Meat Deboning Protocol for Turkey Processing Plants

The aim of a successful processor is cost effective production of meat. This can only be achieved by maximizing meat yield in addition to live weight and feed efficiency (FCR).

Breast meat yield (BMY) can be below goal even when good live weights are achieved. It can be strongly influenced by breed and many environmental factors including nutrition, season, age, growth rate, and more specifically when growth occurs. A commercial processor who does not monitor meat yield at the processing plant is missing out on vital information that could help to improve performance and ultimately profits. Refer to www.AviagenTurkeys.com for the latest Nicholas yield standards.

OBJECTIVE

Collecting detailed information on a small sample of birds / carcasses on a regular basis will prove valuable in building up a picture of performance across the company/farms and can help in identifying where improvements could be made.

The most useful meat yield data is that which relates to the individual, rather than estimates from bulk weighing. Individual yield data allows average performances to be calculated and gives an estimation of variation within a flock. This provides greater flexibility in terms of what type of analysis can be carried out. Data of this nature can be used to:

- Create standards within company / operation
- Compare performance against standards
- Compare the performance of individual farms
- Assess trial work such as changes in nutrition, processing age or growing practices
- Compare the performance of the processing plant, for example, assessing the efficiency of automated equipment for deboning compared to a manual process
- Monitor performance over time

PROCEDURE

Like any job in the processing plant, a risk assessment should be performed. After the assessment, all required Personal Protective Equipment (PPE) should be in place before continuing on the following steps.

There are many ways to measure meat yield in the plant and the method will depend on the individual plant set-up, personnel available, space to carry out the work and time. It would be impossible to outline one procedure that would be suitable for all processing plants, however, the aim of this bulletin is to give the key points that should be considered when designing your protocol.

If possible assemble a permanent team who are skilled at deboning and can be trusted to work efficiently and consistently. The cutup sample should replicate exactly what is done on the processing line whereby any changes to the way the line operates must also be adopted by the sample team. Ensure your protocol is not changed without noting what was changed and when. Changes in the way the birds are deboned, will make comparisons to previous samples invalid.

STEP #1 – SELECTING THE SAMPLE

- Identify a farm/flock and select a representative sample of live birds or carcasses.
  - Do not select from flocks that have had health issues or high mortality.
  - If sample is for breed trial purposes, select birds from 90% pure flocks.
- Repeat yield assessments on a regular basis (e.g. daily) to compare performance over time.
- Determine the number of birds / carcasses to sample based on the capability of the plant. The greater the sample number the more robust the data will be for analysis.
  - 60 birds / carcasses will provide a good estimate of flock yields and plenty of data for analysis
  - 30 birds / carcasses per day should be sufficient to build up a good data base
- Select birds / carcasses randomly, but ensure the sample is representative of the flock, particularly if the sample size is small. For example:
  - Do not select mis-sexes, poor or thin birds / carcasses.
  - Do not select from the first or last load from the farm.
  - Do not select carcasses that have parts missing or noticeable defects.
- Collect all birds or carcasses from the same point in the process. The variations could lead to "yield to live", "yield to carcass without giblets (WOG)" and also could account for chiller water retention. (***Note: Tags should be in compliance with all food safety requirements.***)
  - Live bird at hanging – Weigh and tag live birds at hanging to obtain "yield to live" data
  - Prior to the chiller – Weigh and tag carcasses prior to the chiller then run the carcasses through the chiller to obtain water retention data.
  - After the chiller – Weigh carcasses after the chiller then debone to obtain "yield to WOG" data.
- Carcasses harvested may or may not include the neck and tail. However, at some point in the process the neck and tail must be removed to get everything back to WOG equivalent.

STEP #2 – POSITIONING THE CARCASS

- Orientation of the sample carcass for boning may differ from plant to plant. All methods are equally precise but the position of the carcass dictates the method the parts are removed. The methods include:
  - Cone – the carcass is held upright on a cone positioned within the cavity so that the wings are on top and the legs hanging downward.
  - Shackle/neck - the carcass is held by a the neck in a shackle so that the wings are on top and the legs are hanging downward.
  - Shackle/hock - the carcass is held by the hocks with the breast and wings downward.
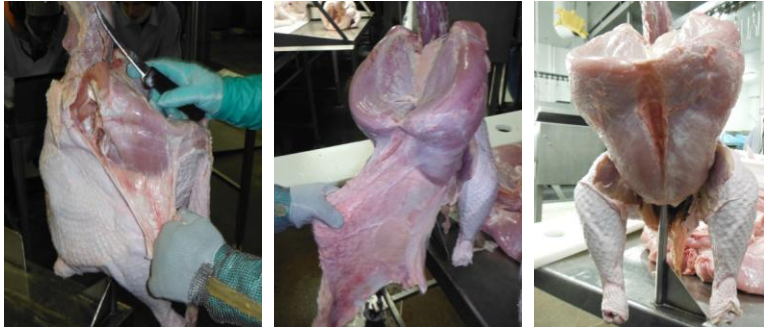

- Steps 3 -10 are examples of cone deboning.

