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A Greener World Technical Advice Fact Sheet No. 7

Foot Pad Dermatitis in Poultry

Certified Animal Welfare Approved by A Greener World (AGW) has the most rigorous standards for farm animal welfare currently in use by any organization in North America. Its standards have been developed in collaboration with scientists, veterinarians, researchers and farmers across the globe to maximize practicable, high-welfare farm management.

Foot pad dermatitis (FPD) – also known as pododermatitis or ‘foot burn’ – is a condition characterized by lesions on the feet of poultry. The associated lesions can vary in size and also in depth (see image below).



Picture: L. Wilkins, Bristol University

What causes FPD?

There are a number of things that can influence whether or not birds show incidence of FPD. The biggest single factor is wet or damp bedding and a number of studies have shown that high moisture litter alone was enough to cause FPD in birds. However, the cause of high moisture bedding may be more complex than a failure to put enough dry bedding in the house. Climatic conditions, ventilation and even feed can all have an effect.

Why worry about FPD?

As mentioned above FPD is sometimes known as 'foot burn'. It is the development of dermatitis that starts as an erosion of the skin of the foot which can look like a dirty mark. But once the skin is broken painful ulcers can develop and, in a severe case, the lesion can act as an entry point for secondary infections.

As most farmers see chicken feet as a waste product the actual incidence of FPD in the flock often goes unnoticed. However, identifying FPD is important: not only can it highlight a potential welfare issue for your birds but it can also alert you to potential problems with litter management or imbalances in the feed that could be affecting the overall profitability of your enterprise.

Identifying FPD in your flock

It is not always easy to identify FPD in free range birds on farm. Perhaps the easiest way to find out whether or not your flock has foot pad dermatitis is to get the information from your slaughterplant, as it is far easier to see any marks on their feet when the birds are slaughtered and cleaned.

The number of birds with FPD is usually reported as a percentage. The figure will not normally distinguish between large or small lesions, or give you any idea of the depth of lesions. The level of FPD will also change over the seasons, with lower levels seen in warmer and drier months.

It is not uncommon for free range or organic flocks to show very high levels of FPD, sometimes reaching 90% or more (Pagazartundua and Warris 2006). Indoor flocks more often report levels around 10 to 15% (RSPCA 2006) - probably as the indoor bird is kept in an environment that can be completely controlled and outdoor birds are obviously outside in all weathers.

When should you take action?

Firstly, you need to establish the level of FPD incidence in your flock. This doesn't mean you have to check every single bird that is slaughtered – you can take a sample of, say, 10% of the flock and look at the feet. If your slaughterplant won't give you this information – and you don't slaughter on farm – you may need to catch some live birds to look at their feet. It is best to have someone to hold the bird while you carefully clean their feet so you can see any marks.

Try to get some idea of the severity of the problem. The picture on page one of this technical paper gives examples of feet scored for the severity of the lesion – 1 to 5 from left to right. Ideally, you only want to see scores of 1 and 2 – if you are seeing birds with score 3 or higher you must take action.

There are other scales for assessment. Some European countries use a three step scale as follows:

Score 0 = No lesions; no or very small superficial lesions, slight discoloration on a limited area, mild thickening of the skin.

Score 1 = Mild lesion; discoloration of the foot pad, superficial lesions, dark papillae.

Score 2 = Severe lesion; ulcers or scabs, signs of haemorrhages or swollen foot pads.

On this three step scale 200 feet are assessed from each flock or farm and if the farm scores more than 50 from this assessment they may face a financial penalty.

As a rule of thumb, if you can get an assessment of severity and you are seeing even one or two birds with a score of 3 or above on the five point scale – or you only have a prevalence assessment and this shows more than 50% of birds with some sort of lesion – you should take action to reduce the problem.

Reducing the incidence of FPD on the farm

Bedding management

Dry, friable bedding is crucial to minimising FPD. If you identify a problem with FPD in your flock the first thing you should do is assess your bedding management:

If you are not doing so already, make sure you top all bedding up regularly to keep it dry (a minimum of once a week is recommended). Consider switching to using wood shavings as a bedding material, as they are more absorbent than long straw and will keep the bedding drier (see 'Case study' below). If you can't get wood shavings then use chopped straw instead of long straw. If the house is on a slope try putting straw down first with wood shavings on top to help stop bedding moving and leaving bare patches.

Check drinkers regularly to make sure they are not leaking or that birds are not spilling water. Researchers have identified that farms using nipple and cup drinkers tend to experience lower levels of FPD in comparison to those with bell drinkers. You may wish to consider replacing bell drinkers in houses which consistently have high levels of FPD.

