# Paws claws and udder things

Gribbles VETERINARY

May 2021

## Queen's birthday weekend hours

All of our laboratories will be open normal business hours on Saturday 5 June, but will be closed on Monday 7 June for the Queen's 95th birthday public holiday. Normal business hours will resume at all sites on Tuesday 8 June.


## What's inside?



## Puppy love

Whether you use in-house analysers or submit samples to the laboratory for testing, it is worth remembering that reference intervals are usually derived from healthy adults, and that significant physiological differences occur between neonates/juveniles and adult dogs.

### Haematology:

At birth, haemoglobin (Hb), haematocrit (HCT) and red cell count (RCC) are close to normal adult levels, but decline rapidly over the first 2 months, then increase gradually to reach adult levels by 6 months to 1 year of age, depending on the breed. The drop in red cell mass is significant, as the HCT can be as low as 24%. In neonatal puppies, the MCV can be 95-100 fl, but with the replacement of foetal erythrocytes by adult erythrocytes, this value reaches adult levels by around 3-4 months.

Healthy adult dogs have < 1.0% reticulocytes in peripheral blood, but puppies can have up to 10% reticulocytes in the first 2 months, decreasing to adult levels by approximately 5-6 months of age. A neonatal puppy has a leukocyte count and differential similar to an adult high-normal, however, they have little marrow reserve; with the result that sepsis will create a rapid neutropenia.

### Biochemistry:

Glucose levels are important, as puppies, especially toy-breeds, are prone to hypoglycaemia due to fasting or stress. As a general rule, blood glucose of less than 1.7 mmol/L in a neonatal pup, or less than 2.2 mmol/L in a 2-6 week old pup, indicates hypoglycaemia.

Total protein (TP) increases rapidly 12-24 hours after birth, due to colostrum ingestion. Both TP and albumin will then fall below the adult reference interval. In puppies that are less than 8 weeks old, the TP may be around 34-39 g/L, and then between 2-6 months of age, will gradually increase to 50-70 g/L.

Urine SG is significantly lower in 0-3 week old pups, ranges from 1.006-1.017 can be used to estimate hydration status, as a urine SG >1.017 in a neonate would suggest dehydration. Mild glucosuria and proteinuria may be noted for up to 6 weeks.

Creatinine levels in puppies are below adult reference intervals, due to their small muscle mass (particularly toy breeds). Under 12 weeks of age it may be in the range of 26.5-53 umol/L. Serum urea may be at the high end of the adult reference interval for 7 days, and then decline to the low end of the adult reference interval.

Phosphate and calcium are generally higher in dogs less than 1 year old, with larger breeds have higher calcium levels up to around 3 months, and smaller breeds have higher calcium levels up to around 1 week old, with a gradual decline as they mature to adulthood.

ALP and GGT may be extremely high in puppies less than 2 weeks old, due to intestinal absorption of colostrum, but then fall significantly by 4 weeks. ALP activity up to 6-7 months of age is mostly reflective of bone iso-enzyme and may be 2-3 fold higher than adult reference intervals.

# Lab updates

>> We currently have **no parasitology** testing capability in our Hamilton laboratory. All samples will be sent to Auckland where they will be given priority. We apologise for any inconvenience this temporary change to our service may cause.

>> Have you spoken to our team about the **Autumn essentials promotion**? Copper and selenium are at the top of the list for checking in autumn, and we've got a special deal on this testing until the end of June 2021. Talk to us today 0800 GRIBBLES.

>> **Keen on participating** in our reference interval study? Check the participation criteria here and keep an eye out for animals that fit the bill.

# Our favourite consumable item

Do you order laboratory consumable items from us online or via our order form? If you need just one blood tube or swab, or enough for a herd, we've got you covered.

Our featured consumable item in May is D-FORMALIZER.

D-Formalizer is a safe chemical treatment for neutralizing spent formalin. It leaves a clear solution, free of solids and aldehyde odour, that can be disposed of without clogging the drains.

