Checking fresh eggs for unwanted embryo development

The best way to look after hatching eggs is to collect them from the nests as often as possible (ideally 4-5 times per day), disinfect the shell surfaces, let them cool evenly and slowly and then hold them at around 15°C until they are placed in the setter.

It is especially important to keep the eggs below physiological zero – the temperature above which embryo development is possible.

When eggs cool unevenly, some of them will develop a lot further than others.

After 18 days of incubation this range will be enough to widen the hatch window significantly, with the quality of the earliest hatching chicks suffering accordingly. Eggs held at temperatures which fluctuate around 20-24°C will show distinct signs of embryo development which if allowed persist for too long will give higher levels of early embryo mortality.

There are several ways to check egg-holding temperatures using simple technology. A max-min thermometer, read once a day and the results plotted manually on a daily graph will tell you if the storage room is suitably insulated, cooled and heated for the local climate.

Data loggers such as Tinytags can measure egg shell temperature at any point in the egg mass, highlighting temperature fluctuations over time.

Several loggers, suitably located, will show if the room conditions are uneven. A cheap thermal imaging add-on for a smart phone will show hot and cold spots within the egg store.

At a biological level, it can be helpful to look at the embryos directly, using hatching eggs from the flock of interest. (Don't use floor or cull eggs – they will have been held under different conditions to the hatching eggs).

This can be done as a one-off, or more usefully as part of a regular sampling program. The work must be done in an area with good bright light. Label each egg to show date, flock and location it was taken from. Use forceps to make a small opening at the very top of the large end of the egg.

Remove the shell and membranes around the hole, to expose the germinal disc without damaging it (the yolk will always float so that the germinal disc is at the top, so will be easy to find.)

Check that the egg was fertile (Hatchery How to 4) and sort the fertile embryos into order of size.

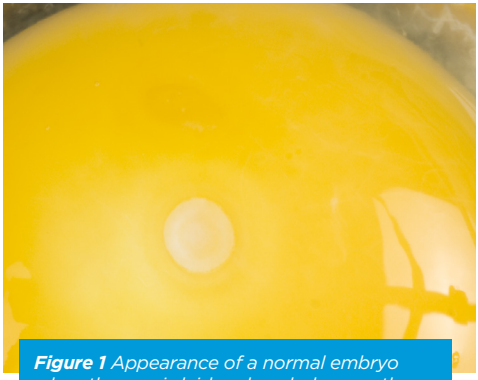

Figure 1 *Appearance of a normal embryo when the egg is laid and cooled promptly.*

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Checking fresh eggs for unwanted embryo development *Continued*

Embryo development takes place for 24 hours after fertilization as the egg forms around the ovum. When the egg is laid there will be 30-60,000 cells in the blastoderm, which will have reached Stage X of development.

Unmagnified, the embryo will look like a ring doughnut, with a transparent area in the middle of the ring – the area pellucida.

Once the egg is laid, provided that holding conditions are correct, there should be no more development.

However, if the rate of cooling is uneven, or the eggs are held in fluctuating temperatures then some or all of the embryos will continue to develop past Stage X.

Some of these embryos had developed past the stage that they would survive the holding period, and even those which would be able to start developing again will develop to produce a very wide, hatch window.

To stop this pattern being a regular part of embryo development in your hatchery, check sample eggs from positions you have concerns about and correct the problem as soon as possible.

Figure 2 *Eggs opened in the hatchery after uneven cooling, showing very variable embryonic growth.*

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