

ETHOLOGY

- Piglets transported shorter distances in the summer had a greater stress response (cortisol and N:L ratio) compared to long distance transport resulting from exposure to multiple stressors (weaning, loading and transport) with limited time to recover.
- A study was carried out to measure piglet's response to weaning over 72 hours (Weaned) compared to piglets left on the sow (Control). Control piglets' weight increased over time compared to Weaned piglets, which remained static.
- Weaned piglets experience a large spike in cortisol levels from weaning to day 3. This indicates weaning stress exerts physiological impacts lasting several days.
- Infrared cameras were used to record temperatures (body and ocular regions) of 120 market pigs before and after transport to a packing plant. A positive correlations was found between increased body and ocular temperatures and stress and poorer meat quality.
- Collection of body temperature data could be automated and used to identify sick pigs on-farm, or to predict stress and meat quality at the packing plant. This allows better management in lairage and improved meat quality.
- A survey of over 100 Canadian herds shows average sow death losses of 6%, with higher losses in larger herds and farms with sows in groups.
- Greater focus on gilt selection and development and improved mortality recording are required to gain a better understanding of the health problems associated with sow death loss.



- Remote welfare assessment of pigs performed from video footage collected via body cameras delivers similar results as when assessments are performed via direct visual observation in the barn. Body cameras show promise as a reliable and cost-effective tool to support animal monitoring and welfare assessment remotely, reducing biosecurity risks and supporting increased oversight for animal care programs.
- Growing pigs interacted with rotated point-source enrichments more frequently than a single suspended chain, but did not influence measures of disease resilience.
- Stall-housed gilts showed higher cortisol levels (than gilts) gestated in groups, suggesting that younger sows experience greater stress in individual stall-housing than groups.

ENGINEERING

- Alternative sanitization and disinfection measures including slightly acidic electrolyzed water (SAEW), alkaline electrolyzed water (AIEW) and selected chemical disinfection agents (namely calcium oxide and peracetic acid) exhibited a strong biocidal effect in laboratory-scale tests, with 99.95 to 100% inactivation efficacy (>3.0 log reduction) against microbial mixture collected from swine barn.
- Results from alternative sanitation and disinfection measures were comparable to conventional disinfectants, namely, potassium peroxymonosulfate (Virkon) and quaternary ammonium compounds (Synergize).
- All disinfectant treatments were found to be significantly different ($p < 0.05$) from the control (no treatment), with the chemical disinfectants showing higher microbial reduction.
- Manure samples in RWA barns had significantly lower levels of Antimicrobial Resistant Genes (ARGs) for tetracycline, phenicol, beta-lactams, and multi-drug resistant (MDR) genes. Piglet feces samples also showed reduced phenicol and tetracycline ARGs, however, a greater frequency of tetracycline-ARGs was seen in the nasopharynx of sows in RWA barns.

- The frequency of pathogens found in barn manure and piglet fecal samples did not significantly differ between RWA and non-RWA farms. However, fecal samples from sows in RWA barns tend to have fewer pathogens, while the sows' nasopharynx have more compared to corresponding samples from non-RWA barns.
- In a study of biological removal of nitrate and/or nitrite from livestock wastewater, spruce wood chips inoculated with a denitrifying microbial culture showed promising performance in the removal of nitrate and nitrite ions either as an individual or in mixtures from water contaminated with 2.5 % v/v manure slurry under various conditions.



NUTRITION

- An extended adaptation period to a diet supplemented with functional amino acids (methionine, threonine, tryptophan) at 120% of NRC (2012) requirements, improves growth performance and immune status of Salmonella-challenged pigs.
- There was little benefit in providing creep feed to piglets on pre- or post-weaning performance.

- There was no preference or impact on performance for piglets feed simple or complex diets.
- Moderate feed restrictions (50% day 1, 25% day 2) in sows immediately post-farrowing had no impact on sow or litter performance.
- Immune stimulated pigs, regardless of disease challenge model used (enteric pathogen, respiratory pathogen, mycotoxin, LPS, sanitary conditions), have reduced growth performance.
- Significant differences exist in performance response (to challenge model depending) on sex and age of pig. Female pigs show a greater negative response than males. Younger pigs have a greater initial response to immune stimulation and recover quicker than older pigs.
- Piglets with low birth weights have altered cerebrovascular blood circulation. Potentially contributing to long-term neurological deficits in growth restricted piglets and human infants.
- There was reduced expression of protein/amino acid transporters in low birth weight pigs with little effect of neonatal nutrient restriction, suggesting nutrients may be limited for growth in low birth weight pigs.
- Nutrient restricted pigs (at four weeks post-weaning) experienced negatively impacted intestinal barrier function and amino acid abundance. This indicates there are long-term negative effects of improper nutrition early in life.
- Grower diets (65 kg BW) containing 40% hybrid rye will maintain growth and feed intake when formulated to contain 2,440 kcal NE/kg.
- Growing pigs fed diets with 40% hybrid rye are unable to adjust feed intake to maintain energy intake when NE of the diet is reduced from 2,440 kcal/kg to 2,340 kcal/kg.
- Extrusion had differential effects on ergot alkaloid epimers (some were increased, others decreased). The toxicity of ergot alkaloids varies based on the ergot alkaloid profile, and affects impact of extrusion.
- Reduced growth and feed intake of growing pigs (65 kg to 130 kg BW) fed 4 ppm ergot alkaloids is not mitigated by extrusion of the contaminated screenings.
- Growing pigs (barrows and gilts) have dramatically reduced levels of serum prolactin when fed 4 ppm of ergot.



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