


CONTENT FOR DEER HERD HEALTH WORKSHOP

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The general purpose of this workshop is to encourage veterinarians to consider their role as production and health advisors to deer farmers. The workshop aims to develop this theme by:-

- (i) Discussion of the role of and opportunities for the veterinarian in providing advisory services to the deer farmer;
- (ii) Discussion of investigation, treatment, management and prevention of two disease occurrences, introducing the concept of the need for a detailed knowledge about the farm;
- (iii) Discussion of ways and means of promoting veterinary advisory services to the farmer;
- (iv) Discussion of other aspects as time permits, e.g. report writing, charging, case referral etc.

1. Role of the veterinarian

Participants will be asked to discuss their views about the relevance of a more formal advisory approach to either individual problems or to health and productivity as a whole.

- 1.1 Should veterinarians be considering whole herd health and productivity services to deer farmers;
- 1.2 Are veterinarians qualified for this role;
- 1.3 What deficiencies, if any, do veterinarians feel when anticipating this activity;
- 1.4 What constraints does practice place on veterinarians wishing to perform this activity and what can be done to overcome these;
- 1.5 what support services or collaborative services are needed, e.g. agricultural consultants, research, and university backup.
- 1.6 What is the role of veterinarians in initiating whole-farm work.

2. Investigation, management, treatment and prevention - two case studies

Case material for each of these is presented:

CASE 1:

Enzootic ataxia

Diagnosis, the causes, treatment and prevention

2.1 The farm

Area -	Total	191 ha
	Deer fenced	20 ha
Rainfall -	Approximately	625 millimetres
Altitude -	Near sea level	
Topography -	Peat flat	10 ha
	Limestone hill	10 ha
Deer -	Mixed age red female	100
	Rising 1-yr.-old	40
	Mixed age stags	8
	Rising 1-yr. stags	10
Farming policy -	Selling weaner stags	May
	Selling yearling hinds	Feb/March
	Maintaining 100 breeding hinds	

2.2 The problem

The problem was referred for consultation November 1987.

1982 Newborn fawns swollen hocks, some swayback. No hinds affected
Newborn animals injected with Coprin. This problem occurred in a dry summer when feed levels were at a deficit.

Since 1982 an occasional mixed-age hind has been seen with enzootic ataxia. In total 3 or 4 hinds.

July 1987 Approximately 20 mixed age hinds and 1 mixed age stag were observed with signs of enzootic ataxia. One stag deliberately left untreated with copper has developed enzootic ataxia subsequently.

QUESTION: WHAT FURTHER CLINICAL HISTORY SHOULD BE RECORDED IN ORDER TO ESTABLISH COMPLETE NATURE OF THE PROBLEM?

2.3 Past treatment

The treatment regime since 1982 has been a bi-annual injection of Coprin post-rut and pre-calving to all deer.

From 1985 copper needles (1 x 4 gm capsule) have been used instead of injection. In 1987 1 x 4 gm capsule was given in June, and after the outbreak (July) 2 x 4 gm capsules were given in August. No further treatment has been administered. Copper sulphate had been applied with fertilizer at 15 kg/ha in 1986.

2.4 Trace element data

Pasture and soil analyses were done late 1985, early 1986 and late 1986. Results are as follows:-

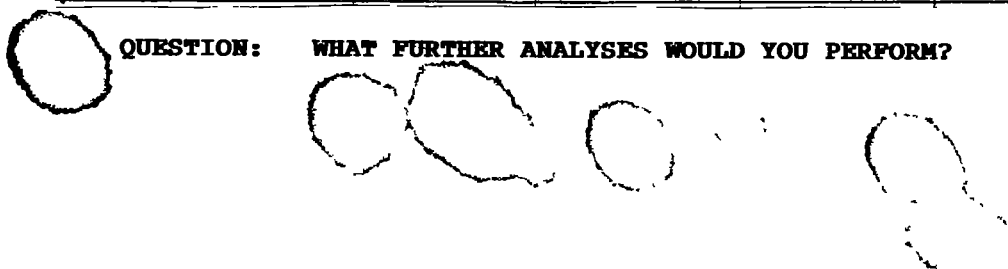
Soil test results:

	11.11.85	SOIL TEST RESULT			11.11.85	2.4.86	3.9.86
	RESULT	LOW	MEDIUM	HIGH			
Bulk Density.	0.55					0.6	0.55
pH.....	7.3	*****				7.4	7.4
Phosphorus...	13	*****				—	31 (high)
Potassium....	0.15					0.31	0.26 (low)
Calcium.....	89.6	*****				395.5	89.5
Magnesium....	4.68	*****				5.6	5.35
Sodium.....	1.61	*****				3.35	2.15
CEC.....	96	*****				405	97
K %.....	0.2	*****				0.1	0.3
Ca %.....	93	*****				98	92
Mg %.....	4.9	*****				1.4	5.5
Na %.....	1.7	*****				0.8	2.2
Phosphate R..	36	*****				261	60
Sulphate S							

