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LAWSONIA:

A PIG OF A PROBLEM?

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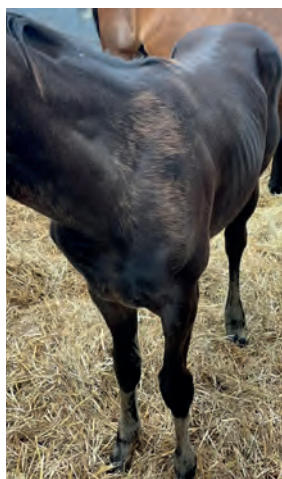
As we come out of summer and into the autumn, various diseases affecting older foals and weanlings come to the forefront of our minds.

'Lawsonia' is one such disease and, since its discovery forty years ago, it has become an increasing problem in the equine youngstock population of the UK. Knowledge of the disease has been slow to spread, especially amongst non-Thoroughbred breeders, where it is often having a foal affected by Lawsonia that first brings this life-threatening disease to a breeder's attention.

What is Lawsonia?

Lawsonia intracellularis is an intracellular bacteria that was initially described as causing a wasting disease of pigs but has adapted to infect horses. While we used to think it was spread from previous application of pig slurry as fertilizer, it is now known to be an entirely different strain that infects horses. This strain is present in many wildlife species in the UK and it is in fact these that are responsible for its spread.

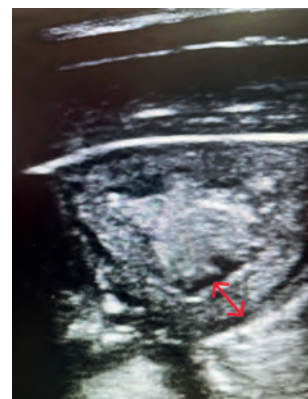
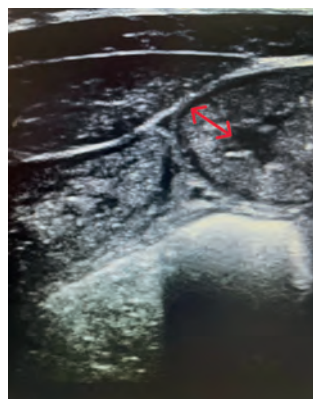
Below left: This weanling presented having lost weight and was failing to thrive. **Below right:** Weight loss can be sudden and dramatic.



What does it do to foals?

Lawsonia bacteria present in the environment are eaten by foals. The bacteria then invade the cells lining the small intestine causing them to multiply, losing their absorptive capacity. This thickening of the small intestine is known as a 'proliferative enteropathy' and leaves the small intestine unable to absorb nutrients or fluids.

Lawsonia is seen in foals and weanlings from approximately 4-9 months and is most prevalent from August through to January. Affected foals will lose weight and fail to thrive. In the acute, sudden onset form of the disease, foals will suddenly appear very sick and may show signs of colic, develop a fever, lose weight dramatically and have moderate to severe diarrhoea. They rapidly become dehydrated and may develop fluid swellings (oedema) under the jaw, belly and in the lower legs due to protein loss. In the more chronic form of the disease, foals will lose condition more gradually. They may have intermittent diarrhoea and gradually develop oedema over time. Both forms of the disease can prove fatal, especially in cases where peritonitis (an abdominal infection)



Above: Abdominal ultrasound images of a foal with Lawsonia. The red arrows show the classic thickening of the small intestinal wall.

develops secondarily. It is known that while only a few animals may get sick with the disease, exposure on infected farms can be high, with multiple foals becoming infected sub-clinically. These foals may fail to thrive and reach target weight.

Diagnosis

Diagnosis is made by clinical examination and confirmed by laboratory analysis.

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Together with external clinical signs, ultrasound examination of the abdomen reveals the thickening of the small intestine. The severity of this can vary depending on the timeframe of the disease, but can be very obvious with small intestinal wall measuring greater than 1cm (a normal measurement would be less than 3mm).

Blood analysis will show a drop in proteins (albumin especially) and rise in white blood cell count. Inflammatory markers may vary as this is a proliferative and not an inflammatory disease. Electrolytes such as sodium and chloride concentration are often altered due to dehydration and fluid loss.

The gold standard diagnostic test for the presence of Lawsonia is PCR examination of faeces. As affected foals shed Lawsonia bacteria intermittently in their faeces, this should be carried out on multiple samples (at least three) taken from different times of the day and pooled together.

Blood testing for antibodies to Lawsonia is cheap, simple and widely performed. Limitations of this for diagnosis must be considered. In an acute case where there has not been time for antibodies

to develop, an affected foal might test negative. A repeat of the test a few weeks later would be expected to be positive. Conversely a positive antibody result only confirms exposure to *Lawsonia* bacteria and not necessarily clinical disease. A positive antibody blood test should therefore be backed up by a positive faecal PCR when confirming a diagnosis of *Lawsonia* in a foal.

