Putting incubation research into practice

The development of avian embryos has been of interest to both biological and environmental researchers for a very, very long time. Indeed, the first thermostat was invented by Cornelius Drebbel in the early 1600s to control the environment in a chicken incubator.

More relevant to modern commercial hatcheries is the huge volume of research published in the last 80 years. This has allowed us to define the essentials of incubation, in terms of the ideal embryo temperature (egg shell temperature or EST) of 100˚F (37.8˚C) from day 0 to day 21, weight loss to 18 days of 10.5-12.5% and chick yield at take-off of 67-68%.

Eggs must be turned once (or twice) an hour through 90˚, from set through to 16 days incubation.

We also know that because the heat output of the embryo changes during incubation, and the optimal embryo temperature is constant, the incubator will need to heat eggs for the first 9-10 days after set, and cool them from then onwards. This might be done by varying the set point in a single stage setter, or in a multistage setter by using the heat from older embryos to heat the freshly set eggs.

Some research projects look promising on a small scale in the laboratory, but are not used in commercial hatcheries. Occasionally this is because the 'problem' is not currently in need of a 'solution'. More often, it is because a treatment which works beautifully in small incubators holding 400-500 eggs proves difficult or impossible to scale up to machines holding many thousands of eggs.

When reporting on the impact of new incubation treatments, it is beneficial to those trying to implement on a larger scale if the report includes not only the treatment, but also how it affected the incubation essentials of EST, water balance, chick yield and turning angle. Equally, if trying a new program out in a large hatchery, it is important to measure its impact on all the incubation essentials to give guidance and support when troubleshooting.

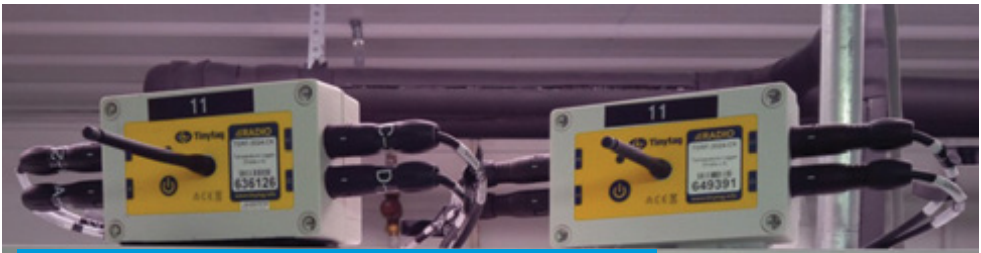

Figure 1 *Radio controllers for TinyTags allow real time measurement of egg shell temperature (EST) in operating setters.*

CONTINUED >

Putting incubation research into practice *Continued*

Incubation trials at Aviagen often involve implementing a novel egg storage or incubation treatment on a larger scale. Some treatments have been useful, others less so. Measuring the real time EST using Radio TinyTags (Fig. 1), water balance and chick yield have helped us to understand why.

Finally, it is always worth remembering that changes at the hatchery can have an effect on chick welfare and quality, on broiler performance and even processing performance. Before mass implementation at the hatchery, it is worth checking what that effect might be.

< BACK