

2018

# Ontario Livestock Research Priorities



## LIVESTOCK SECTOR RESEARCH PRIORITIES 2018

### **Introduction:**

Between February and May 2018 LRIC conducted an email survey of industry organizations requesting their sector priorities for the coming year (Att 1). This year LRIC concentrated its efforts on the sectors who in most cases canvassed their research committees or Boards for opinions on the current priorities. In some cases this was left to the sector research committees and in some, the entire boards were involved. Essentially the individuals who participated in the responses were all either Board members or senior staff of our member organizations with a good knowledge of their industries and the issues facing them that could be addresses through research.

The intention was to elicit priorities for the upcoming 2018 year that may or may not be common to more than one sector but which could be the focus of OMAFRA funding calls in 2018.

The email was very simple. Each of the sectors received the same letter and LRIC then followed up with a phone call if requested should further clarification or discussion be required.

Where LRIC has had recent engagement with the sectors on priorities (such as at the goat industry round table), we tailored the comments to that recent engagement plus previous work that LRIC has undertaken with the sector. Equine sector whilst not directly aligned with the protein producing sectors have nevertheless provided their priorities via an industry meeting organized by LRIC and OMAFRA and facilitated by Susan Fitzgerald which are included in this document.

We received responses directly from Dairy, Pork, Layers, Chicken, Hatching Egg, and Turkeys, Beef, Veal, Goat, Aquaculture and Sheep, their letters/emails are included at the end of the document as Appendix 5.

Some sectors embarked on a much more robust mechanism for eliciting priorities however their meetings (sheep and layers) their reports are included at the end of this document, their priorities included in the consolidated priorities.

LRIC has been engaged with the Ontario Feeds Sector eliciting research priorities for that sector. One major issue of concern to all feed companies is mycotoxins. LRIC is currently developing a project with the feeds sector that addresses this issue.

Att. 4 contains a view from the feed industry of what they see as livestock sector issues – it is included for interest/discussion only.

### **Drug residue depletion studies and information that will inform the use of off-label prescriptions.**

This is seen as a key area for the majority of sectors and support for CgFARAD research being included as a priority under the production systems theme is clearly articulated by the majority of sectors.

### **Canadian Global Food Animal Residue Avoidance Datatbase (CgFARAD) to make application for research funding under the animal production research theme.**

Compared with other jurisdictions Canada and Ontario have low levels of pharmaceuticals approved for use in livestock (particularly for small ruminants). If off-label drugs are to be administered then the administering veterinarian needs to have the dose rate (based on age and weight of animals/poultry involved) and withdrawal periods supported by studies undertaken by the Canadian Global Food Animal Residue Avoidance Database (CgFARAD) group based jointly out of the U of Guelph and U of Saskatchewan. This group undertakes some 2000+ residue testing and depletion studies each year supporting livestock sector productivity, exports and food safety. The service is paid for by industry however, the research it needs to conduct outside of its regular research on specifically requested items is not covered.

The service and the research it conducts is so important to industry that many groups have provided letters of support to open the door for the funding of research from the OMAFRA Animal Production theme to help to inform the industry in the use of off-label drugs. In the past, CgFARAD was able to make application to the Food Safety theme under the OMAFRA TAGs. This is no longer the case as other more pressing food safety issues have taken precedence. However, the work CgFARAD performs remains of paramount importance to all sectors in relation to

production and particularly to the small ruminant and turkey sector. The inclusion of research on drug depletion studies in the priorities will ensure that producers in Ontario will be able to continue to use off-label drugs which will enable them to remain competitive with their counterparts in other jurisdictions. More particularly it will allow the small ruminant and turkey sector to have some defenses against commonly occurring health problems including parasites, that they would otherwise have no opportunity to protect against.

### Consolidated priorities

It is clear from the priorities chart below that health remains a significant priority for all sectors in one way shape or form.

Young stock management (including chicks and poults) is a theme which has emerged this year. This is not surprising in light of the reductions in antibiotic use, as more and more attention is being paid to the management of young animals as a mechanism to grow a stronger, more robust animal/bird. AMU is still an issue and how to manage livestock with less access to antimicrobials. This theme of improved management (including such items as focus on prevention of disease, managing young stock, reducing reliance on antibiotics, general animal management) whilst not explicitly expressed as animal husbandry, appears to be something running through each of the sectors priorities.

In welfare, housing systems and transport remain priorities for some

Production and productivity features strongly with many non-descript items i.e. just general comments about finding ways to increase productivity in a range of areas.

Investigations into the impact of alternative proteins was raised by two sectors which is also interesting.

Disappointing lack of specificity this year as opposed to last year despite the fact that we specifically asked for the top 3-5 priorities.

### **FOR CLARIFICATION AND GREATER EXPLANATION OF ISSUES IT IS MOST IMPORTANT THAT THE READER REFERS TO THE DETAILS CONTAINED SECTOR BY SECTOR BELOW.**

