



Davis-Thompson
Foundation



Workshop on Pathology of Ruminant Diseases, with focus on neurologic, reproductive and calf diarrhea diseases

University of Veterinary and Agricultural Sciences

Lahore, Pakistan

March 6-8, 2023

Executive Summary

Over the course of three days, 40 veterinarians gathered together to participate in group interactive and practical sessions on pathology. Participants came from several academic institutions, governorate directorates, and private sector. Each day they reviewed case scenarios on ruminant neurologic diseases, ruminant reproductive diseases, or calf diarrhea. In addition, there were necropsy sessions and also Zoom lessons held with Dr. Donal O'Toole in Wyoming. Faculty from UVAS helped to facilitate the sessions. All instruction was provided using adult learning theory. Evaluations were positive (see page 9).



Learning Objectives:

At the end of the workshop, participants will be able to:

1. Discuss the pathogenesis of several ruminant diseases
2. Perform a necropsy, with collection of samples and full written report
3. Write complete morphologic diagnoses for accurate communication with colleagues
4. Consider differential diagnoses of diarrhea disease of calves

Monday, March 6

Opening

Dr. Ishtiaq Ahmed opened the workshop. Corrie expressed her gratitude to the participants for their recurring attendance over the years. She also relayed the learning objectives of this workshop.

Adult Learning Theory

Because at least half the participants have been at previous workshops, she asked participants to highlight some of the key features of adult learning. We created a list: material must have relevance to participants; group/social learning is especially effective for adults; full trust between learner and presenter is paramount; problem solving helps to solidify core concepts; frequent breaks with activities to allow transfer to long-term memory.

The group elected class officers – course leader; timekeeper; welfare officers. We called on these three officers throughout the day to help the course run smoothly.

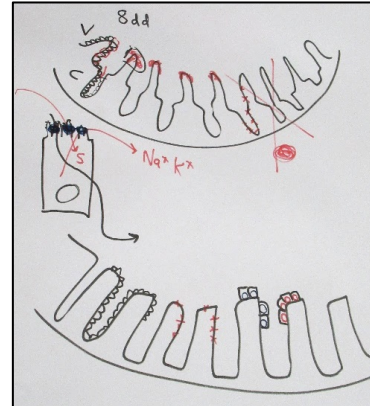
Making a morphologic diagnosis – This is the standard format for communicating lesions to others in veterinary medicine. We reviewed the S-T-D-P-O format. Then, as we went through cases for the rest of the day, we asked participants to create morphologic diagnoses on the lesions seen.

Morning practical session – Diseases of Young Animals

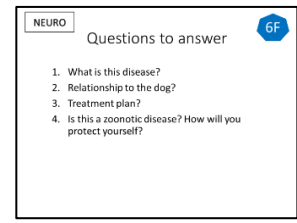
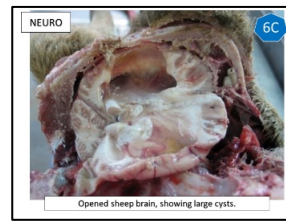
Class was divided into six groups and each group reviewed six previously prepared cases of disease in young ruminants – rotavirus, *Cryptosporidium*, coccidiosis, salmonellosis, mucosal disease (BVD), and septicemia secondary to failure of passive transfer. Drs. Ishtiaq, Muti, Tipu, and Mustafa, all faculty members in the Department of Pathology at UVAS, were very helpful in working with the groups to help them get to the correct diagnosis and answer the questions on pathogenesis.



We then reviewed all six cases. Corrie used a schematic of the intestine to help demonstrate pathogenesis of each and to distinguish among the various mechanisms of diarrhea – malabsorptive, secretory, effusive. These were new concepts to all the participants and facilitators.



Neurologic diseases of ruminants – The groups reviewed 6 previously prepared cases – rabies, listeriosis, botulism, coenurosis, *Histophilus somni*, and poliоencephalomalacia.



Tuesday, March 7

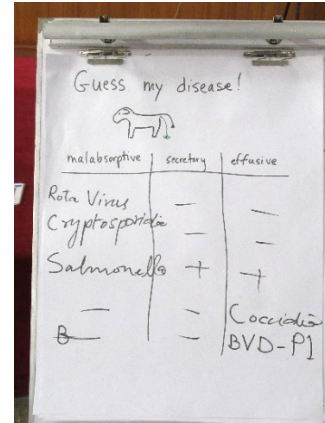
Zoom with Dr. Donal O'Toole



Dr. O'Toole was scheduled to be at this workshop but ran into delays in getting a visa and so was not able to attend. He did, however, prepare many of the scenarios that we used. He joined over Zoom for 30 minutes and shared his experiences with the participants, especially about BVD and histophilosis, which were two of the scenarios we reviewed on Day 1. His comments were very well received and we discussed how both of these diseases are likely distributed worldwide, and so probably Pakistan has them, although they have not yet been recognized here.

