

Hatch window – pre-incubation factors

Much is being said at the moment about hatch window, its management and the benefits it brings to the hatchery, especially in terms of chick quality.

How much of this is new and how much is just good hatchery management that has been given a new buzz word?

However, new incubators and the move to single stage incubation mean that the subject is much more relevant than it once was because now you can do things to manage hatch window which, for obvious reasons, you can not do in multi-stage machines.

Same point of development

This short article is not going to look at the management of hatch windows once eggs are in the machines, it is going to work on the basis that you can only effectively manage hatch window to best effect if all the eggs at the start of the incubation cycle in the machine are at the same point of embryological development.

The egg that has just been laid has already had some 20 or so hours of embryonic development in the oviduct and some cell divisions have occurred.

Good management must put this embryo into limbo and keep it there until the egg is set in the incubator. If this management is variable then eggs at differing stages of embryonic development will be placed in the setter and some of the benefits of hatch window will already have been reduced.

This is especially so in tropical countries where eggs are much more likely to encounter high temperatures prior to incubation.

If the environmental temperature in the nest boxes is above physiological zero (this figure is debated but is probably between 25 and 30°C) then 'incubation' of the egg with associated embryonic development can continue in the nest box after the egg has been laid. If the hen remains in the nest sitting on the egg this will also be the case.

Fortunately, if we are only a degree or two above physiological zero then the rate of cell division in the embryo will be significantly slower.

The transportation of eggs from the laying house to the egg handling area on farm should be looked at. Are eggs taken from each house to the handling area in turn or does the vehicle (which is invariably open sided and with no temperature control, therefore exposing eggs to high temperatures) collect eggs from all the houses before going back to base? If this is the case the first eggs collected could easily be subjected to undesirable temperatures for an hour or so.

At this stage eggs will be cooled, albeit this is often done in the on farm egg store. Here one should be asking how efficient (quick) is this process? Are the trayed eggs stored in a solid mass or are there separate stacks so that air can easily circulate round the trays of eggs and remove the heat? Is there adequate air movement to effect this process efficiently (see Fig. 1)?

Ideally, all eggs should be cooled at the same rate. This does not occur in reality but the time difference between first and last egg to reach required cool temperature is much greater if the trays are stacked in a solid block with no gaps between stacks to facilitate heat dissipation.

When we get to the hatchery we need to reflect on this process in reverse when we consider the pre-warming of eggs that have come out of the egg store.

Broaden the hatch window

Are all the eggs adequately pre-warmed before going into the incubator or, for those that were in the middle, does this process of pre-warming actually continue in the incubator?

If it does, those eggs that were adequately pre-warmed will start their embryonic development in the incubator before the others. Theoretically this will broaden the hatch window.

The impact of these two scenarios are shown in Fig. 2.

One may argue that these differences are too small to have a real impact. This could well be, but when we are looking for more and more out of our incubation process and we are fine tuning everything then these little differences could add up to a significant difference.

Whatever your views, there can be no harm in putting polish into our temperature management of hatching eggs. ■

Fig. 1. The effect of egg trolley management on cooling rate.

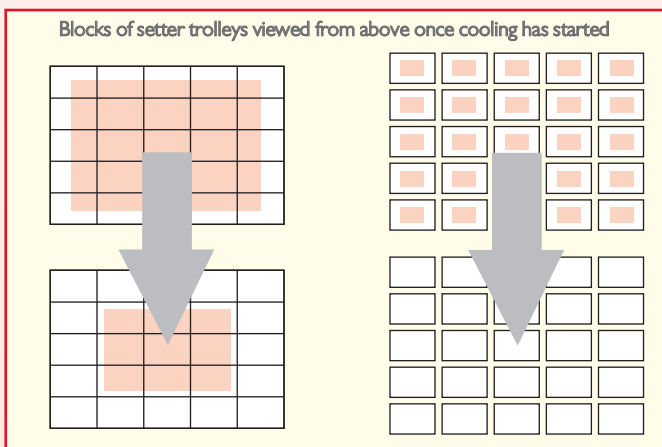


Fig. 2. Impact of external factors on embryo development.

