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Nutritional causes of wet litter in broilers

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This issue explains how nutrition can contribute to wet litter by increasing water intake and water excretion and examines six dietary factors that commonly alter water balance in broilers.

Wet litter ultimately means that more water is reaching the litter than can be removed. House temperature, ventilation, drinker management, and litter condition determine how quickly that water disappears, but nutrition can determine how much water arrives in the first place. From a nutritional perspective, therefore, the important question is not simply why the litter is wet, but why birds are drinking more water or excreting more of it. A formula can support acceptable growth and feed conversion while still increasing water turnover enough to damage litter quality. This is why the diet should be examined even when no obvious loss in performance has appeared.

Broilers excrete urine and feces together through the cloaca, making it difficult to distinguish excessive urinary water from increased fecal moisture under commercial conditions. The same wet dropping may therefore reflect greater drinking and renal output, poorer intestinal water recovery, or water retained within the digesta. More than one mechanism may operate at the same time. Nutrition can influence both through changes in electrolyte intake, nitrogen excretion, poorly digested nutrients, and intestinal water movement. The practical task is to trace the additional water through the complete formula, including contributions from raw materials, supplements, additives, and drinking water. Six dietary areas provide the most useful starting points.

Check sodium intake

Sodium is one of the first nutrients to examine when water consumption increases unexpectedly. Birds regulate body sodium concentration partly by adjusting water intake and renal excretion, so excess dietary sodium stimulates drinking and increases the amount of water that must subsequently be excreted. Total sodium supply should be considered rather than only the amount deliberately added as salt or sodium bicarbonate, because feed ingredients, mineral sources, additives, and drinking water may all contribute sodium. Even when dietary sodium remains within an acceptable range, an unintended increase can increase water turnover and litter moisture.

Consider potassium as well

Potassium receives less attention than sodium, but it can also have a substantial influence on water consumption. Protein-rich ingredients, particularly some vegetable protein sources, can contribute considerable amounts of potassium, so changes in ingredient composition can alter dietary potassium even when the mineral premix remains unchanged. Higher potassium intake increases the electrolyte load that must be regulated and can increase water intake and excretion. This is one reason dietary electrolyte balance should be considered as a property of the complete formula rather than simply as a sodium or potassium specification alone.

Avoid excessive crude protein

Protein retained as body tissue contributes to growth, whereas protein supplied beyond requirements must be metabolized and its nitrogen excreted, primarily as uric acid. Excreting this additional nitrogen still requires water. Unnecessary protein intake can therefore increase water consumption and excreta moisture. Balancing crude protein while maintaining adequate amino acid supply can reduce both. The objective is not minimum crude protein but avoiding nitrogen the bird cannot use productively.

Control poorly digested carbohydrates

Certain non-starch polysaccharides (NSP) can increase digesta viscosity and interfere with digestion and intestinal water movement. They can retain water within the intestinal contents, while reduced digestion increases the substrate reaching the lower intestine and may aggravate intestinal disturbances. The effect depends strongly on ingredient type and NSP composition, so cereals and coproducts are not interchangeable simply because their calculated energy and protein values appear similar. Before considering enzyme use, first understand the carbohydrate characteristics of each individual ingredient.

Watch poorly absorbed minerals

Mineral salts that remain dissolved and incompletely absorbed can increase osmotic pressure and retain water within the intestinal tract. Excessive magnesium and sulfates may increase water output through an intestinal osmotic effect and, depending on their source and concentration, greater water intake and excretion. The problem need not reach conventional toxicity before litter quality is affected. A mineral concentration may have little visible effect on growth but still increase excreta moisture. Growth performance alone cannot therefore dismiss minerals as a cause. Total supply from ingredients, supplements, and drinking water should be considered when wet litter appears.

Examine feed quality

Feed quality can also affect litter moisture by disrupting normal intestinal digestion and absorption. Anti-nutritional factors, poorly processed ingredients, excessive indigestible material, oxidation, or contaminants can impair digestion or disturb the intestinal lining. When intestinal function deteriorates, normal water recovery becomes less efficient. In fact, more water, mucus, and undigested material may appear in the excreta. This may produce diarrhea even when no infectious disease is involved. Feed quality becomes particularly relevant when wet litter develops following the arrival of a new batch of raw materials.

In Brief, wet litter is fundamentally a water-balance problem. Excess sodium and potassium increase water turnover, excess protein increases nitrogen excretion, viscous soluble NSP and poorly absorbed carbohydrates or minerals retain intestinal water, and poor feed quality impairs water recovery. The nutritional investigation should determine whether the diet increased drinking, renal excretion, intestinal water loss, or some combination of them.

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