| Issue  | Layers | Broilers | Turkey | Hatching | Beef | Goat | Sheep | Aqua | Pork | Equine | Veal |
|--|--------|----------|--------|----------|------|------|-------|------|------|--------|------|
| <b>HEALTH</b>  |        |          |        |          |      |      |       |      |      |        |      |
| General  |        |          |        |          |      |      |       | X    | X    |        |      |
| Ground current mitigation  |        |          |        |          | X    |      |       |      |      |        |      |
| Vaccine development  |        |          |        |          |      |      |       |      |      |        |      |
| Alternatives to Antibiotics (Focus on Prevention)                    |        |          |        |          | X    |      | X     |      |      |        |      |
| Disease Transmission   | X(reo) | X(reo)   | X(reo) | X(reo)   |      |      |       |      |      |        | X    |
| Respiratory disease  | X      |          |        |          |      |      | X     |      |      | X      |      |
| Health management at different stages of production (incl mortality) | X      | X        | X      | X        |      | X    | X     |      |      | X      | X    |
| Parasites  |        |          |        |          |      |      | X     |      |      |        |      |
| AMR/AMU reducing   | X      | X        |        |          | X    |      | X     |      |      |        |      |
| Drug depletion studies/approvals (CgFARAD)                           |        | X        | X      | X        |      | X    | X     |      |      |        |      |
| <b>WELFARE/BEHAVIOUR</b>   |        |          |        |          |      |      |       |      |      |        |      |
| Transport  | X      |          |        | X        |      |      |       |      |      |        | X    |
| Stress   |        |          |        |          |      |      |       |      |      | X      |      |
| Pain management  |        |          |        |          |      |      | X     |      |      |        |      |
| <b>NUTRITION</b>   |        |          |        |          |      |      |       |      |      |        |      |
| By-products/new ingredients  | X      |          |        |          |      |      |       | X    |      |        |      |
| Precision feeding & feeds and feed efficiencies                      | X      |          |        |          |      |      | X     |      |      |        |      |
| Microbiome studies   |        |          |        |          |      |      |       |      |      | X      |      |
| Nutrition and Health – including human                               | X      |          |        |          |      |      |       |      |      | X      |      |
| Throughout lifecycle   |        |          |        |          |      | X    |       |      | X    |        |      |

| Issue  | Layers | Broilers | Turkey | Hatching | Beef | Goat | Sheep | Aqua | Pork | Equine | Veal |
|--|--------|----------|--------|----------|------|------|-------|------|------|--------|------|
| <b>PRODUCTIVITY/ PRODUCTION</b>  |        |          |        |          |      |      |       |      |      |        |      |
| Cost of hydro  | X      |          |        |          |      |      |       |      |      |        |      |
| Carbon pricing   | X      |          |        |          |      |      |       |      |      |        |      |
| Housing system innovations   | X      |          |        |          |      |      |       |      | X    |        |      |
| Chick Quality  |        | X        |        | X        |      |      |       |      |      |        |      |
| Multiple aspects of productivity/management practices (see descriptions below) | X      |          |        | X        | X    | X    |       |      | X    |        | X    |
| Genetic improvement  |        |          |        |          |      | X    |       | X    |      | X      |      |
| Grazing – agronomy/farm systems  |        |          |        |          |      |      | X     |      |      |        |      |
| Innovation and new technology  |        |          |        |          |      |      |       |      | X    |        |      |
| OH&S   |        |          |        |          |      |      |       |      | X    |        |      |
| <b>ENVIRONMENT</b>   |        |          |        |          |      |      |       |      |      |        |      |
| Sustainably maintaining productivity while minimizing impact                   |        |          |        | X        | X    |      | X     | X    | X    |        |      |
| Feed production and environment  |        |          |        |          |      |      | X     |      |      | X      |      |
| Understand P risks   |        |          |        |          | X    |      |       |      |      |        |      |
| <b>ECONOMICS</b>   |        |          |        |          |      |      |       |      |      |        |      |
| Understanding economic impact of industry on Province                          |        |          |        |          |      |      | X     |      |      |        |      |
| Benchmarking   |        |          |        |          |      | X    |       | X    |      |        |      |
| <b>MARKET CHALLENGES/OPPS</b>  |        |          |        |          |      |      |       |      |      |        |      |
| Protein alternatives   |        |          |        |          | X    |      |       |      |      |        |      |
| Human Health Attributes  |        |          |        |          | X    |      |       |      |      |        |      |
| Benefits of livestock  |        |          |        |          | X    |      |       |      |      |        |      |
| Product Quality  |        |          |        |          | X    |      |       |      | X    |        |      |
| Consumer confidence/behaviour/trends   |        |          |        |          | X    |      |       |      | X    |        |      |
| Animal Activism  |        |          |        |          |      |      |       |      |      |        |      |

INDIVIDUAL PRIORITIES/RESEARCHABLE ISSUES FOR THE SECTORS RECEIVED BY LRIC.  
2017 (where available) is left in for comparison and to monitor change.

POULTRY LAYER EFO

Marked in red = not researchable issues for OMAFRA purposes

| Broad Issue                | Detail   | # Votes |
|----------------------------|--|---------|
| Health                     | Bronchitis – changing strains -  | 3       |
| Production                 | Spent hen removal options – we need some as the traditional ones may not be there forever  | 3       |
| Productivity               | Improving Efficiency within the entire system  | 3       |
| Productivity               | Energy costs (hydro)   | 3       |
| Welfare                    | Focus of welfare research is wrong – particularly at a national level (EFC) - we start with what activists are wanting, not providing science based welfare solutions that maintain productivity and OH&S conditions and promoting them. | 3       |
| Health                     | False Layers – need early indicators   | 2       |
| Health                     | Poultry Health in general and disease uncertainty  | 2       |
| Health                     | Biosecurity related to area surveillance and density of farms  | 2       |
| Nutrition                  | Protein sources (insects research)   | 2       |
| Production                 | Need enriched housing research   | 2       |
| Production                 | MDS – new building regulations   | 2       |
| Production                 | Genetics – too many small – med eggs – cracks too high as hens get older   | 2       |
| Productivity               | Need better production systems research  | 2       |
| Staff                      | Staff for future farms – how do we fill the skills gap, what do we need?   | 2       |
| Welfare                    | Transport – lack of accountability   | 2       |
| Health                     | Loss of antibiotics  | 1       |
| Nutrition                  | Precision feeds  | 1       |
| Nutrition                  | Feed ingredients research  | 1       |
| Production                 | Construction costs   | 1       |
| Production                 | Manure management – stopping it smelling?  | 1       |
| Productivity               | Need to get information to farmers in a more efficient way – there is no system  | 1       |
| Retailers/Market/consumers | Need to add more value to nutrition of eggs  | 1       |
| Retailers/Market/consumers | Add vitamins? – promote benefits of eating eggs  | 1       |
| Welfare                    | How we transport – the internal environment of trucks  | 1       |

