Poultry News
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from the team at AgriHealth

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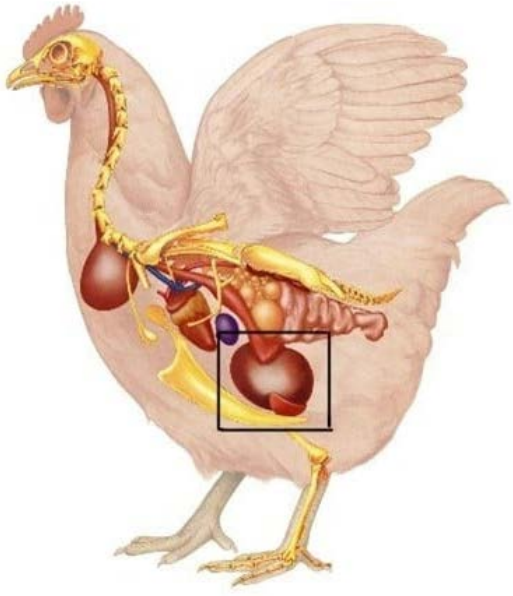
Gizzard Erosions

Gizzard erosions refer to pathological changes in the koilin layer lining the poultry gizzard. This part of the digestive tract is crucial for grinding and mechanically processing feed before it reaches the intestines. Erosions range from mild discoloration or superficial sloughing to deep ulceration and bleeding. These lesions may appear in both young chicks and older birds and often go unnoticed during routine flock management. The consequences on bird health and performance can be significant, necessitating a closer look at their causes, impact, and control.

1. What Causes Gizzard Erosions? An In-Depth Look

1.1 Congenital Factors Before Hatch

Some gizzard erosions can originate even before chicks hatch. The health and nutrition of breeder hens have a direct impact on the gastrointestinal development of the embryo. Research has shown that deficiencies in breeder diets, particularly of key vitamins (A,E, B2, B6, B12, D3) and trace elements (Selenium, Zinc, Manganese, Iron) can predispose chicks to weakened gizzard linings. Older breeder age is another factor associated with reduced chick vitality and a higher risk of gizzard lesions. Additionally, capillary fragility in combination with transient blood pressure spikes during hatching may contribute to gizzard haemorrhaging and subsequent erosion.



1.2 Starvation and Early Feed Deprivation

Feed and water deprivation in the first few days post-hatch significantly increases the incidence of gizzard erosion. The stress of starvation causes both physiological and structural changes in the digestive tract, weakening the protective koilin layer of the gizzard. Even in older broilers, intermittent fasting or feed withdrawal can induce similar erosive damage, highlighting the importance of continuous and early feeding programs.

1.3 Feed Structure, Particle Size, and Fibre Content

Feed composition and texture play an essential role in maintaining gizzard health. Grain-eating birds such as chickens and turkeys naturally ingest grit, which supports the mechanical grinding function of the gizzard. In commercial diets, inclusion of coarse particles (>1mm) has been shown to promote stronger gizzard musculature and healthier lining. Pelleted feed, while efficient, can reduce gizzard activity, especially when birds lack access to litter. Including non-soluble fibre can offset this and encourage natural grinding behaviour, helping to maintain a robust koilin layer.

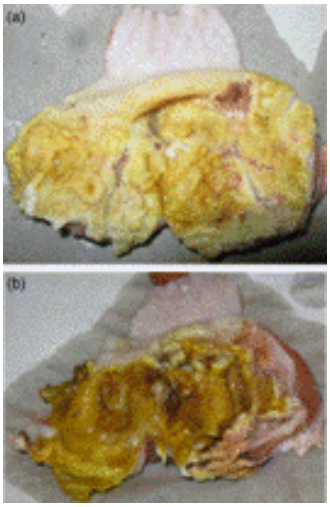
1.4 Nutritional Deficiencies and Imbalances

Nutrient deficiencies are a common but often overlooked contributor to gizzard erosion. Vitamin E deficiency, for instance, is linked to oxidative stress and tissue damage, particularly when diets are rich in unsaturated fatty acids. Vitamin B6 deficiency, often related to methionine shortage, has also been implicated. Supplementing with methionine or its derivatives, such as taurocholic acid, has been found to alleviate such lesions. Therefore, close attention to amino acid balance and vitamin fortification is critical in both breeder and grower diets.

