EGG STORE | SETTER ROOM

Balancing setters when mixing flocks for better heat distribution

During incubation, embryos in large eggs produce more heat per egg than those in small eggs.

Some of the increased heat production in larger eggs is naturally offset by lower fertility, so fewer eggs are producing any heat at all. However, large eggs can also be more resistant to cooling because the surface area to volume ratio allows less surface area for heat loss. In some machines, bigger eggs tend to restrict air flow, which will also limit cooling.

Heat management can become critical if the hatchery is candling and backfilling beyond the capacity of the setters, or when fertility is particularly high in older flocks.

Most modern hatcheries use large capacity single-stage setters. Because of their size, it is almost inevitable that they will be filled with eggs from more than one flock. If not carefully thought through, this can exacerbate any lack of uniformity in the setter.

Ideally, sets should be planned so that all the eggs in a single machine are approximately the same size and overall fertility (small eggs with higher fertility or large eggs with lower fertility).

Unfortunately, this may not always be achievable in practice. It can be possible to mitigate the negative effect of mixing flocks if the hatchery has an accurate picture of hot and cold spots in their incubators.

For example, if the setter has a central or sidewall pulsator and eggs placed close to these fans are more efficiently cooled, then we can plan the setting pattern according to the total heat production from each flock.

GENERAL PRINCIPLES

- **Larger eggs should be placed close to the fan (or older flocks).**
- **Higher fertility eggs should be placed close to the fan.**
- **Try not to set young and old flocks in the same machine.**

SPECIAL CASE:

If high fertility small eggs and low fertility larger eggs will have to be set together, it is possible to calculate the heat load of each flock then set the higher heat load close to the fan.

HOW TO CALCULATE HEAT LOAD?

Calculating the maximum heat production of a batch is not difficult. From data published by Lourens et al (2007) it is possible to use 140mW for 50-59g eggs, 150mW for 60-69g eggs. Multiplying the maximum heat production (mW) by the total number of eggs while correcting for flock fertility will give the heat load for each batch.

AN EXAMPLE

Flock A has 9,600 55g eggs with 95% fertility and Flock B has 9,600 65g eggs with 80% fertility. Both will be set in the same machine, so first calculate which eggs will produce more heat.

Maximum Heat Production =
Maximum Heat Produced by an egg x Total Egg Number x Fertility/100

Flock A: 140mW x 9,600 x 0.95 ÷ 100 = 1.2768kW max heat production

Flock B: 150mW x 9,600 x 0.80 ÷ 100 = 1.152kW max heat production

In this case, lower fertility more than offsets the rise in heat output with larger eggs. In this case, the eggs from the younger flock should go next to the fan.