

CONTRIBUTION TO THE SAFETY OF MEAT RABBIT WITH THE DETECTION OF AFLATOXIN B1 IN BALANCED FOOD FOR RABBITS

**GARCÍA SEGURA F*., VILLARREAL ESPINO BARROS O.A.,
HERNÁNDEZ HERNÁNDEZ J., BECERRA CASTRO E.**

Facultad de Medicina Veterinaria y Zootecnia
Benemérita Universidad Autónoma de Puebla.

*Corresponding author: sersocialflorencia@hotmail.com

ABSTRACT

The aim of this project was to detect the B1 Aflatoxin, in balanced food for rabbits, distributed by different commercial brands, using as method of investigation the chromatography in fine layer, by means of the use of acetonitrilo to obtain the substratum of the food. Once prepared one preceded the plate, it was immersed in a mixture of 98 ml of Tetrachloride of Carbon (CHCl_3) + 2 ml of Methanol (Ac_2O). It was done by the ascending method, this allows that the thinner ascend for the plate almost vertically for the action of capillarity. The plate was revealed by a lamp of ultraviolet light to a wave of excitation of 254 nm.

Observing the plate, the results obtained in the first 6 points, the B1 aflatoxin appeared since they were exposed to different concentrations of B1 aflatoxin, in order that they were serving us as witnesses and in the last three points that correspond to our samples there was not the B1 aflatoxin.

Therefore, our results were negative to B1 aflatoxin for three different commercial brands of balanced food for rabbit that were analyzed.

Key words: Aflatoxin, balanced food, rabbit, chromatography in fine layer, ultraviolet light.

398



V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural,
Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

Introduction

It is mentioned in some studies that rabbit meat is a meat lower levels of mycotoxins because the food is balanced primarily forage and lipids, starches are substrates for fungal growth, and the possibility of its presence is low and sometimes null. But there are few studies to investigate the safety, and order to verify the absence of contamination by mycotoxins in this species, this study aimed to conduct a study to determine the state of Aflatoxin B1 contamination in feed in using different proprietary chromatography method thin layer for detection (DIRECTIVE 2002/32/EC).

Aflatoxins are secondary metabolites produced by some of the *Aspergillus* species that grow in food products, and which in turn consumption can affect the metabolism of almost all living things. the Aflatoxins are considered as the most potent carcinogen produced in nature and are also considered mutagenic agents, teratogenic and hepatotoxic for many living species including both humans and animals, so we need to be protected maximum consumption or contact with these mycotoxins (Mariscal 1997 Q. Jaime Cornejo, 2004).

Aflatoxins have been associated with various diseases, such as aflatoxicosis in livestock, domestic animals and humans. the Aflatoxins have received more attention than any other mycotoxicosis due to its potent carcinogenic effect, which was found in susceptible laboratory animals and their acute toxicological effects in humans human (primary liver cancer) (Avila. 2000).

There are four major aflatoxins: B1, B2, G1, G2. Aflatoxin B1 is the most potent agent among all carcinogenic aflatoxins; most available toxicological data related to Aflatoxin B1 (Alberto G., 2009).

Objective

Determined by thin layer chromatography the feed for rabbit, different brands in the region are contaminated by aflatoxin B1.



UAEM Universidad Autónoma del Estado de México

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
 Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

Justification

In rabbits mentioned that rabbit meat is the healthiest because it has not klenbuterol and mycotoxin-free food is still the most reliable in meat products for this reason this research was designed to determine the level of contamination by aflatoxin B1 in commercial rabbit feed.

Materials and methods

The method is based respecting Mexican Official Standard NOM-188-SSA1-2002 PRODUCTS AND SERVICES. AFLATOXINS IN CONTROL GRAINS FOR HUMAN AND ANIMAL CONSUMPTION. SPECIFICATIONS HEALTH. (5).

We went to commercial establishments located in Tehuacan Puebla, to buy 5kg bags of rabbit feed, in order to collect the amount of different trademarks that offer balanced rabbit feed.

