Good hygiene routine can lessen disease outbreaks

Egg producers are increasingly seeing brachyspira outbreaks — even new units are going down with the disease. *David Burch* of Octagon Services looks at how to tackle it

PICTURE: REUTERS

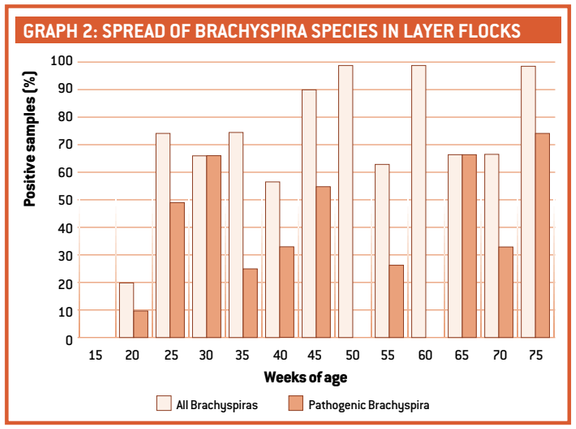
Brachyspira can easily spread to birds drinking from contaminated puddles.

Brachyspira are spiral shaped bacteria that primarily colonise the caeca of laying and breeding hens. They can be divided into those that do not cause disease (non-pathogenic), such as Brachyspira innocens or those that do when in sufficient numbers, mainly present in the UK as B pilosicoli and B intermedia.

There are others, which are less commonly found, such as B alvinipulli, which are isolated in North America, although it has been identified here. B hyodysenteriae, which is more commonly found in pigs, but has been reported in hens and B murdochii, which was originally thought to be non-pathogenic like B innocens. We are now not sure that it is quite so innocent.

They live in the caeca and adhere to the epithelial cell lining. They are not usually very damaging or invasive, but in large numbers, they can almost carpet the caecum (pictured below right), reducing its efficiency. This infection leads to increased caecal droppings, which are brown to yellow and may be soft to liquid and frothy.

GRAPH 2: SPREAD OF BRACHYSPIRA SPECIES IN LAYER FLOCKS



WHAT DO THEY DO?

The long-term effect of brachyspira infections is soft droppings, which may stain eggs, cause pasty vents in the bird and result in wet litter. But the chronic debilitating effect of the infection is a reduction in egg production, bodyweight and possible increase in mortality.

The drop in egg production can occur as they approach peak if the infection is early, or just after peak or any time after then as the infection builds up in the bird. With B pilosicoli, there can be a 5-6% drop in egg production and with B intermedia, it can be as high as 10-12%, which would completely ruin a flock's productivity. Some producers have reported an increase in pale eggs as well, probably due to poorer nutrition. The infection can last for several months if birds are left untreated.

There can be a 0.2kg drop in hen weight, so this is also a useful parameter to monitor.

Mortality usually creeps up. It is not a sudden increase, but almost a doubling or trebling of mortality from 0.5% per month to 1-1.5% per month. Mortality is not always associated with anything in particular, but is thought to be due to the generalised debilitation of the hen and there is often an increase in egg peritonitis caused by E coli. Obviously these lost hens cannot be replaced, again reducing the overall efficiency of a shed, if allowed to continue over a long period.

HOW PREVALENT ARE THEY?

In our first UK mini-survey of 10 free-range flocks, we found B innocens in 90% of flocks and pathogenic ones (B intermedia and B pilosicoli) in 70%, but these were flocks that reported production problems. In addition, they also had a 30% prevalence of worm infestations and 20% had IB (infectious bronchitis). These results highlight the potentially high prevalence of the problem in free-range flocks, as well as the need for a good diagnostic examination of these flocks and the use of a vet and laboratory to differentiate it from other problems.

In a larger survey with the SAC Veterinary Centre in Edinburgh using a quick PCR test, we looked at 96 submissions and 257 samples, which is more representative of the UK sector. They found 70% of the flocks were infected with brachyspira, but 54% had potentially pathogenic strains.

We initially thought that the problem was primarily associated with free-range flocks, due to the inability to maintain good biosecurity and the ease of faecal contamination of water. However, a recent publication (Bano and others, 2008) has shown the problem to exist in cage flocks, too. Brachyspira species were found in 72% of farms tested (21 samples) and pathogenic ones in 35% of farms.

They also reported on the type of caged flocks, whether they had deep pits or used conveyor belts for dung removal and recorded the incidence of brachyspira isolation in 43 sheds (graph 1). Somewhat surprisingly, brachyspira could be found in both types of production.

Our original UK case was in a multi-age laying site with poor production and high mortality, which had struggled to find a diagnosis for 18 months. Subsequently, we have investigated a number of caged laying units and also found brachyspiras can be widely spread throughout the farm.

HOW ARE THEY SPREAD?

