

The importance of the first week for a breeder chick

by the Aviagen technical transfer team.

Management during the first week for a breeder chick is critical as it has a lasting influence on health and performance for the remainder of the bird's life. The principal objective during the brooding period is to achieve the best start possible for every chick.

Excessive stress and challenge during the first seven days post-hatch will increase susceptibility to disease and mortality and decrease growth, uniformity and subsequent flock performance. The chick is dependent on the grower to ensure the brooding environment is well managed.

If this is done and management conditions adequately meet the requirement of the chicks: feeding and drinking behaviour will develop well, initial development will be optimised and subsequent bird health, welfare, uniformity and productivity will be high.

Before chick arrival

The expected delivery time and number of chicks should be determined well in advance to ensure the appropriate brooding space is planned for and the chicks can be quickly placed in the house following arrival.

Ideally the brooding house should be set

Crop fill after 24 hours. The chick on the left has a full, rounded crop, while the chick on the right has an empty crop.

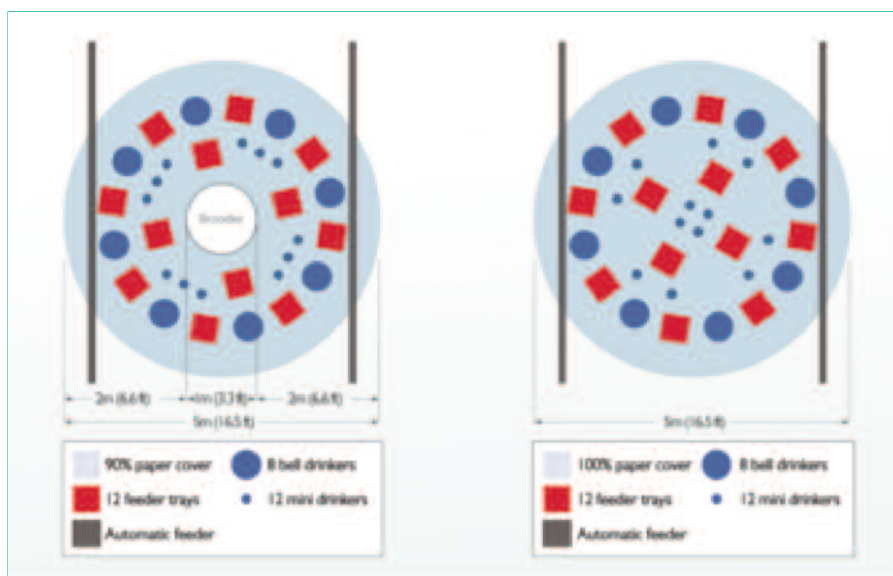


Fig. 1. Appropriate spot and whole-house brooding set-ups.

up so that chicks from different donor flocks can be brooded separately. Chicks from younger donor flocks will achieve weights more readily if kept separate until the first grading at 28 days.

Chicks should be delivered by environmentally controlled transportation capable of providing the following temperature, humidity and ventilation:

- Temperature should be monitored to give a chick vent temperature between 39.4-40.5°C (103-105°F) during delivery.
- As far as possible, relative humidity should be controlled to between 50-65% throughout the journey.
- A minimum ventilation of 0.7 l m³ per minute (25ft³ per minute) should be supplied in transit.

Biosecurity is an important consideration before chicks are delivered to the farm. Individual sites should hold birds of the same age. An 'all in, all-out' principle allows easier and more effective vaccination, cleaning and sanitation, supporting the future health and performance of the flock.

House preparation of the brooding area must ensure correct air and floor temperatures are achieved and tested before chick arrival. Preheating the house before placement is essential; temperature (air and floor) and relative humidity should be stabilised for 24 hours prior to chick placement. Key parameters are:

- Air temperature should be 30°C (86°F) – measured at chick height above the litter in the feed and water area.
- Floor temperature; 28-30°C (83-86°F).
- Relative humidity; 60-70%.

Litter should be evenly spread at a depth

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of 8-10cm (3-4 inches). If floor feeding is practiced after brooding it is advisable not to have litter exceed 4cm (1.5 inches) in depth.

The litter material used should have good absorption, be biodegradable, offer chick comfort, have low dust levels and be free from contamination.

Easy access to feed and water will enhance the opportunity for a good chick start. At placement and for the first 24 hours a chick should not have to travel more than 1.0m (3.3ft) to access water. Temporary drinkers should be placed in the vicinity of the permanent automated drinkers to facilitate easy transfer to the automated drinking system.

Twelve chicks per nipple or eight bell drinkers per 1,000 chicks is advised with water temperature between 15-20°C (59-68°F) initially – chilled water should not be supplied to young chicks. A total of 12 temporary drinkers per 1,000 chicks should also be available.