Simply add one packet of D-Formalizer to 3.75L (a gallon) of used formalin and agitate gently. After 15 minutes, the product can be safely poured down the drain in compliance with local by-laws. The resulting solution will have a pH between 6 and 9 and will be free of polymer by-product.

To neutralise smaller quantities of formalin, the weight of D-formalizer required can be simply calculated pro-rata.

You can find it available online here.

*A user account is required to purchase items via our online shop.*


# Case of the month

**BERNIE VAATSTRA**

This month we present two cases caused by the same aetiological agent.

## Case 1

Seven first-calving Friesian heifers from a Waikato dairy herd developed fever and respiratory distress and three died after returning from grazing and presumably being exposed to BHV-1 circulating in the home herd. Necropsy findings included severe necrotising tracheitis (Figure 1) and pneumonia. Histological examination of trachea and lung revealed tell-tale lesions and secondary bacterial pneumonia (Figure 2).

## Case 2

An outbreak of respiratory disease occurred in mixed age dairy cows on a farm in Taranaki. Five to ten cows developed fevers of >40°C, noisy respiration, nasal discharge (Figure 3), and decreased milk production. Two cows were sampled for biochemistry and serology testing. Both had elevated GGT activities suggesting biliary damage due to sporidesmin toxicity.

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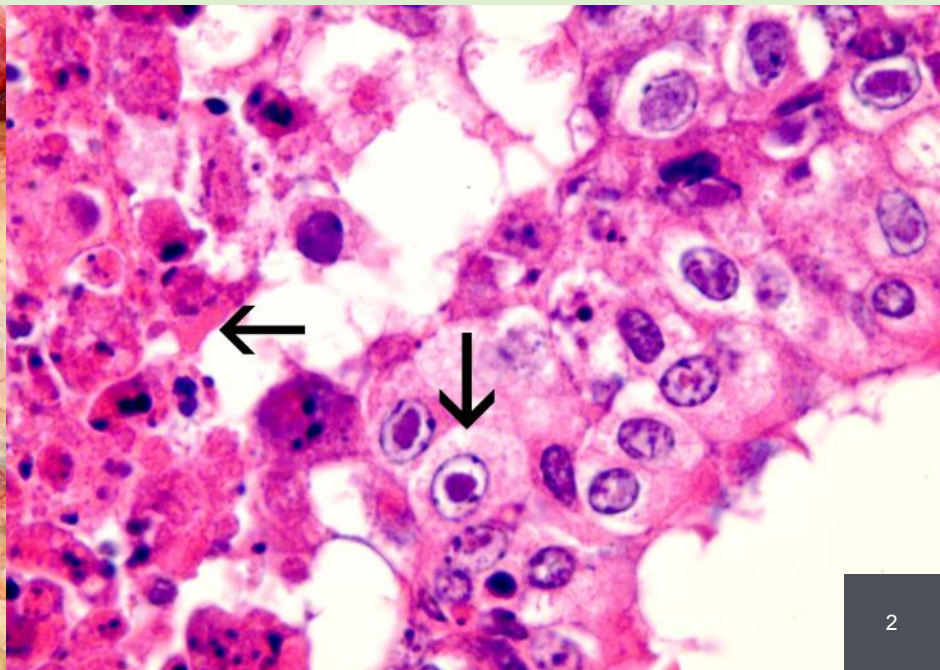
*Figure 1 (left): Trachea from 2-year-old heifer with IBR. Note greenish necrotic material lining mucosal surface (photo courtesy of Axel de Zeeuw, Vetora Putaruru).*
*Figure 2 (right): Tracheal mucosa from 2-year-old heifer with IBR showing necrosis (left arrow) and characteristic intranuclear inclusions (down arrow). HE 100x.*



# Case of the month

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Diagnosis: Infectious bovine rhinotracheitis (IBR).