Plant results:

	11.11.85	PLANT TEST RESULTS			11.11.85	2.4.86.	17.10.86
	RESULT	LOW	MEDIUM	HIGH			
Nitrogen.....	3.3	*****				4.3	4.1
Phosphorus...	0.38	*****				0.33	0.51
Potassium....	1.7	*****				1.7	2.6
Sulphur.....	0.30	*****				0.44	0.42
Calcium.....	0.67	*****				0.81	0.73
Magnesium....	0.19	*****				0.26	0.21
Sodium.....	1.00	*****				1.14	1.15
Iron.....	149	*****				192	187
Manganese....	47	*****				38	88
Zinc.....	21	*****				26	24
Copper.....	5	*****				6	8
Boron.....	10	*****				19	15
Molybdenum...	1.90	*****				3.56	ND
Cobalt.....	0.02	**				0.03	0.09
Selenium.....	0.03	*****				0.02	0.01
Iodine.....	0.70	*****				0.16	ND

QUESTION: WHAT FURTHER ANALYSES WOULD YOU PERFORM?



2.5 Summary of problem

- * What are the underlying causes of the enzootic ataxia problem?
- * Why have animal treatments not been effective in preventing further enzootic ataxia occurrences?
- * Why was application of copper with fertilizer not effective?

2.6 Solution to the problem

- * What is the most appropriate method of copper supplementation for this case?
- * How do you determine the appropriate dosage and frequency of copper supplementation for this property?
- * How would you ensure that your recommendations are implemented?

2.7 Conclusion and discussion of case

3. CASE 2: LEPTOSPIROSIS OUTBREAK

LEPTOSPIROSIS

1. HISTORY

1.1 The property

The property on which this outbreak occurred was a gentle, rolling, well-developed property of approximately 320 ha., farming a red breeding herd of approximately 1700 with an additional 500 velvetting stags and replacements. Few major health problems had been experienced in the herd.

12 June 472 6-month-old red deer hinds were introduced to the property at short notice from approximately 400 km away. The herd was sourced from a number of different properties throughout the North Island and had gathered during the previous 4 weeks. On June 1 four deer died of yersiniosis and during the next ten days a feed and management crisis followed and a large number of deer were lost. The veterinary consultant's decision was to shift the remainder of the deer in total within 24 hours. All 472 deer had been orally drenched with Neomycin sulphate on the day of transport and this was repeated on the afternoon after arrival. Some had been treated for clinical yersiniosis the day before transit. During the next 10 days the deer appeared to settle in well. No losses occurred.

22 June 1 death. No sign of scouring or yersiniosis.

Carcass slightly jaundiced, gross renal lesions, no urine present.

Provisional diagnosis: Leptospirosis

Path. diagnosis : Acute nephrosis (confirmed by leptospiral culture 14.7.87).

1 July 2 deaths.

Gross pathology, severe jaundice, haemoglobinuria, interstitial nephritis. Histopathology confirmed haemolytic crisis. Orange-red casts in renal tubules.

Laboratory report (approx. 10 days later): Lepto MAT positive at 310 in both animals. Suspect L. copenhageni. Kidney and urine stain negative. One deer had MAT 100 L. pomona. No cultures after six weeks.

QUESTIONS :

1. What treatment/prevention would you implement
2. What management procedures would you implement for both the affected group (472 weaner hinds), and the remainder of the herd (approx. 2200 deer).
3. What further investigation would you undertake (if any).

2 July Herd visited to implement procedures determined by questions 1-3 above.

Outcome: 3 weaners noticed ill at that time subsequently died. A number of patches of haemoglobinuria were observed in the wet muddy yards on that day, i.e. haemoglobinuria appeared rampant.

7 July One death, no gross indication of leptospirosis. Pulmonary consolidation. Diagnosis: Diffuse sub-acute alveolar damage.

One mixed age hind death suspect MCF (not confirmed).

16 July 2 sick weaner hinds. Blood results severe hypoalbuminaemia.

Hypocalcaemia (because calcium albumin bound)

Mild elevation GGT

Increased globulin

Suspect chronic liver disease

12 Oct. 1 rising 1-yr-old death. Pathology multifocal renal necrosis and multifocal mononuclear nephritis.

Severe vasculitis of arcuate arteries. No lepto on histo or culture.

Conclusions so far

An outbreak of leptospirosis was diagnosed in an introduced mob of 472 weaner hinds. Six deaths occurred in addition to a variety of other stress-induced health problems in this group. No other groups on the property were affected.

LEPTOSPIROSIS OUTBREAK PHASE TWO 1988

Jan. 22 Redwater diagnosed in one yearling from another mob of 15 deer on the property. Serum L. copenhageni titre 300.

Action: Treated with streptomycin for 3 days, remainder of mob of 15 deer vaccinated.

Mar. 5 2 dead fawns in mob weaned 3 days earlier.

