

Females and fertility

By Ron Meijerhof

When we think about fertility in a broiler breeder flock, we normally consider the males to be the one determining factor. And often that is the case, males of course have a very big influence on the fertility and hatchability results of a flock, and with it on the technical and commercial performance.

But also females do play a role in this, and sometimes this role is bigger than we might expect.

First of all the physical condition of the female is important. Other than mammals, birds can store semen in so-called sperm storage tubes, little organs that are positioned close to the cloaca. When a female is successfully mated, the sperm cells are stored in these tubes, and can remain there for a period of more than two weeks. There is a more or less constant release of sperm cells from these tubes, and these sperm cells move up to the beginning of the reproductive tract to wait for a yolk to be released. We can imagine that the number of cells that can move up to the reproductive tract is decreasing over time, if the hen is not re-mated. This can actually be shown by removing the germinal disc from the yolk in the newly laid egg. If we look at this germinal disc under the microscope, we can detect holes made by the sperm cells that tried to enter the germinal disc to fertilize the egg. When the sperm storage tubes are full, we can observe hundreds of holes, where we see only a few holes if the hen has not been mated for a week or more.

So it is important that the sperm tubes store the semen as good as possible, to keep it alive and active, especially if the mating frequency of the males is going down and the tubes are not re-filled that often. Research has shown that when birds are over weight, the storage capacity of the tubes is negatively influenced and the number of sperm cells at the beginning of the oviduct is reduced. It is not clear if this is because environment in the tubes is less suitable, making the semen dying more quick, or that the tubes are less effectively filled, but the net result of overweighed hens is a reduced fertility and hatchability. On top of that, overweighed hens will perhaps be mated less frequent as well, as they will not move that much and don't come in the litter that often. This means that the tubes will perhaps be filled less frequent as well, where the less favourable environment in the tubes actually requires a more frequent filling and therefore mating.

Another important influence of the females on fertility is their willingness to accept the male. In an ideal situation, the females will try to stay with the males as in nature that is their source of protection. When the males are too aggressive or the females are too shy, the females can easily become scared of the males and try to avoid them. Too many males, too early stimulation of males or a delayed development of the females can cause a poor synchronization of males and females, and as a result the females can become scared. This can be easily observed, as the males will circle around groups of females in the afternoon and try to mate any female that escapes. This is of course not the social interaction between males and females that we want, but when we see this happening we have to realize that we already are late in our reaction. When it happens, the females will get quickly scared of the males and will not easily forget that. Also, the males will get frustrated as there are no females to be mated, and will start fighting with eachother for dominancy. As a result, mortality goes up in males, and mortality in females will go up as well, due to overmating of the males.

For good fertility and hatchability, not only the quality and condition of the males in the flock are important. Also the condition of the females is, both the physical condition as the amount of stress in the flock. If the flock is overweighed, fertility will go down not only because of less male activity, but also because of less fertility of females. If the females are afraid of the males because of poor synchronization, they will avoid mating, and even the healthiest female will not get fertilized if she doesn't get mated.