|                            |   |   |
|----------------------------|---|---|
| Activism                   | Misinformation  | 4 |
| Activism                   | Too influential   | 4 |
| Activism                   | Potentially causing harm to hens  | 4 |
| Activism                   | Diverting research resources and restricting good research  | 4 |
| Activism                   | Undercover videos   | 4 |
| Retailers/Market/consumers | Issue with not knowing what retailers will ask for next and it will not leave time to adapt using science based solutions – Retail Council of Canada pushing for completely cage free – but this is not necessarily the best system. Need better information getting to them. | 3 |
|                            | Stakeholder agreements and relationships (national to provincial) are poor – EFO and EFC relationship   | 2 |

|                                   |  |   |
|-----------------------------------|--|---|
| <b>Relationships</b>              | UoG – no connections between researchers – this is bad | 2 |
|                                   | Nafta/trade deals                                      | 1 |
| <b>Activism</b>                   | Environmental activists                                | 1 |
| <b>Retailers/Market/consumers</b> | Some still think eggs are bad for cholesterol          | 1 |

### POULTRY BROILER

|   |                       |
|---|-----------------------|
| 2017 – provided by PIC – however heavy emphasis on reducing AMU | 2018                  |
| AMR/AMU   | AMR/AMU               |
| Live bird transport   | Chick Quality         |
| Lowering cost of production                                     | Mitigating REO spread |

### POULTRY TURKEY

|                          |   |
|--------------------------|---|
| 2017 (nothing submitted) | 2018  |
|                          | Strong for CgFARAD research   |
|                          | Emerging diseases   |
|                          | Animal welfare <ul style="list-style-type: none"> <li>elimination of toe, beak and snood conditioning and the impact on production</li> </ul> |
|                          | Poult Quality   |
|                          | Reduced antimicrobial use and its impact on primary production  |

### POULTRY BROILER BREEDERS

|                                     |  |
|-------------------------------------|--|
| 2017                                | 2018   |
| precision broiler breeder feeding r | CgFARAD funding for academic research to provide veterinarians and producers with the relevant drug withdrawal period guidelines |
|                                     | Animal Health (field research on diseases – addressing the resurgence of REO)  |
|                                     | Production based research – e.g. addressing fertility  |
|                                     | Food safety (drug depletion periods – specifically in chickens)  |
|                                     | Environmental research – e.g. Ammonia concentrations.  |

## BEEF

| 2017  | 2018   |
|---|--|
| How to produce highly marbled <u>and</u> high yielding carcasses<br>Why important: Efficiency has dropped in past decade as feedlots chased yield through feeding         | To enhance industry competitiveness and reduce production costs, priority outcomes are to enhance feed and forage productivity, increase feed efficiency, and decrease the impact of animal health and welfare issues and production limiting diseases   |
| Identifying SNP's of benefit by breed or across breeds  | To <b>improve public confidence in Canadian beef</b> , priority outcomes are to improve food safety, strengthen the surveillance of antimicrobial use and resistance, develop effective antimicrobial and growth promotant alternatives, improve animal care through an evaluation of various management systems, demonstrate the safety and efficacy of new production technologies, improve environmental sustainability and the environmental footprint of beef production, and measure the beef industry's environmental benefits. In addition, research should conduct a targeted evaluation of phosphorous risks under different cattle management systems and evaluate/develop mitigation tools and techniques. |
| New Tech: Feasibility/effectiveness of virtual fences.  |  |
| Evaluation of phosphorous risks for the Ontario beef industry under different management systems<br>Investigate P in feed that leads to future run off.                   |  |
| Comparison of animal health/welfare impacts for cattle transported long distances. Is there an ideal timeframe or threshold (i.e. less than 8 hours to final destination) |  |
| Highest quality meats attributes and how producers might produce them, select them, process for them etc.   | <b>Building on 2017:</b> To <b>improve beef demand and quality</b> , priority outcomes are to reduce food safety incidences, improve beef quality through primary production improvements and the development and application of technologies to optimize cutout values and beef demand.   |
| Cost effective proof of location of origin. Moving beyond RFID's.   |  |
| Breeding and feeding strategies that would reduce the use of anti-microbials  | <b>Building on 2017:</b> Strengthen the surveillance of antimicrobial use and resistance, develop effective antimicrobial and growth promotant alternatives,   |
| Opportunities for groups to reduce the cost of data collection  |  |
|   | <b>New:</b> including an evaluation of stray current prevalence and mitigation techniques, and the impact that stray current may have on human and animal health and welfare.  |
|   | <b>New:</b> To <b>evaluate the efficacy and demand of alternative proteins</b> , priority outcomes are to evaluate consumer perceptions, health attributes and the environmental sustainability of plant and lab (in vitro/synthetic) based protein in comparison to traditional animal based proteins. An evaluation of the impact that substituting animal with plant and lab based protein production and the impact on human and environmental health is needed, including an assessment of the production resource requirements (land, water, and other inputs) between different protein production  |

