A practical guide to differential diagnosis

2 – Impaired feathering/feather loss

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In poultry, feathers serve important roles in terms of protection and insulation of the body.

Whilst moulting, or renovation of older feathers by new ones, is a natural process occurring in mature layers upon completion of a laying cycle (which itself can be influenced by many factors), feather loss or impaired feathering may be indicative of other problems in the farm.

Feather-related problems in poultry can be roughly divided into two groups, either: They are not properly developed (linked)

- to feather formation) which is often related to nutrition or the presence of mycotoxins.
- They are pulled off by birds (feather pecking), which is a management-related issue.

In each case it is critical to understand the foundation of the problem so that it can be properly solved (see table right).

Stressful conditions in the barn, especially during brooding, such as heat, cold and existence of air currents, amongst others, can result in feather loss and poor feather quality in the birds. In this case, it is crucial that the behaviour and interaction of animals is observed.

Often, feather pecking and pulling can also be triggered by inadequate intake of nutrients. Due to the high protein content in feathers, higher protein levels in feed may encourage faster feather development and shedding.

Imbalance of amino acids in the feed, particularly sulphur amino acids cysteine and methionine, may cause feather abnormalities and/or rough feather appearance.

The dermotoxic effect of trichothecene mycotoxins, such as T-2 toxin and others, may also contribute to low feather quality along with other negative effects, such as oral lesions and decreased performance.

Overall, excessive feather loss or impaired feathering adversely affects feed conversion as birds have to allocate extra energy from the diet to compensate for heat loss.

As such, management, housing and nutrition should be optimised to reduce this occurrence. In terms of mycotoxins, prevention can be undertaken through the use of a proper mycotoxin risk management tool which adsorbs and/or biotransforms mycotoxins, thus eliminating their toxic effects for the animals, while guaranteeing liver and immune protection.

Biomin's Mycofix product line combines



the three strategies – adsorption, biotransformation and bioprotection – which work together to prevent the hazardous effects of mycotoxins in poultry flocks.

References are available from the authors upon request.

Check list	Corrective action
Potential cause: MANAGEMENT: Temperature of barn	
Temperature of barn.Humidity of barn.Ventilation system.	 Improve management of barn. Correct temperature, ventilation rate and humidity according to management manuals.
Potential cause: MYCOTOXINS: T-2 toxin (T-2)/Deoxynivalenol (DON)/ Other trichothecenes	
 Positive for trichothecenes in raw materials (ELISA) or feed (HPLC). Raw materials originating from supplier/region with a history of trichothecenes contamination. Histopathology: Check other target organs for trichothecenes (ex. liver, for hepatic vacuolisation). Decline in overall flock performance. 	 Check the average contamination levels. Use Mycofix at the correct dosage level. Avoid contamination of feed bins or feed/water lines by stale, wet or mouldy feed.
Potential cause: NUTRITION: Amino acid (AA) deficiency/unbalance	
 Level of Total Sulphur Amino Acids (TSAA) in diet. Ratio TSAA/Lys/Arg/Thr. AA scale at feed mill. 	 Increase level of synthetic Amino Acids (AA) in low digestible diets (high levels of by-products).
Potential cause: MANAGEMENT: Red mites	
• Presence of red mites in the barn during the night.	 Flame cages during withdrawal period. Clean egg belts during withdrawal period. Increase biosecurity level. Use plastic egg belts whenever possible.
Note: Pathogene were excluded from the table due to space constraints but may be important to consider	