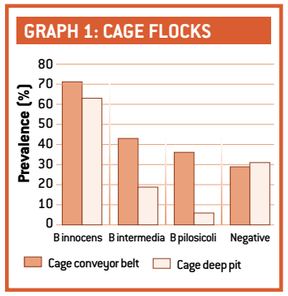
This is really the million dollar question, as even relatively new free-range units have become infected quite quickly. There have been reports of infected pullets coming on to farms, but in all the cases I have looked at, the pullet rearing end has been negative (graph 2), with infections only starting by 20 weeks of age after placement.

Where we have multi-aged cage units, which have become infected, it is easy to imagine carry over in poorly cleaned (or not cleaned) cages between batches as well as circulation between sheds by flies and rodents. Improving hygiene, fly control, especially in deep-pit houses and rodent control is essential.

Mice have been shown to become infected with B pilosicoli and flies can easily carry brachyspira for an hour or two and transmit the infection mechanically from faeces to feed. Free-range birds raise other problems in that biosecurity is impossible and other birds (especially ducks, even partridge) can easily spread the infection by soiling pastures.

Once infected, it can easily be spread by contaminated puddles, from which other hens like to drink. Good pasture management and rotation is important. Brachyspira are meant to survive for only a few days outside the hen, but in the case of B hyodysenteriae, they can survive up to 60 days outside the pig in the right conditions. I suspect this is also happening in free-range farms. Most of the species can be found in pigs and, therefore, the proximity of pig farms might also be an issue.

GRAPH 1: CAGE FLOCKS



Brachyspira pilosicoli.

HOW CAN WE DETECT THEM?

For many years, nobody was routinely looking for brachyspiras in chickens. They are difficult to identify and the only real way to differentiate them is to culture the organism and then sub-culture it and carry out biochemical substrate tests. This takes one week for the initial culture and a second week for the differentiation, so is a slow process.

There are no routine blood tests, but a combination of clinical signs and the presence of brachyspiras, must make one suspicious, as B innocens is quite a frequent organism to identify and the pathogenic ones are not usually far behind. It is essential though that other potential causes have been excluded.

WHAT ARE THE BEST MEANS OF PREVENTION?

For caged birds, good hygiene and cleaning between flocks is very important, although sometimes difficult to achieve in deep pits at certain times of the year. Fly control, even in winter, is also very important (for more, see p24). Again, the older deep-pit sheds seem to be a problem. Finally, rodent control is essential, as they can carry a number of the brachyspiras.

For free-range flocks it is more difficult. Good pasture management and rotation is helpful. Reducing puddle areas by filling in holes and improving the condition of the pop-hole areas are also helpful, as these areas get the most wear and are prone to contamination. Gravel or matting can help reduce contamination.

Work is on going in Australia to investigate the possibilities of producing a vaccine commercially.

WHAT TREATMENTS ARE AVAILABLE?

First consult your vet. Although there are no products specifically indicated for the treatment of brachyspiras in laying hens, there are a number of products that are used in pigs. Tiamulin (Denagard-Novartis) has become the main product for treating and controlling brachyspira species in pigs, because of its relatively low level of resistance development. Tiamulin with chlortetracycline (aureomycin – Fort Dodge) are the two main antibiotics, which have zero withdrawal periods for eggs in the UK, so tend to be the first choices for any treatment in layers.

Where these infections are complicated with mycoplasma infections, which are common in layers or with secondary bacterial infections, such as egg peritonitis caused by E coli, combined use of these products has also proven quite successful in controlling mortality and production. However, both products are POM-V and must only be used under supervision of a vet.

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SELF ASSESSMENT

Test your knowledge with these questions. Answers at the bottom.

Q1. Which is a major disease-causing brachyspira?
a) ☐ B innocens
b) ☐ B pilosicoli

Q2. What colour are caecal droppings?
a) ☐ Black
b) ☐ Brown
c) ☐ Green

Q3. What is the major effect of brachyspira infection on production?
a) ☐ Very high mortality
b) ☐ Feather loss
c) ☐ Drop in egg production

Q4. How commonly are brachyspira found in laying flocks?
a) ☐ 100%
b) ☐ 70%
c) ☐ 10%

Q5. Can caged birds become infected with brachyspira?
a) ☐ Yes
b) ☐ No

Q6. How are brachyspira commonly spread in a shed?
a) ☐ In the air
b) ☐ In replacement pullets
c) ☐ By flies

Q7. Is vaccination successful?
a) ☐ Yes
b) ☐ No

Q8. Which is the most common treatment for brachyspira?
a) ☐ Tiamulin
b) ☐ Chlortetracycline
c) ☐ Tylosin
d) ☐ Colistin

1-b, 2-b, 3-c, 4-b, 5-a, 6-c, 7-b, 8-a