LOW VOLATILE NITROSAMINES CONTENTS IN SOME CUBAN CANNED MEAT PRODUCTS

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SUMMARY

Most of cured meat products from developed countries have been analyzed for the presence of volatile nitrosamine, but there is no information about this problem in foods from Latin America. The aim of this paper is to report the first results about the volatile nitrosamines contents in some samples of Cuban canned meat products and to discuss their significance. Samples were analyzed by means of a mineral oil vacuumm distillation with gas-liquid chromatograph and chemiluminescence detector (GC-TEA) analytical method. The only volatile nitrosamine that was found at very low levels (≤ 0,15 µg/kg) was N-nitrosodimethylamine (NDMA). In accord with hazardous content of volatile nitrosamines in Cuban canned meat products is not probable, however, it would be advisable to confirm this by means of some additional analysis of samples of cured meat products.

INTRODUCTION

The occurrence of volatile nitrosamines in food has received considerable research attention over the last 15 years.

The attention has been mainly focused on food suspicious for posible nitrosamine contamination as, for instance, cured meat and beers.

Most of these foods from developed countries have been analyzed for the presence of the volatile nitrosamines, but there is not information in the reviewed literature about this problem in foods from Latin America.

In the present article, it is informed the first results about the volatile nitrosamines contents in some samples of Cuban foods, and it is discussed about their significance and the relative necessity to extend research works in this field.

MATERIALS AND METHODS

The analyzed samples were canned meat products elaborated with sodium nitrite ($NaNO_2$) by the factories "Planta Habana" and "El Miño". All establishments are located in the City of Havana. Each sample was analyzed four times.

The mineral oil vacuum distillation with gas

chromatography/chemiluminescence detector (GC-TEA) was the method used, performed and validated by Eisenbrand et al (1983). The detection limit of this method is 0,1 µg/kg.

RESULTS AND DISCUSSION

The only volatile nitrosamines that was at very low levels in assayed samples was N-nitroso dimethylamine (NDMA) (Table). These results are in agreement with the fact that NDMA if the most frequently volatile nitrosamines present in foods (Gough et al., 1977; Spiegelhalder et al.,1980; Maki et al., 1980; Sen et al., 1980), however these researchers sometimes found N-nitroso pyrrolidine (NPYR) in cured meats, which was not detected in the Cuban samples, although a very suitable analytical methods was used.

The explanation for the abscence of NPYR and for the very low levels of NDMA is very clear in the cases of Luncheon Meat and Hot Dogs, because these canned meat products contain a little amount of $NaNO_2$ (Beltrán et al.,1983; García Roché 1985), but it is not the same situation for "Chorizo" sausage which receive higher addition of $NaNO_2$.

As in "Chorizo" sausage, the nitrite addition in fresh cured meat products (not analyzed in this very short survey)

is now in Cuba lower than 125 mg/kg (García Roché et al.,1985; García Roché et al., 1987). This level is similar to the regulation of U.S. Department of Agricultural for bacon which is the only food, with the exception of beer, that consistently contained volatile nitrosamines, and 10 μ/kg of volatile nitrosamines in bacon is accepted (Hotchkiss 1987).

According with these reasons and our owm results it is not probable a high and hazardous content of volatile nitrosamines in Cuban meat products. It would be advisable however to confirm this by means of some additional analysis of some samples of fresh cured meat products.

Because their high levels of different amines, fish products to which $NaNO_2$ has been added, are more likely to form nitrosamine. To date, the consumption of fish in Cuba is large, but mainly like fresh fish. With the growing development of the fish industry, it is opportune to take precautions about the nitrite and vòlatile nitrosamines contents in fish products which will be elaborated.

Although it would be convenient to know the volatile nitrosamine contents of some fresh cured meat and fish products and their potential risk, it is likely that

nonvolatile N-nitroso compounds make up a greater exposure than volatiles but suitable analytical methods must be developed (Scanlan et al., 1985). At the other hand, endogenous nitrosation appears to at least ten times the exposure to preformed volatile nitrosamines in foods (Leaf et al.,1987), therefore the significance and relative necessity to extend the research works about these last two aspects seems to be more important.

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TABLE

Volatile Nitrosamine Contents in Some Samples of Cuban Foods.

Food	N*	$\bar{x}$ NDMA (µg/kg)	S	Other volatile nitrosamines
Luncheon Meat	3	0,15	0,040	ND
Hot Dogs	3	0,10	0,085	ND
"Chorizo" sausages	2	0,12	0,014	ND

* - each sample was analyzed four times

ND - not detectable