

MYCOTOXIN LESIONS

IN THE SLAUGHTERHOUSE



Introduction

The main problem with mycotoxicosis in pigs is that in most cases this intoxication occurs gradually. Pigs will ingest subclinical amounts of the toxin for a prolonged period of time, affecting their health status. The manifestation is a growth reduction and poor performance. The analysis of mycotoxins in feed previously consumed by the animals is normally the method used to establish a relationship between the lesions observed in the slaughterhouses and mycotoxins. A problem with this method is that the contaminated feed could have been consumed in the early stages of production and is no longer available for analysis. Another problem is the possibility that the feed analyzed is not the one causing the clinical symptoms.

This guide will help to associate lesions detected at the slaughterhouse with the mycotoxins identified in feed analysis. In addition, this brochure will help to evaluate the effectiveness of the preventative measures adopted to control the contamination of grains, feed and silos. A key factor in the control of mycotoxicosis is establishing a good diagnosis capable of showing both the presence and the severity of the lesions. The examination of gross lesions is routinely performed in animals at the slaughterhouse. Table 1 shows the lesions that can be caused by mycotoxins. The routine review of organs can be adjusted to each company's schedule to be performed monthly or twice a year. A minimum of 45 animals must be examined per session. Tissue samples of lesions should be taken for histopathology. The spleen is an important organ of the immune system so it should always be included in the evaluation.

Evaluation of lesion

Organ		Cause
Oral Cavity	Ulcers, necrosis	
Stomach	Ulcers, epithelial desquamation, damaged pars esophagi, and hemorrhages.	
Esophagus	Ulcers, epithelial desquamation, and hemorrhages.	T-2 toxin
Intestines	Hemorrhages	
Spleens	Size reduction, whitish coloration, and low organ activity (low immunity).	
Lung	Interlobular and mediastinal edema. Hypertrophy.	Fumonisin
Liver	Acute cases: Hepathosis (degenerative process), hepathomegaly, and friable. Chronic cases: Hard to the touch, cirrhosis, fibrous tissue (whitish spots). Pale or grayish color.	Aflatoxin
Stomach	Ulcers	
Spleen	Size reduction, grayish or whitish color, and low activity (low immunity)	
Esphagus	Epithelial desquamation, and ulcers.	
Stomach	Epithelial desquamation, lymphoid reaction, damaged pars esophagi, and ulcers.	Vomitoxin
Skin	Ear necrosis, hoof necrosis, and tortuous blood vessels	Ergotoxins
Kidney	Nephrosis, hypertrophy, whitish spots in surface. Cysts.	Oshastaria
Spleen	Size reduction, grayish or whitish coloration (low immunity)	Ochratoxin
Uterus	Hydrometra, hyperthrophy	
Ovary	Cysts	Zearalenone
Vulva	Vulvovaginitis	

Oral cavity, esophagus, stomach, and intestinal lesions

They are usually observed as irritations with a reddish color or whitish plaques. Localized in the tongue and palate, they can reach the esophagus, stomach and intestines depending on the severity. In severe cases there is epithelial necrosis and desquamation. This lesion, caused by T-2 toxin is seldom observed because animals normally die as a result of the severity of the injuries.

Whitish plaques

Esophagus. Irritation and whitish plaques

Epithelium detachment

Intestinal hemorrhages

Stomach lesions

The lesions vary from irritation, desquamation of the epithelium, mucous exudate, lymphoid reaction, metaplasia, parakeratosis, ulcers, and damage in pars esophageal.

Causes

- Aflatoxins (ulcers)
- Vitamin E deficiency (ulcers)
- Prolonged fasting (irritation, ulcers).
- Vomitoxin (lymphoid reaction, metaplasia)
- Inflammatory processes (presence of mucous exudate)
- T-2 toxin (irritation, lymphoid reaction, metaplasia, damage in pars esophageal, ulcers)
- Variations in granulometry (lymphoid reaction, metaplasia, irritation, ulcers, damage in esophageal pars)

The spleen is an important organ that reflects the immune status of the animal. Erythrocytes and defense cells are produced in the spleen. Atrophy is an indication of low immunity and an inactive spleen, sometimes also with grey or whitish coloration. An enlarged spleen suggests an active septicemic process.

Spleens diminished in size, in cases of poisoning with T-2 toxin, aflatoxins or ochratoxins.

Enlarged (splenomegaly) in infectious septicemic processes.

Liver lesions

The lesions present vary from paleness, jaundice with abnormalities in biliary pigments, irregular whitish spots, and hard to the touch consistency (fibrosis, cirrhosis). Also, severe congestion, reddish color, and friable to the touch (acute hepathosis) are present. Histopathology will help to establish a definitive diagnosis, since aflatoxins cause proliferation of the bile ducts.

Causes

- Aflatoxins. In an acute process, reddish and friable livers will be observed. Chronic process cause pale and fibrous livers, hard to the touch, and whitish spots.
- Vitamin E deficiency. Dietary hepathosis, friable and diffuse reddish spots are present in a septicemic process.
- Bacterial infections. Depending on the type of bacteria present, there may be abscesses. The organ is whitish and friable if it is an acute septicemic process and hard to the touch with fibrosis when the process is chronic.
- Viral infections. In acute processes the organ is reddish and friable. In chronic cases the liver is hard to the touch, and shows cirrhosis.
- · Miscellaneous intoxications. Severe hepatosis and degenerative changes are detected in the hepatocytes.

Chronic process: fibrosis, cirrhosis, and diffuse whitish spots

Acute process: congested, friable Fibrosis

Pale, cirrhotic, diffuse whitish spots, hard tothe touch

Kidney lesions

Widespread whitish spots, paleness, cysts of different sizes and shapes, enlargement, and nephrosis can be present. Histopathology will help us obtain an accurate diagnosis.

Causes

- Ochratoxin. Whitish coloration, swelling, enlargement, icteric appearance
 and the presence of cysts
- · Leptospirosis. Widely spread whitish spots
- Porcine circovirus. Enlarged and friable
- Hepatitis. Generates yellowish color in the kidneys due to variation in the concentration of biliary pigments
- · Congenital cysts. Embryonic problems that tend to disappear shortly after birth

White spots Increase in size

Cysts of different sizes and shapes

Cysts Cysts and repaired tissue

Lung lesions

The principal lesion is the presence of interstitial or interlobular edema, which is related to intoxication with fumonisin. Porcine circovirus 2 also causes this type of edema, but interstitial pneumonia is also present. Histopathology will allow a definitive diagnosis.

Lesions in the reproductive tract

Hydrometra, cysts in ovaries, and hypertrophy. In order to obtain a final diagnosis, other organs must be examined to rule out a possible vitamin E deficiency that may influence fertility and cause a hormonal imbalance.

Causes

- Vitamin E deficiency. Infertility problems
- · Zearalenone. Hydrometra, enlargement of the uterus and presence of cysts in the ovaries
- Hormonal imbalance showing ovaries with presence of corpora lutea, cysts, hemorrhagic or atresic bodies in great quantity

Cysts

Hydrometra and corpora lutea

Enlargement of the uterus

Hydrometra

In conclusion, mycotoxins are products of fungal metabolism that may be contaminating the grains without the pig producer having knowledge. The rapid recognition of the lesions and clinical signs suggestive of mycotoxins intoxication, can represent a big difference in terms of the final effect that this type of intoxication can have on the performance and profitability. A recognized problem of contaminated rations can be more easily controlled before it causes irreversible damage to the swine population. The support of diagnostic techniques, such as slaughterhouse monitoring, should be used whenever possible.

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