Treatment

Early diagnosis is essential when treating affected foals. The mainstay of treatment is antibiotic therapy, usually with Oxytetracycline given intravenously initially followed by an extended course of oral Doxycycline. Other antibiotics may be used in difficult cases that fail to respond well.

Replacement of lost proteins via intravenous plasma transfusion is costly but, in cases where total blood proteins have fallen dangerously low, can be life-saving and in nearly all cases will help turn things around more quickly. Pre-prepared equine plasma is available commercially and offers a quicker and safer alternative to 'homemade' plasma made by collecting blood and leaving it to separate under gravity.

Other supportive treatments include drugs to reduce fever and maintain demeanour and appetite. It is important to try to keep these foals eating to prevent any further loss of protein. Palatable high protein feeds should be offered in increasing quantities. Intravenous fluid therapy may be required to correct electrolyte imbalance and maintain cardiovascular function in severely affected cases. This should be done with caution and most likely in a hospital setting. Oral electrolyte supplementation might be advised.

Recovery can be slow and treatment prolonged and costly. Regular monitoring of blood parameters and repeat ultrasound examinations can be used to monitor progress. Bodyweight can be monitored for evidence of an upturn. Affected foals may struggle to reach potential predicted bodyweights and in Thoroughbreds, *Lawsonia* has been shown to contribute to economic losses due to poor sales performance.





Submitted By:

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Horse

Owner

Veterinary Surgeon

Sample Site

Blood

Lab Reference

Date Sampled

Report date

Clinical Pathology- Haematology				Clinical Pathology-Biochemistry			
HGB	14.5	g/dL	(11 - 19)	Sodium	125	mmol/L	(132 - 140)
PCV	43.50	%	(32 - 52)	Potassium	3.0	mmol/L	(2.4 - 4.7)
RBCs	12.75	10 ¹² /L	(6.5 - 12.5)	Chloride	92	mmol/L	(97 - 108)
MCHC	33.3	g/dL	(34 - 39)	Total Protein	22	g/L	(47 - 72)
WBC	15.1	10 ⁹ /L	(5 - 12)	Albumin	11	g/L	(30 - 40)
Neutrophils	73%	11.0	10 ⁹ /L (2.5 - 7.5)	Globulin	11	g/L	(18 - 36)
Lymphocytes	23%	3.5	10 ⁹ /L (1.5 - 4)	SAA	650.0	ug/ml	(< 15)
Monocytes	2%	0.3	10 ⁹ /L (0 - 0.4)	Fibrinogen	4.3	g/L	(2 - 4)
Eosinophils	2%	0.3	10 ⁹ /L (0 - 0.4)				
Platelets	210	/UL	(100 - 600)				
Film Comment							

Above: Blood analysis showing a rise in white blood cell count and dramatic fall in proteins classically seen in *Lawsonia* cases. Other alterations such as moderately increased inflammatory markers and loss of electrolytes are evident. **Below inset:** Vaccine being administered rectally in a foal. Foals should be over three months of age when given their first dose.

Prevention is better than cure

A commercially available vaccine for pigs can be used (off licence) in horses and is found to be very effective at preventing infection. Given the off licence nature of its use, it is important to note that

this has now been widely used without any cause for concern. Thirty milliliters of vaccine is administered rectally, which is surprisingly well tolerated! Two doses are given one month apart. Foals should be over three months of age when given their first dose. Care should be taken not to leave this too late such that exposure may have

already occurred. Vaccinating foals in batches as they reach the correct age works well.

Periods of stress are known to increase the likelihood of many diseases due to a drop in immune function. As *Lawsonia* cases are most prevalent in recently weaned foals, timing of vaccinations in relation to weaning is an important consideration. It is recommended that ideally foals are a couple of weeks clear of their second dose by the time weaning commences.

Worm control is also an important factor. Anecdotal *Lawsonia* is often seen in

foals in combination with high worm burdens or clinical Cyathostomiasis (larval small red worm emergence). It stands to reason that anything putting added stress on the immune system, coupled with an inflamed and damaged gut, would leave a foal more exposed to infection. Regular egg counts and targeted worming strategies should be implemented in all youngstock.

Consideration should also be given to possible wildlife hosts and their access to areas grazed by foals. Foxes, badgers and rabbits have all been shown to carry *Lawsonia*. Pest control strategies and improvements in fencing may need to be implemented. Changes to grazing plans to reduce exposure of weanlings to certain wildlife hosts should be considered.

In conclusion

Lawsonia intracellularis represents an ongoing and increasing threat to the UK youngstock population. In Thoroughbred populations vaccination protocols are now widely established largely due to the risk of associated economic loss. However, given the ubiquitous and indiscriminate nature of the bacteria coupled with the suffering and heartache associated with an outbreak, it seems prudent to recommend vaccination in all foal populations. ●

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