

# **POULTRY FARM**



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# Poultry-House Equipment



A poultry house is not complete without the accessory equipments or features that make it suitable for the particular kind of production for which it is intended. Pieces of equipment that are built in as a part of the house should be simple, few in number, adequate in size, removable for cleaning, and conveniently and systematically placed in the house; so that their care will take a minimum of labor (Nesheim et al., 1979)

## Nests





The desirable qualities of a nest are that it be roomy, easily cleaned and sprayed, dark, cool and well ventilated, and conveniently located. Dark nests are preferred because the hens like seclusion for laying. Dark nests also reduce the like hood of egg eating. Some arrangement for shutting the fowls out at night prevents them from roosting in the nests and fouling them. This they are prone to do, especially at molting time, in order to escape being crowded by other birds in the perch (Nesheim et al., 1979). Lindley and Whitaker (1996) stated that, nests are banked in lines along outside wall or on either side of a center alley for convenient manual egg.

### Perches

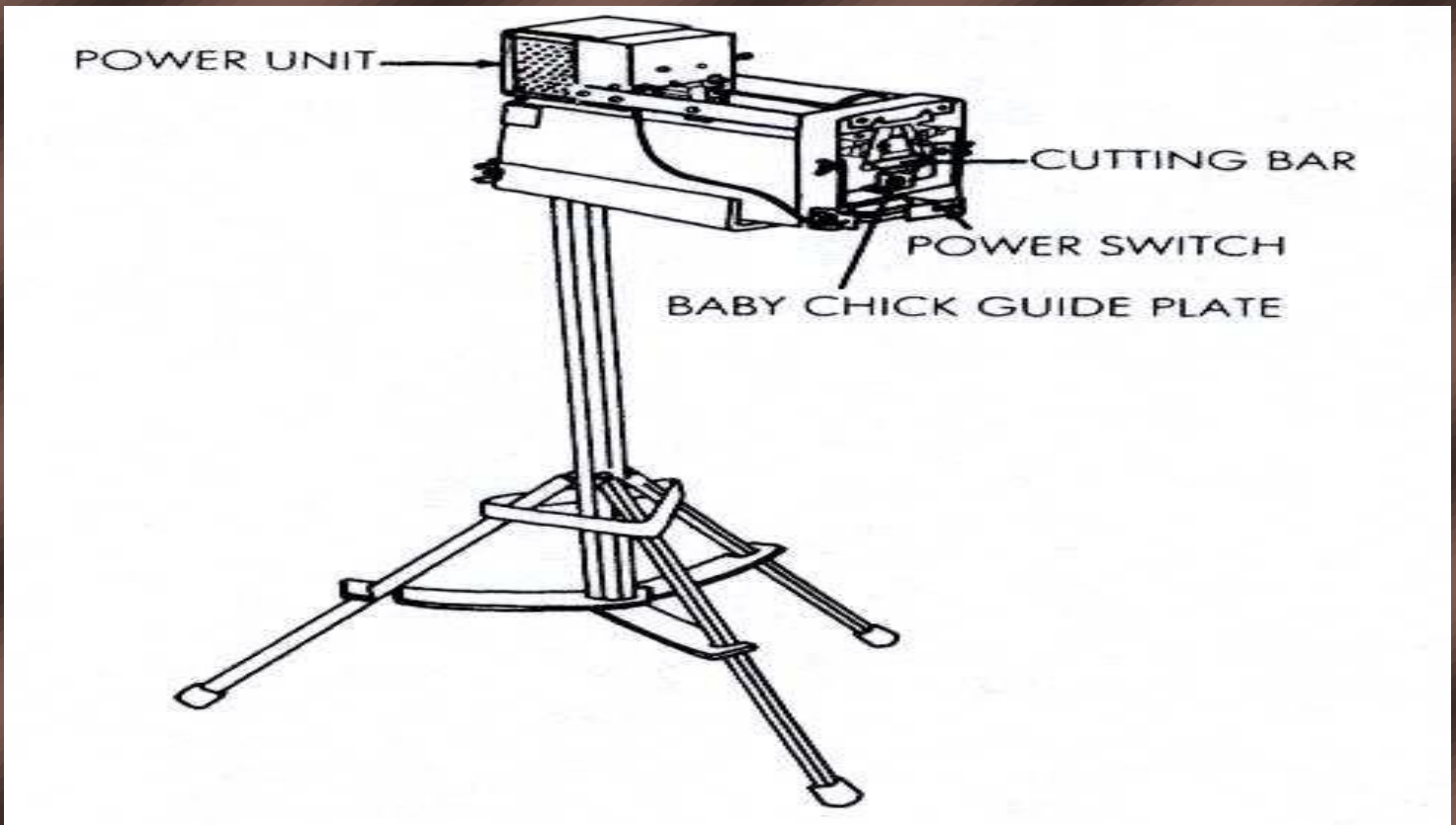
Nesheim et al. (1979) said that, to ensure comfort, the perches should allow from 8 to 10 inches of room for each bird and 15 to 18 inches apart. The most common material for perches is 2 by 3 or 2 by 4 in. lumber. This may be laid on the side or placed on edge. In either case its well to round the upper edge. Chicken need perches in their coop to allow them to sleep without standing in their feces. Chickens roost on perches in the wild to avoid predators at night and during the day. ... Well-placed perches help keep chickens from pooping on each other and from getting injured. Perches allow birds to stay off the floor, particularly during the night. Consequently, manure tends to accumulate under the roost area, and the rest of the bedding material in the house stays cleaner. The use of perches also can affect egg lying.



