



# GOAT RESEARCH PRIORITIES

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# Goat Research Priorities

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## Research Priorities for the Ontario Goat Industry

### Introduction

On December 10, 2019 representatives from the goat industry (see Appendix 1) met to update and prioritize industry research needs. This initiative followed similar work done by the industry in 2014 and 2016. This meeting followed a Dairy Goat Value Chain Roundtable meeting earlier in the day that contained presentations which outlined the state of the Goat industry in Ontario providing context for the research needs discussion.

Priorities identified in the 2014 and 2016 sessions were discussed within four focus areas (listed alphabetically):

- **Health**
- **Nutrition**
- **Productivity**
- **Welfare**

Attendees rotated throughout the room with the opportunity to discuss, edit, change and add any new priorities. A group discussion was then held to prioritize each topic with the four areas.

This document outlines the **prioritized topics within each area**. The results will be incorporated into a research priority document that LRIC prepares annually for OMAFRA. The document is used by OMAFRA for planning and decisions for future research calls and expenditures. It is also used by researchers to assist in development of research proposals. Sharing of this document is encouraged and feedback is always welcome. Research strategies and priorities are dynamic and should be updated on a regular basis and as new issues arise.

Overarching all discussion was the need for **benchmarking data** on the industry. The power of collective data cannot be overstated to benefit and advance the industry. The research areas identified will provide the most significant benefit to the animals and the industry. All research outcomes need to reference economic viability. Also critical for all research is strong knowledge translation and transfer plans to ensure research results are communicated to and adopted by the industry as soon as possible.

A new revised National Code of Practice for the Care and Handling of Goats is being developed and is anticipated will have a draft for public comment in the fall of 2020 and a final in 2021. The Goat Code Scientific Committee has been diligently gathering and reviewing preliminary scientific content toward the preparation of a draft, synthesized summary that will be peer reviewed and returned to the Code Development Committee as the Scientific Committee Report anticipated in June of 2020. The committees are specifically looking at priority welfare issues which include:

- End-of-life management
- Lameness
  - Hoof trimming
  - Nutritional causes of lameness
- Optimizing kid health
  - Optimizing passive transfer of immunity
- Painful procedures
  - Prevention
  - Protocols/strategies
  - Pre and post-op procedures
  - Disbudding, dehorning, horn tipping, and castration
- Space allowance
  - Feeder and waterer space allowance
  - Housing density and indicators of adverse effects
- Natural behaviours
  - Positive states
  - Enrichment

As these topics are all noted in these priorities, it will be important to review and refocus these priorities once the draft Code is released.

## Health

### 1. Chronic Wasting Diseases (Caprine Arthritis Encephalitis (CAE), Johnes Disease (JD), Caseous Lymphadenitis (CL))

- CAE Control Programs – Need to understand the efficacy of control programs for CAE to safeguard producers when purchasing from “CAE free” herds. CAE is one of, if not, the biggest health issue for the goat industry. Developing effective control programs and providing industry-wide education is critical.
- Research the effectiveness of the Gudair Johnes vaccine that reduces clinical signs and shedding. If effective, is vaccinating for Johnes disease a good option for Ontario producers?
- Establish a CAE, JD and CL certification program to increase production, improve animal welfare and protect buyers NOTE: This may potentially more of a program need than a research need).

### 2. Goat Kid Health and Mortality

NOTE: this area ranked second, however the most focused questions will come from current research being conducted by Dr. Cathy Bauman at the Ontario Veterinary College. This research is being monitored and the results will identify areas of research, knowledge transfer and focus that will determine where the industry needs to prioritize.

While being informed by Dr Bauman's research, more is needed to determine kid management practices that protect goats from developing respiratory diseases at any age

### 3. Milk Quality and Udder Health

- What are the organisms that affect udder health, mastitis and milk quality?
- What are the risk factors for mastitis pathogens – individual and herd level?
- What are the risk factors that make animals more susceptible and what interventions can be applied?
- What are the frequency and risk factors for zoonotic pathogens in raw milk (e.g. listeria, coxiella)?
- What are the interventions that can improve udder health and milk quality (e.g. udder preparation, barrier dips, milking time)?
- Does continual milking (no dry period) affect milk quality and animal health?
- What are the actual costs of poor udder health in terms of production losses, food safety and low-quality milk?

NOTE: The industry will be challenged to do this research due to difficulty to trace the animals causing the quality issues, as the cost of individual animal milk tests and given the number of milking goats on farms e.g. 1000 goats / farm. Potential to look for innovations for low cost testing alternatives.

### 4. Animal Health Products

- Drug residue depletion studies are required to determine withdrawal time for pharmaceutical products in order to inform their extra-label use by veterinarians.

NOTE: The industry needs registered pharmaceutical options (eg.vaccine) options in Canada for use in goats. Outside of research this is a lobbying issue for the industry.

### 5. Respiratory Disease

- What are the main organisms causing respiratory diseases? What are the risk factors that predispose old and young animals to succumb to those organisms?
- Is there an optimum time period to feed high quality colostrum to protect kids from respiratory disease?

NOTE: Dr Bauman's project noted in 2 above may provide some research direction on this question of respiratory disease in kid goats.

### 6. Infectious Abortion

- Comprehensive industry benchmarking research is needed to determine prevalence and identify possible prevention methods that prevent for Infectious Abortions.