STEP #3 – WING REMOVAL

While the front half of the carcass remains on the cone, remove each wing. Remove the wing close to the socket so that no breast meat is taken off with the wing. Set aside for weighing.

STEP #4 – BREAST SKIN REMOVAL

Pull or cut away the breast skin from the carcass and place it aside for weighing.

STEP #5 – BREAST LOBE REMOVAL

To remove the breast lobes, first cut on either side of the keel bone starting at the point where the keel attaches to the wishbone downward.

Once this cut is done, continue the wishbone cut on each side upward to the shoulder. During this cut the connective tendon to the tenderloin is severed.

Once all cuts are made, the breast lobes can be pulled downward away from the frame leaving the tenderloins still attached to the frame. Set lobes aside for weighing.

STEP #6 – TENDERLOIN REMOVAL

Tenderloin removal is easy, simply grasp one at a time and pull away from the frame. Set aside for weighing.

STEP #7 – DARK MEAT OYSTER REMOVAL

Spin the cone so that the back is facing you. On each flank just below the thigh is the "dark meat oyster". This cut requires a clean cut that follows the indentation of the frame along the small of the back. Remove oyster and set aside for weighing.


STEP #8 – DRUMSTICK REMOVAL & DEBONE

To cut off the drum, first score the meat where it connects to the thigh. Once scored now bend and snap the joint so that the next cut is more accessible and a clean cut can be made. Repeat on the other side. If only a whole drum is the measure, set aside both drums for weighing later.

If the drum meat is to be measured, place the drum on a table with the major muscle downward. Score and peel off the drum skin. Next make a cut lengthwise along the side of the drum bone, now butterfly cut the meat away from the bone. When finished you should have three pieces for weighing later.
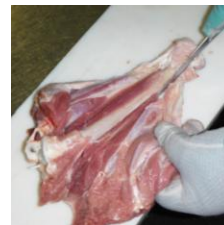
STEP #9 – THIGH REMOVAL & DEBONE

To remove the thigh, simply bend the whole thigh back away from the frame to dislocate it from the hip. Now cut the whole thigh away from the frame and set aside to weigh or place on table to debone.


To debone, place the whole thigh on a table and remove the thigh skin and set it aside. Much like deboning the drum, place the whole skinless thigh outside muscle side down. Next, find the outside edge of the bone, cut lengthwise and separate the meat from the bone while keeping the boneless skinless thigh meat whole. Set this thigh meat aside for weighing later.

STEP #10 – SCAPULA REMOVAL

The only meat remaining whole on the frame is the scapula (shoulder meat). You'll find this located on the backside of each of the wing sockets. Place your knife on the shoulder just below the neck and with a downward motion cut this meat free of the frame. Set aside for weighing.
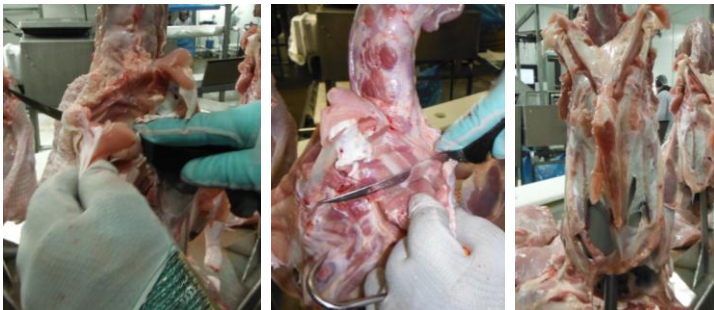
STEP #11 – SCALE / WEIGH

Storage tubs work best in the weighing process. A tare weight for each tub used should be obtained prior to use and recorded. The parts of each carcass to be evaluated should be placed in storage tubs. The tubs may be used in one of two ways:

a. Ideally, each carcass is placed individually in a tub. The tag is placed in the tub with the carcass.

b. Alternatively, all of one part from all of the carcasses, e.g. all breast lobes, are placed in one tub. The tub is then labeled with the name of the part within.

Calibrate scales on a regular schedule. Ideally, scales should measure 0.01 lb increments, or a maximum of 0.02 lb increments.

Recording individual part weights may be made manually on a clipboard or the entire process may be streamlined by inserting a load cell and interfacing computer with the deboning apparatus.

This automated process makes it possible to retrieve data efficiently during the removal process. It also mitigates the risk of human error when writing the resulting data onto a clipboard then transferring it onto a computer.

STEP #12 – CALCULATIONS

The calculation to live weight is:

The sum weight of the part removed divided by the live bird weight. An example would be 11.50 lbs. of boneless skinless breast meat / 42 lbs. live bird weight = 27.38% boneless skinless breast yield to live.

The calculation to CWOG weight is:

The sum weight of the part removed divided by the carcass weight out of the chiller, chilled WOG (CWOG). An example would be 11.50 lbs. of boneless skinless breast meat / 33.18 lbs. CWOG weight = 34.66% boneless skinless breast to CWOG.

The calculation of all parts harvested can be weighed in the same manner and recorded as above. If not automated, spreadsheets come in handy at this point.