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IDENTIFICATION OF M1 AFLATOXIN IN MILK

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Introduction

They have been discovered more than 3500 mycotoxins with different toxicity levels. However, the aflatoxins (AF) are the most frequent and harmful in quantities appearances (µg/Kg or parts for trillion). They are the group of the most frequent studied mycotoxins; they are classified in aflatoxins B1, B2, G1 and G2, calls also secondary metabolits. They are in the milk in form of metabolic residual. The aflatoxins doesn't have flavor, scent, they are fluorescent under the ultraviolet light and they are resistant to high temperatures, more than 320ºC without fragmenting; to boil, to sew, to ferment or to pasteurize the foods, it doesn't exterminate them (Early, 2000).

Permissible maximum levels have settled down: 20 parts for trillion (ppb) for AFB1 in foods for cows milkmaids (Díaz, 2003). In Mexico, the limit of AFM1, it should not be bigger than 0.05 µg/l. The quantity of AF excreted by milk, doesn't have relationship with the production of AF, since it spreads to disappear 3 or 4 days after moving away the administration of the toxic food (Cesar, 2002; Battacone et to the., 2003). Therefore the contamination of the milk by toxic metabolits of AFM1, takes place during the concentration of sharp or chronic consumption of polluted food with AFB1.

The objective of this work was to identify the presence of AFM1 in milk, taken directly of the collection tank.

Material and methods

They were carried out 5 samplings, according to the norm: NOM-091-SSA1-1994. The samples of milk were obtained directly of the tank of general gathering of milk, at the 14:00 hours, with an interval of one week.

The samples were subjected to a toxicological analysis, for the method of chromatography of liquids of high resolution, HPLC, with the use of a standard, to identify and to quantify the levels of AFM1.

Parallel to the last sampling, there were taking a sample of the diet administered to the cluster, directly of the troughs, which was subjected to the toxicological analysis of chromatography in fine layer.

Results

In the following chart the obtained results are shown.

Sample	AFM1/ppb
1	.225
2	N/C >
3	.332
4	.167
5	N/C<

N/C: Non detectable.

>, <: Bigger or smaller than the standard detectable.

The sample 1 shows a quantity of AFM1 for up of the level allowed in Mexico, <.050ppb = corresponding .225ppb; the sample 2, an increase of AFM1, >20ppb, was observed that could not be detected by HPLC. The sample 3, it lowered in comparison with the sample 2, but the levels of AFM1 are above the opposing one in the sample 1,> .225ppb = .332ppb. In the case of the sample 4, a drop was observed in the levels of AFM1, 0.167ppb, in comparison with the previous samples; however these levels didn't diminish the permissible ones in Mexico. The sample 5, reflective the existence of AFM1 in levels non detectable, <.050ppb.

Discussion

The results of AFM1 obtained in the first four samples, surpass the level allowed in Mexico and in the European Union: <.050ppb (Battacone et to the., 2003). In the 2003, Gimeno indicated that the allowed maximum concentration of AFM1 in the raw milk dedicated to consumption human is 0.05ppb. When the level of AFM1 is high, it is due to the ingest of AFB1 by means of the food (García, 2002; Battacone et to the., 2003).

The influence of the stations of the year on the concentration of AFM1 in milk, is related with the consumption of AFB1. Also there is also related with the crop time (Rock, 2004). Later on, in the one stored you can increase the contamination for *Aspergillus* and therefore the mycotoxins.

Taking into account these factors, in this study was carried out an analysis to the sample 5, coming from the proportionate food to the livestock. Multiple analysis of Mycotoxins "Stoloff", which showed negative results to AFB1, indicate that the consumption

of polluted food by AFB1 was minimum or nothing during it finishes week of sampling, because the food was retired of the diet of the animals, in one period of 3 to 4 days before (Cesar, 2002; Battacone et to the., 2003). This indicate that ingest of polluted food and the excretion of AFM1 in milk are intimately related. To the beginning of the study in the sample 1 was 0.225ppb, in the sample 2 >20ppb non detectable; diminishing lightly in the sample 3 0.332 ppb; however, it presents bigger level than in the sample 1, what indicates that the consumption of AFB1 was present in a chronic way. This agrees with that indicated by Gimeno (2003) where the administration of AFB1 in the food in big concentrations, for up of 433ppb, they indicate concentrations of AFM1 in big quantities 1.05-10.58 ppb, in later 6 hours to the consumption, persisting during 62 hours after having administered the mycotoxin. In the same way, when the standard detectable is surpassed, due to the high concentration AFM1 excreted in milk, indicates that the consumption of polluted, for up of the permissible levels for bovine, 20-25ppb of AFB1 in food.

Anton et to the., (2001) they found results non superiors to 0.040ppb in milk, coinciding with the result of the finish sampling carried out in this study, which were concentrations below the standard. It is considered unnecessary the determination of AFB1 in the food, since AFM1 never surpassed the permissible levels. However, the diagnosis of AFB1 should be carried out in foods, as well as its quantification, independently of the quantity of opposing AFM1 in the milk, if the problem, the food is diagnosed it should be moved away immediately.

In conclusion, the existence of AFM1 found in milk, is related with the chronic consumption and without control of the polluted food with AFB1 given to the cluster. The presence of AFB1 in foods for animal consumption represents a serious problem of public health, since besides affecting the agricultural production; it affects the human health, due to the direct or indirect consumption of the metabolits of AFB1 expressed as AFM1. The aflatoxins presence in the milk is also related to the time of the year, time of consumption and to the wrong handling of the food; however, the tendency of decrease of AFM1 in the last sample, reflective that the change of foods contaminated by non polluted foods of AFB1 is the most correct method for the decrease of AFM1 in milk.

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