### 7. Parasites

- Parasites are an issue for goats on pasture (meat and organic milk). This issue should be addressed through education on the use of various anthelmintic. The parasite handbook was updated in the spring of 2019 and is available on the Ontario Sheep Farmers website.

# Nutrition

## 1. Primary Nutrition

There are no recommended ration formulations for different types and life stages of Ontario goats (meat vs. dairy, buck kids, doelings, transition does, etc.). A common misconception that spans many issues of goat husbandry is, “goats are like little cows”. Goats are their own species and have different requirements in all aspects of husbandry, including nutrition. Nutrition research to support recommended nutrient requirements and ration formulations for various types and stages of goat production could have profound effects on animal production, health, welfare, food safety, quality and economics. Research priorities include:

- Conduct a scoping review to identify research needs:
  - What is required to update the 2007 National Research Council (NRC) requirements for meat and dairy goats?
  - What are the nutritional and ration requirements for Ontario meat and dairy goats at different production stages (young animal, stage of pregnancy, transition, stage of milking, dry period, buck kids) and seasons (ie do summer and winter requirements differ)?
- What are the colostrum quality and quantity differences between dairy goats that are dried off before kidding and those that milk continuously?
- Research the water requirements of goats at various stages and seasons. Considerations include: temperature, purity, mineral content, bacteria count and the impacts they have.
- How do different bacteria affect milk quality and cheese production? (e.g. fat / protein inversion issues)
- Developing KTT and education programs based on the above research results is critical.

## 2. Gut Health

- Topics for consideration are subacute ruminal acidosis, role of starches and fibre.
- Impact of probiotics

## 3. Nutritional and Feed Related Diseases

NOTE – There is some overlap with research identified within the health area.

- Pregnancy Toxemia –Does heat stress contribute to bringing on pregnancy toxemia? If so, does this change their nutrition requirements? What are the factors that cause toxemia?
- Ketosis – What is the recommended ration and treatment for ketonic goats? What are the economic consequences of a ketonic doe on milk production, milk quality and kid health?
- Listeriosis – Develop control programs and producer education programs
- Determine recommendations for reduction of Sub-acute Ruminal Acidosis (SARA) in goats?
- What is the incidence of adult disease due to *Clostridium perfringens*? What are the risk factors? Develop control programs and education including vaccination programs, feed management and other factors.
- As part of the scoping research noted above in the Primary Nutrition section include the below areas and identify education needs and/or research gaps related to:
  - the cause of neurological disease.
  - the selenium requirement for the doe to get adequate transfer to the kid? How is deficiency determined as various ages? Are there cost effective tests? Is it better to feed selenium and vitamin E continually or needle goats at a specific time? Is organic selenium absorbed better and therefore more effective? Is there economic benefit to using organic selenium?

#### 4. Feed Additives and Binders

- Specific research questions to be developed

## Production

### 1. Genetics

- There are huge gains to be made in the goat industry through genetic improvement. Research is required to identifying and create tools to assess health and disease status. The industry needs traceability and individual animal identifiers. What tools are needed for producers to incorporate and utilize dairy processing and slaughter plant data in reproductive management, processes and protocols?

### 2. Overall Management Practices

- The industry lacks identifiable benchmarks of traits in the goat sector including but not limited to: feeding, housing, handling, managing illness and lameness, and reproduction. What are the management practices that provide the most significant benefit to animals and producers? Importance needs to be placed on resources that lead to adoption of best management practices on farm.

### 3. Lactation Data

- What are the tools required for compilation of lactation, production and genetics data to advance the goat meat and milk industries?

## Welfare

### 1. Pain Management

- What pain medications are available for goats? Are dosing strategies effective?
- Utilizing results from the work of the National Animal Care Council in establishing the codes of practice research method and products for controlling pain will be needed. This will require research to establish drug withdrawal requirements for off label use of drugs.

### 2. Lameness and Hoof-care

- What are the risk factors and prevention strategies for lameness?
- What are the recommended practices that reduce lameness and promote hoof-care. From the resulting research determine the strategies and methods that result in the greatest on-farm adoption of results.

### 3. Housing and Handling Equipment and Natural Behaviour

- The code of practice will address guidelines on housing and stocking density specifically and the scientific report will address the known research
- What innovative and cost-effective equipment options that are being used for handling goats? Are there common pieces of equipment (feeders, ramps, chutes, etc.) that improve welfare? Are there modifications needed to either the equipment or the handling practices to enhance animal or producer welfare?

#### 4. Euthanasia

- As the code of practice is being developed research in this area is being evaluated. The potential exists that research will be identified by this group and will need to be considered

#### 5. Consumer Research

- How do different bacteria affect milk quality and cheese production? (e.g. fat / protein inversion issues)
- What consumers expectations can be addressed through on-farm welfare and food safety practices/procedures/methods? Are there research and assessment methods of on-farm adoption that address consumer expectations?

#### 6. Nonstun Killing for Halal Food

- What are acceptable methods of slaughter that meet the needs of the religious community and animal welfare?

### Conclusion

The group arrived at solid consensus regarding priority of research aims within each of the four areas. These priorities need to be evaluated in late 2020 or early 2021 following the release of the Code of Practice and completion of Dr. Cathy Bauman research study. Identifying and clarifying research questions will ensure the advancement of this growing industry.



## Appendix 1: Participants

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