VARIATION OF MICROBIOLOGICAL CONTAMINATION DEGREE ON CORN MILLING FLOW

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Abstract

The quality, environment and food safety management sistems implemented corresponding to SR EN ISO 9001: 2001, SR EN ISO 14001:2005 and SR EN ISO 22000: 2005 imposed stringent monitoring of milliing process from corn to corn flour.
It is known that for the agricultural products microbiological contamination vary from one year to another depending on weather and environmental conditions.
Because fungi are plant pathogens and the main micotoxins producers, responsable for mycoses and mycotoxicoses, it is lay on their quantitative and qualitative monitoring.
For mycotoxins were elaborated laws, that limits the existing quantity in products thus the food safety and the human healthy not to be affected.
The maintenance of the entire production chain is made by the correct completion of documents, that are integrant part of procedures and of the preliminar process of production. The existing registration are use to prove that the microoorganisms are keep under control.
Keywords: *contaminants, corn, corn flour, milling, microbiology, mycotoxins,*

Introduction

In present paper is described the way of determination of microbial contamination of corn and corn flour and are presented the obtained results.
In table 1 is reproduced the variation of microbiological contamination on corn milling flow in varied mounths of the year.

Were identified microscopic the main genra of molds, that are contaminants of corn and corn flour: Aspergillus, Penicillium, Fusarium, Mucor, Rhizopus si Alternaria –that has decreasing incidence.

Knowing from speciality literature that the main genra of molds mycotoxin producers are: Aspergillus, Penicillium, Fusarium, Alternaria was proved by special laboratory analyses that if the number of yeast and molds were situate in acceptable limits for corn flour, the quantity of micotoxins produced, are not affecting food safety.

Experimental

To observe the microbial contamination's degree variation were taken as samples corn and corn flour.

Analyses were made in a large period of time, and for the analysed lot in february 2007 were send samples in professional laboratory for mycotoxicologic tests.

The performed analyse was yeast and molds determination/ gramme of product using incorporation tehnique on Sabouraud dextrose agar cloramphenicol culture medium. The number of yeast and molds was calculated according to the next formula from SR ISO 7954: 2001:

$$N = \frac{\sum c}{(n_1 + 0{,}1n_2)d}$$

in that :

$\sum c$= colony sum numbered in all Petri dishes;

n_1= number of the Petri dishes retained from the first dilution

n_2= number of the Petri dishes retained from the second dilution

d= dilution in wich were made the first numbering

Results and Discussions

In table 1 was observed that the 16 samples taken in study covering a large period of time, in vary mounths of the year.

Remarkable is the fact that in cold periods, the number of yeast and molds/gramme product was decreasing than in warm mounths in corn and in corn flour.

Also exist a tight bond between initial quantity of microorganism from corn and the final quantity from corn flour.

Although this values are not exceed the maxim limits admisible at corn flour beeing 1000 microorganisms/gramme.

Table 1: Variatrion of the number of microorganisms on flow mill of corn in vary mounth of the year

Nr crt.	Period	Corn -Yeast and molds [microorganisme / g]	Corn flour-yeast and molds [microorganisme / g]
1	19.09.06	900	400
2	22.09.06	1000	200
3	06.10.06	1600	400
4	20.10.06	3300	600
5	30.11.06	2800	700
6	11.12.06	600	70
7	15.12.06	2000	130
8	29.12.06	400	70
9	26.01.07	500	40
10	**02.02.07**	**1000**	**300**
11	09.02.07	1000	40
12	09.03.07	1900	200
13	16.03.07	1700	400
14	13.04.07	1200	700
15	20.04.07	1700	60
16	08.05.07	1900	600

For the sample from 02.02.2007 were made mycotoxicologic analyses and were obtained the values that are reproduced in table 2. and wich are under the admissible legal limits.

Table 2: The results of mocotoxicological analyses and situation in legal limits

Nr crt.	Mycotoxin name	Legal limits [µg/ kg]	Obtained value [µg/ kg]
1	Zearelenona	200	5.0
2	Deoxynivalenol	750	70
3	Toxina T2	Nu sunt stabilite	50
4	Fumonisina B1	1000	0.05
5	Ochratoxina A	3	0.3
6	Aflatoxina B1	2	0.2
7	Aflatoxine(B1+B2+G1+G2)	4	0.8

This confirms the fact that between the quantity of microorganisms and the mycotoxin quantity produced exist a tight bond. Is known that an

important role is played by the duration and the storage conditions of the corn and corn flour in storehouses.

Considering that after reception, the corn is not stored a long period in society storage, is lay on the determination by laboratory analyses of the yeast and molds number / gramme of corn and corn flour.

As it was observed in tab 1, following a large period of time, the performed analyses are enough to demonstrate that if the number of microorganisms were in legal limits, the food safety wasn't affected.

Conclusions

Conditions and ensilage period are contributor factors to multiplication speed reduction of microorganisms.

We must have in sight that an important role has the initial microorganism contamination degree.

Seeing the above presented things, we can sustain that the microbiological analyses are enoughh to prove if a product is safe or not for human consumption.

If is desirable a complex analyse of contaminants are obligatory mycotoxicological anlyses.

As we have shown from the performed analyses for micotoxins was observed that the corn flour is safe for consumption without affecting human healthy, mycotoxins values beeing in legal limits.

References

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