400



Figure 1. Local Animal Food Markets.

In our gathering we obtained different trademarks; NUTREL, PABSA and PURINA. Following the collection of the samples was carried out to prepare to do the technique of thin layer chromatography.



Congreso Americano de Cunicultura 2014



SAGARPA
 SECRETARÍA DE AGRICULTURA,
 GANADERÍA, DESARROLLO RURAL,
 PESCA Y ALIMENTACIÓN



COMECYT
 CONSEJO MEXIQUENSE DE CIENCIA Y TECNOLOGÍA



UAEM Universidad Autónoma del Estado de México

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
 Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

Sample Preparation

The samples were ground until they were fully powder 50 g was weighed. of each sample and ground, they added 200 ml acetonitrile as a solvent, perfectly mixed, and the mixtures were filtered to obtain the extracts. This procedure was repeated exactly in triplicate and the three samples of each food.

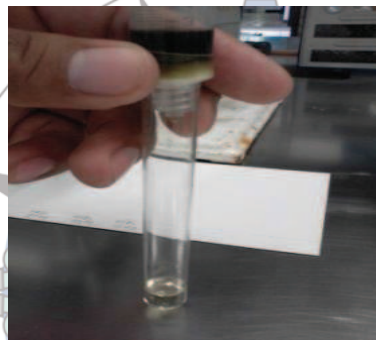


Figure 2. Samples of feed and filtrate

401

Preparation of plates

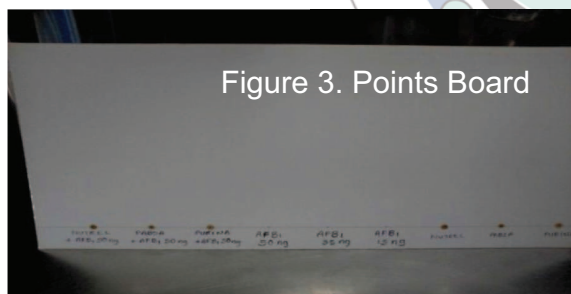


Figure 3. Points Board

On each plate we proceeded to make a line on the bottom line and divide by 9 points, as shown in the picture. The nine points were identified

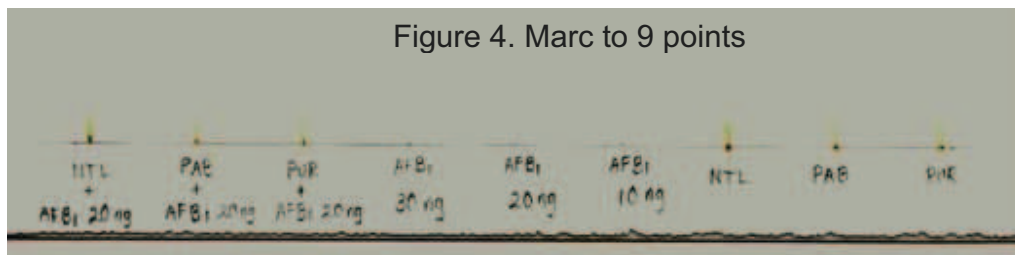


Figure 4. Marc to 9 points



Congreso Americano de Cunicultura 2014



SAGARPA SECRETARÍA DE AGRICULTURA, GANADERÍA, DESARROLLO RURAL, PESCA Y ALIMENTACIÓN



COMECYT CONEJO MEXICANO DE CIENCIA Y TECNOLOGÍA



UAEM Universidad Autónoma del Estado de México

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
 Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

At points 1, 2 and 3 are placed with a micro syringe extract Nutrel sample of Purina + Pabsa and 20 ng of aflatoxin B1 respectively. In paragraphs 4, 5 and 6 were placed with a micro syringe 30 ng, 20 ng and 10 ng aflatoxin B1 respectively.

In paragraphs 7, 8 and 9 are placed with a micro syringe extract Nutrel sample of Purina Pabsa and respectively.



