SETTER ROOM

Balancing a set in single stage setters

Although the optimal eggshell temperature for maximum hatch and chick quality is in the range 37.8-38.3°C (or 100-101°F), it is not always easy to keep within this range in a commercial setter.

One of the most common causes of uneven temperatures is when the eggs are loaded into the setter without allowing for differences in their potential heat output or when gaps in the set allow air to short circuit the optimal path.

Nowadays, more and more hatcheries install enormous setters, to save space and cost. Depending on the make, there will be one air temperature sensor in each setter or in each sub-section of it. In principle, the sensor controls heating and cooling to keep the air temperature within the machine set-points and keep eggshell temperature within the optimal range. For this to work properly embryo heat production needs to be spread evenly throughout the setter and all the eggs affected by a temperature sensor should be of similar size and fertility. Unfortunately in the real world parent flock sizes are often variable and never match the setter capacities available. A large setter will have to be filled using eggs from more than one parent flocks, or sometimes run partially full. If not managed carefully, it is very easy to create an unbalanced loading pattern.

The heat output of a batch of eggs will depend on several factors. It is important to take these into account when deciding where to put each batch of eggs in a large setter.

- **Egg size. Large eggs produce large embryos, which produce more total heat per egg.**
- **Flock age. Eggs from flocks under 30 weeks tend to produce less heat per egg than would be expected for their size.**
- **Fertility. There are more eggs with live embryos when fertility is higher. If a flock is more fertile, heat production per 1,000 eggs will be higher.**

Unbalanced egg loading in the setter may exaggerate variability in eggshell temperature (especially after 12 days of incubation) and consequently widen the hatch window and cause poor chick quality.

Embryo (eggshell) temperature will be cooler where eggs have a lower heat production and these chicks will hatch later and some of them may be culled because they are still wet and lethargic at take-off.

Embryo temperature will be hotter where eggs have a higher heat production causing chicks to hatch earlier, with some of them getting dehydrated before pulling. If eggshell temperature goes to a very high level, 103°F or above, hatchability and chick quality will be depressed.

Here are some tips to balance egg loading in the setter:

- **As a good start, follow the recommendations from the incubator manufacturers.**
- **When you have to mix egg sources in a setter, always choose the ones from similar flock ages and with similar fertility.**
- **Put eggs closest to average next to the temperature sensors.**
- **When you can not completely fill a setter, always set the eggs in a pattern which will not change the normal air flow or cause short-cuts of air flow in the setter. Fill any gaps with empty trays or trolleys.**
- **Always check eggshell temperature and its evenness if you try a new egg loading pattern.**

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