## VEAL

|  |  |
|--|--|
| 2017   | 2018:<br>VFO's focus is supporting research with the overarching goal of reducing anti-microbial usage in veal production through the following research priorities:   |
| <p>Animal health</p> <ul style="list-style-type: none"> <li>Investigate, identify and prioritize the diseases that most adversely affect the health and production of veal in Ontario</li> </ul>   | <ul style="list-style-type: none"> <li>Calf Transport - Age, stress, transfer from farm origin to all points</li> <li>Housing - Benchmarking cleaning disinfection and measuring impact</li> <li>Management Practices - Benchmarking current management practices and investigating ways in which to improve</li> <li>Co-mingling calves - Reducing disease transfer in co-mingled calves in various production systems</li> </ul> |
| <p>Nutrition</p> <ul style="list-style-type: none"> <li>Determine the optimum feeding and nutrition management practices determine the optimal weaning period for calves based on rumen development.</li> </ul>  |  |
| <p>Animal welfare</p> <ul style="list-style-type: none"> <li>Comparative assessment on the types of individual and group housing of veal in Ontario. Design and carry out research that will inform producers of the best practices for individual and group housing.</li> <li>Develop a research project that evaluates different types of flooring and recommend the most appropriate options that ensure proper growth and development.</li> <li>Benchmark average age of transport of veal calves in Ontario. Investigate the optimum time for calves to be shipped considering calf health and the economic benefits for both the buyer and seller</li> </ul> | This theme is continued in 2018 and is related to group housing priority from 2017: Co-mingling calves - Reducing disease transfer in co-mingled calves in various production systems  |
| <p>Food safety</p> <p>Benchmark antimicrobial usage in calves and reduce the use of antibiotics by using alternative products and improving management practices.</p>  | 2017 and CgFARAD related: Drug Labelling & Approvals/Depletion Studies/Metabolism of calves  |

## PORK

|  |   |
|--|---|
| 2017   | 2018<br>NOTE: Ontario Pork is completing a research strategy to be reviewed by the Ontario Pork Board May/June  |
| Investigate and mitigate or control:   | Overarching research objective: "Test potential improvements to swine industry practices"   |
| Phosphorus , soil / water movement;  | <ul style="list-style-type: none"> <li>Including, but not limited to; swine health, swine welfare, swine nutrition, swine husbandry, swine reproduction, barn design and management, employee health and safety, meat quality and safety, marketing and consumer trends and environmental and economic sustainability.</li> </ul> |
| Pork production without antibiotics to meet current consumer needs   | <p>Innovation component</p> <ul style="list-style-type: none"> <li>Multi-species applicability</li> </ul>   |
| <p>Requirements of the new code of practice</p> <ul style="list-style-type: none"> <li>pain reduction ...pain meds, including mixing,</li> <li>loose housing issues – injury.</li> </ul> |   |
| Innovation, <u>how</u> technology can advance the industry   |   |



## GOAT

|  |   |
|--|---|
| 2016/2017  | 2018<br>NOTE: With growth in the sector, all priorities are important and build on 2017   |
| How to rapidly increase herd size  |   |
| Traceability <ul style="list-style-type: none"> <li>• Are there drug or bacterial residues in the milk?</li> <li>• Withdrawal times for all drug treatments.</li> <li>• Adoption research for the full traceability system being implemented through the National Goat Identification Program.</li> <li>• Incidence of foodborne pathogen contamination in raw milk cheeses</li> </ul>   |   |
| Goat Welfare <ul style="list-style-type: none"> <li>• Lameness and Hoof-care</li> <li>• What are the practices farmers needs to follow for hoof-care to prevent lameness?</li> <li>• Post farm gate – Transportation and Slaughter at Unlicensed Facilities</li> <li>• With no traceability in the goat industry, no one knows how long a goat stays in transport and where the goat ends up. This is a welfare concern as some animals aren't able to withstand long or multiple trips.</li> </ul>  | Drug approvals, labelling, access to medications/vaccines<br>Animal welfare addressed in broad terms in dairy Goat roundtable report (see below). |
| Health <ul style="list-style-type: none"> <li>• Why aren't kids surviving</li> </ul> Respiratory Disease <ul style="list-style-type: none"> <li>• What are the main organisms causing respiratory diseases and the risk factors that predispose animals to succumb to those organisms?</li> <li>• Chronic Wasting Disease (CAE, Johnes, Caseous Lymphadenitis) Are there effective vaccines in other jurisdictions? E.g. Australian / Spanish Johnes vaccine that reduces clinical signs and shedding. If effective, is vaccinating for Johnes a good option for Ontario producers?</li> </ul> | Kid Health and Rearing<br>Productivity/efficiency- genetic improvement (how to measure commercially)  |
| Housing and Handling Equipment <ul style="list-style-type: none"> <li>• What are the optimum housing and stocking density conditions for goats of various ages and stages in Ontario?</li> <li>• How does floor type and bedding affect milk quality and welfare?</li> </ul>   | Housing   |
| Primary Nutrition <ul style="list-style-type: none"> <li>• What are the appropriate ration formulations for Ontario dairy goats at different stages: kids, doelings, early pregnancy, late pregnancy, first pregnancy vs. later pregnancies, carrying singles vs. twins or high multiples, transition period, milking, breeding, dry period? Are nutrition requirements different for pregnant goats in the summer vs. the winter? If different feeding regimes require changes to handling and housing, how does that affect the producer economically?</li> </ul>                            | Nutrition/Feeding <ul style="list-style-type: none"> <li>o Various stages of growth, lactation, dry does, young kids, buck kids</li> </ul>        |
|  | Benchmarking current management practices and protocols   |

