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# Kentucky 4-H Poultry: Evaluating Egg-Laying Hens

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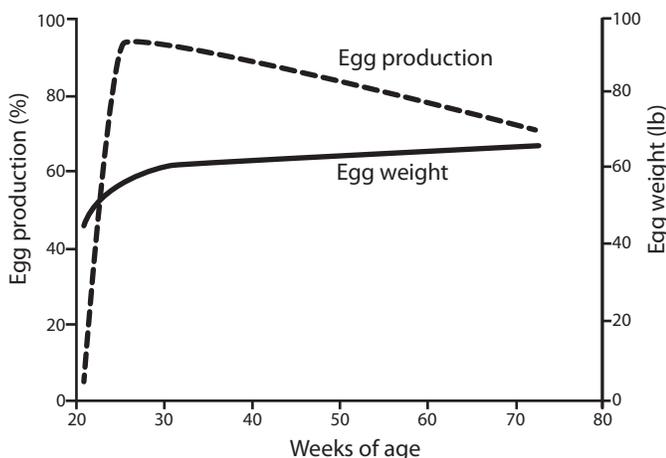
In a 4-H poultry judging contest, participants are required to rank a group of four hens from most to least productive. The criteria used in judging the hens are based on pigmentation, handling qualities, abdominal capacity and molt.

In the “real world,” it is important to be able to judge chickens for their level of productivity.

Most flocks of egg-laying hens go through the same production curve. The flock quickly peaks and then slowly reduces its level of egg production (Figure 1).

It is important to remember, however, that not all hens in a flock will be laying at the same rate. Some hens will never lay a single egg, while others may go out of production earlier than the majority of the flock. Economically, it would be helpful to find such hens and remove them from the flock. To do so requires an ability to assess the persistency and intensity of lay for each hen. Persistency of lay refers to the number of eggs laid over a specific period of time. Intensity of lay refers to the current level of egg production.

Figure 1. Egg production in hens.

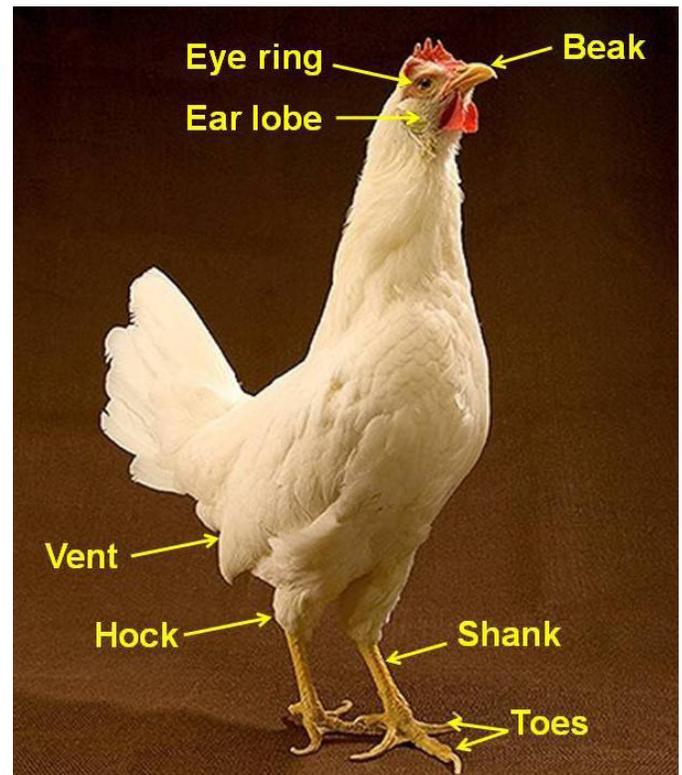


## Persistency of Lay

When placing a class of hens for past egg production, the first criteria to evaluate is the persistency of lay—that is, the number of eggs the hen has laid over a specific time period. Persistency of lay is determined by skin pigmentation and molt, but pigmentation is the first criteria used to place a class of hens.

With yellow-skinned hens, such as leghorns, loss of pigment from their skin is an important characteristic for determining the persistency of lay. As a pullet grows, yellow pigment is deposited in the skin, beak, shanks, and feet. Once the pullet starts laying eggs,

Figure 2. Parts of a hen.



the pigment in the feed is used for the yellow color of the yolk and not the pigmented areas of the skin.

The pigment is removed from the different parts of the body in a definite order—from the vent, eye ring, ear lobe, beak (corner of the mouth toward the tip), bottom of the foot, the shank (front, back, and sides), and finally the hock and top of toes (Figure 2).

Once a hen stops laying eggs, pigment is regained to the skin in the same order in which it was bleached. It is not regained in the reverse order.

