Clean floor eggs: a contradiction

By Ron Meijerhof

Day old chick quality is important for achieving optimal performance results later in life. Quality of a day old chicken starts with quality of hatching eggs. Every hatchery manager knows that one cannot hatch a good chick out of a bad egg. Although producing good eggs is the responsibility of the breeder farmer, it is good that the hatchery realizes what sometimes can happen on the farm.

One of the biggest threads for the embryo and the day old chick quality is the bacterial load that comes with sub-optimal hygiene. Eggs do have several very effective barriers against bacteria, but if the bacteria are able to get into the egg, the embryos will quickly die. Eggs with high bacterial loads will contaminate the chicks during hatch, thus increasing the mortality in the first week.

The biggest risk for egg contamination happens in the first minutes after the egg has been produced. In the body of the hen, the temperature is approximately 41oC. Directly after the egg is produced, it starts to cool down to the temperature in the nest. The rate of cooling is not equal for all types of nests and environments, but for instance in roll-away nests the eggs will normally lose more than 10oC in the first 15 minutes. When the temperature of the egg drops, the content starts to shrink. As the shell cannot shrink, a vacuum is created under the shell and by the incoming air through the pores the air cell is formed. This air cell will expand during further storage and especially incubation, but is formed directly after the egg is laid.

However, the incoming air to create the air cell will also take bacteria that are present on the shell into the pores. These bacteria will settle in the pores against the membrane, and as long as their number is limited, the egg can handle it. Shortly after the egg is produced the pH of the albumen will start to rise due to release of carbon dioxide from the albumen, and this forms a very effective barrier against bacteria. But if the load of bacteria that is drawn into the pores is too high, the effectiveness of the defense systems of the egg is too limited, and the egg has an increased risk of getting contaminated. We all know that, because if we incubate dirty eggs or floor eggs, the hatchability of these eggs is significantly reduced, the quality of the resulting chicks is poor and the number of bangers (contaminated eggs) increases.

But if we look at the process, it is clear that any egg that is produced in a dirty environment has an increased risk of being contaminated by bacteria in the pores, even if the surface of the shell is clean. This can easily be tested by separating the floor eggs in obviously dirty eggs and visually clean eggs, set them separately and compare the results with setting clean nest eggs. It will quickly show that also the visually clean nest eggs do have an increased problem with bangers, hatchability and chick quality. It is obvious that although some floor eggs are visually clean, they still should be considered as a dirty egg that needs extra attention and therefore a separated delivery to the hatchery.

Breeder farmers often do not consider clean floor eggs as dirty eggs. This is very understandable, as visually they cannot see the difference between a clean floor egg and a clean nest egg. This difference will only show during incubation, when the bacteria in the pores will start to grow and overtake the egg. However, for delivering first grade quality chicks that do not provide problems

with mortality in the first week, it is important that all floor eggs are delivered and set separately. This means that during collection all floor eggs must be kept separate, but also that picking up floor eggs during inspection and placing them in the nests if they are clean is not a good practice. Even the payment system for the farmers is important in this. If they receive less money for floor eggs that they deliver separate than for clean nest eggs, the motivation of keeping clean floor eggs separate from clean nest eggs will be less.

Egg hygiene starts in the first minutes after the egg is laid, and is crucial for hatchability, chick quality and contamination. As penetration of bacteria in the pores of an egg shell happens in a dirty environment, a “clean floor egg” is a contradiction, it doesn’t exist. Only a close collaboration between breeder farmer and hatchery can produce the quality chick we need in our broiler farms.