## Mechanical Debeaker

It consists of a cutting blade that is heated to cherry-red color, a support bar on which the beak is held, and a foot pedal that operates the blade. Depressing the foot pedal brings the red-hot blade down through the beak.

Debarking of baby chicks is made easier by a guide plate which takes the place of the beak support. The guide plate is equipped with holes of three different sizes, the choice of which depends upon how big the chick is and how much of the beak you wish to remove. The chick's beak is inserted into



The hole and the hot cutting blade move down immediately behind the guide plate, cutting off the end of the beak. Another attachment that makes chick debarking semi-automatic is a power unit that attaches to the debeaker. The

power unit is activated by pressing a bar on the front of the debeaker, which moves the blade down behind the guide plate and through the beak. The power unit automatically holds the cutting blade in a down position for two

seconds for cauterize the cut face of the beak, the blade then returns to its starting position



## Cage systems

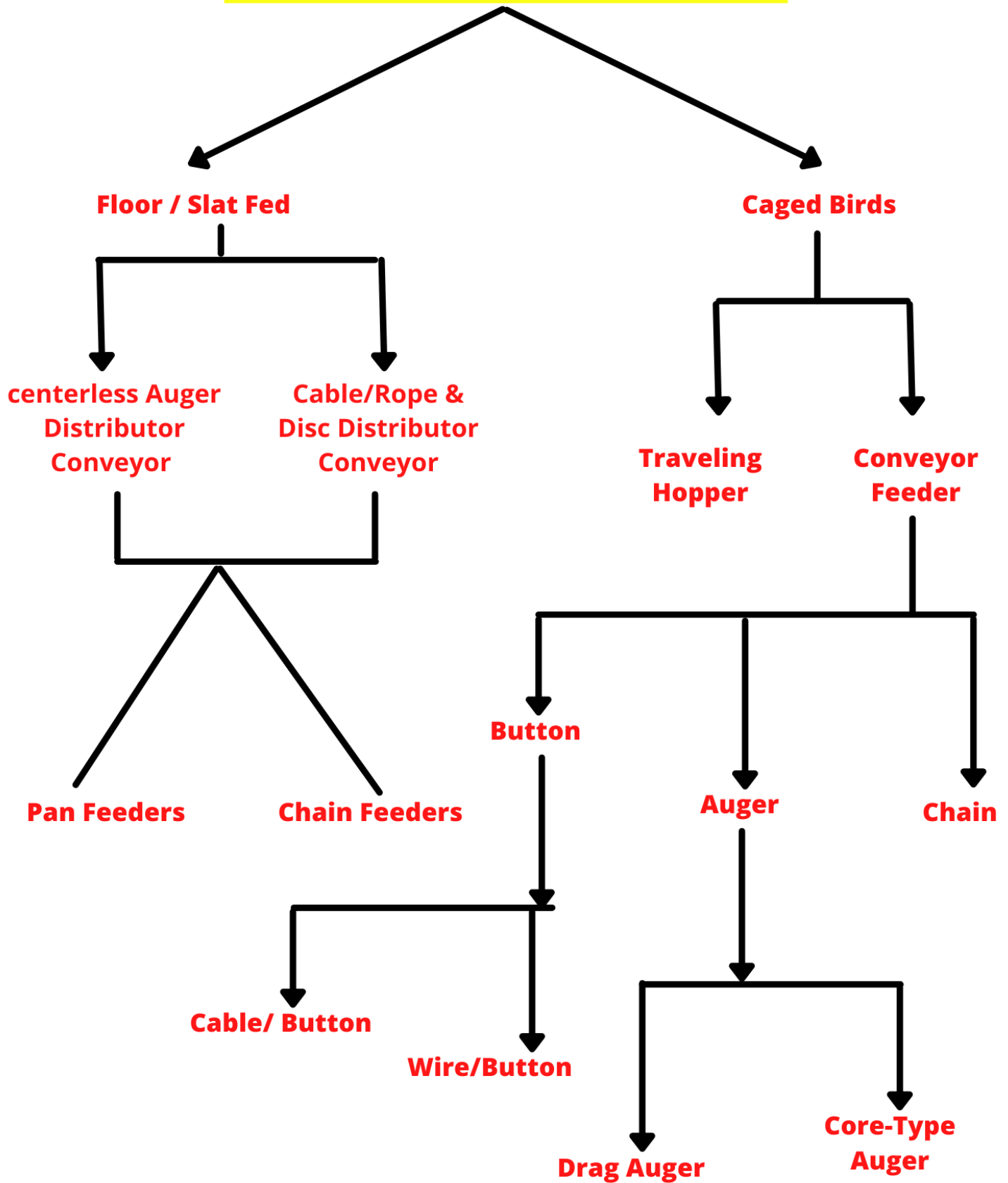
Lindley and Whitaker (1996) indicates that, cage systems may be classified by the number of levels o cages and the method manure elimination from cage area to in-house storage. With the advent of controlled environment housing, cage designs continued to be improved. Three- and four-tier systems and now five-tier systems become popular providing significant increases in bird density within a house. Six tiers require special elevated people-movers to manage the top levels. The most common cage sizes are 400 mm (16 in.) or 600 mm (24 in.) across the front and 450 mm (20 in.) Deep. The 410×510 mm (16×20 in) will house six birds (53.3 in.2/bird), and the 610× 510 mm (24×20 in.) Will house nine birds (53.3 in.2/bird). The European battery cage is usually 50×50 cm (19.7×19.7 in.) and will normally house seven birds (55.4 in.2/bird). Manure elimination is 7 performed using slanted manure collection boards between levels to prevent manure from entering lower cages causing dirty eggs.