As previously indicated, the first place to lose pigment is the vent. A hen that has been producing eggs will have very little, if any, yellow remaining in the skin around the vent. As shown in Figure 3, the hen on the left has yellow remaining in the vent. She has either laid few, if any eggs, or has been laying eggs and has gone out of production, putting pigment back into the vent (since pigment is replaced in the same order it was removed). The vent of the hen on the right has been bleached of pigment, indicating she has laid more eggs and is therefore the more persistent layer.

As shown in Figure 4, no yellow pigment remains in the eye ring, ear lobe, or beak of a hen that has been in production. Yellow pigment is present in all parts of a

Figure 3. Comparison in the color of the skin around the vent of a poor layer (photo on the left) and a good layer (photo on the right).

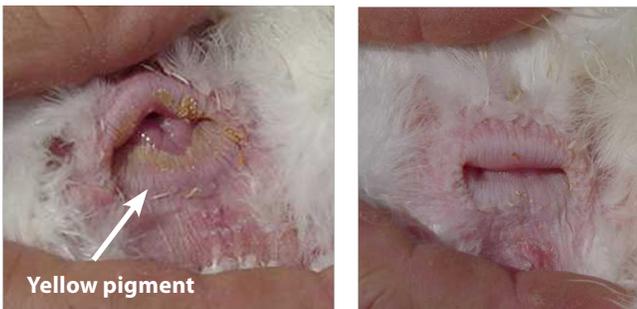


Figure 4. Comparison of the yellow color in the eye ring, ear lobe and beak of a poor layer (photo on the left) and a good layer (photo on the right).



poor layer's head. In addition to differences in pigmentation, the comb of the poor layer is smaller and pale. The head also is too long in proportion to its depth.

The intensity of yellow pigment decreases in the shanks and tops of toes of hens as the number of eggs produced increases (see Figure 5). The hen on the left has a lot of yellow pigment remaining in its shanks, feet, and tops of toes, indicating she has laid fewer eggs than the other two hens. Most of the yellow has been bleached from the feet of the hen on the far right, indicating she has laid the most eggs of the three hens shown and is thus the more persistent layer of the three.

Figure 5. Loss of pigment from the front of the shanks and tops of toes.



## Intensity of Lay

If two hens in a class have equal pigmentation (and are thus equally persistent) then the pair is placed on intensity of lay. Intensity of lay indicates how well the hen is producing right now. She could have laid the most eggs over a period of time (i.e., the more persistent layer) but she might not be laying right now (i.e., the less intense layer).

The intensity of lay is determined by handling qualities, abdominal capacity, and molt. So after comparing the levels of pigmentation, the next factor to consider is handling qualities.

“Handling qualities” refers to the amount of fat in the abdominal area. Unlike cattle, which place their excess dietary energy as fat between muscle fibers to produce the marbling effect of beef, poultry deposit fat under the skin and in the abdominal area in what is referred to as the fat pad (see Figure 6).

A hen uses the energy in the feed she eats to produce eggs. If she is not laying eggs, she does not require as much energy and much of the energy from the feed she eats is deposited as fat. The amount of fat in the abdomen, therefore, is a good indicator of a hen's level of production.

Figure 6. The deposition of fat in a chicken, including the abdominal fat pad.



Figure 7. The location of the vent, pubic bones, and keel of a chicken.

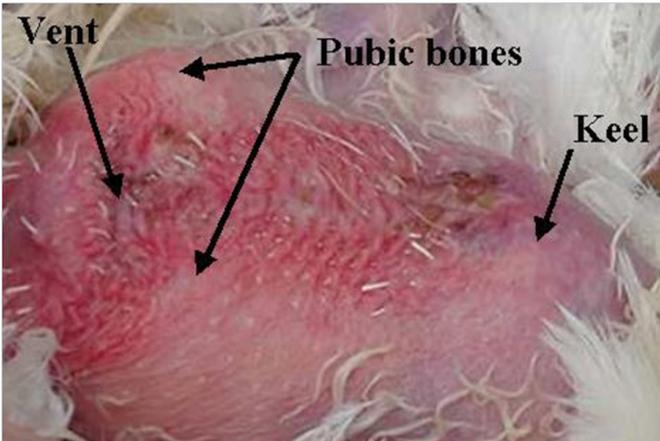


Figure 8. The thickness of skin in the abdominal area of a poor layer (the photograph on the left) and a good layer (the photograph on the right).



To evaluate handling qualities, you need to know where the pubic bones and keel are located in the abdominal area of the hen (see Figure 7). Take a pinch of skin just below the pubic bones, and roll it gently between the thumb and finger to evaluate its thickness (see Figure 8). If a hen is in production, her dietary energy is being used for egg production and she will not have much fat in the abdomen. If a hen is not laying, the energy is deposited in the fat pad in the abdominal area. As shown in Figure 8, a hen in production will have a thinner pinch of skin in the abdominal area than one not laying.