## AQUACULTURE

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| 2018   |
| An in depth discussion relating to Aquaculture is contained in a letter from the industry at the end of this document (Att 3).   |
| <p>Genetics and Reproduction</p> <p>Ontario continues to be very reliant on imported rainbow trout eggs for growout, with genetics that are sub-optimal for Ontario growing conditions. Most of the actions under this theme are still extremely relevant and require continued effort. As a result it maintains the highest research ranking.</p>   |
| <p>Environmental Interactions &amp; Wild Fishery</p> <p>These two themes are very closely linked and combined would have been the highest rated research need in the 2014 research priority setting. There has been some research completed in the last several years regarding the impacts of net pen aquaculture and native fish populations. This topic remains one of the central issues raised by Indigenous communities when they are deciding whether to invest in open water net pen aquaculture of rainbow trout or whitefish. More research needs to be done investigating the impacts of large open water net pens on the environment and wild fishes. Many of the actions identified still remain to be completed.</p> |
| <p>Health</p> <p>Emerging issues in fish health, especially coldwater disease, continue to require leading edge research to find solutions to reduce the economic impact of disease. Communication to producers to disseminate information on aquatic animal health has greatly improved over the last year from the Fish Expert Network of the Ontario Animal Health Network.</p>   |
| <p>Nutrition</p> <p>Most of the trout feed used in the province currently comes from the west coast (Ewos – hatcheries and Taplow Feeds – organic) and the East Coast (Skretting – trout grower diets). Recently, Bluewater Feeds has started domestic production of specialty aquaculture diets. There continues to be a need to investigate new dietary ingredients that may have nutraceutical benefits to improving fish health and immune response.</p> <p>One of the research actions that requires renewed attention is performance benchmarking. This was also identified in the Economics research theme.</p>   |
| <p>Economics and Industry Benchmarking</p> <p>An industry wide benchmarking system has not been implemented.</p>   |

## EQUINE

|  |
|--|
| 2018   |
| <p>Physiological stress</p> <ul style="list-style-type: none"> <li>regenerative medicine/therapies, tissue damage</li> </ul> |
| <p>Nutrition</p> <ul style="list-style-type: none"> <li>diet, microbiome, nutraceuticals</li> </ul>                          |
| <p>Respiratory issues</p> <ul style="list-style-type: none"> <li>allergens, stabled vs pasture</li> </ul>                    |
| <p>Analytical testing and diagnostics</p>  |
| <p>Feed quality and quantity</p> <ul style="list-style-type: none"> <li>climate change, environmental stewardship</li> </ul> |
| <p>Feeding practices linked to health impacts</p>  |
| <p>Animal behavior</p> <ul style="list-style-type: none"> <li>stress</li> </ul>  |
| <p>Senior horse health</p>   |
| <p>Digestion –</p> <p>colic</p>  |

## Equine research priorities – from LRIC facilitated meeting 2018.

### Broad themes

- Animal Health - genetics, nutrition, reproduction, respiratory challenges, biosecurity, etc.,
- Animal Welfare and Behaviour - reduce stress, handling practices, post-competition, etc.,
- Climate Change - weather extremes relating to health, disease pressures from vector borne pathogens, emergency response, etc.
- Economic and Societal Values – data collection and better understanding of equine sector
- Environmental Issues - water, forage production, etc.,
- Labour Productivity and Education - human health and safety, nutrition information

### Specifics in priority order

Items in red are those which the group ranked highly and have therefore been left in the document. However, it was suggested to the group these items are unlikely to be eligible for scientific research funding from the OMAFRA Production Systems theme. However they are exactly the kinds of topics that would receive attention from AAC or similar 'industry' funding. They have been left in the document for information only. Therefore only those items in black (bold) should be considered for insertion into the OMAFRA priorities 2018/19.

## Equine 2018 Ranking Priorities

| Ranking | Research Area  |
|---------|--|
| 1       | <b>Physiological stress – regenerative medicine/therapies, tissue damage</b> |
| 2       | Data gathering for baseline herd health and disease                          |
| 3       | <b>Nutrition – diet, microbiome, nutraceuticals</b>                          |
| 4       | <b>Respiratory issues – allergens, stabled vs pasture</b>                    |
| 5       | Data collection – economics, industry size, #s                               |
| 6       | <b>Analytical testing and diagnostics</b>                                    |
| 7       | Emergency management – disease, fire, preparedness/risk mitigation           |
| 8       | <b>Feed quality and quantity – climate change, environmental stewardship</b> |
| 9       | <b>Feeding practices linked to health impacts</b>                            |
| 9       | Human/horse interaction  |
| 9       | Non-productive horses – mgt., behaviour, relocation                          |
| 9       | <b>Animal behavior – stress</b>  |
| 10      | <b>Senior horse health</b>   |
| 10      | <b>Digestion – colic</b>   |
| 10      | Transportation – standards, BMPs   |
| 11      | Employee health and safety   |

## Sheep

The Livestock Research Innovation Corporation (LRIC) in conjunction with Ontario Sheep Farmers organized a meeting to discuss sheep research in Ontario on June 4, 2018 in Guelph. Invitations were extended to a broad cross-section of sheep industry stakeholders including producers, veterinarians, research and academia, government staff and OSF representatives. The objectives of the meeting were:

- to discuss issues and challenges relating to the provision of sheep research in Ontario, and
- to identify the top research priorities with a focus on a five to 10-year objective.

There were 37 meeting attendees including the facilitator and meeting organizers divided into groups of six to eight for the discussion segments. The list of participants is included in section 9 of this report.

Tim Nelson, CEO of LRIC, opened the meeting with an overview of research priority setting followed by Jennifer MacTavish who provided highlights of Ontario sheep research. A copy of Jennifer's presentation is included in section 10. This report focuses on the content of the facilitated discussions.

