

CHAPTER 1

Selecting for Meat Qualities and Rate of Growth

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This outline for selecting desirable production traits in chickens was developed as part of an American Livestock Breeds Conservancy pilot project to recover breed production characteristics of endangered poultry. These guidelines are from well-established parameters developed by “old school” poultrymen, as documented in some of the early to mid-20th century poultry texts. This once commonplace knowledge and practice has become unknown to most modern chicken farmers due to the ready availability of chicks that can be purchased from large hatcheries.

The following information can be used by the producer to identify birds that will excel in production traits and would be good candidates to retain for breeding stock. Keep in mind that any bird that is selected must also meet the established historic standards for the breed. These historic standards were written at a time when chicken breeds were being used for commercial production within several production systems. Input from the top breeders of each breed was used to establish the particulars of size, and other qualities, that would produce the best specimen for the role each breed was designed to fulfill.

When comparing birds within a flock they must be of the same breed, sex, and age in order to get an accurate assessment of their production qualities. (It’s a matter of comparing “apples to apples.”) It is best to evaluate multiple birds when making culling or breeding decisions for the flock. The first bird to be assessed will serve as the “example bird” to compare with the second bird. If the second bird has better qualities than the first, then the second bird then becomes the example for comparison – and so forth and so on it will go for the rest of the flock evaluation. There is also value in using a poor representative of the breed for comparison in order to fairly assess poor production qualities and better recognize mid-level or superior qualities. It is further suggested that the pullets be assessed first so that the initial impression of the pullet size is not influenced by having handled the naturally larger cockerels. Put aside superior birds that are potential “keepers” until the en-

tire flock has been assessed. Go back to the “keepers” to have a second or even third look at them, in order to be thorough and make sound decisions that will help to ensure the future quality and productivity of the flock.

A producer needs far fewer males than females to be retained for breeding stock. With this in mind, rigorous selection of the males is an important component to a sound, breeding program. It should also be remembered that adult size is controlled by both male and female stock – under-sized or otherwise poor quality males or females should not be retained. Better to hatch more chicks from fewer hens, than to retain under-sized or poor quality hens to increase flock size.

Purpose of the breed evaluated is critical to success if the breed is to serve in the purpose for which it is designed. Dual-purpose breeds, such as American breeds like Buckeyes, Delawares, New Hampshires, Plymouth Rocks, and Rhode Island Reds, should have equal consideration given to egg production indicators as to meat considerations in order to retain their practical usefulness. Egg laying breeds, such as Leghorns, Minorcas, or Anconas, should have more emphasis placed upon the sections of their bodies devoted to egg production, but will still benefit from a sound overall appraisal.

Choosing an Evaluation Age

Much will be served by having a standard age at which to evaluate young growing birds for productive indicators. This will allow long-term tracking of progress of efforts and comparison of mature birds for qualities, such as rate of growth, which are not readily apparent as the stock matures. Consideration of the breed’s history and purpose can affect the decision of evaluation age. One would not wish to cull young Jersey Giants too early, as an example, as the breed traditionally took 26 weeks or more to grow to market age to produce a very large roasting fowl. A unique aspect of this breed is that some individuals grow fairly quickly and flesh-out at a relatively early age – but these individuals do not reach the mature size for which the breed is known.

ALBC’s original production selection work work used

CHICKEN ASSESSMENT FOR IMPROVING PRODUCTIVITY

the Buckeye chicken breed. This breed had a history of use for the production of broiler chickens not dissimilar to some other American breeds, like Plymouth Rocks or Rhode Island Reds. By way of experiment, it was decided to evaluate the young birds at 8 weeks and again at 16 weeks of age. Interestingly, all of the

birds identified at 8 weeks as being superior for their sex were again found as superior at age 16 weeks of age. Since these two ages are good measures for most American breeds, they are recommended below. For faster or slower growing breeds experience will dictate more appropriate ages.



The proper way to hold a chicken: With its breast resting in your palm, slide one leg between thumb and index finger, and the other leg between index finger and middle finger. Tilt bird with its front slightly downward and it will remain calm.



When using hands-on appraisal, it is helpful to remember that under those feathers is a chicken to eat. The live chicken must have flesh on its bones or it will not be good when processed. This chicken had a wide body and a large thigh area.

Assessment at 8 and 16 Weeks of Age

1. Skull width – A wide skull on a chicken is a strong indicator of good growth potential. If birds cannot be physically examined, often judging skull width visually can be a reliable indicator of young birds with good growth potential. If the skull is narrow, then the rest of the bird will be narrow. As a rule of thumb, medium to large skull width is good for egg layers, and large to extra wide skulls are better for meat birds.



In both photos the bird on the right has a wide skull and the one on the left a narrow skull. A wide skull is a good indicator of a good skeleton and good rate of growth.

2. Heart girth – A good heart girth is an indicator that there is enough space for the internal organs to be of good size, maximizing the bird's potential for growth and development. Care must be taken to ensure that the girth is accurately assessed. Often, if the bird's legs are held slightly forward during the assessment, the girth can seem larger than it actually is. For a more precise assessment have the legs of the bird pointing towards the rear of its body and place your fingers on each side of the ribs just behind where the wings attach to the birds body.



Measuring heart girth on live bird.



Heart girth is important as it yields space for the heart and lungs.