Review of Calf Diarrhea cases

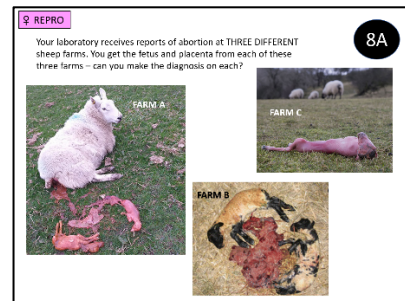
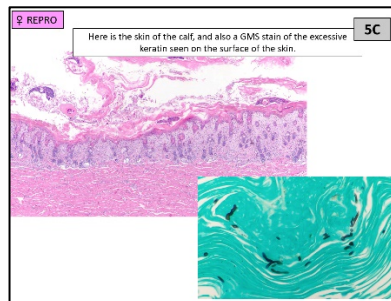
This was done as a contest. Each table represented a calf with diarrhea and was given a clue about what was happening in the body. The other tables had to guess the disease, and then put the disease in the correct category – malabsorptive, secretory, effusive. First table to answer each case received candies.



Review of neurologic disease scenarios

Tables reviewed the disease for the group, but doing it as if they were talking to farmers.

Case Scenarios – female reproductive

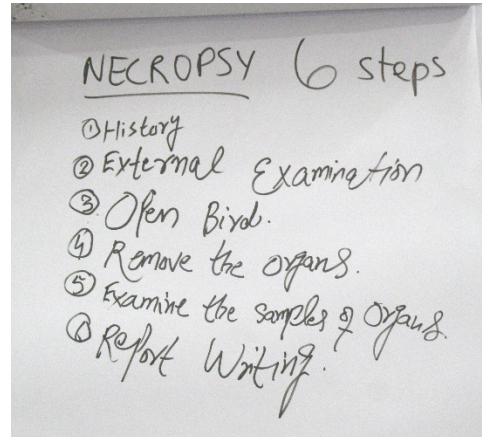


Seven previously prepared scenarios were reviewed by each table. At the end, Corrie did an overview of causes of abortion in sheep and goats, using a simple drawing. Then tables were given an etiology (*Coxiella*, *Brucella*, *Chlamydia*, *Toxoplasma*), and had to discuss the pathogenesis using the drawing, and determine if placentitis was only cotyledonary or if was also intercotyledonary, and the zoonotic potential of each.

For the other reproductive diseases, we tasked tables with reviewing the disease for the whole group in a quiz format.



After lunch, there was a presentation by Rumi Poultry, one of the sponsors of the workshop. Following that, we reviewed the 6 Steps to a Necropsy, and then moved to the necropsy room where a black buck fawn was presented for necropsy. Every group had to submit a complete necropsy report for evaluation.



Wednesday, March 8

Zoom with Dr. Donal O'Toole



Dr. O'Toole has extensive experience with bovine abortions, and helped participants to understand the myriad of difficulties in diagnosis. It is rare to see any gross lesions in the fetus, histopath for discerning lesions in the fetus is essential. The fetus is often quite autolyzed and his lab refers to them as DRLS (Dirty Rotten Little Stinkers). For BHV-1, viral inclusions may only be seen in the adrenal. Having the placenta available greatly increases chances for diagnosis, but this needs to be relayed to the producer, as they are naturally more oriented toward the economic loss in an abortion and so are focused on the fetus. Sample at least 3 cotyledons from every placenta. Participants expressed their desire to have Dr. O'Toole attend the next national pathology workshop!

Review of Necropsy

The necropsy reports, which had been reviewed by Corrie the previous evening were all excellent. Some had left the necropsy room prior to more thorough dissection of the digestive tract, so they had missed the multifocal hemorrhagic enteritis. All the lesions in the young deer pointed to a loss of blood somewhere, but none were found. So, prior to leaving the necropsy room, a few pathologists stayed to do a more thorough assessment of the intestines. In multiple areas, mostly in the small intestine, the contents were bloody.

