LRIC LIVESTOCK RESEARCH INNOVATION CORPORATION

Equine Research Priorities 2019-2024

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Background

The Livestock Research Innovation Corporation (LRIC) in conjunction with the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) organized a meeting to discuss equine research in Ontario on March 1, 2018 in Guelph. Invitations were extended to a broad cross-section of equine industry stakeholders including owners, veterinarians, feed and service suppliers, research and academia, government and equine association representatives. The objectives of the meeting were:

- to discuss issues and challenges relating to the provision of equine research in Ontario, and
- to identify the top research priorities.

There were three elements discussed at the meeting:

- Part 1 – Weaknesses or Challenges Related to Equine Research in Ontario
- Part 2 – Priorities for Research
- Part 3 – Ranking Research Priorities

Weaknesses or Challenges Related to Equine Research in Ontario

Funding

Without stable and sufficient equine sector funding grant leverage dollars, the number of research submissions has declined. If it is perceived there is little opportunity to conduct equine research at the University of Guelph, it will be extremely difficult to attract or retain researchers in this field thus reducing capacity.

Funding Challenges

- Equine research has access to infrastructure and animals at the University of Guelph (Tier 2) but lacks access to research dollars (Tier 1)
- Not a lot of data on the industry, majority of data from racing
- Undervalued careers in equine – viewed as “stall cleaners”
- There is a risk of not being able to attract equine researchers at the University of Guelph.
- Faculty need to do research in order to achieve tenure, they will go where prospects are more assured.

No Research Lead

The equine industry is very fragmented with many and diverse groups focused around their particular activity or breed. This results in no single organization being accountable for equine research or taking the lead on developing a comprehensive research strategy.

Lack of Industry Data

There is insufficient data on the equine industry as a whole in terms of numbers of farms, animals and people employed and in terms of economics. This type of baseline data would be useful for illustrating the broader benefit of the equine sector to the rural community and the provincial economy. Depending on the metrics, the information could also identify priority areas for research efforts, i.e. animal health and well-being challenges

Priorities for Research & Ranking

The ranking and total votes were as follows 11 priorities were established some were more likely to be eligible for OMAFRA Research program funding than others. Based on simple scoring mechanism the priorities were ranked and the top 5 research priorities that would fit into the OMAFRA competitions were as follows:

Ranking	Total Points	Theme	Research Area
1	**260**	Health	Physiological stress – regenerative medicine/therapies, tissue damage
2	**210**	Nutrition	Diet, microbiome, nutraceuticals
3	**200**	Health	Respiratory issues – allergens, stabled vs pasture
4	**120**	Health	Analytical testing and diagnostics
5	**95**	Nutrition	Feed quality and quantity – climate change, environmental impact

Potential areas of investigation:

Animal Health

Physiological stress research

- Regenerative medicine therapies Horses as models of human disease – value to society
- Real-time assessment of impacts of physiological stress (e.g. under high performance conditions)
- Management practices that fit the ethology of the horse. Grazing and movement effects on performance
- Traction and broad force reactions, issues in soft tissue damage (could tie into environment)
- Animal welfare – facture prevention, compare CT scans with death registry, DNA studies
- Cardio research
- Respiratory research – pasture 24/7 versus stabled and low turnout horses
- Characterize bioactivity of nutraceuticals for equine arthritis

Analytical testing and diagnostics

- Vaccination use is very varied, research is needed to understand owner attitudes and choices related to vaccinating.
- Rapid stall-side testing (e.g. respiratory, GI)
- Emergency management of herd disease

- Animal health/welfare – sudden death (A/F), further work on Holter monitor (mobile ECG machine)
- Glucose levels as indicators of equine metabolic syndrome and related issues
- Basis of and treatment of heritable diseases using equine models (e.g. PSSM)
- Colic-preventative measures
- Respiratory disease research
- Traceability - future – microchip technology & data management

Potential Animal Health Priorities

- Transportation – develop best practices related to stress and health
- Transport manufacturing standards related to behaviour and health concerns
- Emergency response at temporary locations (shows, fairs, etc.)
- Statistics related to conformation issues and relation to specific lameness types in performance/racehorses

Nutrition

- What is the effect of high protein diets on acid/base balance in performance horses?
- What is the effect of dietary antioxidants on post-exercise inflammation resolution?
- Evidence-based research to support nutrition practices
- What is the impact of high intensity exercise on gut microbiome?
- Over-feeding and under-work and the effects on overall health and behaviour.
- Increased precipitation and paddock conditions on feed health – BMPs
- Forage production and hay harvest (small bales vs large bales vs cubes) and respiratory conditions
- Senior Horse needs

Climate Change Impact

- Emergency preparation including disease, but also beyond disease to include weather etc.
- Need a baseline understanding of historical disease trends in order to inform surveillance programs. Under a climate change scenario, trends may change. We won't know we have a problem if we don't have data (e.g. vector-borne diseases)

Other environmental questions

- Weather – cold vs. hot/humid conditions, need evidence-based information for guidelines
- Safety – fire risk, assessing current practices and how to improve safety
- Impact of horse operations on environment (manure, watershed, pasture care, etc.)
- What is the environmental footprint of the industry?
- Forage – drought issues – increase production
- Opportunities to link forage coverage with environmental sustainability and climate change, soil health, etc. Weather – increased precipitation affects hay quantity that will impact availability for Ontario and export markets (impact on economy).