

Do submissions to a veterinary diagnostic laboratory accurately reflect livestock disease incidence or prevalence?

Kathy Zurbrigg Vt, MSc.
Ontario Ministry of Agriculture, Food and Rural Affairs
(OMAFRA)

Kathy.zurbrigg@ontario.ca

Objectives

- To determine the frequency of submissions to the provincial veterinary laboratory by veterinarians that examine diseased livestock.
- To identify correlations between the number of samples or specific test submissions to the provincial veterinary laboratory and the number of farm calls where specific clinical signs or syndromes are observed.

One Health Medicine

- Livestock disease can have a negative impact on the agri-food economy, animal welfare and public health.
- Livestock diseases of public health concern include zoonoses such as: Bovine Spongiform Encephalopathy, Salmonella spp., MRSA, West Nile Virus, etc.
- Accurate surveillance of livestock diseases leads to improved prevention and control of outbreaks in both animal and human populations

Challenges with livestock disease surveillance

- Veterinarians are not obligated to report livestock diseases to government and there is no official “reporting system”. Foreign animal diseases are the exception.
- Veterinarians are not compensated for reporting livestock diseases.
- There is no “standard” vet clinic software system and many food-animal clinics do not store medical records electronically.

Livestock laboratory data

- Most common source of data for livestock disease surveillance.
- There are multiple veterinary labs in Ontario, however the Animal Health Lab, University of Guelph (provincial lab) is the only lab to perform many specific food-animal diagnostic tests.
- OMAFRA can only access livestock data from the provincial laboratory.
- Producers/owners of livestock are responsible for the cost of all diagnostic testing.

Livestock laboratory data

- Therefore diagnostic testing is influenced by:
 - economic state of the specific livestock industry*
 - owner perception of the need for diagnostics*
 - veterinarian perception of the need for diagnostics*
- All of these factors influence how well the provincial laboratory data reflects the health of the Ontario livestock population.
- Alternative sources of data on livestock disease occurrence are needed.

Farm-call surveillance project

- In Jan 2009, OMAFRA launched a 4 year pilot program to collect syndromic data on disease-related farm calls by livestock veterinarians.
- The goal is early detection, prevention, communication and control of livestock diseases.
- Veterinarians send in weekly data on the clinical signs and suspected diagnoses observed on farms.
- Compensation for participants is by subsidized diagnostic testing at the Animal Health Laboratory, University of Guelph

Frequency of sample submissions to AHL per disease-related farm call

- The number of disease-related farm calls from Jan-Aug 2009 was totalled for each of the 11 project clinics.
- For each project clinic, 3 control clinics were selected matched by geographic region and number of vets employed.
- The project clinic was used to estimate the number of farm calls for the controls.
- Lab submissions were totalled for each of the 44 clinics and frequency rate was calculated.

Frequency of sample submission per disease-related farm calls

- 50% (226/450 clinics) of the food-animal clinics in Ontario submitted samples to the provincial lab from Jan-Aug 2009.
- The 44 (11 case and 33 control) clinics for which the frequency rate of sample submission per disease-related farm call was calculated represent 19% of the submitting clinics.
- Submission rates were highly variable. A Kruskal-Wallis ANOVA showed no significant difference in the variability between project and control clinics.

Frequency of sample submission per disease-related farm call

Statistic	Project Clinic	Control Clinic
N	11	33
Mean	15%	11%
SD	8.3%	8.5%
Min	4%	1%
Max	29%	44%

Conclusions

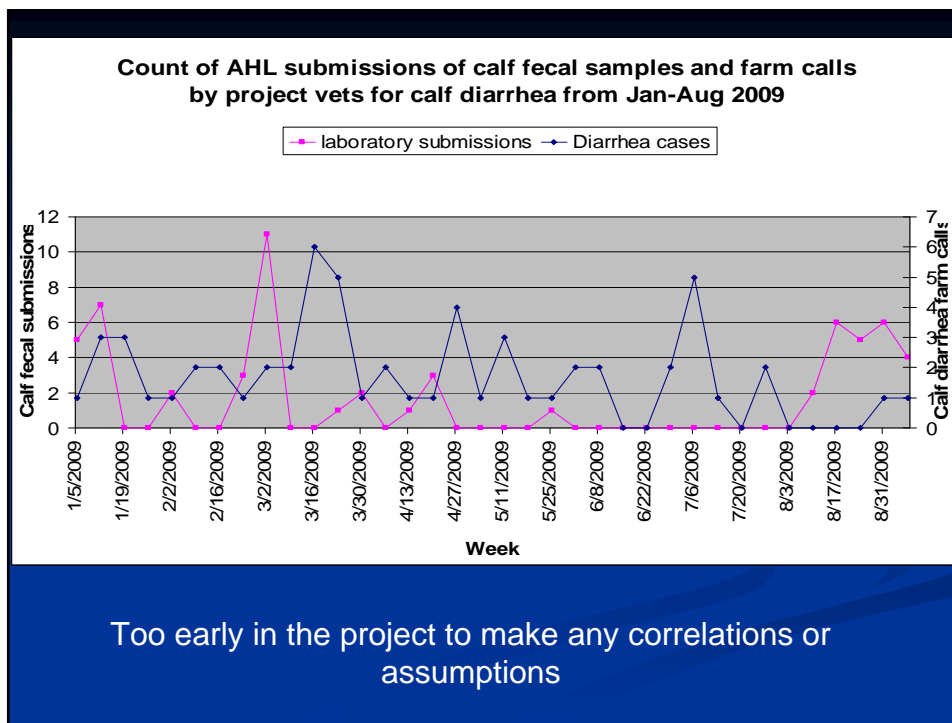
- Frequency of submissions per disease call is low for both project and control clinics.
- Economic state of commodity, producer and vet perception of the need for testing influence the sample submission rate.
- Although project clinics have subsidized diagnostic testing, the rate of submissions remains low.
- Many “diseased” livestock have no diagnostic tests performed.