Discussion:

Bovine Herpesvirus 1 (BHV-1) is a common cause of respiratory and genital infection in New Zealand cattle. There are three subtypes recognised worldwide: BHV-1.1, BHV-1.2a and BHV-1.2b. Only subtype 1.2b is reported in New Zealand (Wang et al 2006). This subtype is associated with respiratory disease (infectious bovine rhinotracheitis - IBR) and genital disease (bovine pustular vulvovaginitis and balanoposthitis), but not abortion or encephalitis. The virus is highly infectious and seroprevalence is high across New Zealand farms (>65%), increasing with cow age.

Acute IBR is characterised by one or more of nasal discharge, rhinitis, tracheitis, conjunctivitis, milk drop, and fever. Some cattle present with conjunctivitis only. In general, symptoms are short lived and self-limiting but can be prolonged and severe where there is secondary bacterial infection or underlying/concurrent disease. It is worth noting that many infections will be subclinical and therefore, when clinical outbreaks occur, underlying factors such as BVD infection, parasitism, nutritional stress, or mixing of naïve cattle with an infected population should be considered.

In recent seasons, we have received submissions from a number of significant IBR outbreaks. Along with the samples, we often field questions about the most appropriate sample types and tests to use.

Gribbles Veterinary offers two ante-mortem diagnostic tests for IBR – **antibody ELISA and PCR.**

***Which test should you use to confirm IBR during an outbreak of bovine respiratory disease?***

We advise PCR as the first line test in this situation as it detects viral shedding by acutely infected cattle. Collection of nasal or conjunctival dry swabs from 2-3 cows increases the probability of detection given variable shedding rates. At the same time, collect serum samples to hold in case the PCR result is 'not detected'.

***How long after the onset of clinical signs, will the PCR detect virus?***

Viral shedding may continue for approximately 14 days based on testing of experimentally infected naïve cattle (Nandi et al, 2009).

***What if the PCR returns a 'not detected' result in cattle suspected of having IBR?***

In this situation, antibody ELISA testing may provide additional information but needs to be interpreted with caution. Cattle develop a detectable antibody response from approximately 2-3 weeks post BHV-1 infection. Therefore, in an outbreak situation, seroconversion demonstrated by an initial negative IBR antibody ELISA followed by a positive antibody ELISA also confirms infection. Note that a single positive IBR ELISA does not confirm clinical infection given the high natural seroprevalence to IBR.

If both IBR PCR and antibody ELISA are negative in an animal with a recent history of respiratory disease, IBR is unlikely.

***Is it possible for cattle to have a positive IBR antibody ELISA and PCR concurrently?***

This occurs rarely in the subacute stages of infection when an antibody response has developed but there is still residual virus detectable, or in cattle with a latent IBR infection that recrudesces due to concurrent illness or stress (see case 2).

*Figure 3: Cow (Case 2) with purulent nasal discharge from herd with IBR outbreak confirmed by PCR and serology (photo courtesy of Peter Benn, Energy Vets Taranaki Ltd.)*

***Is it possible to distinguish cattle with natural immunity to IBR from those vaccinated with a marker vaccine?***

A specific IBR-gE ELISA will differentiate between natural immunity and vaccinal immunity in cattle vaccinated with the marker vaccine. However, commercial laboratories in NZ currently offer only the IBR-gB ELISA, which detects antibodies produced to both natural infection and vaccination.

***Does the IBR PCR distinguish between different BHV-1 subtypes?***

No. If one of the exotic subtypes (BHV1.1, BHV1.2a) is suspected based on clinical presentation (e.g. abortions, encephalitis, abnormally severe respiratory disease outbreak with no evidence of bacterial involvement), notification of MPI is required for further investigation.

Case studies:

In case 1, BHV-1 and *Mannheimia haemolytica* were detected by PCR on fresh lung tissue. The lesions seen on histological examination of the trachea and lung were compatible with IBR and secondary bacterial pneumonia (including characteristic herpesviral inclusions indicated in Figure 2).