## Mechanized Poultry Feeding Systems



Poultry and poultry products offered for import into the US are subject to the Wholesome Poultry Act, also enforce by the food safety and inspection service to which inquiries concerning such products should be addressed. The term ‘poultry’ means any live or slaughtered domesticated bird (chickens, turkeys, ducks, geese, or guineas),

# Mechanized Poultry Feeding Systems





## Conveyor Feeder



Lindley and Whitaker (1996) mentioned that, conveyor feeder are also called automated closed loop mechanical feeders which can be used in any of the cage systems. Moreover they added that, there are five common types:

1. Flat-link chain is a heat-treated steel link with a loop (hook) formed from the center of the link and extending to catch the next link. The connecting loop is nearly closed so that the chain links do not easily disconnect, but can be forced to make splices and repairs. The chain travels at 100 to 500 mm/s (20 to 100 fpm) depending on user preference with 200 to 300 mm/s (40 to 60 fpm) being common. A v-belt drive allows easy adjustment of speed. Ninety degree corners are enclosed with contoured wheels and chain guides. Higher speeds tend to accelerate wear. A 30 m (100 ft) circuit requires a  $\frac{1}{2}$  hp (1.1 kW) motor. The chain operates in a flat bottom trough with one vertical side and one flared side.

2. Drag auger is a hardened spring coil similar to a coil spring except constructed with flat wire instead of a round wire. It operates in a closed loop, and as the name implies, it is dragged around the circuit. The auger is powered by a toothed gear located above the auger and successively engaging each flight of the auger. Ninety degree corners are curved tubes where the auger slides around the curve. Feed helps to act as a lubricant. Auger ends are joined by brazing. A 30 m (100 ft) circuit requires three,  $\frac{1}{3}$  hp (0.25 kW) gear motors to power the circuit. The standard speed is 80 fpm. The auger travels in a U-shaped trough with sides.





Babb (1990) reported that, pan feeders offer a number of advantages over chain type trough feeders. Pan feeders increase the ability of birds to move over the whole floor area. Also, pan feeders offer around one third more feeder space than the same length of trough. The system comprises a series of circular floor mounted or suspended pan feeders supplied by either cable and disc tube conveyor or center less auger conveyor. He added that, there are many varieties on pan feeder design and most are made from molded plastic. Some comprise two parts only: a circular pan with inward curving lip and a cone to receive feed and allow it to be dispensed downwards around its bottom periphery. Other pan feeders incorporate a slated grille to segregate birds and also to help minimize waste. Depth of feed can be adjusted by raising or lowering the central cone on pre-set holes on a central rod with locating pin. Filling of pans is achieved either from high or low mounted center less auger conveyors with drop tubes to Feeders or from a low level circuit of cable and disc conveyor.