Testing for antigen vs. testing for antibody

Several scenarios were reviewed at each table, involving the relevance of testing for antibody or antigen in a specific disease or situation. This exercise helped participants to understand distinctions of testing methodologies and how to interpret results.

<p>Testing exercise 2</p> <ol style="list-style-type: none">1. Producer says his cow has aborted. He shows up at your door and has serum from the cow. He wants you to test it to determine why his cow aborted.2. Will you test the serum? Why or why not?3. You tell him you need the fetus and placenta (see next page). What tissues will you take and why? What kind of testing will you ask for? 	 2
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Communications Exercise

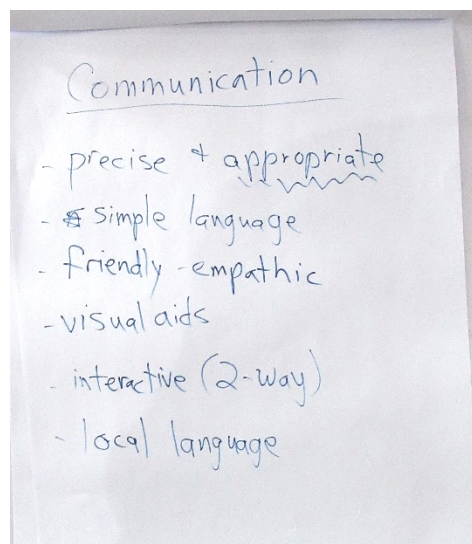
We held a “talk show” featuring groups of animal health experts. Each of the six tables was tasked with preparing key messages on some potentially controversial topic that had arisen in the news. Then each group was called to the stage to discuss/refute the topic. Corrie played the role of talk show host.

Here were the topics given to the various tables:

- Several children have died of cerebral coenurosis. Some public health authorities are suggesting that the country stop rearing sheep.
- Government is launching an anti-rabies campaign – what will be the key messages?
- There has been a big problem this year with sheep abortions. Why? And what can vets do? What should farmers do?
- An outbreak of lumpy skin disease has spread to people?
- A new “health food” craze in Pakistan is to drink raw milk. Why is this dangerous?
- Animal rights groups in Pakistan are petitioning to ban all necropsies as they feel this process is disrespectful to the animals.



Many groups struggled with this public speaking exercise, reverting to technical jargon and over-explaining. So, at the end, we asked the group what are the lessons learned? What do you need to remember when talking to the general public? Or to farmers? We created a list of points to remember.



Closing ceremony

Ceremony began with a reading of the Koran. Selected participants gave their impressions of the course. They were thankful for the interactive nature of the learning, and felt that their own teaching methods could be adapted to be more learner-friendly. Dr. Omer Chugtai, major sponsor from CADx, an animal diagnostic laboratory established in 2020, discussed how this branch of the national business is growing, they are continually adding new tests and modalities. Corrie thanked the participants for their good work and friendship. She also acknowledged the faculty of UVAS for their help with facilitation. She especially mentioned the efforts of Dr. Ishtiaq, who is a full member of the GHPN. Dr. Naseem Ahmed, Vice Chancellor, gave closing remarks. He emphasized how the function of the academic institutes is to help solve the real problems in the field. He encouraged the participants to have confidence and to continually grow the gray matter. Certificates were awarded, and everyone received a copy of *A Field Manual to Enhance Diagnosis of Animal Diseases*.





Cow and buffalo, didn't read the sign



Sheep at the veterinary hospital



Goat in taxi for return home

After the workshop (next day), Corrie delivered a class on Poultry Pathology, for the veterinary students. And then the Department of Pathology honored Corrie by planting a tree in her honor.



Appendix 1 - Evaluations:

Each score based on Likert scale (1, strongly disagree, to 5, strongly agree)

INSTRUCTION	
Learning objectives were accomplished	4.6
Necropsy exercise was valuable	4.6
Interactive group exercises were valuable	4.9

If this course were changed, what is ONE thing you would NOT like to see changed?

- Group discussions of case scenarios (X14)
- The “talk show” at the end (X12)
- Hands-on training in necropsy (X6)
- Interactive nature of the training (X9)
- Making everyone in the workshop feel valuable (X2)

If this course is given again, what is one thing you WOULD change?

- Add histopathology (X8)
- Poultry and pets next time (X8)
- Add basic diagnostic techniques for all of these diseases (X4)
- Focus more on necropsy, more sessions (X2)
- Include all animal species
- Tumor-based gross pathology
- Give books and literature to all participants
- Invite more speakers