

Take care of your little babies

By Ron Meijerhof

Introduction

High quality rearing is essential for obtaining maximum production results. Rearing determines the development of the birds and with that the potential to realize their production targets. Especially for high-yielding breeders the quality of the rearing is crucial.

During rearing, the first weeks are especially important, because in this period not only the organs and the skeletal frame are developed but also the immune system. It is therefore logical that a good start of the birds is very valuable. A flock with a difficult start, especially during the first days/weeks, has an increased risk of poor production performance.

Before arrival of the chicks

Quality of day old chicks

Obviously, a good start of the flock starts with an excellent chick quality. Given a good quality hatching egg, the quality of the chicks depends mainly on the incubation process and must get maximum attention in the hatchery. The driving factor for chick quality during incubation is embryo temperature, i.e. the temperature inside the egg. This embryo temperature determines the development of the embryo and with that the quality of the day old chick. A certain air temperature does not automatically convert into a specific embryo temperature. The embryo temperature depends also on for instance heat production of the embryo and factors that influence heat loss, like air velocity and humidity. Controlling the incubation process based on embryo temperature needs a lot of attention, measuring and fine tuning, but an increase in chick quality is absolutely worth that effort.

Transportation

During transportation, it is very important that the body temperature of all the chicks remains constantly at 40°C or 104°F. It can be easily measured with a human fever thermometer in the cloaca of the chicks. The body temperature depends on the balance between heat production of the chick and the amount of heat loss, which depends in itself mainly on temperature and air velocity. Next to body temperature, also air quality and relative humidity are important. We need to refresh enough air to keep the carbon dioxide level at an acceptable level, preferably not over 3000 ppm. For pure refreshment of the air (so not for cooling) a maximum ventilation capacity of 15 m³/h/1000 chicks is needed during transportation. When ventilation also is needed for cooling, the capacity depends on the outside conditions.

Feeding

Recently, special feeds have been developed for the day-old chicks during transportation, to be added in the chick boxes. Research shows that providing these feeds do not only give the chicks a better change to survive transportation, but also gives the chick a better start by activating the intestinal tract.

The first days

To some extent, we have to compare day old chicks with newborn babies (fortunate enough not to all extent, just imagine 10.000 crying babies...). If a chicken (or a baby) is born they can't adjust their own heat production to the environmental temperature. They react in principle cold-blooded (poikilotherm). If they lose more heat than they produce, their body temperature quickly drops without a possibility for them to correct this. After approximately 4-5 days they can respond better to the outside temperature. Chickens (both at day 1 and older) need to have a rectal temperature (so-called deep body temperature) between 40.0 and 40.5 °C (104 and 105°F). This can be simply measured with a normal thermometer used for measuring fever in humans. We often see that chicks experience a fast drop in body temperature directly after placement. In some extreme cases, a drop from 40.5°C to 36°C (105°F to 97°F) within 30 minutes has been observed. In nature, a certain drop in temperature is not so much of a problem. Chicks can stand this drop for a short time, will start screaming, their mother will go after them or call them and takes them under her wings to recover. In our poultry houses, a chick does not have the opportunity to correct its own body temperature and this is a big problem. We tend to think that chicks will find a warmer spot themselves (move towards the heater), but if we measure their body temperature we often see that the body temperatures dropped so far that birds can't do much more than sit down and suffer. Because by coincidence other birds are on a more favorable spot and don't experience that drop in temperature, the start of the flock is already not uniform. In the graph, a typical body temperature profile is given, as measured in broiler breeders about 4 hours after placement. In this particular flock, we measured a total of approximately 50 birds. Notice the enormous variation in body

temperature in that flock, although they are all placed in the same house. Although feed and water are important for the chicks in these first days, it is especially body temperature where we have to focus on.

Temperature

Chicks lose body heat mainly through the floor. It is therefore important to heat up the house in time, so that also the concrete floor will be heated. Because litter isolates, it will take more time to heat up the floor when the litter is spread out during heating. Bring the litter in the house but spreading it out as late as possible can prevent this problem. When the chicks arrive, the floor temperature has to be at least 27°C (80-81°F), but preferably close to 30°C (85-86°F). If we with that we maintain an air temperature of approx. 34-35°C (93-95°F), the chicks will normally be able to maintain their body temperature. If they start up well, it will be necessary to quickly drop temperature slightly, because their metabolic heat production will increase. Check body temperatures during the first days (look especially for chicks that are not active or that are extremely noisy) to see if the temperature in the house is correct. Only looking at behavior and spread of the chickens is in my opinion not enough, because the drop in body temperature can be quite severe before you see it in behavior. Also, weak chicks and chicks from young parents don't show too well that their body temperatures is decreased, so we tend to pay attention to the stronger chickens.

Ventilation

We ventilate houses to remove moisture, ammonia, carbon dioxide and other gases, and to add oxygen. Because of temperature, we often tend to limit ventilation the first days, or to ventilate not at all. The production of carbon dioxide and moisture is low, and oxygen is hardly needed. Because of the relative low density of (grand)parent stock in rearing this is not so often a problem, but in broilers sometimes the ventilation is so limiting that the carbon dioxide levels rise to 3000 ppm (10 x outside concentration) and more. This is often not because of the breathing of the chicks but because the heaters consume oxygen from the house and produce carbon dioxide. Also pay attention to the ventilation at the start of the chickens and don't close the house up completely, even in wintertime. Also this depends on the outside situation and the house, often older houses are not so tight anyway and then the problem solves itself. With every ventilation system, pay attention to draft, as this air movement will have a high impact on the heat loss of the chicks and therefore on their body temperature.

Feed and water

It is clear that the birds need to find feed and water as quickly as possible. It is advisable to use a special, high quality feed for the first two weeks, with a high protein content and a very good digestibility. The use of feed plates and giving fresh feed on paper, renewing feed frequently to keep it fresh is time consuming, but attention to these details pay back quickly. Also a good management of the drinkers, eventually with extra drinkers for the first days is important. Flush waterlines just before arrival of the chicks, to make sure the water is clean and cool. This helps the early water intake. Be careful with additives in the water that give a bad taste. When birds don't drink enough early, they will easily develop kidney lesions, if they do survive the first days.

Common sense

Attention and time for rearing is a well-spent effort, because it forms the base for future performance. Although many aspects are important in rearing, a good day-old chick quality and arrival and start of the chicks is crucial. To provide this, the basic principles are relative simple and mainly a matter of common sense.

chicks

