Avian Mycoplasma Conference looks at recent advances in control

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The First International Avian Mycoplasma Conference was recently organised by the Belgian veterinary practice, Vetworks, to inform veterinarians about recent advances in the control of avian mycoplasmas.

The first speaker was Janet Bradbury who gave a broad based overview of mycoplasma knowledge for the other speakers to build on.

Control of M. synoviae

Wil Landmann of GD, the Netherlands, argued that more pathogenic strains of Mycoplasma synoviae (MS) had recently emerged in Europe making the need for control greater (other factors may have also contributed including inability to control MS and previous routine antibiotic administration).

Indeed our academics have argued for half a century that MS needs to be controlled. Biosecurity was acknowledged by all as necessary, no matter what other strategies were adopted.

Wil gave us an update on their strain ID development programme which has completely sequenced 15 MS strains including the MSH vaccine strain and developed two PCR tests with a probe for a SNP in MSH not seen in the other 14 strains. This will allow the identification of both field strains and MSH in single samples. Whether this SNP is stable in vaccinated birds is not known.

Other people doing strain ID work in Europe have done Hammond (and Hong) vlhA sequencing. Wil's results suggest that this is not good for strain differentiation, but it was suggested that it is good enough for MSH identification in Europe as long as the sequence is identical to MSH (and thus be called MSH like).

Comparisons of amplicon length do not identify MSH uniquely in Europe. Having analysed over 600 sequences from Europe in the last two years it is my impression that we can identify MSH and perhaps also Belgium EAA strains with vhlA sequencing. Wil's results analysed with his e-MLST technique often showed two strains in outbreaks which, to my way of thinking, says that there was two outbreaks and makes one wonder if biosecurity is suboptimal for MS control with freedom.

Wil has looked at four cases on pullet rearing farms in the Netherlands where only part of the farm was vaccinated with MSH. In three of the four cases they saw spread from vaccinated to non-vaccinated birds. This seems higher than other places in the world and suggests that improved biosecurity could decrease this.

Spread to unvaccinated flocks by introducing MSH vaccinated cockerels has been seen by two others during spiking but no effects were seen and in one case two sheds not spiked on a farm with four sheds spiked remained negative.

Next came a series of papers on the incidence of MS infection in Belgium. The first was a preliminary study using serology and this needs confirmation with PCR. Other speakers had more panoramic surveys of breeders, layer breeders, broilers and layers. A high incidence of MS was recorded but the Belgium industry is small and this could rapidly change with control or an outbreak.

Use of MSH vaccine

Other speakers presented case reports in breeders, layer breeders and layers on the use of MSH vaccine. Vaccination in breeders saw a decrease in respiratory disease in broilers progeny from MSH vaccinated flocks when compared to broilers from previous MS positive flocks using the performance of eggs purchased from non-vaccinated flocks as a time control. The experimental design of this field trial is not perfect but the company veterinarian has convinced himself that the benefits are there. He reported decreased bacterial contamination in the hatchery which he thought was from better shell quality and in a separate smaller trial an inability to be able to find vertical transmission of the vaccine or wild MS strains from vaccinated flocks compared to 10/29 MS PCR positive from unvaccinated control flocks at 14 days.

A layer breeder operation was affected with EAA eggs – spectacular responses to Tylvalosin and deoxycline on day two of treatment but EAA affected eggs returned gradually from 12 days after the cessation of treatment. It was decided to vaccinate the next replacement flocks. These flocks were seen to be MS positive by PCR before vaccination and were treated with Tylvalosin and then vaccinated three days later.

These flocks have since been extensively examined by PCR post vaccination and only MSH has been detected (4-6 weeks), EAA was prevented and progeny were of a better quality and hatchability was also improved. Similar results have been seen with layers even on multiage sites.

Complete elimination of EAA in MSH vaccinated flocks (similar experience to Japan) was seen. For layers a ROI (return on investment) of over x3 was seen from vaccination. This was without any estimate of effect on FCR of feed into eggs. Japan saw a 4% reduction in FCR in vaccinated flocks. It is unfortunate that we have no estimates on the FCR cost of MG infection in layers.

Antimicrobial resistance

The conference also discussed antimicrobial resistance in mycoplasmas and Maarten De Gussem described a rough and ready field test for antibiotic resistance; PCR before and after treatment. If the flock is still positive after treatment then antibiotic resistance should be suspected. This PCR technique can also be used to see what frequency antibiotics should be used when doing preventative medications in lay. Maarten pointed out that there is no antibiotic resistance data from countries where antibiotic use is the greatest. Certainly India and Thailand have no confidence that quinolones will work against MG.

Some differences in the post vaccinal response to MSH measured by BioChek ELISA and Idexx ELISA were reported in Germany. BioChek ELISA becoming positive earlier on the same samples after vaccination.

Killed vaccines were considered to have several down sides including vaccinated birds still becoming infected and becoming a reservoir (and perhaps also increasing the efficacy of vertical transmission by decreasing pips). Maternal antibody is recognised as having no protective effect in chicks against becoming infected. Some people have used killed vaccines to make maternal antibody to cover up natural infection. Autogenous vaccines were only mentioned in passing but are widely used in Europe with a MS isolate from the farm being incorporated in multivalent vaccines. It is hard to see the value of this but it is not that expensive in a multicomponent vaccine.

European problem

It was concluded that MS is a problem in breeders, layer breeders and broilers in the Benelux and adjacent parts of Germany. This was confirmed by UK, French and Spanish experiences. This is further underlined with MSD developing a live MS vaccine for decentralised registration in some European countries. The pressure to decrease antibiotic usage is an important driving factor.

Reflecting on all the presentations at the conference, the big incidence of MS currently, the benefits demonstrated by controlling infection, the (unexpected) success in vaccinating flocks that were already infected, suggests to me that vaccination could be the first step in eradication of MS (like the successful bovine brucellosis, bovine contagious pleuropneumonia and pullorum disease control programmes).

Once the incidence is low enough maybe vaccination would be stopped, but the existence of two separate industries which may have different priorities (layers and breeders) may mean vaccination could be needed for a long time to come. ■