



OAHN FINAL REPORT

Project #: OAHN-04b

Project Title: Investigation of adult small ruminant mortalities

Project Lead: Dr. Maria Spinato

Collaborators: Dr. Paula Menzies, Dr. Andria Bitton-Jones, Dr. Jocelyn Jansen,
Ms. Jeanette Cooper

Start date: January 2016

End date: March 2018

Executive Summary

The “Distance support for on-farm investigation of adult small ruminant mortalities” project was developed to investigate which diseases cause mortality in Ontario’s sheep and goat populations. An online tool was designed to encourage postmortem submission and to assist in improving the technique of veterinarians performing on-farm postmortems for adult animals. To date, 60 of the projected 70 postmortem cases funded by OAHN have been submitted to the AHL for laboratory tests that are completed or in progress. Confirmed diagnoses in sheep to date include: nasal tumours (5), copper toxicity (4), haemonchosis (2), gastrointestinal parasitism (2), Caseous lymphadenitis (2), dental disease (1), ionophore toxicity (1), endometritis (1) polioencephalomalacia (1) and pituitary tumour (1). Diagnoses in goats include: Caprine arthritis encephalitis virus (5), pneumonia (4), clostridial enteritis (3), copper toxicity (2), endometritis (2), dental disease (1), Johne’s disease (1), megaesophagus (1), thymoma (1), and *Yersinia pseudotuberculosis* enterocolitis (1).

Focus groups are now being arranged with the veterinarians and producers who have submitted a postmortem using the online tool. These groups will explore perceptions of, and experiences with, health management and the veterinarian-producer relationship, with the goal of identifying what motivations and barriers may exist to the use of veterinary services and adoption of health management programs in the Ontario sheep and goat industries. Focus groups will also be used to evaluate the utility of the online tool and identify improvements that will enhance its continued usefulness.

Objectives

The overall objectives of the distance support project for on-farm investigation of adult small ruminant mortalities are:

1. to **increase and improve the level of surveillance** (detection and monitoring) of infectious, emerging, zoonotic and other production-limiting diseases of adult sheep and goats on Ontario sheep and goat farms;
2. to develop and evaluate a **distance-support system** of transfer of information regarding on-farm mortalities that improves: (i) the accuracy and detail of the information received at the AHL, and allows for improved rate and accuracy of diagnose provided to veterinarians, and (ii) improved knowledge transfer between veterinarians and producers;
3. to provide producers and their veterinarians with **information regarding the presence of specific disease(s) on their particular farm**, so that they can create sound flock/herd health and biosecurity plans.

This project supplements a KTT project (KTT2014-10082) that was funded in 2015. KTT funds are expected to cover the costs of 100 on-farm postmortems and laboratory tests. OAHN funding was requested to expand the project to perform approximately 70 additional on-farm postmortems. The anticipated benefits of including additional postmortem cases are to provide adequate representation of small ruminant producers and veterinarians across Ontario, and to derive enhanced epidemiologic analysis of data.

Materials and methods

Visual Thinkers, a local web design firm was contracted to develop a project-specific web-site that veterinarians log into to access information related to performing on-farm postmortems and collecting appropriate samples to submit to the AHL for laboratory testing. To qualify for project funding, participating veterinarians have to submit the following: a detailed submission form that includes history and summary of clinical and postmortem findings; a complete set of the required formalin-fixed and fresh tissues; and digital postmortem photographs. Web-site development was completed in June 2016 and six small ruminant veterinarians were solicited to perform beta-testing of the web-site. Following resolution of technical issues related to transfer of the project web-site to the University of Guelph server, the SRAM project was launched on April 19, 2017. Tissue collection kits were assembled and shipped to veterinarians as they enrolled in the project, and the first case was received at the AHL on May 2, 2017.

The project team was successful in obtaining funding for a MSc student in Population Medicine. Ms. Jeanette Cooper was awarded an OVC Scholarship, and will use the quantitative analysis of diagnostic data and qualitative analysis of focus group project evaluations as the basis of her MSc. Thesis. Focus groups are now being arranged with the veterinarians and producers who have submitted a postmortem using the online tool. These groups will explore perceptions of, and experiences with, health management and the veterinarian-producer relationship, with the goal of identifying what motivations and barriers may exist to the use of veterinary services and

adoption of health management programs in the Ontario sheep and goat industries. Focus groups will also be used to evaluate the utility of the online tool and identify improvements that will enhance its continued usefulness. Anticipated completion date for this portion of the project is August 31, 2018.

Results

To date, 47 food animal veterinarians have registered for the project by obtaining a user name and password for the web-site. Some of these veterinarians have not yet submitted a case, whereas others have submitted multiple cases (now capped at a maximum of 10 submissions per veterinarian).

