POULTRY PROCESSING

Processing Steps

Shackling

- Poultry meat processing is initiated by hanging, or shackling, the birds to a processing line.
- Birds are transferred from coops or transport cages to a dark room where they are hung upside down from shackles attached to an automated line.

Stunning

- **Electrical stunning** -- delivers a current through a water bath to immediately create a state of unconsciousness.
  - An effective stun will cause the bird to arch the neck, hold the wings tightly to the body, and sometimes have body tremors.
  - The current should be compliant with minimum recommended current / bird and may vary for broilers, turkeys and other types of poultry.
- **Controlled Atmosphere Stunning** -- Gas stunning is another form of stunning. Birds are immersed in an approved gas or mixture of gases (i.e., CO_2) in order to displace Oxygen and render the bird unconscious.

Processing Steps (continued)

Bleeding

- After stunning, the birds are passed through an automated knife that makes an incision on the neck to cut the major blood vessels.
- With the carcass hanging upside down and the major blood vessels cut, the majority of the blood is drained from the carcass.

Scalding

- Scalding loosens the feathers to facilitate their removal.
- Carcasses are submerged into the scalder that contains water heated to 125-150 °F, depending upon type and age of bird.
- This high water temperature serves to loosen the connection of feathers to the skin.

Processing Steps (continued)

Picking

- Picking is a term that refers to feather removal.
- The picker removes the feathers on the carcass.
- The picker is an automated machine that contains rubber finger-like projections that rotate in a circular motion to remove feathers without damaging the carcass.

Removal of feet, head, neck and oil glands

- Feet are removed at the ankle joints.
- The head is cut and removed.
- The neck is cut by machine and esophagus is exposed.

Processing Steps (continued)

Evisceration

- Evisceration refers to the removal of internal organs.
- The inedible viscera consists of the spleen, esophagus, lungs, intestines and reproductive organs.
- The intestines (viscera) are federally inspected for signs of disease or other problems.
- Identified disease or other problems results in the removal, or condemnation, of the carcass from the processing line.
- The edible viscera, or giblets, consists of the heart, liver, and gizzard.
- The giblets are packaged in the carcass or sold separately.


DANGER
DANGER

Processing Steps (continued)

Washing the carcass

- The carcasses are cleaned for microbial and visible concerns.
- When processing chicken, microbial bacteria such as E. Coli and Salmonella are analyzed.

Chilling

- The carcass temperature must be reduced to prevent microbial growth.
- The USDA specifies the amount of chilling for specific bird sizes.
- 4 lb broiler: 40 °F within 4 hours
- 4-8 lb broiler: 40 °F within 6 hours
- >8 lb broiler: 40 °F within 8 hours
- Submerging the carcass in an ice (chilled water) bath is the most common method of carcass chilling.
- Carcass can also be chilled by air chilling.
- Air chilling occurs by passing cold air over the carcass. This is a more expensive process but some consumers are willing to pay more for air chilling.

Processing Steps (continued)

Cut-up and deboning

- On average, 75-80% of the live animal weight is retained in the carcass.
- This amount of live weight retained in the carcass is known as the dressing percentage or yield.
- The carcass can be sold whole, or individual components of carcass can be cut-up for individual sale.
- Cut-up often times includes removal of the breast, thigh, drumsticks, and wings.
- Deboning refers to the removal of bone from the cut-up meat.
- Breasts and thighs are commonly deboned.


Boneless Thigh Meat
Boneless Leg Meat
Boneless Skinless Trimmed Breast
Boneless Tenders
Split Wings
Whole Wings

Processing Steps (continued)