Is laboratory data representative of the incidence of specific syndromes or diseases?

- Veterinarians and producers may be more concerned by zoonotic diseases and the frequency of sample submissions may more closely represent actual disease in the population.
- The number of farm calls for specific syndromes and the laboratory submissions for the syndrome-specific samples or tests were compared.

Syndrome-Calf Diarrhea

- Calf diarrhea is caused by numerous agents including *Salmonella* spp. or *Cryptosporidium parvum*.
- Fecal samples are the most common sample submission for calf diarrhea.
- Project clinics had 172 sick calf calls from Jan-Aug 2009. 60 calls were for calf diarrhea and 6 fecal samples were submitted (10%).
- Of the 226 food-animal clinics submitting to the lab, 59 calf fecal samples were submitted.



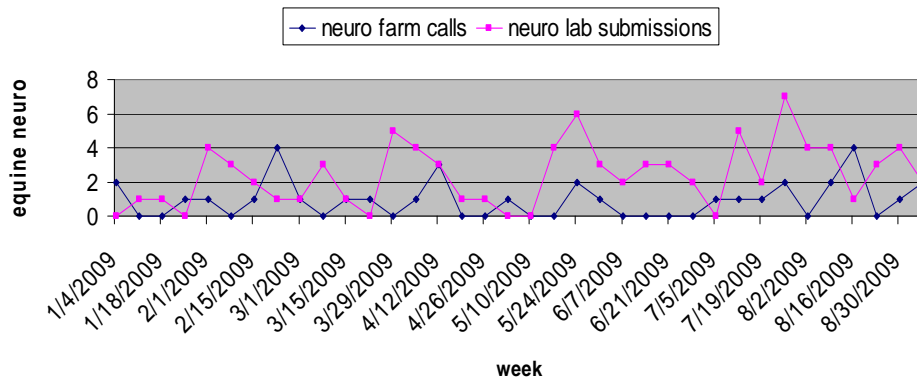
Syndrome-Equine Neurological Disease

- Many equine neuro diseases are vector-borne and peak in the summer to early fall.
- Diseases include: Eastern, Western and Venezuelan encephalitis, West Nile Virus, Equine Herpes Virus and Equine Protozoal Myeloencephalopathy.
- While the viral diseases are zoonotic, horses are “dead-end hosts” for these diseases and are considered sentinels for the presence of the disease in a region.

Syndrome-Equine Neurological Disease

- Total number of equine farm calls by project clinics from Jan-Aug 2009 was 1039.
- 49 of those calls were for horses with neurological signs and 5 submissions were made to the AHL (10%).
- Of the 226 food-animal clinics submitting to the lab for the same time period, 84 samples (blood, CSF, carcass) were submitted to test for infectious equine neurological diseases.

The number of equine neurological submissions to the AHL and project clinic farm calls for neurological horses from Jan-Aug 2009

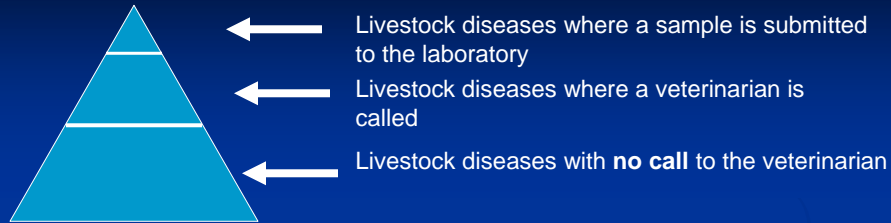


Too early in the project to make any correlations or assumptions

Conclusions

- Laboratory data may be more representative of certain livestock syndromes. “Novel” syndromes or zoonotic diseases may increase the number of submissions from veterinarians.
- At present the data is insufficient to determine if there are correlations between the number of farm calls for specific syndromes and the frequency of requests for specific tests at the laboratory.
- These correlations will be investigated as more clinics are enrolled in the project.

Conclusions



- Submissions to the provincial lab are only a small portion of the livestock diseases occurring in Ontario.
- Low submission rates for livestock diseases indicate that veterinary laboratory data are not a good predictor of livestock disease prevalence or incidence in Ontario.

Acknowledgements

- Veterinarians and staff of clinics participating in the Ontario Farm-call Surveillance Pilot Project.
- Staff of the Animal Health Laboratory for their assistance with data downloads.