University of Saskatchewan
Poultry Management & Welfare

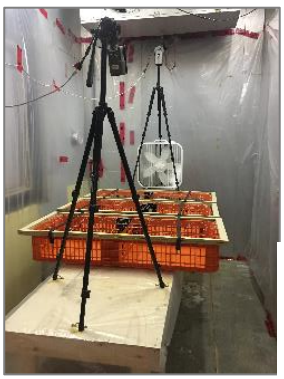
Research Summary

Effects of simulated transport on brown-feathered strain end-of-cycle hen blood physiology, stress, behaviour, and meat quality

Purpose of the Study

Transportation of poultry can be very stressful as birds are exposed to weather-dependent conditions, vibration, and noise. Published research pertaining to the transport of EOCH is limited, and much of it involves epidemiological studies that reveal few details about bird behaviour or physiological responses. In addition, EOCH pose unique challenges as they may be metabolically stressed, prone to bone breaks, have varied feather cover, and are often transported for longer distances compared with broilers.

The goal of this study was to provide comprehensive data (gathered with use of environmental chambers) on the effects of various temperature and humidity combinations, and duration on both well and poorly feathered brown strain EOCH.



Transport simulation chamber

Methods

Birds

- 540 brown-feathered EOCH from 3 commercial farms

Treatments

- Temperature/Relative Humidity
  -10°C uncontrolled RH (**-10**)
  +21°C 30% RH (**21/30**)
  +21°C 80% RH (**21/80**)
  +30°C 30% RH (**30/30**)
  +30°C 80% RH (**30/80**)
- Duration of exposure: 4, 8, or 12 hours
- Feather Cover: Well or Poorly

Data Collection

- Hens were placed in drawers (54.5 kg/m^2) and positioned in environmental chambers
- Parameters evaluated included: mortality, blood physiology (glucose, electrolytes, blood gases, hematocrit, and heterophil/lymphocyte ratios (measure of stress)), behaviour, core body temperature (CBT), and meat quality (live shrink, pH, colour, drip loss, thaw loss, and cook loss)

Findings

Blood physiology. After simulated transport exposure, the change in pH and pCO_2 was greatest in the 30/80 treatment. Birds in the -10 treatment had the largest change in pO_2, sO_2, glucose, and H/L ratio.

Behaviour. Hens exposed to hot treatments (30/30 and 30/80) spent the most time panting. Birds exposed to the neutral treatments (21/30 and 21/80) spent the most time preening. Birds exposed to -10 spent more time shivering.

Core Body Temperature. The CBT decreased in birds exposed to -10, and it did not change in birds exposed to 21/80. The only mortalities occurred in the -10 treatment and increased with longer duration.

Meat Quality. Live shrink (%) was highest in the hot treatments, lowest in the neutral treatments, and increased with duration. Final breast and thigh pH were highest under -10. Cold exposure also resulted in changes in thigh meat colour.

Poorly feathered hen on the left; Well feathered hen on the right

Conclusions

Brown-feathered EOCH are susceptible to transport stress regardless of feather cover, however brown-feathered EOCH cope with heat stress better than cold stress, suggesting that summer transport may be less stressful for the hen.

About Us

Kailyn Beaulac is a Research Assistant, working with Dr. Karen Schwean-Lardner.

Dr. Trever Crowe is the Associate Dean of Research and Graduate Studies in the College of Agriculture and Bioresources at the University of Saskatchewan. He has a PhD in Biological and Agricultural Engineering, and much of his research focuses on transportation of farm animals.

Dr. Karen Schwean-Lardner is an Associate Professor in the Department of Animal and Poultry Science at the University of Saskatchewan. Her research focuses primarily on the management and welfare of laying hens, broiler chickens, and turkeys.

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