

Improving transport conditions of day old chicks pays off

by **Gerrit van der Linde, senior poultry specialist, Heering Poultry Transport Technologies, The Netherlands.**

Hatchery managers having to organise the transport of day old chicks to their customers, can find a guide in this article about factors related to transport performance.

Your chick transport fleet can be as professional as the hatchery. Payback time for improving transport performance is often surprisingly short if you think of the possible effects on chick quality and farm performance, including the intensive use of transport equipment.

Transport performance can be seen as the sum of chick quality, reliability, capacity and hygiene.

The optimum balance should be found with costs (investments, labour, fuel) and time for loading, driving, delivery and cleaning.

Historic situation

Over the years, chick trucks have developed from open trucks in countries where the climate was suitable for them, to closed trucks, with ventilation, and later heating and cooling.

Specialised chick truck design covers:

- Ventilation capacity in recirculation and fresh air.

Quick unloading and space between the trolleys prevents overheating.



- Temperature difference within the truck should be limited.
- Sufficient cooling capacity.
- Distribution of air.
- Utilisation of air.
- Air in- and outlet (location and size).
- Hygienic arrangements for cleaning and disinfection.

Chick quality

The most important aspect is quality of the day old chick; in other words – what will be the performance on the farm?

Critical points to measure are water (and weight) loss, cloaca temperature, possible dead on arrival or mortality after seven days, and behaviour.

Transport cannot improve the quality of the day old chick as it leaves the hatchery, but can certainly harm it. Thermoregulation is the main reason that chicks will expend energy.

- If the temperature is too low, they have to heat themselves, by burning nutrients from the yolk sac. Smaller chicks, from young parent stock are more susceptible to under cooling. Negative effects of too low temperatures normally show later in seven day mortality figures, black vents and low uniformity.
- If they are overheated, they will respire quicker, the so called panting, and evaporate water from the yolk sac as well. This behav-

our also uses more energy, so in both cases of temperature deviation, extra energy is spent.

Large chicks, from older parent stock are more sensitive to overheating. Effects can appear right away, up to unconsciousness and death on arrival.

● Special attention should be given to loading and unloading the chicks. Since the forced ventilation of the truck stops when the chicks are unloaded, their own heat production will overheat them very soon.

Quick unloading, immediate space between the trolleys and preferably chick boxes can help prevent problems.

A major part of transport deaths occur during unloading. Unloading should be quick, as even in cold circumstances overheating of the middle stacks can occur.

Nutrients that are needed for development of the intestinal tract and for immunity are producing that energy for thermoregulation, leading to retarded development, reduced immunity, diseases like yolk sac infection and reduced performance.

Since chick quality varies from the point they leave the hatchery, it is not easy to measure the effects of transport, but practical experience shows us that it is more important than commonly expected.

Other climatic factors, like humidity, air speed and air composition, are influencing factors as well, but less important than temperature.

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High density of chicks requires sufficient ventilation and cooling capacity.



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Climate details

Body temperature should be 39.5-40.0°C, where the corresponding air temperature in the truck depends on the air flow. Chick size and age influence this as well, so optimal set points are between 27-29°C. Chicks do produce heat, water vapour and carbon dioxide in an increasing amount. The climate system of the truck has to compensate for that.

Increased heat production from embryos also affects metabolism during transport. The extra energy for the embryo heat limits the remaining yolk, which leads to a smaller buffer for the day old chick. On long journeys, this can lead to a shortage in nutrient supply. For longer journeys, it is preferable to use larger chicks (from older parent stock), since they tend to have larger yolk sacs. The available water should be enough to comfortably last several days, since water (and weight) loss is about 1g per day under normal conditions, relating to a water reserve of about 4g. During heat stress, the aforementioned panting behaviour to cool the body leads to an increased water evaporation of several grams per day.

Humidity

The optimal range for humidity is between 50-70%, although 40-80% is still acceptable for shorter periods. At high temperatures, high humidity should be avoided. In winter time, lowest humidity levels are observed, due to heating of cold and dry air. Keeping humidity on an acceptable level can be achieved partly by reducing the ventilation. Humidifying systems have a limited effect in ventilated trucks as a lot of water is needed to be effective. The cooling effect of evaporation can cause local drops in temperature. Possible contamination in the water will be spread over the chicks. These side effects should be prevented.

Dehydration of day old chicks is, in most cases, caused by overheating. A common misconception is that low humidity is the

cause of dehydration. Low humidity does have an effect on trachea epithelium and eyes and, if damaged, this can cause severe vaccination reactions. The real water loss however remains limited under thermo neutral conditions.

Trying to compensate dehydration caused by overheating by applying increased humidity will not be effective, and will even reduce the possibility for the day old chick to reach a sufficient heat loss by evaporation – in this way aggravating the heat stress.

Reliability

In modern specialised chick trucks, capacities go up, and many chicks are put together in a small volume. We make them rely on forced ventilation and climate control and, if these systems fail, damage will be done in a short time. We need very reliable systems to make sure our chicks are transported safely and comfortably during the complete life cycle of the truck. This makes reliability a key factor. Options exist to fit double systems, where one can serve as a back-up for the other.

Capacity

Capacity and transport performance go together, as large amounts of chicks can be transported efficiently in large trucks. However, farm size and accessibility of the farms influences the optimal capacity as well. In partial loads occupying only a small part of the capacity of the truck, efficiency is strongly reduced. Combining several loads from different farms could solve this, but from a hygienic viewpoint this is not a good solution. The empty chick boxes returning from one farm should not be in contact with chicks from other farms.

Capacity per volume depends on the type of chick box and containers used. In case hatching eggs are transported as well, a separate capacity calculation has to be made to optimise the truck. Special care is required in transporting large amounts of chicks, to balance capacity and risk.

Hygiene

Transport is on the crossroads of farms and hatchery, and therefore a critical step in the production chain. Proper logistic planning, cleaning and disinfection as well as truck design decide the hygienic performance.

To improve hygiene, more frequent and thorough cleaning is the trend, leading to easier to clean filters, but also the use of more aggressive disinfectants. Automatic soaking and disinfection can improve cleaning results and reduce cleaning time.

The importance of hygiene cannot be underestimated, but is not the scope of this article.

Trends

Due to genetic changes that have taken place in broiler strains, growth and feed consumption have increased, leading to a higher production of heat – not only during the growth phase, but also as an embryo. We see the same effect in day old chicks.

- Overheating is more likely and cooling capacity had to increase.
- Hygiene has become more important, with transport as a crucial point. Automatic, secured cleaning and disinfection systems are developed and more commonly applied.
- Driver awareness and skills are as important as good transport equipment. We have seen in the field the extra benefits trained drivers can give and this is also appreciated by the farmers. As a good chick truck is an extension to the hatchery, a well trained driver is an addition to your hatchery staff and responsible for your presentation to the customer during delivery.
- Transport capacities per truck tend to increase with increasing farm size.
- Distances covered by chick trucks tend to increase.

It has been proven that a professional chick transport fleet can boost a hatchery's transport performance.

You can also bring your transport operation to that same level, and Heering have the expertise to help you further improve your transportation performance. ■

In warm climates, cooling is even more important.



The capacity of the truck tends to increase with farm size.

