

# ZOONOTIC THREAT

## Professor Tom Buckley and Niamh Roche of the Irish Equine Centre look at the zoonotic implications of *Clostridium difficile* in Irish horses

**A** ZONOTIC disease is a disease that can be transmitted from animals to people.

*Clostridium difficile* - an anaerobic, spore-forming bacteria - is a major cause of antibiotic-associated colitis in humans.

It also causes enteritis, and disease develops in a variety of other species including horses, cattle, dogs, cats, rodents and rabbits.

The organism produces protein toxins A, B and the binary toxin CDT in the intestine. Toxin A is an enterotoxin that can cause tissue damage. Toxin B is a cytotoxin that is capable of inducing inflammation and necrosis.

*Clostridium difficile* is the infectious agent and occurs primarily in faeces and contaminated soil. Clinical signs and intestinal lesions of *Clostridium difficile* can-

not be used to distinguish from the clostridial infections and Salmonella. Detection of toxin A and B would be the most reliable criteria for *Clostridium difficile* infection.

Several studies have looked at the prevalence of *Clostridium difficile* in horses and these differ by culture methods used. Prevalence may vary by location and region.

The bacterium can survive in nature and in stables for up to four years.

Very little is known about what type of *Clostridium difficile* ribotypes are found in horses in Ireland. It appears very little has been published on *Clostridium difficile* prevalence or ribotypes in horses in Ireland.

### RESEARCH

From concurrent work carried out in the human population by the reference laboratory at St. Vincent's Hospital, the Irish Equine Centre (IEC) was able to determine the correlation between human and equine isolates.

If the same ribotypes were found in humans and horses, this may be of significance in the spread of *Clostridium difficile*.

### TESTING

The IEC focused on diarrhoeal samples and non-diarrhoeal samples from normal throughput and requested samples.

They requested samples from a number of practices in Ireland. Samples were

tested from foals and adult horses that have enteritis.

A series of normal faeces from healthy horses and foals were also analysed.

This determined if *Clostridium difficile* was a normal inhabitant of equine faeces. It was expected that we would have up to 50 samples positive for *Clostridium difficile*.

Assessment of faecal samples is the standard practice for diagnosis of disease.

The prevalence of a variety of ribotypes in horses has been established, but not in Ireland. This study confirmed what ribotypes are present in the horse population and if a common ribotype was present here.

A total of 570 clinical samples and 100 healthy horses were tested for *Clostridium difficile*.

### RESULTS

Out of 570 samples tested, 70 samples tested positive for *Clostridium difficile*. This represented 13.8%.

There were a number of different ribotypes identified in the study.

The most frequently isolated ribotypes were 078 (7 positives - 10%), 014/020 (7 positives - 10%) and 012 (21 positives - 30%). These ribotypes represented 50% of those detected and were common to both humans and horses.

From the results of the study, it would now seem that *Clostridium difficile* could be passed from horse to human and probably vice versa, representing a zoonotic threat.



***Clostridium difficile* bacteria is a major cause of antibiotic-associated colitis in humans. It also causes enteritis, and disease develops in a variety of species including horses, cattle and dogs. From the results of a study carried out by the Irish Equine Centre, it would now seem that *Clostridium difficile* could be passed from the horse to the human and probably vice versa, representing a zoonotic threat**