band all hens that have laid in the winter.

Points to observe:

1. On the yellow skin birds examine the beak. Laying hens that have given profitable laying production will show a faded or bleached beak, non-laying hens that have not produced during the winter period will show a yellow beak.
2. On white skin birds examine the lay bones or pelvic bones which are located at either side of the vent. If these bones are thin and pliable the hen has been a good winter producer. If they are thick, firm and rigid and covered with fatty deposits, the hen has not laid enough in the winter to be profitable.

In this winter culling, mark with a colored band the hens that have been profitable and retain the other hens until the close of their spring laying period and then sell them.

Fast Laying.—In order to distinguish the difference between the fast and slow laying hens examine the flock in June. The hens that have laid rapidly will show a bleached or faded shank, including the back of the hock joint. At this time examine only those birds which are leg banded with a colored band indicating that they have been profitable winter producers, and remove the band from those hens that do not show faded shanks and hock joints, which means that they are to be sold as soon as they stop laying.

In this June culling, sell any birds that are not laying that do not carry a colored leg band. Those hens that retain their bands after this culling will be early maturing, good winter layers, and fast layers. In other words, they will be very desirable hens to keep.

Persistence in Laying During August and September.—A rough check on this characteristic can be obtained by the per cent production of the hens remaining, or better still by culling again about the first week in September. "Handling Qualities" or the points indicating present production are used at this time. Molting can be considered in this culling. The best laying hens molt rapidly and most of them late. This is indicated by the primary feathers of the wing. From July 1 to October 1 birds that are molting and dropping 3 or more wing primaries at one time are classed as fast molters. If they have also been, early maturing, good winter layers and fast layers, they should be kept. Broodiness is not so much of a factor in well bred stock. However some strains of breeding are more broody than others and some method of recording broodiness in individuals should be devised. A good method is to use a certain colored band to indicate broodiness and place one on the shank of a hen each time she goes broody. Hens that go broody for the third time during one season should be culled out.

Management plays an important part in control of broodiness. All nests should be closed in late afternoon and hens found on nests and showing signs of broodiness, should be confined to a properly constructed broody coop and fed a good laying ration. A broody coop should be constructed with a slatted or hardware cloth floor and set up on legs so that there is good circulation of air under the hen. The principle is to prevent the hen from conserving heat and this discourages broodiness. The broody coop should have a water tight roof and be set outside in a shady spot where the hens confined will be comfortable. The feeding of broody hens is important. One cause of broodiness is loss of body weight. Hence the more a broody hen is starved the sooner she will become broody again. Prompt removal of broody hens from the nest to the broody coop, good circulation of air, general comfort, and good feed while confined will keep broodiness at a minimum.

Late molters are good hens: Hens molting after September 15 are considered late molters. They are as a general rule good hens and if they have passed the tests of the previous cullings they should be kept. Recent experiments in regard to the age of profitable egg production of hens show conclusively that hens should not be kept longer than the second year of production for market eggs and that most of the profit is made the first

year. The results of these investigations show that the light or egg breeds produce only about 80 per cent of their first year's production in their second year and much less in the third year. The general purpose breeds produce only 70 to 75 per cent as well in their second year.

By selling the old hens each year avian tuberculosis can be kept out of the flock or eradicated if it has appeared. Tuberculosis is a relatively slow progressing disease and seldom attacks a bird less than one year of age. Avian tuberculosis is a common ailment of poultry in South Dakota. A recent survey conducted by the Department of Animal Industry covering 10 townships in one South Dakota county showed 40 per cent of the flocks examined to be tuberculous and 7 per cent of all the birds in the flock to be affected.

We still believe in a good looking hen that is up to standard weight, having good body size, bone and substance, with full developed rose-red comb and wattles and bright eyes to indicate vigor, vitality, and ability to lay well.

Hens to Keep:

Those with:

1. Bright prominent eye.
2. Full warm, waxy, red comb.
3. Flat shanks, well bleached.
4. Feet free from disease.
5. Late rapid molter—Sept. to Nov.
6. Flexible pelvic bones, wide apart.
7. Large abdominal capacity with soft pliable fat.
8. Worn plumage from spring until molting.
9. Active, alert, vigorous, healthy.

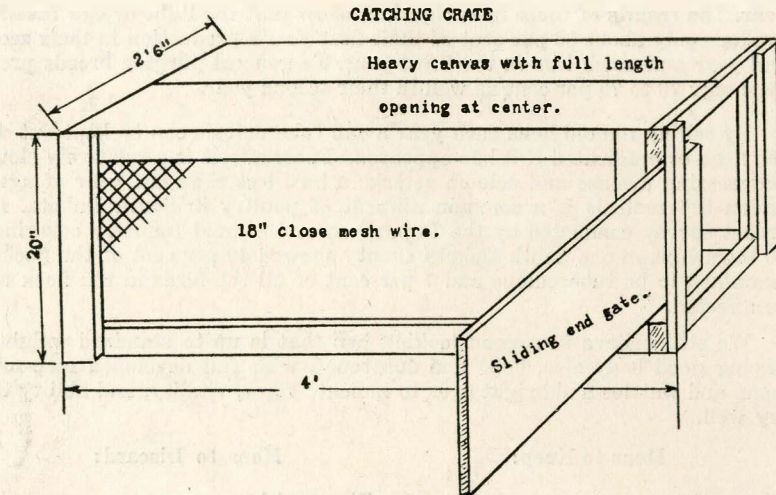
Hens to Discard:

Those with:

1. Extremely long narrow head.
2. Deep set or dull eyes.
3. Pale comb and face.
4. Large rounded shank.
5. Early molter—June, July, Aug.
6. Small abdominal capacity or with hard muscles and fat.
7. Small, dry or puckered vent.
8. Molt slowly—few feathers at a time.
9. Yellow beak and shanks.

The disease factor in addition to the profit factor makes it impractical to keep over a large percentage of old hens. Commercial egg farms keep only 20 to 25 per cent of hens over for the second year's production. It is necessary to use some artificial mark such as leg band, wing band, toe punch, etc., to distinguish two-year-old hens from mature pullets. In the past, culling was considered a rather seasonal practice, yet for best results it should be a continuous program throughout the year. By following a culling program similar to the one outlined herein, for 3 to 5 years the average production of the flock can be improved materially.

A catching crate is a great convenience in poultry work, and every up-to-date poultryman should have one. The sketch is self-explanatory. A bottom is not required in the crate, unless it is to be used in moving birds. The birds are removed through the opening in the center of the canvas top. The crate is placed outside the poultry house, before the hen runway; or it may be used at an ordinary doorway by suspending a canvas or blanket from the top of the door frame to the top of the crate. If the crate is constructed larger than $2\frac{1}{2}$ x 4 feet it does not prove as satisfactory, as the distance required to reach for the birds becomes too great. Four old



A Handy Catching Crate

inner tubes slit open and tacked on overlapping each other about 3 inches will serve as good as a canvas top.

Material required for construction of catching crate:

- 4 pieces 1x4, 4 feet long.
- 4 pieces 1x4, 2½ feet long.
- 8 pieces 1x4, 20 inches long.
- 1 piece 1x12, 3 feet long.
- 1 piece heavy canvas, 3x4 feet.
- 11 lineal feet 18-inch close mesh chicken wire.
- 1 lb 6D box nails.
- ½ lb chicken fence staples.
- 1 box double point tacks.

Hens caught by this method do not become so excited as when caught by a wire hook and the egg production is not reduced as much, thus saving the cost of the crate in a short time. Unless a catching crate is available, culling, delousing, treating for worms, separating cockerels from pullets and such important poultry work just does not get done.

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