

# Poultry housing and management in developing countries

## Housing and management of broilers

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### MANAGING THE ENVIRONMENT

The most important aspect of broiler chick management is producing an environment without temperature fluctuations. This is difficult to achieve in village operations, but commercial systems can do so in a number of ways, through whole-house brooding, or partial house brooding to conserve heat and reduce energy costs (Cobb-Vantress, 2008). Correct temperatures are more easily maintained in a small area. Ventilation also needs to be considered, as it distributes heat to the birds and helps maintain good air quality in the brooding area. Chicks are more susceptible to poor air quality than older birds are. High ammonia levels have been shown to reduce the body weight gains of seven-day chicks by 20 percent.

In semi-commercial and large-scale operations, lights are needed along the brooding area above the heat source in the house, to attract chicks to the feed and water. These lights should be used during the first five days after the chicks arrive, after which background lights should be gradually increased, to reach normal lighting by the tenth day.

A well-insulated roof reduces solar heat penetration into the house on warm days, thus decreasing the heat load on the birds. In village settings, many farmers use discarded iron for roofing, but local leaf material made into thatch is preferable (especially in tropical countries), as it insulates the building from extreme heat.

In cold weather, a well-insulated roof reduces heat loss and the energy consumption needed to maintain the correct environment for broiler chicks during the brooding phase. In poorly insulated buildings, an area can be set up inside the shed where temperature fluctuations can be minimized by using curtains and a false ceiling running from eave to eave, to reduce heat loss and make temperature control easier.

### STOCKING DENSITY

It is essential that meat birds have adequate room, whether they are housed in small groups on village farms or in larger semi-commercial or commercial sheds. Lack of space can lead to leg problems, injuries and increased mortality (Sainsbury, 1988). As they approach market weight, an approximate maximum stocking density for fully confined birds on deep litter is 30 kg of bird per square metre of floor area.

### DRINKER MANAGEMENT

Providing clean, cool water is critical in broiler production. Without adequate water intake, feed consumption will decline and bird growth will be depressed. There are many types of drinkers; in high temperature conditions, drinkers that allow water circula-

tion and cooling are best. In small-scale operations, it is important to keep drinkers topped up, to clean and refill them daily, and to locate them in a cool part of the pen or cage, away from any heat source or the sun's rays.

### FEEDING MANAGEMENT

If feeder space is insufficient, growth rates will be reduced and uniformity will be compromised. Feed distribution and the proximity of the feeder to the birds are essential for achieving optimum feed consumption rates. In tropical developing countries, the main factor reducing feed consumption is high temperatures. Feed should be withheld at the hottest time of the day, to prevent heat stress and the resultant mortality. Pan feeders are better than



*Large-scale naturally ventilated broiler house*

Photo Credit: Robert Pym



*Sector 3 small-scale broiler house (Bhutan)*

Photo Credit: Karma Nidup

trough feeders, as they allow unrestricted bird movement around the feeder and there is lower incidence of feed spillage and improved feed conversion.

In most commercial operations, automated pan or trough and chain feeders are used, providing 2.5 cm of feeder space per bird. To reduce feed spillage, the lip of the feeder should be level with the bird's back. An issue in developing countries is ensuring continuity of feed supply. This can be achieved by having a rodent-proof storage area for keeping at least five days of feed consumption. Most village farmers in small-scale operations purchase all the feed required for one grow out. This is essential in remote regions, but farmers must store the feed in strong watertight bins, to reduce the risk of rodent attack and of mould and bacterial growth on the feed.

### LITTER MANAGEMENT

Litter management is a crucial aspect of environmental management, and is fundamental to bird health and performance and to final carcass quality. If the litter is too hard, birds will develop lesions on the keel bone. If the litter is allowed to get wet, birds will develop foot lesions, and the associated high ammonia levels will cause respiratory problems and also affect the birds' immune system.

### CHICK PLACEMENT MANAGEMENT

In village settings, it is normal to have multi-age flocks. However, it is best practice to place broiler chicks of the same age and flock source in a single house, and attempt to operate an "all-in, all-out" production system. Chicks must be carefully placed and evenly distributed near feed and water throughout the brooding area. If lights are available, they should initially be set at full intensity in the brooding area, to attract the chicks to the feed source. The first two weeks of a broiler chick's life are critical for its future growth.

### UNIFORMITY

In large commercial operations, the average weight and uniformity of a flock are usually determined by taking a random sample of approximately 100 birds and recording their individual weights. Of the 100 birds weighed, the number that is within 10 percent of either side of the average body weight is used to calculate the uniformity, expressed in percentage terms. In a village broiler flock housed in a small enclosure it is important that the farmer

identifies the birds that are underweight, and ensures that they have good access to feed and water.

### LIGHTING PROGRAMMES

In most village operations, lighting is not provided, although the amount and intensity of light affect broiler activity. Correct stimulation of activity during the first five to seven days of life is necessary for optimal feed consumption, digestion and immune system development. Reducing the energy required for activity during the middle part of the growing period improves production efficiency. Uniform distribution of light throughout the house is essential. It is recommended that 25 lux at chick height be used during the first week of brooding to encourage early weight gains. For optimum performance, light intensity at floor level should not vary by more than 20 percent. After seven days of age, light intensities should be diminished gradually to 5 to 10 lux.

### CATCHING PROCEDURES

Feed should be withdrawn about eight to 12 hours before birds are sent to slaughter (Barnett *et al.*, 2001). The purpose of this is to empty the digestive tract and prevent ingested feed and faecal material from contaminating the carcasses during processing. It is important that farmers know the local or national regulations concerning the recommended time for feed withdrawal prior to slaughter.

### REFERENCES

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Trough and chain automated system of feeding broilers

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