

Key control points for the optimal transportation of day-old chicks to the farm

The transport of live animals is considered a great source of stress, which consequently reduces animal welfare. When chicks are taken out of the hatcher, they leave a controlled environment to move to a holding room and then to a transport vehicle in which they will be exposed to very different and uncontrolled environmental conditions.

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The journey, the type of vehicle, the season, the duration and/or the distance of the journey and the number of unloadings during each trip are factors to be considered, as they can vary considerably, producing instabilities in the environmental conditions inside the truck.

The main challenges during transportation

The major problems of chick transport in trucks with refrigeration systems are related to the thermal heterogeneity within the load trailers and inadequate air circulation. In addition to these problems, chicks are neonatal animals with an immature physiology, and they are exposed to many challenges during transportation.

One of the most important challenges is the maintenance of body temperature, which is strongly influenced by the microclimate

Table 1. Environmental recommendations for day-old chick transport.

	Inside crate	Loading area
Temperature (°C)	30-33	26-28
Relative humidity (RH %)	50-60	40-55
CO ₂ (ppm)	-	1.500

Ambient temp. (°C)	Cloacal temp. (°C)	Chick behaviour
>42	44.0-45.0	Many chicks will become unconscious and die
40	>42.0	Heavy panting, loud vocalisations
38	41.0-42.0	Respiratory distress, open beaks, fast panting
>34	40.5-41.0	Wings open, chicks are spread out in the crate
30-33	40.0-40.5	Normal and quiet
28-30	39.5-40.0	Incidental huddling, soft vocalisations
>24	>39.5	Huddling, chicks close together and at one side of the crate
>15	34.0	Drooping and hunching – head hanging down, eyes closed

Table 2. Description of the expected chick behaviour depending on the temperature to which they are exposed.

conditions causing negative effects directly related to it, such as dehydration, stress and mortality. However, it can also cause several non-visible effects, for example weight loss during transport, effect on the yolk weight and chick growth or immunity depression.

Key control points

Therefore, we will explain below how we can verify through different control points if this process has been carried out properly.

First, we should perform an analysis of all the monitoring information available, both through the truck's probes and the rest of the information collected during the process.

In this way we will be able to evaluate:

- The efficiency of the ventilation and air conditioning systems.
- If the type or design of truck is appropriate.
- If the air renewal is appropriate.
- If the driver's handling during the process is correct.

Temperature in the truck

Another important point to consider is the setpoint temperature in the trucks. This setpoint temperature for the ventilation and cooling system can vary depending on several factors. It is true that, independent of the outside weather and the number of chicks loaded, our vehicle should allow us to work with the same setpoint temperature.



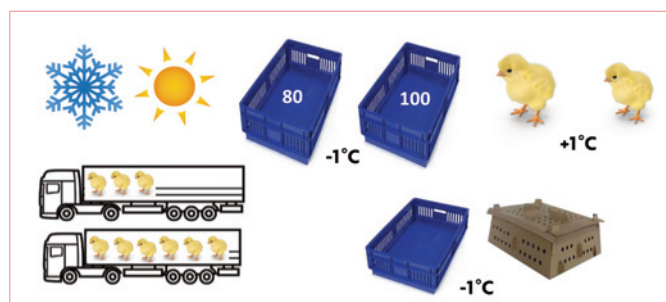
However, this setpoint temperature should be modified depending on the crate material used, the number of chicks per crate (density) and the size of the chicks.

This last factor is difficult to consider when adapting the setpoint temperature, as chicks of different batches (size variability) are usually loaded together during transport.

Animal-based welfare indicators

As well as considering the two points mentioned above, it is important to consider the

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assessment of animal-based welfare indicators. Some are listed as follows:

● **Cloacal temperature**
Both cloacal temperature and behaviour are indicators that will give very accurate information about the welfare of the chicks during this process. Related to this, Table 1 is presented as a guideline of the environmental conditions suitable for the chicks to show a comfortable behaviour and a cloacal temperature within the optimal range (40-40.5°C).

● **Chick behaviour**
In addition, Table 2 shows the description of the expected chick behaviour depending on the

temperature to which they are exposed.

● **Body weight**
Finally, regarding the third indicator, in our experience, broiler chicks transported without incident on journeys of up to six hours can lose, on average, 1g per chick. These weight losses are usually associated with water losses. However, weight losses of more than 4-5g per chick can cause serious problems such as the death of the chicks.

Summary

In conclusion, to verify that the transport process is carried out

properly, we should consider the data assessment in the following points:

- Evaluate the environmental conditions in the holding room.
- Measure and evaluate cloacal temperature at different points in the holding room.
- Measuring chick weight in the holding room.
- Observe chick behaviour in the holding room.
- Assess environmental conditions during transport.
- Measure and assess cloacal temperature of chicks at unloading.
- Measure and record weight of chicks at unloading – to assess weight loss during transport.

- Observe the behaviour of the chicks at unloading.
 - Note and evaluate mortality at unloading.
 - Observe and evaluate the time it takes to distribute 100% of the chicks in the house.
 - Measure and evaluate production parameters, such as the average weight gain (AWG) and the FCR during the first seven days.
- By assessing all these points, it is possible to get a very accurate picture of the process, as well as to associate possible losses or problems to it. ■

References are available from the authors on request

STUDY: The effect of environmental conditions during transport on chick weight loss and mortality by M. Yerpes, P. Llonch, and X. Manteca.

To study the effect of environmental conditions during transport on chick weight loss and mortality, probe equipment was installed in a truck of a poultry company in Spain, including a total of 66 journeys made in commercial conditions between May and November 2017.

Animal-based measures collected included body weight (before and after transport), mortality during transport, and mortality during the first week of life. These were contrasted against a series of environmental variables including air temperature, relative humidity, and carbon dioxide (CO₂) atmospheric concentration for every journey, and other more variables. The results showed that chick weight loss was positively associated with journey duration and relative humidity. No effect of environmental variables was found on mortality during transport. However, chick mortality during the first week of life was related to the percentage of day-old chicks loaded per journey and chick gender.

For the full report visit: <https://doi.org/10.1016/j.psj.2020.10.003>

Fig. 1. Aerial view of the truck, highlighting the centre and lateral rows. The coloured squares represent the boxes with temperature and RH probes. The position of the CO₂ probe is also shown.



Fig. 2. Side view of the truck, highlighting the distribution of the temperature and RH probes inside the container. The coloured squares represent the boxes with temperature and RH probes.