The serology of both cows sampled in case 2 were positive for IBR antibody ELISA and positive IBR PCR on nasal swabs. The stress of facial eczema in cows previously exposed and immune to IBR may have resulted in recrudescence of infection, viral shedding, and transmission to naïve cows within the herd.

References:

Wang J, Horner GW, O'Keefe JS. Genetic characterisation of bovine herpesvirus 1 in New Zealand. *NZ Vet J*. 54:61-6, 2006

Nandi S, Kumar M, Manohar M, Chauhan RS. Bovine herpes virus infections in cattle. *Anim Health Res Rev.* 10:85-98, 2009

*Many thanks to Peter Benn of Energy Vets Taranaki Ltd. and Axel de Zeeuw of Vetora Putaruru, for the case submissions and photographs.*

# How do you read our newsletter?

Do you still read this newsletter via email? Do you read the posts on our website or Facebook page? We are looking to determine the best ways for you all to receive this information, so we'd love it if you could answer a few questions. If you'd prefer to do this online, please click here.

1. Do you read our newsletter? *(please circle)* Yes No
2. Which format do you prefer? *(please circle)* PDF Links to website Facebook posts
3. Is there any specific type of information you'd like to see in our newsletters?

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We'd also appreciate it if you could provide feedback about your local Gribbles Veterinary laboratory. If something is not as good as it should be, was better than expected, or you have a suggestion for improvement – please let us know below.

**Your comments:**

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*Name: ……

*Clinic: ……

Date: ……

** Providing this information is optional, however if you would like us to respond to your feedback, please include details.*

Please email this feedback form to karen.cooper@gribbles.co.nz

***Thank you for your feedback!***

# Did you know?

**ROB FAIRLEY**

Did you know that encephalitic listeriosis and enteric listeriosis are two quite separate diseases? It would be uncommon for these two conditions to occur at the same time.

Enteric listeriosis mainly occurs when sheep are fed poor-quality baleage or silage, and clinical signs develop within a few days of consuming the poor-quality feed as large numbers of ingested *Listeria* are translocated to the abomasum and lower intestine.

The encephalitic form on the other hand, occurs when *Listeria* ascend the cranial nerves from the lips or mouth to the brainstem, and experimentally, it takes around three weeks for the earliest cases to show clinical signs of encephalitis after oral inoculation. It is therefore possible to see cases of encephalitic listeriosis and enteric listeriosis in different sheep from the same offering of baleage or silage, but the encephalitic cases will occur some weeks after the cases of enteric listeriosis (and I have seen one such case).

If, during an outbreak of enteric listeriosis, you also happened to have the odd case of encephalitic listeriosis in other sheep, it would be coincidental. The animal with encephalitis would have been infected some weeks prior.

We are often asked why encephalitic cases are not seen in conjunction with the enteric cases, or why there are no lesions in the brains of animals with enteric listeriosis. Now you know!

Photo credit: thefarmingforum.co.uk

# Plasma ACTH testing reminder

We featured an article in June 2019 regarding factors that can interfere with ACTH testing for diagnosis of Pars Pituitary Intermedia Dysfunction (PPID) in horses.

Since both non-PPID and PPID horses display higher ACTH concentrations in autumn (March, April, May) compared with other times of the year, now is a timely reminder of these interfering factors.

>> Falsely increased ACTH concentrations can occur as a result of recent transportation, heavy exercise, sedation/ anaesthesia, pain, and illness.

*"Only test unsedated horses that are otherwise well and have not been recently exercised or transported."*

>> The magnitude of the seasonal increase in ACTH may vary in different breeds. Higher ACTH concentrations have been reported in pony breeds in autumn.

*"Test results from ponies during the autumn should be interpreted cautiously with careful consideration of the clinical picture and signalment."*

>> Reference intervals for donkeys need to be used with caution.

Read the full article from 2019 here, and brush up on sample collection requirements in our Vet Handbook here.

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Gribbles VETERINARY

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