### Watering Equipment

Tillie (1999) mentioned that, poultry should be provided with sufficient cool drinking water without wastage. The drinking trough should be easily reached. Lindley and Whitaker (1996) reported that, water is critical to egg production and bird comfort. The water system in each house must be adequate, reliable, and free of contamination from feed, manure, and bacterial growth. Poultry watering systems help keep your poultry flock and game birds healthier **by supplying cleaner water**. We also offer replacement poultry nipples,



poultry watering system hoses and regulators. Need to filter your poultry drinking water? We have that too — from broilers to layers, Resupply is the leader in poultry watering equipment



## Water-Supply Systems

### Laying Hens

In cage-breeding systems the dripping system is used or the suckling drinker into

which the water is led by gravity from constant-level tanks located at the end of each battery



In the cage two drippers should be available to each hen. A device for water recovery (cup or gutter) is fitted below each drinker. This contributes to obtain dry droppings

### **Broilers**

Tillie (1999) added that, dripping systems (pipette) fixed on a feeding pipe and hanging inside the building, supplied trough gravity, or round drinkers can be used. Height above floor le

### **Turkeys**

Automatic round drinking bowls can be used. A flap system regulates the water level and prevents overrunning, thus keeping the litter dry. The number of drinking bowls depends on the age of the fowls

Vela depends on the size of the fowls and on the period (either starting or breeding). Lindley and Whitaker (1996) said that, two more satisfactory methods of supplying water to cages are in common use today. The first is a water cup with a trigger in which the flow is activated by the chicken. Generally, one cup will adequately serve up to 12 birds. Typical line pressure is 14 to 28 kPa for horizontal valve cups and 150 to 200 mm of water for



vertical valve cups. The second method is a nipple waterier mounted overhead in the cage. The bird has to push or peck on the valve to get water. Generally one nipple serve up to 12 birds, 8 to 10 birds per nipple work best. Line pressure usually ranges from 100 to 200 mm of water. Modifications of the watering units and cooling systems were made by Puma et al. (2001), Water flow rate of the modified waterier was measured to range from 33 to 22 mL /min (0.52 to 0.35 gal/h), corresponding to reservoir volume of 1500 to 1000 mL (0.40 to 0.26 gal) or column height of 72 to 60 cm (28 to 24 in.). A copper cooling line was coiled around the water column as a heat exchanger, and the assembly was then placed inside another 10-cm (4-in.) diameter water-laden PVC cylinder, forming a cooling water jacket.



. 1the drinkers are either hanging or set on the floor. For a 1000-m

Building, 96 turkey-type drinking bowls are provided (Tillie, 1999).

