

# Lawsonia intracellularis infection: an emerging but manageable condition?

Lawsonia intracellularis is a bacterial species that infects weanlings. A few years ago, it was a relatively unusual diagnosis but it is now much more common. It also becoming increasingly obvious that where there are one or two weanlings that are clearly sick, there is usually low-grade sub-clinical infection of others that may not be overtly ill but are failing to thrive and this infection may be impeding optimal growth and weight gain within the herd.

## THE ORGANISM

The causative organism can infect a large number of species. Lawsonia intracellularis infection is commonly diagnosed in pigs but recent research from the United States has shown that the strains that infect foals are different from those that are capable of infecting piglets so it is unlikely that pig farms represent a significant source of infection for horses. On the other hand, bacterial strains that are found in foals are also found in numerous species of wild life and birds. Rodents are an important reservoir of infection on horse farms. In all species, the infection establishes in the intestinal tract and it spreads from animal to animal via the ingestion of infected faecal matter.

## THE DISEASE

The intestinal condition caused by Lawsonia intracellularis is known as Equine Proliferative Enteropathy. Infection occurs when foals ingest the organism, it then enters the small intestinal cells and causes massive thickening of the intestinal wall, primarily in the small intestine. This in turn compromises the foal's ability to absorb nutrients from

the intestinal tract and results in protein loss as the damaged intestinal wall becomes leaky. With severe infection, foals may become depressed, lethargic and reluctant to eat. They may have fever, colic or mild diarrhoea and a common feature is oedematous, fluidy swelling of the lower limbs and around the face. Dramatic weight loss can occur.

The disease occurs from August to late February in UK and Ireland and is seen at similar times of year in the United States and Canada. There is an incubation period of 2 to 3 weeks. Many foals will be able to fight off infection and it is usually the weaker members of the group that will become overtly ill. Stressors such as concurrent illness or injury or factors such as transport, weaning or mixing with others can tip the balance and cause a foal that is incubating the disease to develop obvious clinical signs.

With severely affected clinical cases, the characteristic clinical signs coupled with finding low protein concentrations in the blood are often enough, to fuel suspicion that the disease is present. Ultrasound provides further evidence because the thickened small intestine can usually be seen very readily.



Fig 2. This weanling has lost a significant amount of weight due to Lawsonia infection.



Fig 1. This weanling has so much swelling around its throat, it is unable to swallow properly and his tongue has swollen.

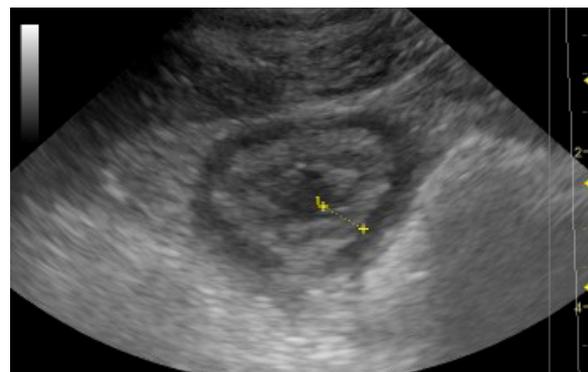


Fig 3. An ultrasound image of thickened small intestine in a foal with Lawsonia infection.

## HOW IS INFECTION CONFIRMED?

There are two main laboratory tests that are used for investigation of Lawsonia, each with specific strengths and weaknesses and both of which are available at Beaufort Cottage Laboratories. Faeces can be tested for the presence of bacterial genetic material or DNA. This test, known as the PCR test, is very helpful in confirming the infection in sick foals. However, because the organism may be deep within the intestinal cells (the clue is in the name – intracellularis!) or because the foal may no longer be shedding the organism in its faeces by the time illness is obvious, in around 1 in 5 infected foals, the PCR test may be negative.

The second test, serology, is based on the identification of antibodies, the proteins made by the infected animal's immune system as it tries to fight off infection. A positive result with serology tells you that the foal has been exposed to the organism, but many foals can fight off the organism without necessarily being sick so a positive serology simply confirms exposure not disease. Alternatively, the serology test can be negative early in the stages of infection and so it is not particularly effective in confirming the diagnosis in the sick individual. Serology's main value is that it is a useful tool for screening a herd and it can help pick out foals that might benefit from vaccination.

## TREATMENT AND PROGNOSIS

Most foals can be successfully treated with antibiotics and generally either the tetracyclines or a combination of erythromycin and rifampin are used. Some will require intensive care and in particular, intravenous fluid therapy designed to combat the low protein concentrations. Occasionally foals can succumb to Lawsonia infection, particularly if there are secondary complications such as peritonitis.

Infection can dramatically affect the foal's growth at a critical time. A research study performed in Kentucky highlighted this and showed that foals that had been infected failed to reach as high a price at yearling sales as other yearlings by the same sire.

## PREVENTION IS BETTER THAN CURE.

Consideration should be given to which species might be the reservoir of infection with rodents and birds being obvious culprits. Measures to keep these species away from the foal herd should be reviewed and upgraded and, any foals with active infection should be kept away from others while under treatment.

A vaccine has been in use for prevention of Lawsonia intracellularis infection in pigs for some years. Researchers based in California have now tested this vaccine in foals and the vaccine has also been in use on horse farms in Kentucky for several years and in UK and Ireland in 2012 and 2013.

The vaccine contains an attenuated, effectively a disabled, strain of the bacteria which is alive but unable to cause disease. It has to be given as an enema – this may seem strange but it is because it needs to reach the intestinal tract and if it is given by mouth, the acid in the stomach kills the vaccine before it has any beneficial effect.

On farms with a previous history of Lawsonia infection, the vaccine is usually given around a month before cases have appeared in previous seasons, with a second dose 30 days later. On farms considering vaccination because they are experiencing Lawsonia infection for the first time, it can be helpful to blood test all the foals before or at the time of the first vaccine. Where there are obvious clinical cases, it is likely that some foals in the herd will already have successfully fought off the infection. These foals will have a positive serology result and do not need vaccination. Other foals in the herd may be harbouring sub-clinical infection and these foals might benefit from treatment with antimicrobials rather than vaccination. These individuals can be identified from a combination of serology and measurement of blood proteins. The group that will benefit from vaccination are those that have normal protein concentrations and negative serology results suggesting they have not yet encountered the organisms and may need protection in case they do.

It is important that foal owners understand that the product available for use is a pig vaccine and it is not licensed for use in horses in Europe or North America. The research supporting its use on horse farms is encouraging but it is based on small research studies on limited numbers of foals. Nevertheless, clinical experience of the vaccine in the USA, Ireland and the UK, suggests that at the very least, it appears to be safe and harmless and it may help to reduce the prevalence of this debilitating illness.

To date, results with cases I have been directly involved in have been encouraging with no confirmed disease in any vaccinated animals. In a small number of cases, foals vaccinated very early in the season have shown mild signs of hypoproteinaemia some months later but the organism has not been found. This could be a coincidence due to another infection. But, we need to know more about the duration of protection from this vaccine, it is possible that some farms may have to use a third booster if their farm-specific history requires early vaccination.