Meeting attendees were provided with a worksheet and asked to record their personal thoughts for each topic in addition to the open group discussion comments. While verbally submitted comments were recorded on a flip chart and also on sticky notes posted on the walls during the meeting, it is recognized that not all comments and ideas end up being shared in open discussions. Twenty-seven completed worksheets were received at the end of the meeting. A compilation of the feedback is included in section 7.

There were four segments to the facilitated portion of the meeting:

- Part 1 – Identifying Top Barriers for the Ontario Sheep Industry
- Part 2 – Strengths and Weaknesses Related to Sheep Research in Ontario
- Part 3 – Priorities for Research
- Part 4 – Ranking Research Priorities

### **Top Barriers for the Ontario Sheep Industry**

The attendees were asked to consider what is limiting or restricting the Ontario sheep sector from reaching its potential. This did not have to be related to research per se. They spent a few minutes recording their opinions on their personal recording sheets followed by 10 minutes sharing within their table group. Based on the contributions during the open discussion (section 2) and the personal worksheets summary (section 6), the most significant barriers, in no particular order, are:

- **Education/Knowledge and Retaining Producers** – There is a high turnover rate of new entrants which may be due to a lack of easily accessible production and management information. The same is true for producers who want to optimize their production and/or expand; there is insufficient knowledge transfer whether from more knowledgeable producers or industry experts.
- **Cost of Production** – The cost of production in Ontario is high: land costs, feed costs, labour shortage and labour per unit produced.

- **Access to Quality Animals and Low Number of Sheep Overall** – There is not enough sheep to meet Ontario market demand for lamb and a lack of quality breeding stock to support expansion
- **Market/Price Uncertainty** - The market price of lamb is unpredictable and inconsistent.
- **Inconsistent Product and Lamb Availability** – There is an inconsistent supply of lamb (seasonal lambing cycles and not enough producers) and also inconsistent carcass quality. The latter is exacerbated by the disconnect between price and quality, i.e. good quality lamb does not necessarily bring a premium price and lower quality carcasses still find a market.
- **Benchmarking and Record Keeping** - Lack of benchmark data and good record keeping to improve genetics and overall business viability
- **Limited Access to Registered Medications and Vaccines**
- **Animal Health Challenges** – Examples include lamb mortality, parasites, pneumonia

Ranked Priorities – note those issues marked in red were deemed to be prior

Marked in **red** = not researchable issues for OMAFRA purposes

| Ranking   | Total Points | Research Area  |
|-----------|--------------|--|
| 2         | 250          | Parasites  |
| 3         | 240          | Lamb mortality   |
| 7         | 180          | Efficacy trials and diagnostic tests                   |
| 7         | 180          | Feed efficiency  |
| 7         | 180          | Grazing – agronomic factors                            |
| 8         | 120          | AMR/AMU, alternatives, gut health                      |
| 9         | 100          | Housing – space requirements, ventilation, air quality |
| 9         | 100          | Pneumonia  |
| 10        | 50           | Pain mgt. for lambs                                    |
| 10        | 50           | Social science/decision-making                         |
| 11        | 40           | Coccidiosis  |
| 12        | 30           | Fertility/reproduction traits                          |
| <b>1</b>  | <b>385</b>   | <b>Benchmarking/CoP/composite industry data</b>        |
| <b>4</b>  | <b>205</b>   | <b>Market traits – carcass quality characteristics</b> |
| <b>5</b>  | <b>200</b>   | <b>KTT/communications</b>                              |
| <b>6</b>  | <b>190</b>   | <b>Environmental impact/sustainability</b>             |
| <b>7</b>  | <b>180</b>   | <b>High health status programs</b>                     |
| <b>13</b> | <b>15</b>    | <b>Consumer perceptions/preferences</b>                |

## Follow up letter to sector organizations re-secor priorities and drug depletion research (CgFARAD)

Colleagues for the record:

I met with the relevant OMAFRA staff at OMAFRA responsible for the priorities that end up in the Food Safety calls for proposals. I have brought Ron up to speed on the conversation and I understand he was to speak with them yesterday.

The bottom line appears to be that whilst OMAFRA agrees that this is potentially a food safety concern they believe there are other food safety problems that deserve more priority than this. I would not be confident at this stage of seeing the CgFARAD work in the Food Safety priorities.

Dr. Johnson will be contacting each of you to ask you to write to LRIC to ensure that this years priorities include the issue of violative drug residue and depletion studies in the two funding streams that we bring your priorities to the table on – production systems and emergency management.

The priorities you provide to LRIC guide the decisions made that end up being the final priority listings in the OMAFRA research priorities document each year. In 2017 for the first time, individual sector priorities were cited in that document – this is a great step forward.

So please remember that we would like to receive your sectors top 5 priorities for the year that your organization would like to see in the OMAFRA priority document in the next 4 weeks (before April 10 please).

As a result of the recent email exchanges between us we will also include the work CgFARAD does as an overarching priority that affects and is supported by all sectors.

LRIC has provided significant support for CgFARAD over the past 4 years and will continue to do so going forward, but LRIC does not have funds of its own to support research work.

Please ensure that your sector sends a letter of support through LRIC for CgFARAD work to be included in the upcoming priority setting discussions at OMAFRA and also, **PLEASE** send LRIC your top 3-5 priorities for inclusion in this important document. If we don't receive them we can't get them included when we meet with the Province.

Best Regards

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## Summary of Dairy Goat Roundtable discussions

### Animal Health (Lead, Dr. Cathy Bauman)

- Work has been underway to coordinate access to pharmaceuticals. However, lack of funding for studies informing use and withdrawal is an impediment. There has, however, been some interest in coordinating efforts from Quebec small ruminant veterinarians.
- Next Steps: Continue to explore options to move forward and engage Quebec veterinarians in the discussion.