It is evident that these comprehensive postmortem submissions are resulting in a higher diagnostic rate for morbidity and mortality. Therefore, there is a much higher perceived value obtained from performing laboratory testing, a result that produces better feedback of information for both the veterinarian and the producer. Moreover, small ruminant producers are receiving valuable information from each postmortem that will assist them in making meaningful management decisions. Several cases of subclinical copper toxicosis have been identified in sheep flocks, an indication that ration evaluation and feeding practices need to be evaluated to prevent future losses due to acute copper toxicity. Quantitative fecal flotations performed on each animal provide an indication of the type and extent of gastrointestinal parasitism in adult animals. A diagnosis of production-limiting infections such as CAEV, Johne's disease or nasal adenocarcinoma virus should initiate a conversation between veterinarians and producers regarding implementation of herd health programs to mitigate production losses caused by these diseases. It is expected that these conversations should increase the perceived value of veterinary and laboratory services for the small ruminant sector.

Confirmed diagnoses causing death or identified as the cause for culling/euthanasia include:



Results so far - Sheep

Species	No. of Cases	Diagnosis	No. of Cases
Sheep	24	Nasal adenocarcinoma	5
		Copper toxicosis	4
		Haemonchosis	2
		Gastrointestinal parasitism	2
		Caseous lymphadenitis	2
		Dental disease	2
		Ionophore toxicity	1
		Endometritis	1
		Heart Failure	1
		Polioencephalomalacia	1
		Pituitary adenoma	1
		Undiagnosed	2



Results so far - Goats

Species	No. of Cases	Diagnosis	No. of Cases
Goats	30	Caprine Arthritis Encephalitis (CAE)	6
		Pneumonia	4
		Clostridial enteritis	4
		Endometritis	2
		Copper toxicosis	2
		Dental disease	1
		Johne's disease	1
		Megaesophagus	1
		Thymoma	1
		Chronic Bloat	1
		Yersinia pseudotuberculosis enterocolitis	1
		Undiagnosed	6

Discussion / Suggestions for next steps:

Focus groups are now being arranged with the veterinarians and producers who have submitted a postmortem using the online tool. These groups will explore perceptions of, and experiences with, health management and the veterinarian-producer relationship, with the goal of identifying what motivations and barriers may exist to the use of veterinary services and adoption of health management programs in the Ontario sheep and goat industries. Focus groups will also be used to evaluate the utility of the online tool and identify improvements that will enhance its continued usefulness. If this tool proves to be of value, it may be incorporated into routine AHL laboratory operations. Similar user-friendly web-based applications may be developed in the future to support on-farm postmortems performed by other livestock industry groups.

Communications

Date	Type	Location	Title
Mar. 31, 2016	Oral Presentation	Small Ruminant Veterinarians of Ontario (SRVO) Spring Meeting	Distance support for on-farm investigation of adult small ruminant mortalities
Jun. 5, 2016	Oral Presentation	Canadian Association of Veterinary Pathologists' Annual Meeting, PEI	Distance support for on-farm investigation of adult small ruminant mortalities
May. 22, 2016	Oral Presentation	9th International Sheep Veterinary Congress, UK	Investigating small ruminant adult mortalities on farm with an online support tool
Oct. 27, 2016	Poster	OSMA Sheep Convention 2016	On Farm Investigation of Small Ruminant Mortalities
Nov. 16, 2016	Poster	OVC Graduate Student Symposium	Investigating Small Ruminant Mortalities on Farm with an Online Support Tool
Mar. 27, 2017	Oral Presentation	PopMed Seminar Day	Distance support for on-farm investigation of adult small ruminant mortalities
Oct. 3, 2017	Newspaper Article/Interview	Ontario Farmer	More postmortems needed for small ruminant study
Oct. 26, 2017	Poster	OSF Sheep Convention 2017	Tales from the Grave: How dead sheep can help you and your vet help your farm
Oct. 31, 2017	Poster	CPHAZ One Health Day 2017	Distance support for on-farm investigation of adult small ruminant mortalities
Dec. 8, 2017	Print Article	OSF The Messenger	Tales from the grave: how postmortems can improve the health of your flock
Fall 2017	Print Article	OAHN Small Ruminant Expert Network Quarterly Producer Report - Fall 2017	Tales from the Grave: How postmortems can improve the health of your flock or herd
Jan. 31, 2018	Poster	OAHN Disease Surveillance Meeting	Distance support for on-farm investigation of adult small ruminant mortalities
Feb. 7, 2018	Oral Presentation	SRVO Winter 2018 Meeting	Distance support for on-farm investigation of adult small ruminant mortalities
Mar. 21, 2018	Oral Presentation	Ontario Goat AGM	Tales from the Grave: How dead goats can help you and your vet help your farm

