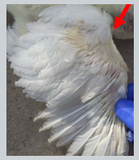
LESIONS ASSOCIATED WITH POSSIBLE MYCOTOXIN CONTAMINATION

EXTERNAL APPEARANCE: FEATHERING

Normal feathering



Abnormal feathering

- Feathering issues can be caused by stress, environmental management, external parasites, behavioral problems, mycotoxins and improper nutrition.
- *Fusarium* mycotoxins: trichothecenes (T-2), deoxynivalenol (DON) and diacetoxyscirpenol (DAS).
- Decreased production and performance and increased condemnations from scratches.

NECROPSY FINDINGS: ORAL CAVITY

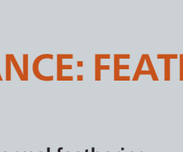
Mouth lesions/erosions
0 = Absent 1 = Present

- Assess around the beak region, hard and soft palates, under the tongue and esophagus
- Characterised as: mild, moderate or severe
- Mycotoxins, feed particle size (>20% fines), high concentration in feed or water with organic acids, copper sulfate ($CuSO_4$)
- Mycotoxins such as trichothecenes (T-2) and Deoxynivalenol (DON)
- Decreased production and overall performance

To assess, wipe feed & debris off

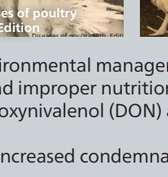
Normal oral Cavity

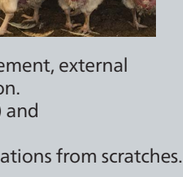
Mild oral lesions



Moderate oral lesions

Severe oral lesions





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GIZZARD EROSION SCORES AND PROVENTRICULITIS

Gizzard lesions +/- proventriculitis causes can be due to: viral pathogens (adenovirus I, IBDV), mycotoxins, biogenic amines, rancid fats, high concentration copper sulfate ($CuSO_4$)

Fusarium mycotoxins: trichothecenes (T-2) and deoxynivalenol (DON)

Examine the gizzard (ventriculus) for signs of inflammation and ulcerations

0 = Absent, normal koilin lining, smooth surface
1 = Rough koilin, no ulcers present
2 = Superficial erosions that don't extend into the mucosal surface; hyperemia may be present
3 = Erosions that extend into the mucosal surface; hemorrhage is present

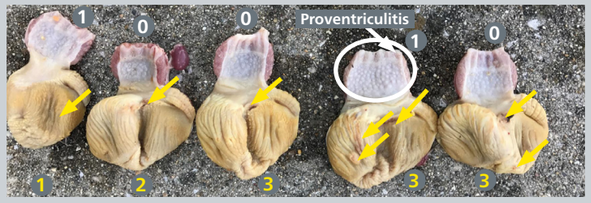
Examine the proventriculus for signs of inflammation

0 = Normal size of proventriculus and glands
1 = Proventricular enlargement and glandular hypertrophy
2 = Edema, flabby gizzard with marked proventricular enlargement, glandular hypertrophy
3 = Loss of gizzard tone, severely hypertrophied and edematous glands, severely enlarged proventriculus

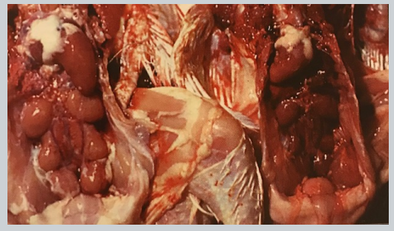
To assess: Wipe feed/debris off, may be confused with lesions.

Normal gizzard and proventriculus (0)

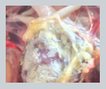
Proventriculus and affected gizzards with sores



ANOTHER ORGAN AFFECTED: KIDNEY



- Kidney lesion causes can be due to: viral pathogens (IBV), dehydration, mycotoxins and nutritional imbalance (Na, Ca, vitamin, D3)
- Ochratoxins, oosporein, citrinin and aflatoxins can impair renal function.



OTHER ORGANS THAT CAN BE AFFECTED: LIVER

Pale to tan-yellow liver, petechial hemorrhages, increased fragility

- Liver lesion causes can be due to viral pathogens, mycotoxins, nutritional imbalance (fats, protein and carbohydrates) or hormonal imbalance (estrogen).
- Aflatoxins (very hepatotoxic), fumonisins, trichothecenes, rubratoxins, ochratoxins, among others, can affect hepatocellular function.
- Other signs associated with aflatoxicosis are: innapetance, anemia, loss in egg production, increased liver condemnations, increased bruising, hemorrhage, impaired immunity and increased susceptibility, decreased production and decreased overall performance.

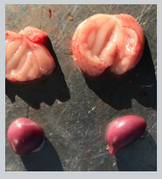
Normal liver

Abnormal liver

IMMUNE SYSTEM

- Immunosuppression causes can be due to viral pathogens, mycotoxins, nutritional imbalance and environmental stressors.
- Aflatoxins, fumonisins and trichothecenes, among others, can affect immune status and lead to immunosuppression.
- Mycotoxins have an effect on cell membrane integrity, cell proliferation and cytokine response. Immunosuppression signs can be associated with vaccine programme. failure, uniformity issues, increased susceptibility to viral and bacterial infections, decreased production and decreased overall performance.