### Herd Management, Production, and Co-ordination of Genetic Improvement (Lead, Marlene Paibomesai, OMAFRA)

- A sub-committee has been assembled and met in mid-February to discuss past and current initiatives, the scope of the committee and is working to develop a Terms of Reference. The group plans to meet every 6-8 weeks
- Next Steps: Continue to develop a Terms of Reference and identify areas of work for the group.

### Business Planning, and Coordination of Industry Communication (Lead, OMAFRA and Ontario Goat)

- OMAFRA and Ontario goat will be meeting to determine how to coordinate online industry resources that reside in different places
- OMAFRA and Ontario goat are collaborating to hold a lenders meeting in early April
- The Cost of Production work that Ontario Goat undertook is seen as valuable for the industry. However, there are challenges with respect to ongoing funding for the work.
- Next Steps: Coordination of online resources, and ongoing discussion on how to further the Cost of Production work

### Animal Welfare

- Cull animal decision making tools (Lead, Steve Palmer, OMAFRA)
  - o Ontario Goat has developed a resource kit for producers regarding on-farm decision making that is available to non-members (for a fee) and members.
  - o OMAFRA will coordinate the development of a Disposition Guide that can be used to improve decision making on farm with respect to treating/shipping/euthanizing goats
- Code of Practice Update (Lead, Co-chairs)
  - o The co-chairs have written and sent a letter to the National Farm Animal Care Council expressing support for the updating of the Code of Practice for the Care and Handling of Goats and recommending that the update happen at the earliest opportunity
- Next Steps: Development of the Disposition Guide for on-farm decision making.

### One Voice for the Industry

- This action item was listed as “pending” subject to further discussion by the Steering Committee.
- The Steering Committee has agreed that while supportive of a collective voice for producers and recognizing that it is important for the industry, it is not within the scope of the Roundtable to directly influence.

END GOAT ROUNDTABLE INFORMATION

### Brief Aquaculture Sector Snapshot

Aquaculture in Ontario has seen recent significant growth of 12 to 15% a year over the past 4 years as a result of renewed investment in the net pen farming sector of rainbow trout and new species development in land-based recirculating systems. Much of the new investment and current projects under development are being driven by indigenous involvement in the open water net pen sector in northern Ontario around Manitoulin Island. A detailed economic analysis of the sector is published annually in the *Aquastats* publications by the Aquaculture Center at the University of Guelph.

### Research Overview

Pending the formation of the Ontario Aquaculture Research and Services Co-ordinating Committee, which will produce an updated list of research priorities, the following is a revised research priorities list. The foundation for the *Ontario Aquaculture Research Priorities for 2018* was derived from the LRIC-sponsored *Ontario Aquaculture Research Strategy Workshop* that which was held in Little Current on September 10, 2014 along with discussions with several key industry leaders.

At the 2014 research priority setting meeting the participants identified the following research themes:

#### Identifying Research Themes

*Participants confirmed and expanded the list of themes or areas of research that should be addressed in the Ontario aquaculture industry research. They prioritized the research themes where action would have the most positive impact on the aquaculture industry research in Ontario. On a ballot they indicated the number of points they would give each research theme.*

| Rank             | Key Area of Focus         | Total Score |
|------------------|---------------------------|-------------|
| 1 <sup>st</sup>  | Regulations               | 675         |
| 2 <sup>nd</sup>  | Genetics and Reproduction | 580         |
| 3 <sup>rd</sup>  | Engineering               | 475         |
| 4 <sup>th</sup>  | Social License            | 465         |
| 5 <sup>th</sup>  | Environment               | 455         |
| 6 <sup>th</sup>  | Fish Health               | 415         |
| 7 <sup>th</sup>  | Nutrition (Fish)          | 355         |
| 8 <sup>th</sup>  | Wild Fishery              | 320         |
| 9 <sup>th</sup>  | Economics                 | 280         |
| 10 <sup>th</sup> | Market Research           | 215         |
| 11 <sup>th</sup> | Nutrition (Human)         | 205         |
| 12 <sup>th</sup> | Food Safety               | 195         |
| 13 <sup>th</sup> | Fish Welfare              | 130         |

#### Regulatory:

Several notable developments have occurred since the research priority setting meeting – primarily the decision notice was posted on the Environmental Registry of the *Application Guide for Cage Culture Aquaculture Facilities in Ontario*. In addition, the federal government has moved towards consultations on the potential development of an Aquaculture Act to enable the aquaculture sector to move forward in Canada. As a result, many of the outcomes of the *Regulations* theme have been met.

#### Genetics & Reproduction:

Ontario continues to be very reliant on imported rainbow trout eggs for growout, with genetics that are sub-optimal for Ontario growing conditions. Most of the actions under this theme are still extremely relevant and require continued effort. As a result it maintains the highest research ranking.

#### Engineering:



Development in the engineering theme have occurred with two sinkable net pen designs now operating in the Manitoulin Island area that can withstand high energy colder offshore environments. Though further refinement is occurring, most of the actions under this research theme are being addressed.

**Social License:**

After many years of community involvement and communication, it can be argued that the aquaculture sector has achieved “social license” in the Manitoulin and Parry Sound areas that currently have net pen rainbow trout farms. There will always be opposition groups to any activity that have a philosophical opposition to economic development of any kind and no amount of proactive communications or transparency will make a difference to their opposition. With proposed stable funding for the Ontario Aquaculture Association in the coming years the actions under the social license theme will continue to be fulfilled.

**Environment & Wild Fishery:**

These two themes are very closely linked and combined would have been the highest rated research need in the 2014 research priority setting. There has been some research completed in the last several years regarding the impacts of net pen aquaculture and native fish populations. This topic remains one of the central issues raised by Indigenous communities when they are deciding whether to invest in open water net pen aquaculture of rainbow trout or whitefish. More research needs to be done investigating the impacts of large open water net pens on the environment and wild fishes. Many of the actions identified still remain to be completed.