Nipple drinkers should be placed at eye level during the first 24-48 hour period to entice the chicks to drink. Water pressure can be increased during the first 1-3 days to produce a 'droplet' of water on the nipple pin to attract the chicks.

Easy access to feed must also be ensured. A good quality, sieved-crumble or mini pellet no more than 2mm (0.6inch) in diameter must be provided on supplementary feeder trays (1 for every 80 chicks) and spread on paper to give a feeding area covering at least 90% of the brooding area.

The appropriate lighting target during brooding is 80-100 lux (8-10 foot candles) in the feed and water area to encourage consumption. Surrounding areas will be dimly lit at 10-20 lux (1-2 foot candles).

There are two methods of brooding. Spot brooding provides a local heat source so chicks can move either to or from the heat

Age (days)	Dry bulb temperature at RH% °C (°F)				
	40	50	60	70	80
Day old	36.0 (96.8)	33.2 (91.8)	30.8 (84.4)	29.2 (84.6)	27.0 (80.6)
3	33.7 (92.7)	31.2 (88.2)	28.9 (84.0)	27.3 (81.1)	26.0 (78.8)
6	32.5 (90.5)	29.9 (85.8)	27.7 (81.9)	26.0 (78.8)	24.0 (75.2)
9	31.3 (88.3)	28.6 (83.5)	26.7 (80.1)	25.0 (77.0)	23.0 (73.4)
12	30.2 (86.4)	27.8 (82.0)	25.7 (78.3)	24.0 (75.2)	23.0 (73.4)
15	29.0 (84.2)	26.8 (80.2)	24.8 (76.6)	23.0 (73.4)	22.0 (71.6)
18	27.7 (81.9)	25.5 (77.9)	23.6 (74.5)	21.9 (71.4)	21.0 (69.8)
21	26.9 (80.4)	24.7 (76.5)	22.7 (72.9)	21.3 (70.3)	20.0 (68.0)
24	25.7 (78.3)	23.5 (74.3)	21.7 (71.1)	20.2 (68.4)	19.0 (66.2)
27	24.8 (76.6)	22.7 (72.9)	20.7 (69.3)	19.3 (66.7)	18.0 (64.4)

Table 1. Dry bulb temperatures required to achieve equivalent temperature at varying RH. Dry bulb temperatures at the ideal RH at an age are coloured red.

source to control their body temperature. Brooding rings are used to prevent the chicks moving too far away from the heat source.

Whole-house brooding does not provide a temperature gradient. House temperature is more constant and so the ability of the chicks to move to a preferred temperature zone is limited. Appropriate spot and whole-house brooding set-ups are illustrated in Fig. 1.

Chick arrival

Upon arrival, chicks should be placed into the brooding area quickly to give access to feed and water. Empty cardboard or plastic chick boxes must be removed and disposed of quickly, and the chicks left for 1-2 hours to settle in their new environment.

Regular checking of the chicks and their environment should resume after the initial settling in period to ensure all the chicks

have ready access to feed and water and that the environmental conditions are correct for an optimal chick start.

Brooding management

Subsequent levels of flock performance and welfare are dependent on attention to detail and high standards of management during the first 7-10 days of a chicks' life.

Observation to determine the chick's reaction to the environment is key, together with monitoring feed and water intake. Replenish feed frequently; during the first three days feed should be provided in regular small allocations given 5-6 times per day.

This will ensure feed remains fresh and encourages eating. Open source drinkers should be cleaned out and refreshed regularly as bacteria can build up quickly in open water at brooding temperatures. Remove supplementary drinkers gradually to encourage chicks to use the automated drinking

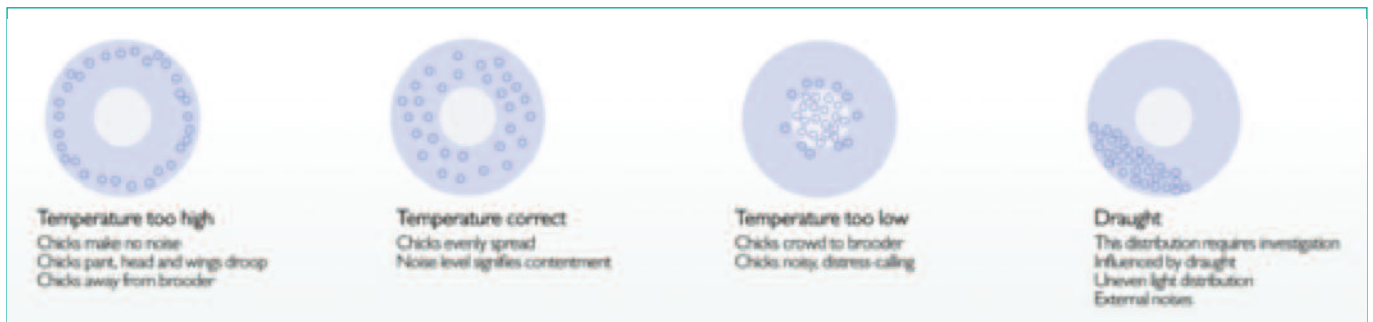


Fig. 2. Chick distribution in response to temperature variation.

system. All supplementary drinkers should be removed by 3-4 days of age.

