

Poultry housing and management in developing countries

Housing and management of breeders

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HOUSING OF BREEDERS IN DEVELOPING COUNTRIES

In village settings, some farmers use bush materials to construct houses for their breeder chickens, which provides some protection. Typically, a village flock comprises ten to 12 layers with one or two cockerels. Natural incubation by broody hens is common, and egg fertility ranges from good to poor, depending on several factors. The decision to construct a house for chickens is often determined by the individual farmer's access to materials, the availability of space within the village, and other social and economic factors. However, the houses built are basically for night shelter, and the breeding birds are left to scavenge for feed during the day, thus they remain prone to predators even though shelters are provided.

In commercial and semi-commercial settings in developing countries, breeders are normally housed in naturally ventilated houses, with some additional lighting provided if electricity is available. The house is usually fitted with nest boxes, feeders and drinkers. Some large-scale operations use automatic feeding and egg collection systems.

BREEDERS IN DEVELOPING COUNTRIES

A number of government, non-governmental and training organizations have developed poultry breeding programmes for producing local chickens in developing countries. Some centres have imported improved commercial strains for crossing with the local chickens to improve the meat and egg production of small-holder poultry flocks. The breeding centres often distribute chicks to farmers for use in their village farm operations. Larger commercial integrated poultry franchises in developing countries normally import fertile eggs from commercial layer or broiler breeder flocks. These eggs are set in large hatcheries, and hatched chicks are either sold in small lots to village farmers or used in commercial or semi-commercial operations to produce chicken meat and eggs for consumers in towns and cities.

The poultry breeding facilities established in developing countries are normally small-scale. Ideally, the breeding flock should comprise females with good egg production, which are mated with active cockerels. A major issue is maintaining a supply of fertile eggs. Young breeder flocks produce fewer fertile eggs than those at peak of lay, and fertility also tends to be lower in eggs produced by older breeders. Hatchability and the uniformity of hatched chicks depend on management of the eggs produced by the breeders. In larger-scale operations, eggs should be collected at least four times a day, handled carefully to prevent breakages, and stored for no longer than seven days in a cool room at 15.5 to 17 °C and relative humidity of 75 percent. Eggs on the floor or

that are dirty should not be set. In small-scale village operations, farmers can clean dirty eggs with abrasive paper and make use of all the eggs that are available.

BREEDER CHICK MANAGEMENT

Chicks that are reared for use in a breeding programme should be kept separate from other birds in other age groups. Cockerels should also be grown separately from females, preferably until five months of age. Generally, however, this approach is not possible in village operations. Most chick rearing in hot-climate developing countries is carried out in naturally ventilated houses. In commercial operations, chicks scratch in the litter, creating uneven litter levels, particularly around feeders and drinkers. Small



Small-scale breeding programme with indigenous breeds



Broiler breeder hens and cocks in a deep-litter naturally ventilated house

birds will not be able to reach the feeders or drinkers if the litter levels are not kept even. In large commercial operations in colder climates, the building should be pre-heated so the floor is warm and the air temperature close to 32 °C when the chicks are placed. If provided, lighting should be continuous for the first 48 hours after the chicks arrive.

Beak trimming is practised where required to prevent injurious pecking in the flock. Males often need re-trimming before they enter the breeding programme, to reduce the risk of pecking damage to the females during mating.

GROWTH AND PRODUCTION

During the rearing and growing period for breeder stock the major objective is to control body weight, particularly to ensure that all the birds reach target weight-for-age uniformly. Body weight targets are achieved by controlling feed allowances. Feed amounts during rearing are based on body weight and maintenance; during lay, egg production and egg weight are also important (Cobb-Vantress, 2008a).

In meat and layer type birds, body weight uniformity is critical during the first six weeks of the breeders' growth. Weekly body weight increase is a good indicator of how successful the brooding has been. High-quality feed of appropriate particle size must be provided to obtain adequate feed intake in the first week. Crop size is a good guide to how well the chicks are consuming feed and water. In developing countries, it is often difficult for breeder farms to meet the body weight standards set for developed countries, owing to poor feed quality and the typically hot environment.