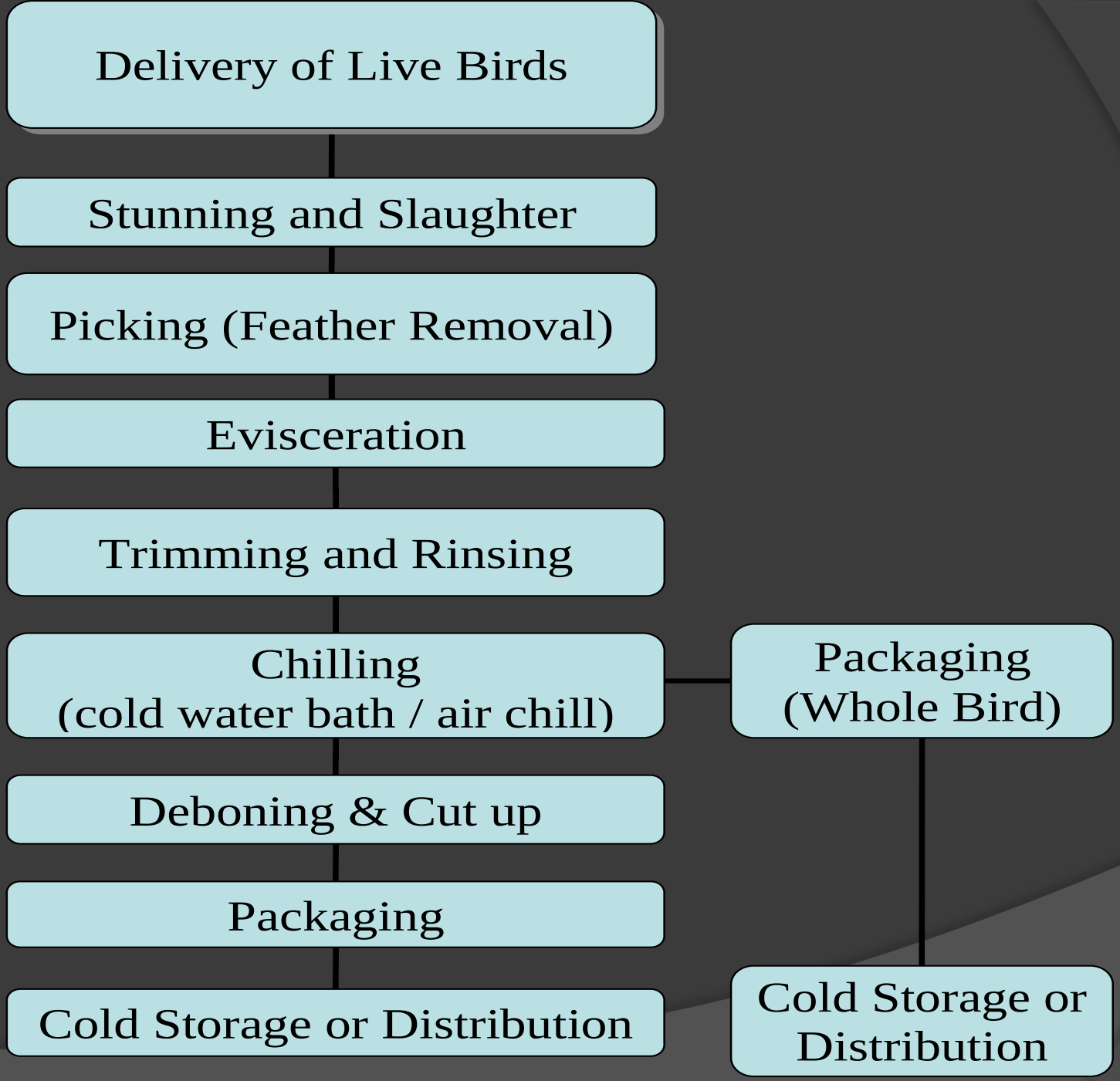
Further processing

- The whole carcass or cut-up and deboned pieces may be further processed for added value.
- Further processing may include forming, curing, smoking, and cooking of products.
- Forming product requires a change in particle size and often includes the addition of nutrients to add flavor.
- Forming product also requires the use of a mold to obtain desired shape.
- Formed products include hot dogs, chicken nuggets, or sausage.
- Curing involves the addition of preservatives, often nitrates, to the meat to improve flavor and product shelf-life.
- Smoking also acts as a preservative while providing additional flavor to the product.
- Some product may prepared in a form that is edible without additional preparation and is known as “ready-to-eat”.

Processing Steps (continued)

Storage

- Poultry meat should be refrigerated around 30 °F. Keeping the poultry below 40 °F reduces the risk of microbial growth.
- Refrigeration and freezing does not kill all microbes.


Delivery of Live Birds
Stunning and Slaughter
Picking (Feather Removal)
Evisceration
Trimming and Rinsing
Chilling
(cold water bath / air chill)
Packaging
(Whole Bird)
Deboning & Cut up
Packaging
Cold Storage or Distribution
Cold Storage or
Distribution

Equipment Used in Plant

Stunning cabinet

- Electrical circuit passes through the whole body. The amount of current required depends upon the type of bird, i.e., chickens, turkeys, ducks, etc.

Automated knife blade

- Cuts the neck and major blood vessels allowing the blood to flow out of the bird. All birds are stunned and insensible to pain prior to entering the automated knife machine.

Scalding tank

- The purpose is to loosen the feather follicles of the bird so that the picker can remove the feathers.

Picker

- Soft, rubber projections are installed throughout the inside and the purpose is to remove all of the feathers so the bird is ready for processing.

Pnuematic shears

- A n air powered device to remove the neck and head.

Layout of Plant

Flow of operations

- Poultry processing plants are highly organized and mechanized facilities that contain state-of-the-art technology to ensure the safe preparation of poultry meat products.
- Processed product should travel from the area of highest potential contamination to the lowest potential contamination.

Personnel traffic flow

- Personnel traffic flow should be restricted to prevent potential contamination of product.
- Personnel should be restricted to their routine work area.

Separation of raw and ready-to-eat product

- Ready-to-eat products must be located in a separate facility from raw product in order to prevent potential contamination.
- Ventilation systems should direct airflow away from cooked products.

Requirements of a Packaging Label

- 1. Sell-by date
  - Preferred by stores
  - Date used for quality assurance.
  - Food can still be consumed if meat is frozen and the sell-by date is expired.

Requirements of a Packaging Label

- 2. Plant Code
  - All product inspected at retail stores.
  - Used for bacteria outbreak and recalls.

Requirements of a Packaging Label

- 3. Grade of Chicken
  - Grade A is the best quality.
  - Includes plump, bruise free, and no broken bones.

Requirements of a Packaging Label

- 4. Keep refrigerated.
- 5. Follow label instructions.
- 6. Nutrition Facts
  - Serving sizes
  - Fat, sugar, sodium, and carbohydrate inclusion.