During the first two days light should be available on a 23 hour light and one hour dark rotation. After this, day length should be gradually reduced to reach a constant eight hours by day 10 of age.

From three days of age, the area contained by brooding rings should be expanded gradually to allow the complete removal of the rings by 5-7 days of age.

Remember chicks at this age are highly susceptible to chilling.

Ventilation even at this early stage is required to remove waste gas and excess moisture as well as to replenish oxygen and maintain temperatures and relative humidity at the desired level.

However, young chicks are prone to wind chill effects and it is important to maintain air speed at less than 0.15m/s (30ft/min) during brooding.

It is important that RH levels during the first three days are kept at 60-70% as this will make chicks less prone to dehydration and generally allow a more uniform start for the flock. Both temperature and RH should be monitored closely and routinely to maintain better control of the environment.

If RH falls below 50% in the first week the environment will be dry and dusty and the chicks will begin to dehydrate. Action must be taken to increase RH. Humidity can be raised by the use of mister or a portable backpack sprayer with a fine mist nozzle.

Optimal temperature is essential for health and appetite development in young chicks. In spot and whole-house brooding, the goal is to stimulate activity and appetite development early. Young birds below the age of 12-14 days cannot fully regulate their own temperature and so it is of great importance to provide the correct environmental tem-

perature and adjust settings in response to bird behaviour.

The dry bulb temperature required to achieve the target environmental temperature will vary depending upon the RH. Table 1 shows the dry bulb temperatures required to achieve equivalent temperatures at varying RH. Dry bulb temperatures at the ideal RH are given in red.

To be effective, temperature and humidity should be monitored at least twice per day for the first five days and then daily thereafter. Readings should be taken at chick level to represent more accurately the environment the birds are experiencing

By far the best indicator of correct brooding conditions is frequent and careful observation of bird behaviour. If birds are exhibiting behaviour that suggests they are too hot or too cold, temperature should be adjusted appropriately.

In spot brooding, correct temperature is represented by chicks being evenly spread throughout the brooding area, incorrect environmental condition are indicated by uneven patterns of chick distribution in response to temperature variation or draughts (Fig. 2).

In whole-house brooding monitoring chick behaviour is less easy as there are no obvious heat sources. Birds will gather in areas where the temperature is closest to their requirements. If temperatures are correct, normally chicks will form groups of 20-30, with movement between groups and continuous feeding and drinking (Fig. 3).

Sometimes a noticeable increase in chirping may be the only indication of discomfort among the chicks in whole-house brooding.

Measures of success

If chicks are eating and drinking normally, the crop will be full with a mixture of feed and water. Careful measurement of crop fill during the first 48 hours is a key indicator of a successful chick start. The objective is to have chicks with a full crop as soon as possible after placement.

The aim is to have at least 75% of chicks with a full crop two hours after placement, increasing to a target of over 95% of the chicks having a full crop 24 hours after being placed.

By 48 hours after placement all chicks should have full crops. If these targets are

not being met then it is a clear indication that the chicks are not finding feed and water and action should be taken (Table 2).

To assess crop fill, collect small samples of 30-40 chicks at three or four different places in the house (or per surround where spot brooding is used). Each chick should be handled and the crop felt gently. In chicks that have found food and water, the crop will be full, soft and rounded. If the crop is full, but the original texture of the crumb is still apparent, the bird has not yet consumed enough water (see photographs on page 7).

Conclusion

Young chicks need special care and attention to make a good start and are totally dependent on the early management of the environmental conditions in making this happen.

They are required to adapt quickly to new conditions and access new feed and water sources during a period when they are unable to regulate their own body temperature.

It is therefore important that conditions during the first 7-10 days of a chick's life provide the optimal environment and easy access to feed and water.

Promoting appetite development during this early stage is key. Bird behaviour will reveal if environmental conditions are not correct and conditions must be adapted to the behaviours seen.

Success can be monitored by measuring crop fill; at least 75% of the flock should have found feed and water within the first two hours of placement. Achieving success in the first 7-10 days will lead to subsequent success in health and productivity later in the bird's life. ■

Table 2. Target crop fill assessment guidelines.

Time of crop fill check after placement	Target crop fill (% of chicks with full crops)
2 hours	75
8 hours	>80
12 hours	>85
24 hours	>95
48 hours	100

Fig. 3. Chick distribution in whole-house brooding

