

# TECHNICAL FOCUS

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## COMMERCIAL YIELD TESTING

JAY HUGHES, PRODUCT MANAGER

### INTRODUCTION:

The selection strategy used by the Research and Development staff at Cobb is designed to provide product lines which exhibit continuous improvements in key performance traits. The key performance traits in which the product will improve annually can be broken into three major areas; breeder performance, live broiler performance and performance at the processing plant. A "bottom line assessment" must utilize both a breed's performance characteristics and the finished product mix of a producer to accurately make the best decision on breed selection.

One of the best tools to determine how different breeds will perform in your operation is a broiler yield trial run under commercial conditions. This article will provide a guide on what we at Cobb feel is the most accurate way to perform a commercial yield trial.

### PURPOSE

The purpose of any yield test is undoubtedly to determine which broiler cross will give you the most meat yield and how that yield is distributed within the carcass. The yield test itself will not tell you what breed you should use, but combined with the live production data such as production, livability, feed conversion and other factors it can give you a good idea.

There are many different factors to consider in performing an accurate and successful yield test. The first and most important is selecting your sample. We recommend that you choose birds that are in good health and are representative of the entire flock. The best way to do this is through a Restricted Random Sample.

The procedures for taking this kind of sample are described in this document along with a less comprehensive but also less accurate alternative. We also suggest that you

keep males and females separate in your test. Males and females of any breed will differ in yield and should be measured separately. Another extremely important consideration is when to debone the birds. We recommend hot deboning (pre-chill) for all yield testing because your goal is to see what the meat yield of each bird is, not its capacity for holding water. Finally, it is imperative that the birds are individually identified by a numbered tag or band. This is important, not only to keep males and females separate, but also to calculate yield on an individual bird basis.



### HOUSING

We recommend that the breeds being tested come from similar age breeder flocks, be grown on a single farm with the same caretaker, and in houses that are as close to identical in management and equipment as possible. This will standardize as many variables involved in the growing process as possible and ensure that none of the breeds have an unfair advantage going into the plant.

### SAMPLING

#### Method 1.

#### Restricted Random Sample for Estimating Yield

The purpose of using simple random sampling is to estimate the average yield of a cross by individually processing birds chosen at random from that cross. Restricted random sampling limits or restricts the sample to just those birds that are very close to the average weight of the flock or broiler cross. This procedure is of great advantage when only limited numbers of birds can be individually processed because this process forces the researcher to choose birds from around the average weight of the flock. It is valuable when the researcher is more interested in accurately estimating the average yield of each cross than in estimating the variation in yield of each cross.

Continued on page 2

Continued from page 1

If you weighed every bird in the house your weight distribution would be in a “normal distribution.” In a normal distribution 2/3 of the birds will weigh  $\pm 1$  standard deviation from the mean and 1/3 of the birds will be between 1 and 2 standard deviations from the mean. The restricted random sample encourages you to choose birds from within  $\pm 2$  standard deviations of the average weight. We prefer this to a simple random sample selection of sample birds because with the simple random sampling method you have no guarantee that the sample you select to process will give you the real average yield of the flock unless you individually process an extremely large sample (approximately 10% of the flock).

### Restricted Random Sampling Procedure

1. Individually weigh approximately 100 birds of each sex to get a mean and a standard deviation for both males and females. **It is important to weigh every bird that is driven into the catch pen while obtaining the average weight. This will eliminate any unintended bias in the average.** Any statistical calculator can calculate both mean and standard deviation. Follow the instructions on the calculator.
2. Set cutoff weights for each grouping of birds. 1/3 of the birds should be chosen with weights between the mean and the mean plus 1 standard deviation and 1/6 of the birds should be chosen with weights between the mean plus 1 standard deviation and the mean plus 2 standard deviations. Also 1/3 of the birds should be chosen with weights between the mean and the mean minus 1 standard deviation and 1/6 of the birds should be chosen with weights between the mean minus 1 standard deviation and the mean minus 2 standard deviations.
3. Repeat Restricted Random Sample procedure for each sex and line in the yield test keeping lines and sexes separate by banding the birds and either placing them in a catch pen in the house or placing them in coops if the plan is to process them immediately. Each sex of each line will be a separate group in the test.

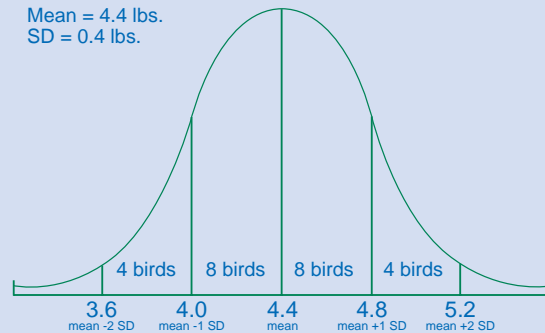
### Method 2.

#### Simple Random Sampling for Estimating Yield

A simple random sample may not be as accurate as a restricted random sample in estimating average yields since very small or very large birds might dominate the sample. Sometimes, however, you just don't have the time or people

The Average Body Weight Distribution chart illustrates the mean and standard deviation of birds.

#### Average Body Weight Distribution



**For example** – You have decided to process 24 birds per sex of each line. You weighed 100 males and your mean is 4.4 pounds with a standard deviation of 0.4 pounds. You will select 8 sample birds that weigh between 4.4 lbs and 4.8 lbs and 4 sample birds that weigh between 4.8 lbs and 5.2 lbs. You will also select 8 sample birds that weigh between 4.4 lbs and 4.0 lbs and 4 sample birds that weigh between 4.0 lbs and 3.6 lbs.

to perform the restricted sampling procedure to get your sample birds. If you choose to take a simple random sample there are a few things to keep in mind and watch out for.