402

Figure 5. Application to board balanced food

Once prepared, it was plaque proceeded to immerse into a mixture comprises from 98ml of carbon tetrachloride (CHCl_3) + 2 ml of methanol (Ac_2O) was performed by the rising method, that is to allow the diluent ascend plate almost vertically by capillary action.

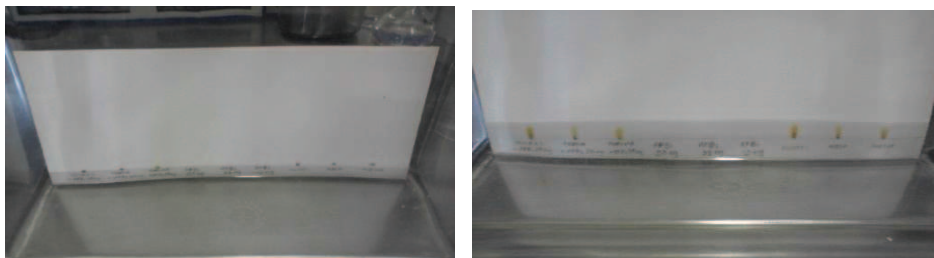


Figure 6. Plates immersed in CHCl_3



Congreso Americano de Cunicultura 2014



SAGARPA
 SECRETARÍA DE AGRICULTURA,
 GANADERÍA, DESARROLLO RURAL,
 PESCA Y ALIMENTACIÓN



COMECYT
 CONSEJO MEXIQUENSE DE CIENCIA Y TECNOLOGÍA



UAEM Universidad Autónoma del Estado de México

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

Read plates Subsequently the plates get thinner, the reading was done by developing the ultraviolet (UV) at an excitation wavelength of 254 nm.

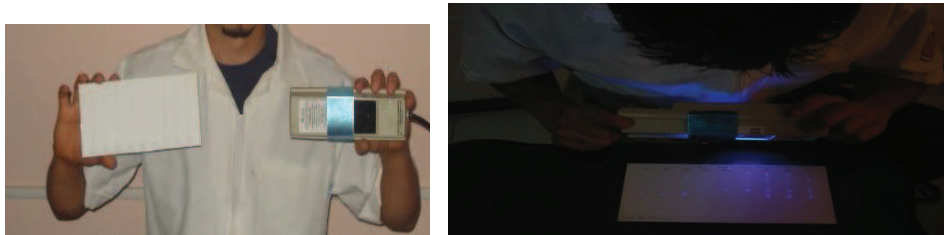


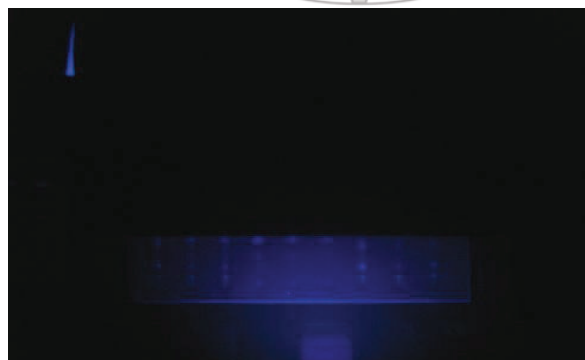
Figure 7. Revealed plates with ultraviolet light

The development was carried out in a dark room watching aflatoxin B1, which is in our interest, which is observed in a blue color.

Results

Looking at the plate have resulted in the first 6 points, ran aflatoxin B1, as these points were exposed to concentrations of aflatoxin B1 and the last three points correspond to our samples, ran no aflatoxin. Therefore, our result is negative for the different Aflatoxin B1 trademarks of balanced rabbit food analyzed thin layer chromatography.