Mar. 6 8 more weaners dead. 4 necropsies gross lung pathology. Histopathology severe pulmonary congestion.

Bacterial isolates: proteus bacillus, non-haemolytic streptococci, coliforms, staph. aureus, alpha haemolytic streptococci. Lungs: extreme congestion, mild alveolar oedema.

Diagnosis Toxaemia, septicaemia, stress-related?

Note: Weaning occurred in hot and dusty conditions. Animals which were observed clinically ill were treated with long-acting tetracycline with good response.

Total losses over 4-5 days: 13 weaner hinds, 12 weaner stags, i.e. 25 out of one mob of 350 weaners (Mob 1).

Mar. 19 1 death Mob 1. No PM

Mar. 20 Further deaths Mob 1.

PM: severe jaundice, haemoglobinuria, gunmetal blue kidneys, congested liver.

Diagnosis: leptospirosis.

Action: treated entire mob with streptomycin and vaccinated with bivalent vaccine.

Note: the owner originally considered the deaths to be grain overload.

Histopathology:

Haemoglobinuric nephrosis. Orange-red proteinacious deposits in tubules and ducts. The hepatic centralobular ischaemic necrosis consistent with leptospirosis. No culture requested because of diagnostic certainty.

Clinically it was not possible to detect clinically sick animals in the mob.

- Mar. 21** Further deaths in MOB 2 (350 weaners weaned for 3 weeks)
- Mar. 23** Mob 2 treated with streptomycin and vaccinated with leptospiral vaccine.

MOB 3 (300)

First deaths occurred in this mob and all were treated and vaccinated.

Mar. 23 Mob 1, 2 and 3 re-treated with streptomycin.

Mar. 24 & 25 Deaths stopped by this stage.

Total deaths since March 19: 32 female 53 male Total 85

Further action:

Some hinds and fawns were not weaned by this stage. Early in April they were vaccinated as they were weaned.

All fawns and hinds on the property have now had 2 vaccinations.

The occurrence of leptospirosis in March coincided with the onset of very wet weather associated with Cyclone Bola. The property has a winter stocking rate of 5.5 deer per acre, and this increases considerably during summer with newborn fawns. There is a considerable reliance on supplementary feed consisting of both silage and grain.

QUESTIONS:

1. Consider in hindsight what action could or should have been undertaken with this herd in response to the 1987 outbreak.
2. What management and prevention strategies should be implemented for this herd from this point on?

4. HOW CAN THE VETERINARIAN DEVELOP HERD HEALTH AND PRODUCTIVITY SERVICES?

- 4.1 Self-training and evolution of expertise
- 4.2 The need for formal training
- 4.3 Individual problem vs. whole herd approach
- 4.4 Promotion to farmers

5. OTHER ASPECTS, E.G. REPORT WRITING, FEE CHARGING

Health Workshop:

Supplementary Information for Case 2.

Decisions taken

Q.1: What treatment/prevention would you implement?

On the gross pathological conformation of leptospirosis a decision was made immediately to vaccinate all 472 weaners with a bivalent (pomona, hardjo) vaccine.

In addition all 472 weaners were treated with streptomycin at a dose rate of 25 mg/kg subcutaneously.

Q.2: What management practices would you implement for this group and the rest of the herd?

(a) Affected Group:

The affected group returns after vaccination and antibiotic treatment to a paddock hitherto uninhabited by that group since its arrival on the property 18 days earlier. A paddock at the periphery of the farm was chosen with a watershed away from the remainder of the property (no consolation to the neighbours!). They were observed several times daily for further illness problems.

(b) Remainder of the herd

The remainder of the herd was kept out of fence contact with the affected group. They were not grazed on paddocks grazed by the affected group since arrival.

Q.3: What further investigations would you undertake?

(a)

July 2 - 14 plain blood samples were collected and submitted for leptospiral titres. Results are as follows:-

Lepto titres 14 weaner hinds collected 2.7.87

Hardjo	Pomona	Copenhageni	Bratislava
< 1.10	20480	20	40
"	1280	< 10	10
"	10	20	10
"	10	< 10	< 10
"	< 10	20	10
"	80	10	80
"	40	80	10
"	40	20	40
"	< 10	< 10	< 10
"	10	10	10
"	< 10	< 10	< 10
"	< 10	< 10	< 10
"	640	10	10
"	10	10	< 10

From these results which serovar is incriminated?

What is the significance of titres to Copenhageni and Bratislava?

Can any conclusions be made about the stage of the outbreak?

July 20 - 20 sera from mixed age hinds from other groups on the property were submitted for leptospiral serology. These hinds had no contact with the affected group of weaners. Results showed 12 had low titres to hardjo (1 x 100, 3 x 200, 2 x 300, 6 x 400). Other serovars were negative.

Aug 10 - All of the affected group of weaner hinds were re-vaccinated with the bivalent leptospiral vaccine.