



A Review of the Causes of Mortality in Pre-Weaned Dairy Calves

Katrina Henderson
SRUC Veterinary Services, Dumfries

Leading the way in Agriculture and Rural Research, Education and Consulting

Pre-weaning calf mortality

- Brickell et al, 2009 – between 0 and 12% of calves died in the first month of life
- Johnson et al, 2017 – average in the first two months = 4.5% (1.9-8.3)
- Knowledge gap – causes of mortality
- All diagnostic post-mortem and viscera submissions between 2014 and 2018 reviewed



Results



- 614 calves/viscera examined, definitive diagnosis reached in 603 (98% diagnostic rate)
- 1017 diagnoses made from these calves
- 69% infectious: 25% nutritional: 6% other
- 26% of calves had a significant nutritional component in the death of the calf (excluding underfeeding)

Biggest single cause



- Ten individual biggest contributing causes of mortality were:
 - Cryptosporidia (127)
 - Rumen drinking (101)
 - Rotavirus
 - Salmonellosis due to *Salmonella* Dublin
 - Colisepticaemia
 - Navel ill
 - Pneumonia due to *Mycoplasma bovis*
 - Pneumonia due to *Mannheimia haemolytica*
 - Pneumonia due to *Trueperella pyogenes*
 - Pneumonia due to *P.multocida*

Causes of pre-weaning pneumonia deaths



- Pneumonia made up 216 of the 1017 diagnoses

Diagnosis	Percentage of pneumonia diagnoses
<i>Mycoplasma bovis</i>	19
<i>Mannheimia haemolytica</i>	17
<i>Trueperella pyogenes</i>	14
<i>Pasteurella multocida</i>	13
<i>Salmonella</i> Dublin	11
Aspiration pneumonia	6
RSV	6
Pasteurellaceae	6
<i>Histophilus somni</i>	3
PI3	2
<i>B.trehalosi</i>	2

Infectious enteric diagnoses



- 345 of 1017 diagnoses were infectious enteric diseases

Pathogen	Percentage of enteric diagnoses
Cryptosporida	37
Rotavirus	19
<i>Salmonella</i> Dublin	18
Coronavirus	8
K99+ <i>E.coli</i>	8
AEEC	3
<i>Salmonella</i> Typhimurium	3
Coccidiosis	2
Clostridial enterotoxaemia	2
<i>Salmonella</i> Mbandaka	1

Nutritional causes



- 247 of 1017 diagnoses were nutritional, 26% of calves had a nutritional component significant to their death
- Rumen drinking/acidosis/rumenitis
- Fungal rumenitis
- Abomasitis/ulceration/bloat
- Aspiration pneumonia
- Malnourishment

Nutritional causes

- 247 of 1017 diagnoses were nutritional, 26% of calves had a nutritional component significant to their death
- Rumen drinking/acidosis/rumenitis
- Fungal rumenitis
- Abomasitis/ulceration/bloat
- Aspiration pneumonia
- Malnourishment



What do we mean by rumen drinking?



Sequels to rumen drinking

- Acidosis
- Rumenitis
- Fungal rumenitis
- Abomasal bloat
- Abomasitis
- Aspiration pneumonia
- Scour
- Dysbiosis



Factors influencing rumen drinking



Factor	Odds Ratio	95% CI
Drinking from a bucket	4.35	1.91-9.87
Drinking from an automatic feeder	0.13	0.05-0.31
Feeding of waste milk	Only rumen drinkers	N/a
Low feeding volume (≤ 2 litres twice daily)	4.5	1.01-20.11

Take home messages



- Postmortem of pre-weaning calves are an important and useful method of investigating high mortality rates in calves
- High diagnostic rate
- Significant nutritional and management component to a quarter of pre-weaning calf mortality