Active immune response in the bursa



Bursa and spleen

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How do I know there is a problem?

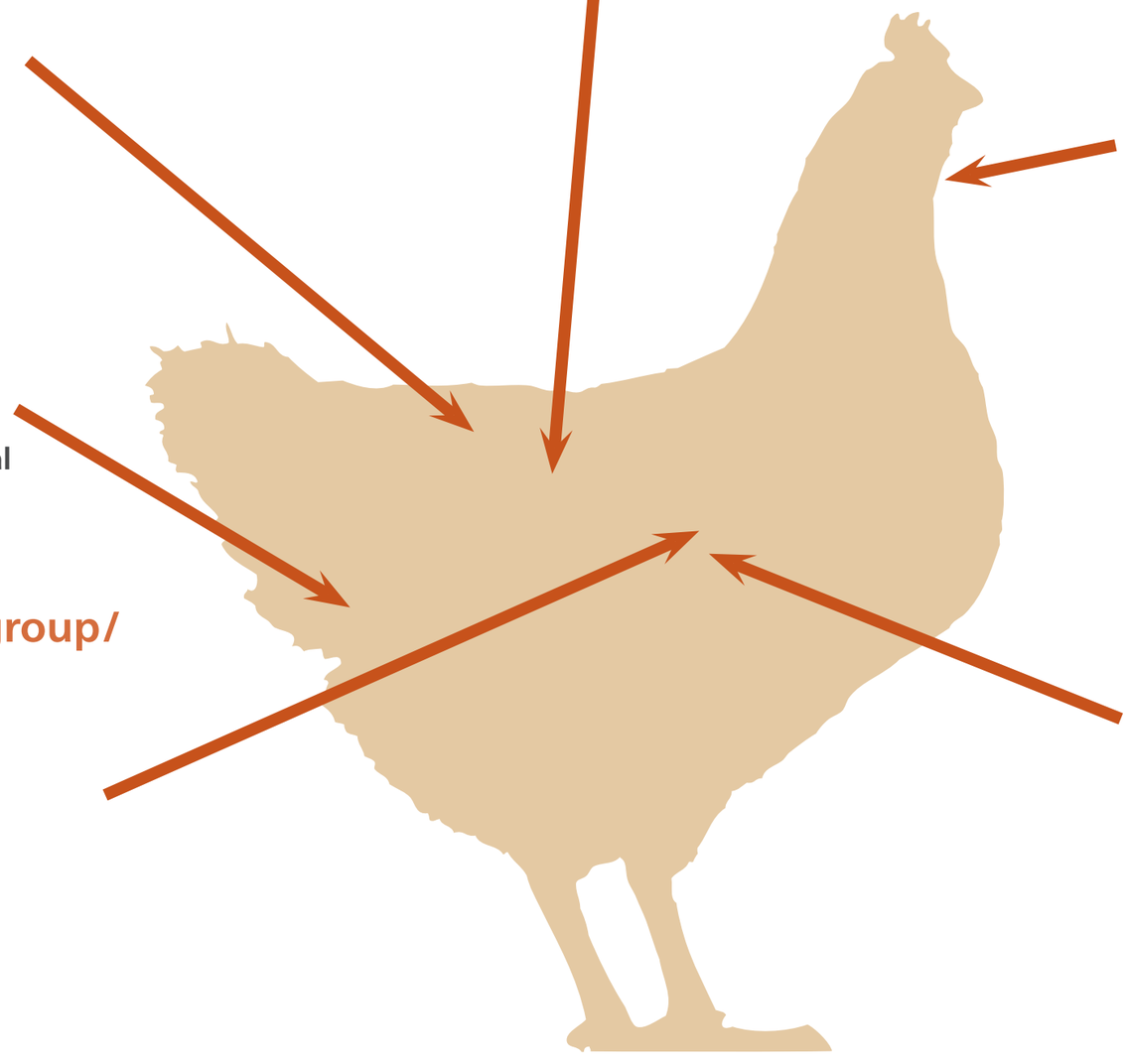
Increased demands on animal performance brings new challenges and risks to today's livestock operations. Mycotoxins – and their impact on the health and performance of animals are inherently linked to these demands, and if left untreated, can pose a significant threat to animal productivity and farm profitability.

Ochratoxins/citrinin/ penicillic acid:

Kidney damage
Uric acid crystals in kidneys (gout) and joints
Increased water consumption/wet litter

Aflatoxins/zearalenone/DON group:

Poor fertility
Early embryonic mortality
Poor hatchability



T-2 group/DON group:

Gizzard erosions
Oral lesions: ulcers and plaques
Reduced feed intake

Aflatoxins/DON group/ T-2 group/fumonisins:

Damage to gut integrity
Decreased villus height and surface area
Poor intestinal digestion and absorption
Undigested feed particles in feces
Diarrhea
Necrotic enteritis/cocci infection/bacterial infections

Aflatoxins/ochratoxins/ fumonisins:

Liver damage
Liver enlargement
Fatty liver
Bile duct hyperplasia

Aflatoxins/ochratoxins/T-2 group/ DON group:

Poor antibody production/vaccine titers
Poor cell-mediated immunity
Altered cytokine profile
Increased mortality

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