1. Make sure you select as many birds as possible. The larger your sample size the more accurate a random sample will be.
2. Keep your sexes separate. As noted before, sexes within any line of broilers will differ in yield. You don't want your results from one line to be different than another just because there were more or less females in the sample.
3. Avoid extremely large or small birds. If you accidentally pick more extremely large or small birds in one line than you do in another your results will not accurately tell you the yield difference between the lines.

### PROCESSING

At the processing plant we recommend re-weighing each bird individually since there will be some shrink between the farm and the plant. This is the bird weight that you should use to make all “percent of live” calculations. The birds should be identified with a unique band or badge at this point in order to track and record weights individually.

Continued on page 3

Continued from page 2

As stated before, we recommend hot deboning. This will give you the most accurate estimates of yield without introducing the variable of water uptake in the chiller, which can be highly variable from bird to bird.

The following pages of pictures will walk you through the process we use at Cobb for processing at our own yield trials. There are certain techniques pointed out in the deboning section which will help with removing the meat from a pre-chill carcass.

Once the processing is finished you will have all of the data needed to create a spreadsheet with which you can calculate the percent of live weight of the following parts: Wing, fillet, tender, breast meat (fillet+tender), thighs, drums, whole leg (thigh+drum), cage, back, breast skin,

abdominal fat. Optionally, you may also wish to debone thighs and drums.

If you wish, you could calculate eviscerated weight and WOG weight by adding parts together. This will save you time during processing since you will not have to stop and record these weights individually.

**Eviscerated weight=**  
**fillet+tender+cage+back+thigh+drum+wing+skin**

**WOG weight =**  
**Eviscerated weight + abdominal fat**

A Cobb representative is available for any assistance needed to run a successful yield test including assistance in data collection, analysis, and interpretation of your data.



**1** Birds should be identified by a wing tag or a band with a unique number.



**2**

Each bird is weighed and the weight recorded next to the corresponding bird number on your data form.



**3**

After being weighed, birds are hung on the shackle line for evisceration.

Continued on page 4

Continued from page 3



After evisceration the abdominal fat is pulled and each bird is placed on a tray. After cutup, all parts for the bird will be put on a single tray and weighed in sequence.



5

A cut is made in the back of the carcass to facilitate the removal of the thighs.

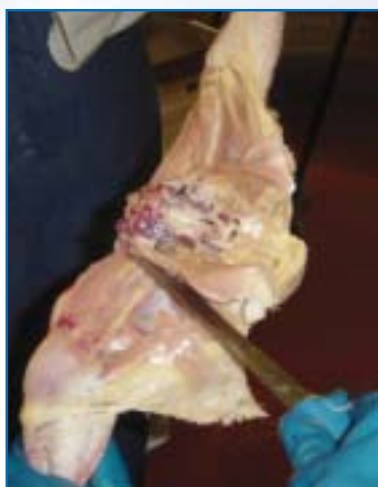


6

The wings are removed and placed on the tray.

7

The front half of the carcass is removed and placed on the tray.



The legs are removed from the back and placed on the tray.

Continued on page 5

Continued from page 5



9

The thighs are removed from the drums and they are all put on the tray. The tray is then passed to the Deboner.



10

The deboner first removes the skin covering the breast and places it on the tray.



11

These are the parts removed from each bird prior to deboning.



12

The breast is placed on a deboning cone and cuts are made along the backbone to remove the meat.



13

The meat is separated from the ribs on each side by pulling, not cutting. This ensures a cleaner removal of the breast meat.



14

After the fillet is separated from the ribs on each side it is pulled off of the keel and placed on the tray.

Continued on page 6

Continued from page 5

16



And then they are pulled off of the cage and placed on the tray.

15



The tenders are separated from the keel by a knife.

18



The parts are weighed and recorded in order either in a computer or on a form.

17



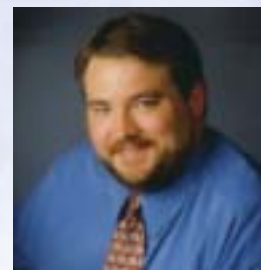
The parts on the tray are arranged and ready for weighing in the following order: Wings, Fillet, Tenders, Cage, Back, Thighs, Drums, Skin, and fat.

### Jay Hughes

Jay graduated with a BS in Poultry Science from the University of Georgia. He then attended the University of Arkansas where he earned his Masters in Poultry Breeding and Genetics.

Jay joined Cobb in 1997 in Research and Development and served as the GP/GGP Selection Manager for three years. He then joined the

genetic staff as a Research Geneticist, a position he held for three years. His responsibilities included running all internal broiler/breeder testing. In June, Jay was appointed Product Manager for North/Central American Sales and Service where he assists customers with yield testing, breed comparison and data management.



COBB-VANTRESS



**COBB-VANTRESS, INC.**  
PO Box 1030, SILOAM SPRINGS,  
ARKANSAS 72761, USA  
TEL: +1 479 524 3166  
FAX: +1 479 524 3043  
EMAIL: info@cobb-vantress.com



**COBB EUROPE**  
MIDDEN ENGWEG 13, 3882 TS  
PUTTEN, THE NETHERLANDS  
TEL: +31 341 36 08 80  
FAX: +31 341 36 05 24  
EMAIL: info@cobb-europe.com



**COBB-VANTRESS BRASIL, LTDA.**  
RODOVIA ASSIS CHATEAUBRIAND, KM 10  
CEP: 15110-000/CAIXA POSTAL 2,  
GUAPIAÇU-SP-BRASIL  
TEL: +55 (17) 3267 9999  
FAX: +55 (17) 3267 9992  
EMAIL: cobb.info@cobb-vantress.com.br

WEBSITE: www.cobb-vantress.com