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ASSESSMENT OF SOME MYCOTOXINS IN MEAT AND MEAT PRODUCTS

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Summary

By their metabolism, microorganisms from the food affect their quality, salubrity and freshness, more precisely they can increase or reduce the quality of the food which may not be consumed as result of microorganisms pathogenic action, degradation and toxic compound synthesis.

Every nutrient usually contains some microorganisms' species which may be developed, having different metabolic properties. The conditions offered by a certain alimentary product and by its environment lead to the fact that only microorganisms able to adapt could develop. Following their multiplication, in the product appear some changes which permit other microorganisms species from the substratum to develop, even if before these changes, they weren't able to develop.

Key words: mycotoxins, aflatoxins, meat, meat products, chromatography

The alimentary raw material and the final products can be contaminated by spores and pieces of mycelium from environment, the contamination being possible at different levels of the production. The presence of a high number of spores or pieces of mycelium in products which don't seem to be moldy can show either a general contamination of the environment or the processing of a moldy raw material.

Mycotoxicological exam has a sanitary importance as well as an economical one, with up to date implications as food batches are very large. Due to this, the mycotoxicological exam must be correctly done, with results as relevant as possible and a professional interpretation.

Materials and methods

This work had in view some mycotoxins tests in animal products, based on a standard official method as well as on ELISA method. Samples were harvested from units in the DSVSA (Sanitary Veterinary and Food Safety Directorate) Bucharest activity area. The actual laboratory analysis was preceded by other stages: samples harvesting, packing and transportation, preparing necessary materials and substances.

The samples, harvested in order to be as representatives as possible for the batch were packed in clean dry containers, hermetically closed and properly individualized.

The method for revealing aflatoxins in meat and meat products involves the following stages: extraction, purifying the extract (liquid-liquid partition, purifying on the chromatographic column) and quantitative examination through thin layer chromatography (TLC) by UV lamp with wavelength 360 nm and comparing the intensity of standard solution spot with the intensity of samples spot.

For establishing meat and meat products content of B1 aflatoxin, it has been used ELISA immunochemical method. Antigen-antibody reaction is highlighted by turning the color from blue into yellow, color intensity interpretation being made by photometry at 450 nm, the absorption being in inverse proportion with B1 aflatoxin from the sample.

Results and discussions

They were harvested 5 pork sample and 4 pig liver samples from slaughtered animals. The samples were analyzed in laboratory in order to identifying and measure B1 aflatoxin. The obtained results are shown in table 1.

Table 1

Results of b1 aflatoxin identification in meat and organs

No.	Sample type	Result (ppm)
1	pig liver sample	negative
2	pork sample	negative
3	pork sample	negative
4	pork sample	negative
5	pork sample	negative
6	pig liver sample	negative
7	pork sample	negative
8	pig liver sample	negative
9	pig liver sample	negative

Following the data in the table, all 9 samples were conformingly with the legal provisions, B1 aflatoxin being identified in none of them.

The B1 aflatoxin identification in meat products has been made based on ELISA method. In this purpose, there were tested 19 samples of pressed ham and long-life cased meat products: Sibiu and Bacau salami. Dry and semi-dry and raw salami was tested for a period of 2 months long, harvesting samples from different trading units, having in view that the material to be tested should contain also the casing with the mould layer developed on it.

The results of the tests run both on pressed harm and dry and semi-dry salami are shown in table 2.

From the 19 analyzed samples, 9 of them (47.37 % from the total number of meat products samples analyzed in the present work) were extracted from Sibiu salami. The obtain results show that none of them presents B1 aflatoxin.

Four samples (21.05 % from the total meat products samples analyzed) were harvested from Bacau salami and the rest of 6 samples (31.6 %) were harvested from pressed ham. As noticed in table 2, all samples were adequate - in none of them B1 aflatoxin being identified.

Table 2

Result determinations aflatoxinei b1 from product from flesh

No.	Sample type	Result (ppm)
1	Sibiu salami sample	negative
2	Banatean salami sample	negative
3	Pressed ham sample	negative
4	Sibiu salami sample	negative
5	Sibiu salami sample	negative
6	Banatean salami sample	negative
7	Banatean salami sample	negative
8	Sibiu salami sample	negative
9	Pressed ham sample	negative
10	Sibiu salami sample	negative
11	Banatean salami sample	negative
12	Pressed ham sample	negative
13	Sibiu salami sample	negative
14	Pressed ham sample	negative
15	Pressed ham sample	negative
16	Sibiu salami sample	negative
17	Sibiu salami sample	negative
18	Sibiu salami sample	negative
19	Pressed ham sample	negative

Conclusions

- Thin layer chromatography for aflatoxins identification has been used to assess 28 meat and meat products samples.
- Following the tests run on these samples (harvested from different units) there has been noticed that the maximum allowed limit regarding aflatoxin content was not exceeded and B1 aflatoxin was not identified.
- Mycotoxins identification in animal origin products is highly correlated with the prior existence of environmental conditions and substratum which lead to development and metabolites synthesis, following the common animal-fodder circuit or as other mycotoxin's metabolites.

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