

# Health, efficiency and sustainability: making the first seven days count

There are an estimated 65 billion broiler chickens hatched every year. Poultry meat consumption in 2018 was 122 million metric tonnes, a figure which is only going to increase in future years.

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With changing demographics and societal attitudes, the move towards minimal antibiotic use within livestock production and the ever-increasing need for meat production to be sustainable, the importance of a good chick start to ensure health, efficiency and sustainability throughout the entire growing period has never been greater.

It is a well-known, simple biological principle that chicks require a good start to secure subsequent performance (all other things being equal). The foundation is a good brooding set-up. However, with the first true assessment of flock performance not occurring until seven days of age in the form of a seven-day weight, when it comes to assessing brooding practices, it can be a case of looking back to the past to improve the future.

Correct brooding conditions will result in a seven-day body weight of at least four times the chick weight at placement. If chicks are of good quality and free from health challenges when they are placed, failure to achieve the target body-weight at seven days of age may indicate sub-optimal brooding conditions. However, a number of key areas can be considered prior to this age. So what are the key areas to look into?

## Biosecurity

Like any young animal, chicks are susceptible to disease/health challenges. Appropriate biosecurity measures must be in place before, during and after chick placement.

The biosecurity of the farm must be tested and confirmed prior to chick placement, with subsequent procedures in place to prevent any new pathogens entering the facility (i.e. minimise visitors, have boot dipping in place, showering on and off, etc).

## Know the condition of your chicks

Knowing the condition of the chicks after transport allows informed decisions about the suitability of the

in-house brooding environment to be made. It is a good idea to take the vent temperatures of a sample of chicks from different areas of the transport vehicle during unloading.

If environmental conditions during transport have been correct and uniform, then chicks (from any area of the vehicle) will have a vent temperature in the range of 39.4-40.5°C.

If chick vent temperatures indicate that the environment during transportation has been sub-optimal, vigilant monitoring of chick behaviour in the first 1-2 hours after placement will be required to check the suitability of the brooding conditions for the chicks received.

## Develop appetite

Appetite will be developed and feeding and drinking behaviour optimised if chicks are supplied with an environment (temperature, relative humidity, ventilation) that is stabilised prior to chick placement, which maximises chick comfort and provides unrestricted access to feed and water (Fig. 1).

- Air temperature:
  - 30°C for whole-house brooding.
  - 32°C at edge of brooder for spot brooding.
- Floor temperature: 28-30°C.
- RH: 60-70%.

- Ventilation: CO<sub>2</sub> below 3,000ppm.

The provision of paper and supplementary feeder trays is pivotal in encouraging chicks to eat. Placing feed in trays (1 per 100 chicks) and on paper occupying at least 80% of the brooding area makes the best use of the chicks' natural curiosity and uses the stimulus of sound to attract chicks to the feed. Starter feed formulation should be based on promoting good biological performance to support good early growth, physiological development, health and welfare, rather than cost alone.

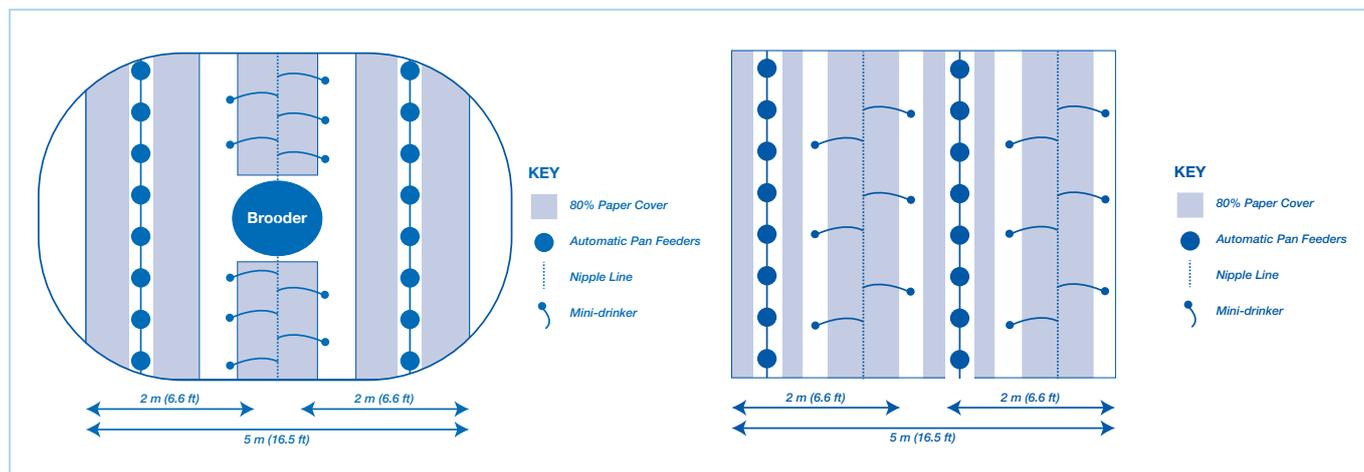
Promote good feeding behaviour by supplying feed in a highly palatable form (dust-free crumble or mini-pellet) and providing regular feed top-ups on the paper during the first 3-4 days.