3. Back flatness, length, and breadth – A flat back makes for a more attractive carcass on a table bird. Good length and width contribute to the quality of the dressed bird as well. Flat backs are one indicator of good bone development in a bird. The back should be wide and carry its width along its length. Generous length and width of back are indicators of longevity, vigor, and provide ample capacity for egg and digestive organs. Birds with narrow or tapered backs lack the capacity for satisfactory egg production.



Feeling flatness of back.



A flat back yields a more presentable carcass.



Even with feathers, you can see the wide back on the right and narrow back on the left.



Width of back is about the body under the feathers. Hand shows position to appraise.

4. Body depth, capacity – As with heart girth, this aspect of the bird's body indicates whether there is ample or restricted space for internal organs. Body depth is the thickness between the back and the keel. Good depth gives birds an advantage for internal organ development. This factor also contributes to carcass appearance for the table bird.



Body depth is the distance from the chicken's back to its keel bone.



Capacity is the distance from the center of the back to the tip of the keel. Because chickens are three dimensional, this distance may vary even when body depth appears the same.



Notice on the processed bird how the rear is deeper in body depth than the front. This trait is found in all good egg-laying breeds as it allows more room for egg and digestive organs.



Good capacity allows more room heart and lungs, but also allows more flesh on the breast.

5. Breast and keel – The keel is examined for its straightness & length (for good carcass appearance) and the breast is inspected for development of good meat proportions. The amount of meat on the breast will ultimately drive the bird's appeal to the consumer. Position the bird in an inverted manner to get an accurate feel for fleshing.



Position to hold while appraising fleshing on breast. Pushing the legs a little toward the front of the bird will allow the breast muscles to relax.



Measuring the distance of the keel bone. Straight keel bones look much better on the plate, so breed for good straight keel bones.



Large amounts of meat on the breast of a chicken are to be desired.



The keel bone is much like the keel of ship in that all organs rest on it. A short keel will cause the chicken to look meaty, but leaves little room for healthy organs.

6. Weight – Young birds can be weighed to determine overall growth rates for the flock. Weight has the advantage of being an impartial record that can allow comparison of different generations of birds. As your flock grows and years of selection occur, target weights can be designated as minimum qualifications for retention of breeding stock. In the Buckeyes we quickly found that males should meet or exceed 5.1 pounds and females 3.5 pounds by age 16 weeks. *The heaviest birds that make the cut in the first 5 categories can be marked as potential breeders as early as 8 weeks of age.*

7. Color – Early in the flock’s management color is observed in all of the birds. Although ideal color is nice, it is not a necessity in the early stages of selection for production traits in a breed. Unless a bird is completely off color, it can be acceptable as breeding stock early on in a recovery program. It should be noted that it is more important to have males with good color than females because the males carry two genes for color (ZZ) and females only one (ZO). Once production traits meet the program’s goals, then color can be improved through further selective breeding. The bottom line is that color is much easier to correct than production traits.

Width of skull, heart girth, flatness of back, and fleshing on breast are the most significant qualities to look for in the selection process with young birds. They are characteristics that all of the superior birds excel in. Typically, the birds that excelled in these traits at 8 weeks of age will remain the top birds at 16 weeks of age.

Some Other Points

1. Appetite equals rate of growth – A bird’s body grows according to the inputs it receives. Thus, a bird that eats larger quantities of food will grow faster than a bird that eats smaller quantities of the same food. All other factors being equal, individual birds that show strong appetites should be given consideration when choosing breeding stock.

2. Protein equals rate of growth – Just as the amount of food consumed affects the rate at which a bird grows, so does the quality of the feed provided. Higher protein diets, up to 30% protein, are to be preferred for birds that have access to range and which are expected to grow at significant or reasonable rates. Low protein diets, 16% protein and lower, can reduce the rate of growth by as much as 50% and cause adult size to less than the genetic potential – not to mention that lower protein diets often cost more money in the long



The Satisfaction of serving quality chicken that you grew is what it is all about. Here Fred Beranger prepares two Buckeye chickens that he grew.

run, as the birds will often eat more total pounds of feed for pounds gained.

3. Wide feathers – Birds with wide feathers grow at a faster rate than birds with narrow feathers. This has largely to do with the fact that narrow feathers allow more body heat to escape and thus less of the food consumed goes into growth. Birds with narrow feathers can be identified at an early age, as they are apt to be slow to grow back feathers for the first 6 weeks of life.

4. Mortality – Extremely slow or excessively fast maturing chicks tend to suffer higher mortality than chicks which grow at a “normal” rate. Excessively fast maturing poultry have thinner gastro-intestinal tracts, which allow for faster nutrient uptake. But the thinness of these tracts can also make for proneness to intestinal blowouts and infections.

5. Size – Mature size and rate of growth are not positively correlated. In the Buckeye study the largest male produced weighed 9.5 pounds at one year of age. This same male weighed only 5.13 pounds at 16 weeks of age while others reached as much as 6.0 pounds by the same age. Both mature size and rate of growth are important considerations for potential breeding stock.

Resources and Suggested Reading

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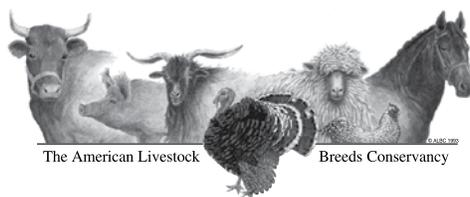
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