During the period from six to 16 weeks, meat and layer breeders are usually put on a controlled feeding regime to keep their body weight on target. When the birds reach 16 weeks, they are stimulated by providing up to an hour of additional artificial light per day, to promote sexual development. Particularly in layer strain breeder flocks, it is essential that the female parent achieves sufficient body weight between 16 and 20 weeks of age, to maximize peak egg production and achieve consistent egg production throughout lay. Breeder flock egg production can be optimized by appropriate feeding programmes that ensure that the pullets have uniform body weight. It is also important to keep the breeding flock body weight in check after maturity, by handling and weighing birds often and adjusting the feeding levels as required.

Layer breeding stock should be fed daily from hatch to end of lay, whereas for broiler breeders during the rearing phase, skip-a-day feeding is often used because of the relatively severe restriction that is needed to achieve the desired body weight in these much heavier birds. Uniformity and bird welfare suffer if daily feeding is used, as the more timid birds miss out on their daily allowance. On the alternate days, scratch grain is often provided to reduce hunger. During the laying period, from about 21 weeks of age, broiler breeders are typically fed a restricted amount daily. The restriction at this time is considerably less severe than it is during the rearing period. Separate-sex feeding is normally practised during the laying period, with males having no access to females' feed, and vice versa. This has more to do with diet composition than quantity, as males have a far lower calcium requirement than females.

LIGHTING PROGRAMME MANAGEMENT

The onset of lay in layer and broiler breeder hens is critically linked to change in day length: increasing day length stimulates the onset of sexual maturity, while decreasing it has the opposite effect. In developing tropical countries, natural day-light rearing of breeding stock is generally used, and works well, because the variation in natural day length is small. During the rearing period, birds can remain in natural light in all seasons until artificial light stimulus is given, normally at 20 or 21 weeks of age in meat breeders and from 18 weeks in layer breeders. When extending the day length, artificial light is provided at both the beginning and the end of the natural day-light period (Lewis and Morris, 2006).

WATER MANAGEMENT

Breeding birds in village systems are normally provided with water in open containers. Most commercial operations provide one bell drinker per 80 birds, while nipple drinkers, which are a more hygienic water delivery system, are provided for eight to ten birds per nipple. Chickens normally drink between 1.6 and 2.0 times their daily feed intake at 21 °C, in both *ad libitum* and control fed flocks. At ambient temperatures higher than 30 °C, water consumption increases to more than twice the feed intake. High water consumption may indicate errors in feed formulation or leaking drinker systems.

RELOCATING BIRDS

In village farming systems, breeder birds are often sold and transferred to other village farms. In semi-commercial and commercial operations, the age for transferring stock to other farms is determined mainly by the facilities available, the birds' body weight and the lighting programme. Transfer can be very stressful for the birds, and every effort should be made to ensure that it is carried out smoothly. It is best to transfer males a week earlier than females, so they can adjust to their feeding system. The ratio of males to females is usually kept at about 1:10, and males should be healthy with no obvious skeletal defects.

PRODUCTION PERIOD

In most developing countries, manual nesting systems that allow about four birds per nest are used. Young breeder males are often added to an older flock to overcome the decline in fertility that usually occurs after peak egg production. Older males usually undergo a decline in mating activity and a reduction in sperm quality.

EGG WEIGHTS

There are considerable advantages in weighing a sample of eggs to establish the trend in egg weight. Analysis of this trend provides a useful guide to breeder flock performance, and gives early indication of problems. An egg weight that is too low could be the result of insufficient feed or water intake, high shed temperatures or disease. If egg weight is too high, birds may be overweight or overfed.

EGG HANDLING

On larger breeder farms, eggs are collected two to three times a day and kept in a cool place for three to four days before setting. If held for longer than seven days, they must be stored at 16 to 17 °C.

Maximum hatchability and chick quality can only be achieved when the egg is held under optimum conditions between laying and setting in the incubator (Cobb-Vantress, 2008b). It is normal practice to sanitize hatching eggs prior to setting. Methods commonly used are formaldehyde fumigation, dipping in ammonium solutions, ultraviolet light and ozone. Eggs should be allowed to cool gradually before being placed in the cool room at a relative humidity of 75 percent.

In larger commercial operations, vehicles that maintain a temperature of 16 to 18 °C are used to transport eggs from the breeder farm to the hatchery. Fertile eggs are also maintained

under cool conditions when they are transported by air. During loading, care must be taken to avoid egg breakages when carrying and stacking the egg fillers. Particular care must be taken when transporting eggs on rough roads, which are common in developing countries.

REFERENCES

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