1.5 Toxic Compounds in Feed

Certain feed ingredients, especially those exposed to heat during processing, can become harmful. Gizzerosine, a compound formed from lysine and histidine in overheated fish meal, is known to stimulate acid hypersecretion in the proventriculus, leading to erosions in the gizzard. Mycotoxins like fumonisins, deoxynivalenol (DON), and T-2 toxins, even at low levels, can cause irritation, inflammation, and lesions in the digestive tract. These toxins can accumulate in improperly stored feed and should be monitored using regular lab analyses and mitigated through use of effective toxin binders. Lesions can be also found in the mouth, which provides a good way for a differential diagnose.

1.6 Infections and Microbial Involvement



Fowl Adenovirus* (FAdV)** is one of the most common infectious agents linked to gizzard erosions, particularly serotype 1 of FAdV-A. This virus can be transmitted both vertically from breeder hens and horizontally within broiler houses. Infected birds may show poor weight gain, reduced uniformity, and in severe cases, clinical signs like inclusion body hepatitis or hydropericardium syndrome. ***Clostridium perfringens has also been implicated, especially in young chicks under four weeks old. A notable outbreak in Germany affected 22 broiler flocks, all traced back to one breeder source, reinforcing the importance of monitoring both breeder and broiler health.

1.7 Mechanical Damage from Litter Conditions

Poor litter quality can physically contribute to gizzard trauma, particularly in combination with dietary or infectious stressors. Litter that is too coarse, dusty, or contaminated with sharp materials can indirectly affect feed intake or cause systemic stress that predisposes birds to gastrointestinal issues, including gizzard erosion. Maintaining clean, dry, and friable litter is a foundational step in preventing mechanical injuries and supporting overall gut health.

2. Consequences on Bird Health and Growth

Gizzard erosion affects more than just the digestive organ — it can undermine the bird's overall performance and welfare:

- **Reduced feed intake:** Birds with gizzard discomfort eat less, affecting energy and protein intake.
- **Impaired digestion:** The gizzard's grinding function is compromised, reducing nutrient utilization and gut motility.
- **Poor growth rates:** Energy diverted to inflammation and repair leads to stunted weight gain.
- **Higher feed conversion ratio (FCR):** More feed is needed to achieve the same weight, lowering profitability.
- **Increased morbidity and mortality:** Severe cases can cause bleeding, secondary infections, or death.
- **Flock unevenness:** Affected birds lag in growth, leading to processing challenges and economic losses.

3.Diagnostic Tools

Accurate diagnosis is essential for effective intervention. A combination of the following approaches is recommended:

Post-mortem necropsy:

Direct observation reveals **ulcers, erosions, necrotic patches, or hemorrhages** on the gizzard lining, often at the koilin layer.

Normal gizzard

Mild errosion

Moderate ulceration

Severe ulceration

Histopathological examination:

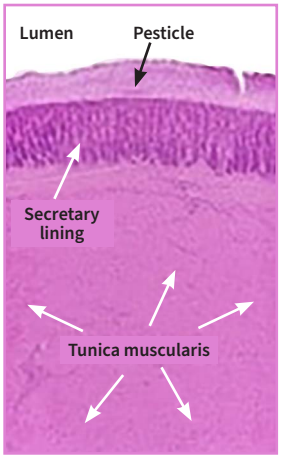
Tissue sections show **epithelial necrosis, hemorrhage, inflammatory cell infiltration**, and in some cases, **fibrin deposition**.

Mycotoxin testing:

Laboratory assays (e.g., ELISA or HPLC) can detect toxic metabolites in feed samples and identify specific contaminants. Assess feed for fumonisins, DON, CPA, and T-2 toxins.

Microbiological and viral testing:

PCR, culture, or serology to confirm **viral or bacterial involvement**, especially when clinical signs suggest a systemic issue.



Histology of the gizzard

Feed and ingredient analysis:

Assessing the **nutrient composition, oxidation levels of fats**, and **additive concentrations** can pinpoint nutritional causes.

4. Key Actions by Category

Category	Actions
Nutrition	Supplement vitamins (E, B6), manage methionine and fatty acid levels
Feed Management	Use coarse particle size, include insoluble fibre, ensure feed quality
Toxin Control	Apply toxin binders; avoid overheated fish meal
Biosecurity	Prevent FAdV spread; clean/disinfect facilities thoroughly
Diagnostics	Use PCR, histology, & feed analysis to monitor
Breeder Management	Optimize breeder diets & monitor hatchery health
Vaccination	Consider if vertical transmission of adenovirus is confirmed

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