

The use of essential oils in the control of wet litter

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The control of wet litter in broilers and more specifically low level enteritis has, over the last few years, become one of the most difficult and recurrent problems we face as poultry veterinarians.

The modern broiler seems too easily stressed and the early clinical sign of such stress is a more rapid gut passage of food material. The bird has evolved and been bred to have a short intestine compared to mammals and for this intestine to digest food fully there is a system of retro-peristalsis. The food is passed up and down the intestine, and experimentally it has been shown that material at the rectum can be found back in the duodenum within one hour.

Gizzard function

The movement of food back towards the duodenum is partially controlled by the gizzard and any interference with gizzard function can lead to a failure of retro-peristalsis. Food is then found in partially digested form in the lower intestine and caeca where it acts as a nutrient for the alkaline loving bacteria such as campylobacter, E. coli and some clostridia. They multiply, in some cases producing toxins, and often leading to a frothing in the caeca.

It must be remembered that the caeca has a major function in water control with urine

being passed back to the caeca from the opening of the ureters in the cloaca, and reabsorption of water. If the caecal bacterial flora is disturbed there is a major issue of wetter droppings being passed onto the litter. The gizzard's control of retro peristalsis is compromised when there is gizzard erosions and infection.

Mycotoxins and histamine derivatives (such as gizzarosine) have been known for a long time to cause gizzard erosion but more recently the involvement of fowl adenoviruses has been more important. The particle size of the feed, failure of young chicks to consume adequate feed and over heat treatment of feed can all cause the gizzard to malfunction, with resultant effects on intestinal peristalsis.

Treatment of wet litter has tended to focus on the use of antibiotics to treat the bacterial overload and the presence of dysbacteriosis has been documented in many countries. This approach is often counter-productive as the use of antibiotics for the control of bacteria enteritis will put pressure on the development of resistant strains of bacteria, and it is often the non-pathogenic bacteria that are killed by the bacteria with the resistant strains surviving and repopulating the space.

The total effect of antibiotics on the bacterial ecosystem needs more attention, however they are often clinically effective. The pressure on the farm to have suitable and rapid treatments for wet litter in order to improve bird welfare is immense, with regulators in many countries associating wet lit-

ter with pododermatitis and using stocking density control to apply pressure on the farm. This misses the point that wet litter is not one condition, and it might be simply rapid gut passage with increased water content, in which case pododermatitis is often not present, or it can be associated with an enteritis, malabsorption and the presence of ammonia and proteins in the faeces which burn the feet.

As veterinarians we therefore face a lot of pressure to medicate for wet litter, and equal pressure to reduce the prescribing of antibiotics into food producing animals. With this in mind, we have over the last five years developed a new approach to wet litter on farms in the UK, based on successful therapies used in other EU countries.

Essential oils

Many articles and reviews have been written about the use of essential oils and I do not intend to go over this work here, but rather discuss the practical application of essential oils in modern broiler husbandry with focus on gut health.

When introducing essential oils it is important for the veterinarian to have confidence in the therapy and carrying out a thorough internet search for literature is both important and enlightening. The therapy has to be based on clear scientific research and due to lack of funding this is often not present.

We are all used to seeing full documentary evidence of the efficacy, testing and con-

A. Physiological faeces: solid, dark brown, white uric acid coating. B. Wet litter effect: Less solid, changes in colour, elements of undigested feed. C. Moderate diarrhoea: Lack of regular structure, excess mucus, odour. D. Acute diarrhoea: Foamy faeces, lack of structure, odour.



traindications of medicines and the absence of this can be disturbing to a generation of veterinarians educated in conventional therapy. We have with trial and error developed our own confidence in essential oils, and how to use them, and it is for individuals to work their way through this process.

We use products which are mixtures of essential oils and licensed as feed additives with no meat withdrawals. The basic issue is to put in place rapid and early treatment with the very first signs of a gut rapid passage are seen.

Visual inspection

Techniques measuring water content have been developed by various companies, but we prefer visual inspection, and looking for the paler, porridge type dropping which is the first sign that the gut is stressed. In some cases this will pass, specifically if the stress has been mild and short term such as a feed change. In others it will develop into a brown liquid droppings.

We have therefore developed a 'Wet litter Box' which is a set of treatments left on the farm for the farmer to use whenever early signs are seen. In the first instance when porridge droppings appear we recommend the use of Biostop from Biopoint, Poland, a mixture of essential oils which leads to increased mucus production by the enterocytes as well as an antibacterial effect.

The actual mode of action is not clear but this product used quickly and early will over two days return the gut to normal activity. We almost see it as a calming effect and whether this is an effect on the gizzard or the intestine is not known.

The treatment is given for 12 hours per day for up to five days in the water. If however the stressor remains present then recurrence of the problem can occur. Where there is already some evidence of intestinal inflammation either by post mortem examination or by the presence of some more liquid brown diarrhoea we move to the next stage which uses both Biostop and natural salicylic acids produced from willow bark called Salivet (Biopoint).

The use of a natural anti-inflammatory was discovered by accident when we were treating slightly lame birds with antibiotics. As a trial I added some Salivet to one house with the antibiotic and compared this to a house with just antibiotics. It was the farmer who noticed that the litter was significantly better in the combination Salivet treated house, and since then we have used this product on many farms with success.

Once again you need to treat quickly and as the essential oils can be used without prescription, there is no reason why stocks of product could not be on farm before a problem develops.

The functional barrier between the lumen of the gut and the cells lining the intestine is the tight junctions which in healthy birds allow nutrients and water to pass but are a

barrier to bacteria. There is now considerable evidence in humans and birds that the loosening of tight junctions is a major factor in allowing bacterial invasion from the intestine and subsequent isolation in joints etc.

The tight junctions are affected by enzymes which break down the cytoskeleton and these enzymes are released as a response to some stresses. Blocking the enzyme activity has been investigated and it seems that it is at this level that the Salivet might be working.

As usual without major funding the actual mode of action is not known and all one can do is assume that it is similar to synthetic aspirin, although milder in action. We alternate the Biostop and Salivet using each for

12 hours per day. The treatment is for three days. Of course not all birds respond to this treatment and it is very important to look closely at farms where therapy fails. Other causes of enteritis need to be investigated and preventative policies put in place, and with the modern broiler only having a short life, there must also be no delay in using conventional therapy where it is needed.

Over the years we have found that essential oils have a role in the control of wet litter, they require good management and a high level of husbandry. We now use them in association with conventional therapy not as a replacement, and in this role they are a valuable tool to reduce the use of antibiotics. ■