

Evaluating egg laying hens

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Most flocks of egg laying hens go through the same typical production curve. As shown in Figure 1, the flock quickly peaks in egg production and then slowly reduces its level of egg production.

It is important to remember, however, that not all the hens in a flock will be laying at the same rate. Some hens may 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.

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, the pigment is then removed from the pigmented areas to provide the yellow color in egg yolks.

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 (see Figure 2 for the parts of the hen).

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 yellow remain-

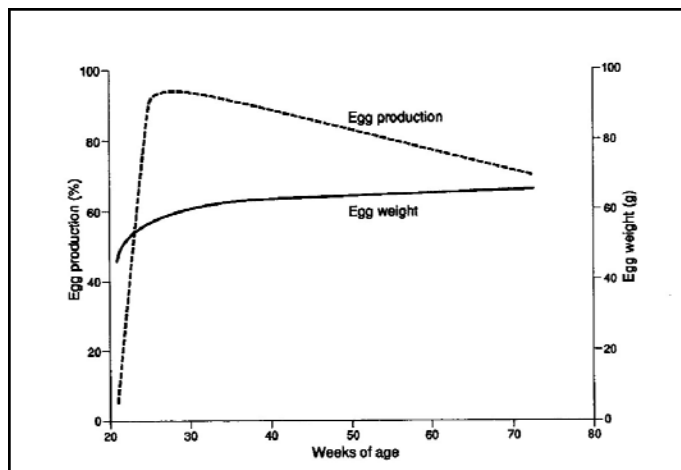
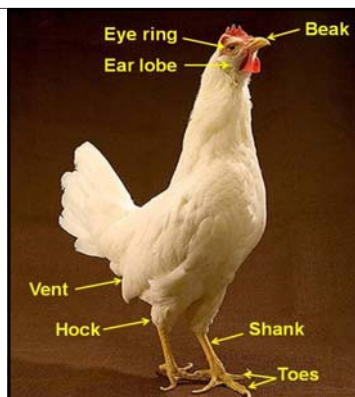


Figure 2. The parts of the chicken bleached of pigment during egg laying.

Source: Modified photo from the USDA/ARS photo gallery



ing in the skin around the vent. As shown in Figure 3, the hen on the left still 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, there is no yellow pigment remaining in the **eye ring**, ear lobe and **beak** of a hen that has been in production. Yellow pigment is present in all parts of a poor layer's head. In addition to differences in pigmentation, the comb of the poor layer is smaller and pale. The head is also too long in proportion to its depth.

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)

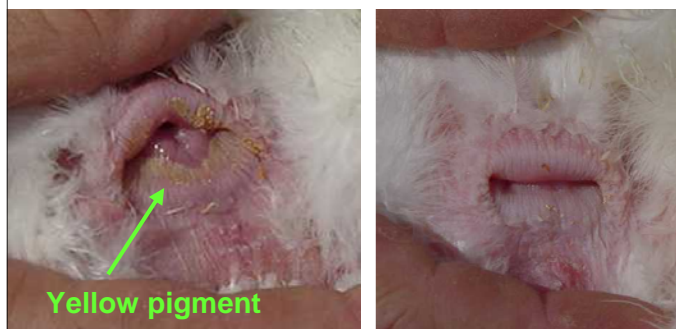


Figure 2. Comparison of the yellow color in the eye ring, ear lobe and beak of a poor layer (photo on the left) and a good layer (photo on the right)

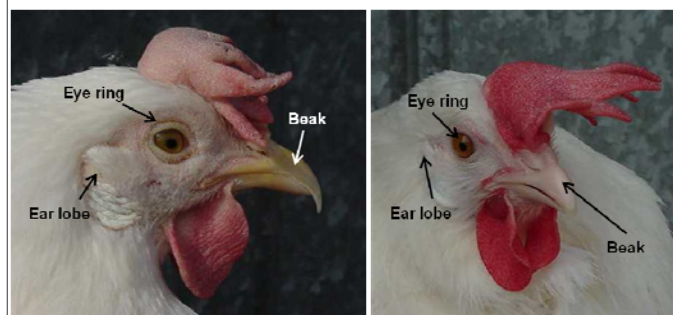


Figure 5. Loss of pigment from the front of the shanks and tops of toes.

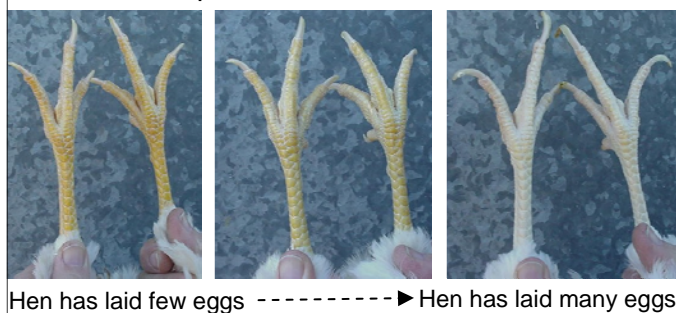


Figure 6. The deposition of fat in a chicken, including the abdominal fat pad.



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

If you are comparing two hens of equal pigmentation the next factor to consider is 'handling qualities.' **Handling qualities** are also the main factor to consider when comparing hens from breeds that do not have yellow skin so that the level of pigmentation cannot be used as an indicator of egg production.