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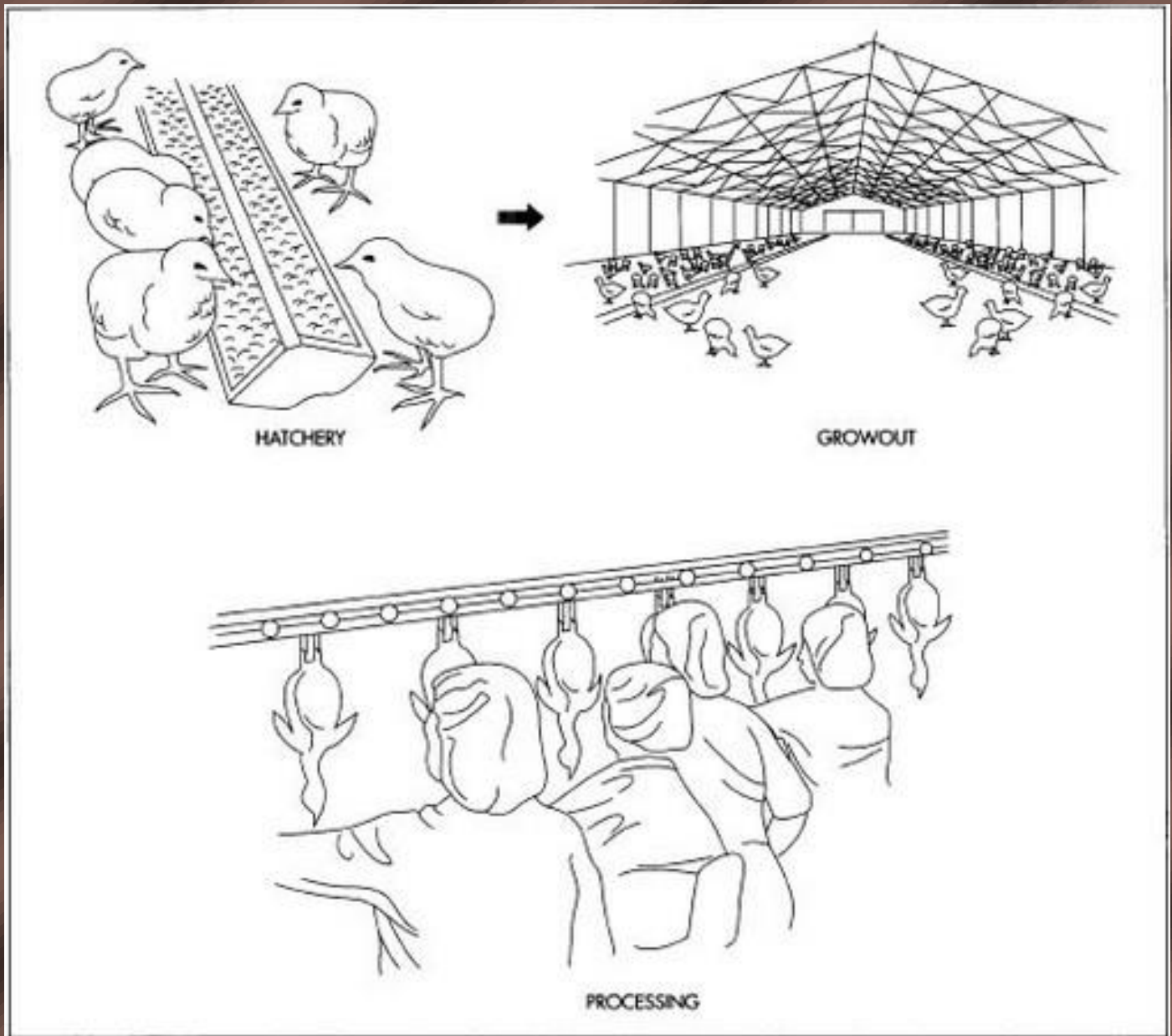


### Mechanical Poultry Harvesting

Barbut (2002) cited that, the catching operation still remains one of the few aspects of broiler production that is not very automated. Overall, most birds, around the world, are loaded manually; however, this is the starting to change as poultry companies beginning to automat this step. He added that, one of the earliest designs was the large foam rubber paddle that was a self-propelled harvester. The system captured the birds with large foam rubber paddles that rotated down on top of the birds and then pushed them onto a conveyor belt. The belt carried the birds to a loading platform where they were deposited into modules made of a series of layered compartments that were carried on the back of the machine. The whole assembly was mounted on a truck-powered vehicle, which maneuvered inside the barn through almost any type of litter. Barbet (2002) added that, a vacuum system was an attempt to use the pneumatic system that could best be described as a large vacuum cleaner. The birds were suspended in air as they passed through a tubing system while there feathers helped to prevent or reduce bruising. The birds were Placed by hand in a funnel-like aperture and pulled by suction through tubing. Prototype mechanical harvester with rubber-fingered rotors for picking up birds and associated conveyors for placing birds in coops or cages. Collecting mats have been used to harvest birds in the Netherlands. These mats are laid down in sections over the entire floor of the



broiler house a few hours prior to catching. Collecting mats have been used to harvest birds in the Netherlands. These mats are laid down in sections over the entire floor of the broiler house a few hours prior to catching. The mats, with birds on top of them, are mechanically pulled from the house one at a time. The birds drop into stackable crates as the mats are rolled up by machine. This process is probably not practical in the U.S. due to differences in house design. In addition, the hand labor involved in placing mats in the houses is considerable (Kettlewell and Turner, 1985).



Into the crates on a truck. Problems with this system were encountered when birds were placed in the funnel too quickly, resulting in malfunction and unacceptable injuries to the birds. He added that, a built-in conveyor belt was developed and tried in Georgia. It consists of a mechanized growing, harvesting and transporting system. The barn was

equipped with a permanent, recessed conveyor belt built into the concrete floor . During catching, the birds were mechanically herded onto the recessed belt using large paddles that rolled on metal tracks. The conveyor carried the birds out of the barn to a short, inclined conveyor



## Summary

Equipment and handling forage, mechanized poultry feeding systems and automatic feeding systems, watering systems and watering equipment, egg collection equipment, manure handling systems and manure collecting equipment and manure spreading equipment, mechanical poultry harvesting, truck designs for broilers transportation, and mechanical ventilation systems were discussed in this paper.