403



Congreso Americano de Cunicultura 2014



SAGARPA
SECRETARÍA DE AGRICULTURA,
GANADERÍA, DESARROLLO RURAL,
PESCA Y ALIMENTACIÓN



COMECYT
CONSEJO MEXIQUENSE DE CIENCIA Y TECNOLOGÍA

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
 Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

POINT				CONTAINS				RESULTS
1	Nutrel	+	20	ng	of	Aflatoxin	B1	Positive
2	Pabsa	+	20	ng	of	Aflatoxin	B1	Positive
3	Purina	+	20	ng	of	aflatoxin	B1	Positive
April	30		ng	of	aflatoxin	B1	Positive	
May	20		ng	of	aflatoxin	B1	Positive	
June	10		ng	of	aflatoxin	B1	Positive	
7				Nutrel				Negative
8				Pabsa				Negative
9	Purina							Negative

SPECIES (µg / kg) micrograms / kg									
		SHEEP	GOAT	CHIKEN	PIG	MILK BOVINE	MEAT BOVINE	TERNE RAS	RABBITS
LATIN AMERICANA	El Salvador	20	20	20	20	20	20	–	?
	Chile	10	30	30	10	10	30	–	?
	Colombia	–	–	20	50	50	50	–	
	MEXICO	–	–	–	200	–	200	–	?
	NORMA OFICIAL MEXICANA NOM-188-SSAI-2002	–	–	100 Excep to pollos de engorda	25-45 kg. 100 Mayor 45 kg. 200	–	Maduros destinados a reproductores 100 De engorda en etapa de finalización 300	–	?

Figure 9. Results and revealed

V CONGRESO AMERICANO DE CUNICULTURA, MÉXICO 2014

Facultad de Medicina Veterinaria y Zootecnia, Asociación Científica Mundial de Cunicultura – Rama Americana
Secretaría de Desarrollo Agropecuario del Gobierno del Estado de México, Secretaría de Agricultura, Ganadería, Desarrollo Rural,
Pesca y Alimentación, Consejo Mexiquense de Ciencia y Tecnología

Discussion

The above table shows that there are no studies of aflatoxin B1 in food for rabbits, for that reason this study was conducted, and rabbit meat is an alternative for human consumption.

Conclusion

According to the rules, regulations and consulted research made reference to the concentration of aflatoxin B1 in balanced feed for rabbit, it is concluded that Nutrel, Pabsa and Purina brands, which were analyzed by the method of thin layer chromatography are free of aflatoxin B1.

Bibliography

AVILA. Organic Chemistry: Experiments with an ecological approach. UNAM, 2000:
<http://depa.pquim.unam.mx/~fercor/dqo/manuales/1311/p7.pdf>

Jaime Cornejo, Villarroel Oriolis: General background on aflatoxins and other Mycotoxins and elements to consider in the design of good practices cultivation and processing of nuts: 2004:
<http://www.minsal.gob.cl/portal/url/item/72fd6274dad8792cc04001011f0109e4.pdf>

Alberto Gimeno. Veterinary Albéitar 2009 MERGER REVIEW
Maximum tolerable MYCOTOXIN IN FOR CERTAIN FOOD
Expert in the field of mycotoxins, technical consultant Special Nutrients, Inc.,
2766 Douglas Road, Miami, Florida, 33133 USA.

DIRECTIVE 2002/32/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF
7

May 2002 on undesirable substances in animal feed: 2002:
<http://www.knowmycotoxins.com/es/regulations.htm>

Monica G. Mariscal Quintanar, Rosa Garcia Escamilla Ma: Effects of ingestion inoculum of A. flavus and F. moniliforme citomorfologia in blood, marrow bone and concentration of serum albumins and globulins in rabbits: 1996:
<http://www.medigraphic.com/pdfs/vetmex/vm-1997/vm972a.pdf>

Official Mexican Standard NOM-188-SSA1-2002, Goods and Services. Control aflatoxins in cereals for human and animal consumption. Sanitary specifications: 2002
<http://www.salud.gob.mx/unidades/cdi/nom/188ssa12.html>

TLC: <http://goo.gl/IBFODO>