'Handling qualities' refer to the amount of fat in the abdominal area. Unlike cattle which place their excess dietary energy as fat between muscle fibers producing the marbling effect of beef, poultry species deposit fat under the skin and in the abdominal area in what is referred to as the fat pad (see Figure 6). You do not see a marbling effect in poultry meat. That is why poultry meat is so much leaner than beef, especially if you remove the skin with its underlying fat.

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 current level of production, known as the **intensity of lay**.

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 she is eating is

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

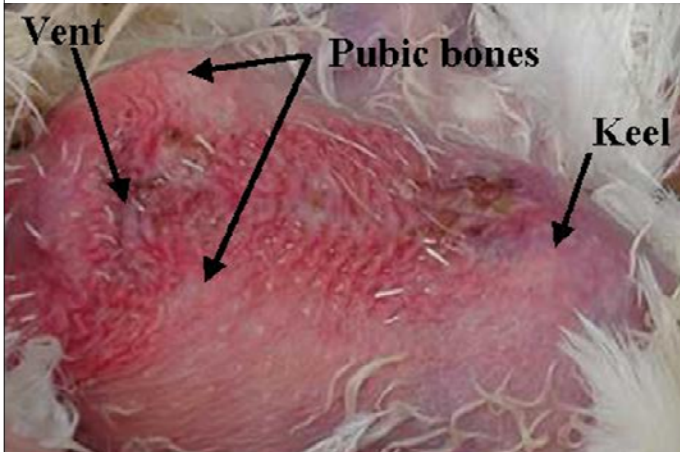


Figure 8. The thickness of skin in the abdominal area of a poor layer (the photograph on the left) and a good layer (the photograph on the right)



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



not being used for egg production so it is deposited in the fat pad in the abdominal area. As shown in Figure 8, a hen which is in production will have a thinner pinch of skin in the abdominal area than one not laying.

Note: When handling the hens be especially careful with the pubic bones, which can break easily if handled too roughly.

Another important factor in evaluating laying intensity of hens is 'abdominal capacity.' The larger the abdominal capacity the better the current level of production. To evaluate abdominal capacity, place as many fingers as you can between the bottom of the pubic bones and the tip of the keel (see Figure 7 for the location of these parts of the chicken). Count the number of fingers you can get between these two locations. This is the depth of the abdomen. Place as many fingers as you can between the two pubic bones. Count the number of fingers you can get between these two bones. This is the width 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 2 finger width x 2 finger depth. This is an example of a poor layer. The abdominal capacity of the layer in the bottom pair of photographs is 3 finger width x 4 finger depth. This is an example of a good layer.

Molt is another factor that can be used to evaluate the level of egg production for individuals in a flock. 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).

To evaluate the status of a molt (including whether or not it is in a molt) it is these 10 primary feathers that are examined. Hens in a molt lose their primary feathers, starting with the feather closest to the axial feather and move outwards. Old feathers that have not molted will be worn on the ends and may be dirty and/or broken. New feathers are typically

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

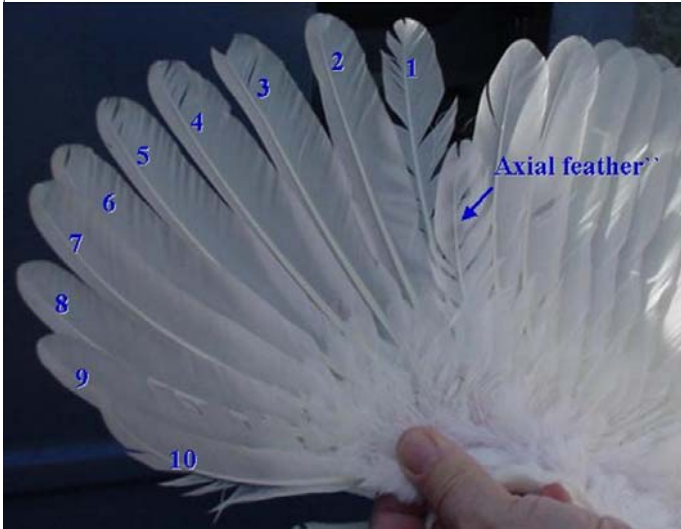


Figure 11. Two different levels of molt.



smooth and clean.

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

Typically when a hen is in molt she goes 'out of production' (i.e., stops laying eggs) but some hens will continue to lay while molting, but usually at a reduced rate.

As previously mentioned, when a hen goes out of production pigmentation returns to the various parts of the skin in the same order that it was lost. It is possible, therefore, to have a hen bleached all the way through to the back of the shanks but still have yellow pigment in her vent.

SUMMARY

Economically it is important to remove the unproductive hens from a flock. For those breeds with yellow skin color, level of pigmentation is a good tool for evaluating the level of production of each hen. Yellow-skinned breeds include most of those typically kept for egg production - Leghorn, Plymouth Rock, Rhode Island Reds and New Hampshires.

The Australorp, an egg laying breed used in Australia, are not yellow-skinned. Their skin is black, though the bottoms of the feet and toes are pinkish white. For those hens that do not have yellow skin, the level of production of the hens can be evaluated using handling qualities (level of fat in the abdomen), abdominal capacity, and molt.