**Fish Health:**

Emerging issues in fish health, especially coldwater disease, continue to require leading edge research to find solutions to reduce the economic impact of disease. Communication to producers to disseminate information on aquatic animal health has greatly improved over the last year from the Fish Expert Network of the Ontario Animal Health Network.

**Nutrition:**

Most of the trout feed used in the province currently comes from the west coast (Ewos – hatcheries and Taplow Feeds – organic) and the East Coast (Skretting – trout grower diets). Recently, Bluewater Feeds has started domestic production of specialty aquaculture diets. There continues to be a need to investigate new dietary ingredients that may have nutraceutical benefits to improving fish health and immune response. One of the research actions that requires renewed attention is performance benchmarking. This was also identified in the Economics research theme.

**Economics:**

An industry wide benchmarking system has not been implemented.

**Market Research, Nutrition (human), Food Safety, Fish Welfare:**

Research has been completed in these areas since the research priorities were established in 2014. These would remain minor research areas. However, it is expected that fish welfare research in humane slaughter will require research for technology that works in Ontario’s environment.

**END AQUACULTURE**

**View from the feed industry – not included for the OMAFRA document – but an interesting view from a different sector – recorded 2017.**

**1. AMR/AMU**

- How to inoculate gut so the good bugs stay in the microbiome
- How do different ingredients affect the gut wall?
- Research seeding barns with complex good bacteria loads in feed and water.
- Research barn disinfecting protocols for RWA animals/ birds
- Pre and probiotics. What works? What doesn't?

**2. Hoof injury from loose housing**

- a. Genetics – not geared – losing hooves?
- b. Could this be feed oriented?

**3. Pigs**

- a. Aggressive pigs → is this across all genetics?
- b. Mineral requirements for sows

**4. Ruminants**

- a. Reduction of methane emissions
  - i. Essential oils and feed additives for reducing methane
  - ii. Need a Canadian benchmark for emissions (not just EU standard)
  - iii. Grass-fed vs. intensive corn-fed
  - iv. Feeding (flax, chaff, chart?) to reduce methane
- b. Dairy cattle micro-minerals and selenium
  - i. Sources have changed
  - ii. Amino acid complexes

**5. Prevalence of Roundup residue (glyphosate) on desicated grains**

- a. Meta-analysis on reproduction, etc.
- b. Impact of residue on gut health

**6. Microbiome**

- a. What do ingredients do to gut wall?
- b. Up regulation and down regulation
- c. How do you inoculate gut so the good bugs stay in the microbiome

**7. Solving respiratory issues within RWA livestock**

**8. Antibiotic alternatives**

- Seeding barns with complex good bacteria loads in feed and water.
- Not having to use antibiotics
- In RWA don't disinfect after every crop.

**9. Aquaculture**

- a. Feeding advice needed

**10. Goat**

- a. Feeding advice needed → nutrition planes, etc.

**11. Bacterial loads carried on farm through feed ingredients**

- a. How do we sterilize feeds when the ingredient is untraceable?
- b. Contaminants – physical and bacterial
- c. Imaging?

**12. Combinations of pre and probiotics to replace antibiotics**

**13. Testing imported ingredients**

- a. Quality of vits and minerals
- b. CFIA standards vs Industry needs

**14. Better understanding Disease Fundamentals (Cross-sectoral? – mainly aimed at poultry but could fit swine)**

- a. How does disease impact animal performance?
- b. Immune system driving histamine response?
- c. Glucose metabolism
- d. Is this physiology present in species other than poultry?
  - i. Heat stress
  - ii. Cocci
  - iii. Necrotic Enteritis
- e. What do we learn?
- f. What innovation strategies can be used to offset the problem with disease (glucose gap → being diverted to the immune system)
- g. By-pass technologies?

**15. What are the Benefits of Antibiotics that we might lose when removing them?**

- a. What are they doing?
- b. How do they work?
- c. What are you replacing when you use alternatives to antibiotics?

END - Attachments below.

Attachments below this page are the letters/emails received by LRIC in relation firstly to priorities and secondly for priorities plus support for the depletion studies work etc. that CgFARAD does or in a couple of cases just the support for CgFARAD (e.g. DLAC).

## Sheep Farmers Priorities

Here are the Ontario Sheep Farmers research priorities – the caveat being that our priority setting day is not until 4<sup>th</sup> June.

- 1 Managing animal health – this includes pneumonia and finding alternative means of managing animal health (outside of antibiotics i.e., genetic resistance, vaccine development), with a focus on prevention
- 2 CgFARAD – since so few drugs are registered for use in sheep, work done by CgFARAD on setting appropriate drug withdrawal times is critical in ensuring food safety and maintaining public confidence in our product.
- 3 Environment – how to adapt to and minimize impact on
- 4 Productivity, product quality and profitability
- 5 Economics – getting a better understanding of the economic impact of the sheep industry to Ontario and Canada

Jenn



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## Veal Priorities

### Overall goal:

VFO's focus is supporting research with the overarching goal of reducing anti-microbial usage in veal production through the following research priorities:

1. Calf Transport
  - Age, stress, transfer from farm origin to all points
2. Drug Labelling & Approvals/Depletion Studies/Metabolism of calves
3. Housing
  - Benchmarking cleaning disinfection and measuring impact
4. Management Practices
  - Benchmarking current management practices and investigating ways in which to improve
5. Co-mingling calves
  - Reducing disease transfer in co-mingled calves in various production systems

Thanks

Jen

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