Ventilation

Good ventilation not only means that birds have fresh air but also that humidity and moisture does not build up in the house. Jones *et al* (2005) showed that ventilation and humidity had a major effect on the welfare of broilers. Where relative humidity was too low in the first week of life they found a greater risk of dehydration and uneven growth; where humidity was too high in later weeks they found higher levels of FPD.

Range quality

Wet, muddy ranging and foraging areas – especially around the pop holes or doorways into the house – can sometimes have an effect on levels of FPD (particularly during the wetter months), although there is no clear scientific evidence of this. Placing rubber mats around the pop holes – and covering excessively muddy areas with sand, wood chips or even bedding – can help to reduce problems.

Diet

Scientists don't yet fully understand everything about how diet affects the incidence of FPD but there is evidence to suggest that it plays a key role.

Methionine is an important amino acid for poultry and helps with skin healing, so a diet low in methionine may lead to higher levels of FPD. In addition, if the diet is not especially formulated to balance the essential amino acids that the birds require, then it may be overloaded with crude protein. Some feed mills simply add bulk protein on the assumption that the birds will be able to get what they need from it. However, this overloading can lead to the birds excreting excess nitrogen and loose, sticky droppings, which can make it harder to keep bedding dry and stick to the bird's feet – making them even more prone to FPD.

Anecdotal evidence from poultry farmers also suggests that some forms of soya used in chick diets can affect the gut, leading to looser droppings that can 'burn' the tender feet of the young chick in the brooding phase.

Aside from methionine and soya, research also indicates that biotin (a B group vitamin) may also have an effect on FPD, while deficiencies in zinc, copper and molybdenum may also adversely affect levels of FPD.

So what can you do in terms of dietary management?

It is important to check what is in your feed. Fishmeal is particularly high in methionine but is only permitted under Certified Animal Welfare Approved by AGW standards when it comes from sustainable sources. Full fat soya and soya expeller meal also contain reasonable amounts of methionine but bear in mind the comments on the adverse effects of soya above. It may be necessary to use synthetic amino acids to ensure a properly balanced ration.

If you experience problems with FPD, make sure your feed compounder is aware and discuss any possible changes to the ration you buy. If you mill and mix your own rations make sure your amino acid levels – and particularly your methionine levels – are adequate. Contact a poultry nutritionist if you are unsure.

If your birds' droppings are particularly loose or are sticking to the birds' feet you will need to pay even greater attention to bedding management – see above.

Summary

FPD can be a serious welfare problem for poultry and may occur in your flock without you even noticing. Aside from being a welfare indicator high levels of FPD may mean you have other problems with feed and nutrition that could be affecting the economics of production too.

As you may only have a limited influence over the birds' diet, the key approach to minimizing the potential welfare problems associated with FPD is through high levels of bedding management and, where possible, range management to reduce the amount of mud the birds are walking in.



Reducing the incidence of FPD – a case study

Sheepdrove Organic Farm produces around 90,000 organic chickens a year. All birds are processed in an on-farm abattoir, allowing instant feedback on a range of production factors – including levels of FPD.

Birds are brooded in groups of 2,000 in brooder houses with verandas to ensure birds get used to natural light. Chicks are also played recordings of sounds they are likely to hear when they go out to the field. In the brooding phase wood shavings are provided as bedding.

At 28 days old the birds are moved out to the field. Before 2008, straw was used as bedding material in the field huts and this was topped up with fresh straw as required. However, despite this regular topping up, it was hard to keep the bedding dry and FPD levels could get quite high with over 70% of birds showing lesions and a slightly smaller percentage showing severe lesions; some birds were found with ulcerated feet at slaughter.

As a result, in 2008, the poultry manager decided to bed the birds on wood shavings from placement at day old through to slaughter. The new system required around 12–14 bags of wood shavings for each 500 bird house, with more shavings added regularly –

usually about once a week, depending on the weather – throughout the birds' lives. In total, around 24 bags of wood shavings were needed to provide bedding for each group of 500 birds from four weeks old when they go out to the field to slaughter at 10–12 weeks old.

Wood shavings are more expensive than straw and using them through out the birds' lives adds approximately £120 (or around \$200) to the cost of rearing each group of 500 birds. However, the poultry manager reports that the benefits have been immense: the results from the processing site showed that there was a clear difference in levels of FPD from birds reared on wood shavings all through their lives compared to birds reared in the field on straw. The levels of FPD on the farm now run at between 5–15%, compared with previous levels of more than 70% when straw bedding was used in the past.

References

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<http://www.rspca.org.uk/servlet/Satellite?pagename=RSPCA/RSPCARedirect&pg=FarmAnimalsReportsandResources>

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Foot Pad Dermatitis in Poultry is one of A Greener World's Technical Fact Sheet range, designed to provide practical advice and support to farmers. For more information, visit agreenerworld.org.

KEYWORDS

Welfare; poultry; foot pad dermatitis (FPD); management; diet; nutrition