Break outs: putting the pieces together

By Ron Meijerhof

Hatchery results are highly dependend on a consistent optimization of the incubation process, resulting in standard settings that give the best results for that particular breed, age and machine. However, even with a high level of standarization, fluctuations in hatch results will occur, simply because we are working with complex biological processes, variation in materials and input variables that cannot be fully controlled. But when the hatch results are not to our satisfaction, we want to know the cause, to be able to make the right corrections.

One of the methods to get information is doing a break out, either at candling or (more common) after pulling the hatch. Opening the unhatched eggs and examining the content, is a very practical and useful method to quickly get information on possible causes for observed problems.

The technique for doing a break out is not difficult, it just requires time and experience. A number of trays are selected, usually from pre-determined positions in the setter. Preferably, these trays are not candled or, when candled, the clear eggs are not removed. If they are removed during candling, than they should be opened after candling, to examine the content, because without opening the egg its difficult to make a distinction between infertility and early deads. The unhatched eggs are opened and the stage of development at death is examined, as well as the number of infertiles and the number of abnormalities as contamination, malpositions, malformations etc. The level of detail depends on the problem and the skills (and the patience..) of the person performing the procedure.

Every breeding company and incubator manufacturer provides detailed information on how to perform a break out, how to interpret the stage of development and what can be expected as standard levels of embryo mortality. However, doing the break out is only half of the job, turning the gathered data into information and learning from it is equally important.

In many hatcheries, break out procedures are done as a standard, with regular intervals. All too often the data is collected, but because of lack of time is not really processed into information. The break out sheets are stored, and only when there is a problem a closer look is taken. This is a pity, because even if there is no problem it can be worthwile to analyse trends. It is therefore a good practice to not only collect the data and store them on a shelve, but to make a simple database in a spread sheet program which can be used for analysing trends over time. To put the data in a spread sheet requires extra time, but without it the time that we already put in collecting the data is not fully utilized.

But even when we do analyse the data, its good to remain critical on what the data is actually telling us. To illustrate this, I will give a couple of examples.

We normally consider early deads (1-7 days) to be influenced by storage time, storage temperature etc. This is true, but we can say more about this if we separate the early deads in embryos that die between 1 to 3 days, and 3 to 7 days. When we see that the majority of embryos died very early, we can indeed expect factors as storage time etc. But embryos that did start and lived for a couple of days are more likely to be killed by circumstances that happened in the start up period of incubation. So although all of them are classified as early deads, very early deads are usually more farm and storage related, where “older” early deads are more related with factors that occur during the incubation process itself.

If we see more late deads during incubation, we normally look at factors that are occuring later in the process, like overheating, cold spots, too low moisture loss, limited ventilation etc. However, if the late mortality is caused by an increased number of malformations like double limps, double heads,

open brains etc, our focus should not be towards the end of incubation. Double heads will not be caused by incubation conditions when the embryo is already 18 days old, but will occur in the first days of incubation, although they show only much later as embryonic mortality.

We normally express the categories of mortality as a percentage of the eggs set. So when we find 6 early deads on a 150 egg tray, we conclude that we have 4% early deads, which is probably more than what we want. But we have to realise that infertile eggs cannot die. In other words, if we would add 150 infertile eggs to that breakout, we would have 6 early deads from 300 eggs, which gives us a very acceptable level of 2% early deads. We would of course be triggered by the low fertility, but the fact that we are also having too much early deads would be covered.

Performing regular break outs is a good practice to obtain information. But to make use of the technique, we need to process the data into information and ultimately into knowledge, which requires a continious and critical observation.