

Heat stress modeling and mitigation measures (ITAVI): Improving broiler transport efficiency



ITAVI is a French national institute for applied research in poultry, rabbit and fish. Heat stress experienced by broilers during transport to slaughterhouses poses a significant challenge to the poultry sector. Prolonged exposure to high temperatures combined with poor ventilation can severely impact the welfare of the birds. The developed model offers a predictive analytical tool for evaluating and forecasting thermal microenvironments inside transport vehicles.

The Computational Fluid Dynamics (CFD) model takes into account important environmental factors, such as temperature, humidity and air velocity.

These factors, together with broiler-specific parameters such as metabolic heat production and stocking density, determine the microenvironment within broiler containers during transportation. Furthermore, effective temperature (ET*) and exposure time are used as evaluation metrics to quantify and assess the heat stress experienced by broilers during transport.

Simulation results suggest that leaving empty containers in strategic locations might be the most effective solution in hot weather. This model will be used as a predictive tool to optimise transport conditions and enhance animal welfare.

ET* - An experimentally determined index that combines dry-bulb temperature, humidity, radiant conditions and air movement in order to indicate the thermal sensation experienced in a given space. Representing the dry-bulb temperature of a thermo-equivalent environment with 50% relative humidity and specific radiation conditions, it is a reliable indicator of thermal comfort or discomfort.

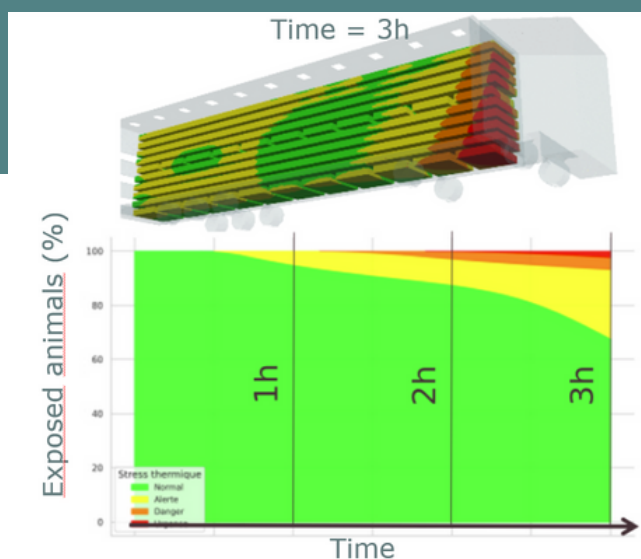


Fig.1 - Illustration of heat stress repartition within containers (T outside = 30°C, green : no stress, yellow: alert, orange : danger, red, emergency)



Workshop - Improving Broiler Transport