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**Note:** When handling the hens, be especially careful with the pubic bones, which can break easily.

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The second measure of laying intensity of hens is abdominal capacity. The larger the abdominal capacity is, the better the level of egg production. To evaluate abdominal capacity, place as many fingers as you can easily fit between the two pubic bones (see Figure 7 for the location of these parts of the chicken). Count the number of fingers you can get between these two bones. This is the width of the abdomen. Count the number of fingers you can easily fit between the bottom of the pubic bones and the tip of the keel. This is the depth of the abdomen. The abdominal capacity is then described as width by depth.

Figure 9 gives examples of the abdominal capacities for two hens. The abdominal capacity of the layer in the top pair of photographs is two-finger width by two-finger depth. This is an example of a poor layer.

The abdominal capacity of the layer in the bottom pair of photographs is three-finger width by four-finger depth. This is an example of a good layer.

Figure 9. Photographs showing the abdominal capacity for a poor layer (top pair of photos) and a good layer (bottom pair of photos)



## Molt

Molt is another factor used to evaluate the persistency of lay of hens. The short feather in the middle of the wing is known as the axial feather. The 10 feathers outside of the axial feather are the primary feathers (see Figure 10).

Examine these 10 primary feathers to evaluate the status of a molt. Hens in a molt lose their primary feathers, starting with the feather closest to the axial feather and moving outward. Old feathers that have not molted will be worn on the ends and may be dirty and/or broken. New feathers are typically smooth and clean.

The photographs in Figure 11 show two hens in different levels of molt. The hen on top is missing one primary feather--referred to as a one-feather molt. The hen on the right has four new primary feathers--referred to as a four-feather molt.

When a hen is in molt, she typically goes out of production, but some hens will continue to lay while molting. Usually, they will do so at a reduced rate.

Figure 10. The axial and primary feathers on a wing of a chicken not in molt

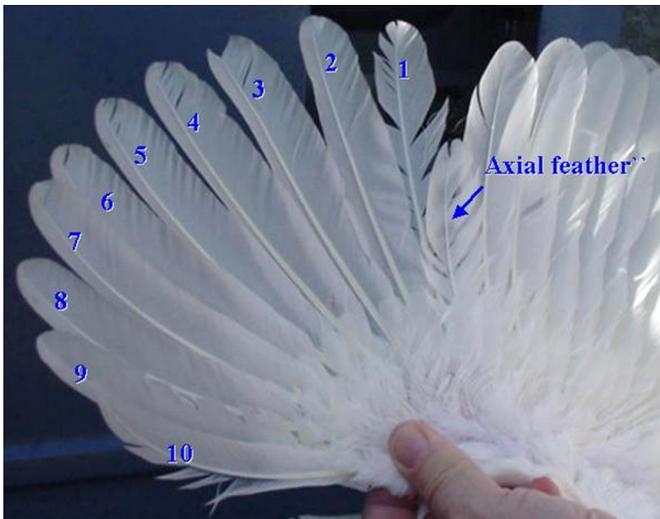
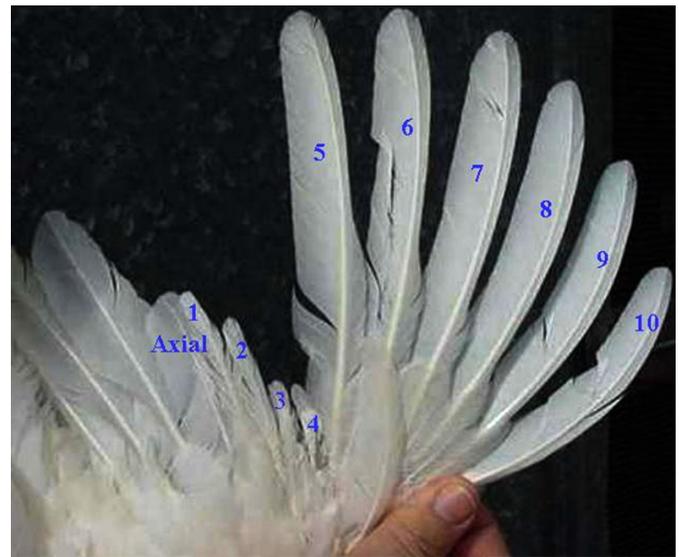


Figure 11. Two different levels of molt



## Summary

When placing a class of hens in a poultry judging contest, the first criteria to evaluate is the level of pigmentation, since it is an indicator of persistency of lay.

If two hens have equal pigmentation, the tie is broken on the basis of handling qualities, followed, if necessary, by abdominal capacity.

The most-persistent layer is at the top of the class, regardless of her intensity of lay. The least-persistent layer is placed at the bottom of the class.