

# Combatting wet litter problems in poultry with enzymes

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The problem of wet litter is one that can affect poultry producers worldwide, with subsequent issues such as footpad dermatitis (FPD), breast blisters and hock burns a major concern. Not only are there significant potential financial losses from reduced end-product quality, increased infection levels and lower growth rates, but there is also now considerable attention being focused on the animal welfare implications.

The European Union (EU) Broiler Welfare Directive, in particular, has increased the pressure on producers to overcome wet litter problems, since FPD is one of the parameters for judging broiler welfare.

## A growing challenge

The challenge for poultry producers is that litter quality is a 'multi-factorial' issue, with management, building design, ventilation and bird nutrition all affecting the outcome. Small changes and attention to detail in a number of areas can together result in significant improvements. One such area to be considered is enzyme application.

## Feed enzymes as solutions

In regions where birds are fed wheat-based diets, the use of xylanase-based feed enzyme products has become widespread. By breaking down the long-chain non-starch polysaccharides (NSPs) responsible for increasing digesta viscosity and thus retaining additional water within the gut content – and a subsequent increase in excreta water content – xylanase enzymes such as Econase XT can be highly effective in reducing wet litter problems for producers.

Further reductions in FPD arise from the increased level of protein digestibility, and subsequent reduction in protein excretion, achieved following application of an effective xylanase.

The selection of the correct xylanase is extremely important in order to reliably and consistently reduce wet litter problems. To effectively reduce digesta viscosity, the xylanase selected needs to be highly effective at breaking down soluble long-chain NSPs.

It also needs to be sufficiently stable to reach the broiler small intestine in an active state, and to remain active under the conditions of the gastrointestinal tract.

## Proven improvements

An improvement in litter quality followed the application of Econase XT to wheat-based broiler diets fed from 0-42 days of age.

The results of the trial, carried out at Schothorst Feed Research in the Netherlands, showed that Econase XT significantly reduced digesta viscosity (measured at day 22) from 10.82 to 4.92 cPs (centipoise), and also significantly improved overall feed conversion ratio (FCR) from 1.747 to 1.666 ( $p < 0.05$ ).

Litter quality score (1 = poor; 10 = good) was determined between days 34 and 36 of the trial. The pens where Econase XT was fed produced a significantly ( $p < 0.05$ ) higher score of 6.69 versus 5.75 for the control, highlighting the improvement in litter quality.

## Emerging role of phytase

Whilst the effects of xylanase on wet litter have been well understood for a number of years, recent scientific trials and field trials run on UK broiler farms have highlighted the additional positive role that phytase can play in this area.

Although phytases are not typically considered in relation to litter quality, it has recently become clear that when Quantum Blue superdosing is employed, litter is drier, and a decrease in the incidence of FPD is also observed.

As previously mentioned, the cause of wet litter is multi-factorial, with issues such as an imbalance of minerals and a lack of protein diges-

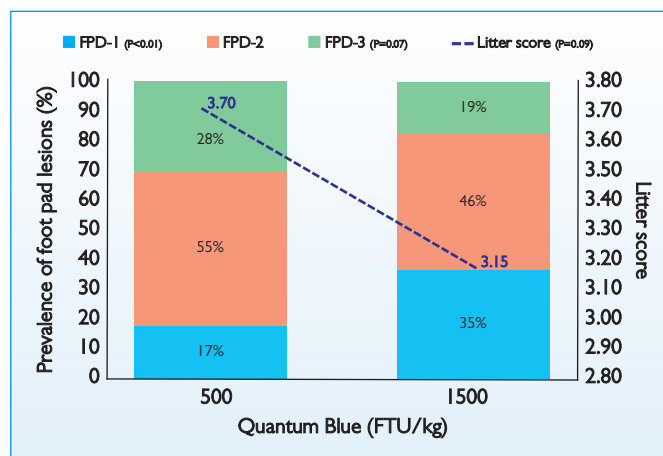


Fig. 1. The effect of Quantum Blue phytase superdosing on litter quality in 0-42 day broilers fed wheat-based diets (AB Vista, 2015). FPD-1 = no or minor foot pad lesions, FPD-3 = major lesions; litter score of 5 is poor, 1 is good.

tion leading to increased water intake and poor gut health, contributing to poor litter quality.

Minerals and protein can be bound to the phytate found in feed, making them unavailable for digestion. By breaking down the phytate with Quantum Blue superdosing (typically three to four times the standard phytase dose rate) to eliminate its anti-nutrient effects, there is an increase in protein and mineral absorption, subsequently improving litter quality. This is in addition to the three to four point improvement in FCR achieved from superdosing Quantum Blue, which comes from the breakdown of phytate.

## New trial results

Litter quality improvements with Quantum Blue superdosing have now been shown in a number of European trials. In one such trial, the use of Quantum Blue at standard (500 FTU/kg) and superdosed (1,500 FTU/kg) levels was evaluated either with (16,000 BXU/kg) or without (0 BXU/kg) Econase XT xylanase.

Quantum Blue superdosing in this trial improved body weight corrected 1-42 day FCR from 1.60 to

1.56, and increased 42 day body-weight from 3.475 to 3.547kg.

In addition, litter quality score improved and water-to-feed-intake ratio tended to be lower for birds receiving the superdosed levels of phytase. FPD incidence was reduced, with significantly more birds with clean feet in the Quantum Blue superdosed group (see Fig. 1).

Combined with growing industry recognition regarding improvements in litter quality commercially, these trials offer clear evidence of the additional gains available from this novel concept.

Quantum Blue superdosing has been shown to improve litter quality and reduce FPD on a number of UK broiler farms in addition to the scientific trials, which is a major factor for producers when selecting Quantum Blue superdosing for their feed.

For nutritionists looking to combat wet litter issues as this problem increases throughout autumn and winter, the novel concept of using phytase superdosing to improve litter quality is sure to be of interest.

Combining a further reduction in FPD over that possible with xylanase alone with significant improvements in FCR, the result is a true win-win solution. ■