Feed intake is dependent upon adequate water intake, and early water intake should be encouraged through the provision of supplementary or mini drinkers (one for every 100 chicks). The water provided to the chicks must be fresh and clean. Ideal water temperature is around 18-21°C; temperatures of less than 5°C or above 30°C can reduce water intake.

Provision of feed and water must be coupled with ease of chick movement.

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Fig. 1. The set-up for spot brooding (on the left) and whole-house brooding (on the right).



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Litter depth is a balance between allowing chicks to move easily around the brooding area and providing adequate protection from the 'cold' house floor. A litter depth of 2-5cm is ideal; the higher litter depth is necessary in colder geographical regions.

### Do not forget about light and ventilation

Chicks need to be provided with ventilation right from placement to ensure air quality and help maintain house temperature and RH. In fact, it is good practice to establish a minimum ventilation rate before chick placement to safeguard initial air quality at placement.

Ventilation settings must ensure that cold air from the inlets does not drop down onto the floor, risking chilling the chicks, but moves to the centre of the house ceiling to mix with the warm air before reaching the chicks.

During the first seven days, the provision of light must help chicks adapt to their new environment and develop feeding and drinking behaviour.

This means providing 23 hours of light (30-40 lux/2.8-3.7 fc) and one hour of dark (≤ 0.4 lux/0.04 fc).

Once feeding and drinking behaviours are established (after seven days) hours of light must be reduced to safeguard bird well-being.

### Transition to automated feeding systems

The transition to automated feeding systems must be made gradually (over a period of 2-3 days) and should be led by the chicks; there is no point in removing supplementary feed if the chicks have not yet learnt to feed from the main system.

Flooding the automated systems at placement and placing feed in the vicinity of the automated feeders should help chicks learn to use them. During the period of transition, chick behaviour and crop fill should be monitored to ensure chicks continue to maintain feed intake.

### Measure, monitor and react

There are three key areas to monitor during brooding:

● **Chick behaviour:** A fundamental indicator of adequate environmental conditions. The brooding area should be evenly covered by chicks vocalising contentedly. If chicks are huddled

under the brooder or are gathered away from the heat source or towards the edge of the brooding area, environmental conditions are not correct.

● **Vent temperature:**

Vent temperature should continue to be monitored for the first 4-5 days after placement.

● **Crop fill:**

A key indicator of appetite. Crop fill should be monitored at key times during the first 48 hours of placement (Table 1).

In addition to the three areas above, it may also be useful to measure the coefficient of variation (CV) and daily chick weights if seven-day weights are not being reached.

Individually weighing a sample of chicks every day, at the same time of day, for the first seven days will help you to identify if there is a specific time when chick growth is being compromised i.e. if there is a drop off in weight gain at day 4-5 this could be related to transfer from floor to automatic feeding system, or if on day two chick weight is lower than expected, this could be related to environmental conditions or feeder and drinker availability.

Calculating CV or uniformity at the same time as daily weighing can also be helpful in indicating if there is a problem during brooding.

A change in, or worsening, CV or

Time after placement (hours)	Target crop fill (% chicks with full crop)
2	75
4	80
8	>80
12	>85
24	>95
48	100

**Table 1. Crop fill targets during the first 48 hours after placement.**

uniformity would indicate that further investigation is needed into the environment and the availability of feed and water.

### Summary

A number of key areas during brooding can be monitored to provide an indication of the adequacy of the brooding conditions provided.

Learning from past inadequacies as indicated by the chick's behaviour and development will ensure improvements can be made for both current and future flocks. ■