

A FEW TOXICOLOGICAL ASPECTS IN RAW-DRY PRODUCTS

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Abstract

The present study focuses on the analytical results of the different types of raw-dry salami distributed in the commercial market area of the city of Brasov. The food additives' accurate measurement is essential for the necessity of respecting the law as well as for the consumers' adequate informing regarding what they consume, taking into account the possible toxic effect of some additives (nitrites, antioxidants).

From an analytical point of view, the analysed products' stability and safety have been observed by determining the heavy metals such as Cd and Pb. The obtained results were reported to be tantamount to the product standards and the laws regarding the levels of contamination and food additives (Order. 438/2002 of Family and Safety Ministry and Agriculture, Foods and Woods Ministry; Order. 97/ 2005 ANSVS.)

Keywords: *Raw-dry sausages and salami, residual nitrite, the heavy metals.*

Introduction

The necessity of obtaining some products of an always-higher standard is directly dependable on the consumers' imposed demands. The informed consumers prefer fresh meat products. Raw-dry sausages and salami fall into this category because they are well-preserved for longer periods of time and for their specific flavour.

The important role played by the sodium nitrite (E250), is already known from specialized literature for technological reasons, but also from the positive influence that nitrite has on the characteristics of the finite product.

Nitrite (E250) is used in meat products for the formation of the characteristic colour (3-50 mg/kg) (Cassens,1995), and the product's preservation: antibotulin(0-160 mg/kg) by Banu, (1997, 2000), bacteriostatic and bactericide whose action affects a large number of micro-organisms and pathogenic bacteria even in small quantities(80-150 mg/kg) (Dan, 2000 and

McKnight, 1999). It also contributes to the flavor which characterizes the salted products with a salt mixture (20-40 mg/kg) (Banu, 2000).

Because the presence of nitrites in meat products is related to N-nitroso compounds, in certain conditions (temperature, pH), which could be carcinogenic, the controlling and checking of the added dosage is compulsory. (Ionescu, 1990).

The maximum admitted quantity of these additives is determined by the law (Order 438/2002 of Family and Safety Ministry and Agriculture, Foods and Woods Ministry). The present law was line according to the European law (89 / 107 /CEE; 95 / 2 /CE).

In this respect the producers are required according to the law in force to mention the use of additives on the product's label.

Heavy metals may also be present in meat products, either from its raw material or from the technological process's deficiencies. The presence of heavy metals, such as Pb and Cd, can lead to changes in the human metabolism the consequence of which could be acute intoxication if taken in large quantities. For preventing these aspects maximum limits for the admission of these elements in meat products are imposed (Order. 97/ 2005 ANSVS.) (Roman, 2006).

Experimental

The present study's aim was to determine the residual nitrite quantity in raw-dry products. It was analyzed also heavy metals such as Pb and Cd.

The determinations were made:

- according to the standard methods
- the weighing of the samples was made on the electronic scale, precision of 10^{-4} g .
- the content of the residual nitrite was made using the Griess method
- for the determination of Pb and Cd the samples were burned to ashes and diluted. The results were read with the help of a spectrophotometer with atomic absorption capacity

All the determinations were made using modern equipment from Sanitary- Veterinary and Food Safety Direction-laboratory of Brasov. This laboratory applies a GPL system and a quality system.

The final results were achieved by comparing the acquired values with the values imposed by the producers' firm standards, the professional standards as well as the present law

Results and Discussions

The determinations were made on samples: of raw-dry products (sausages and salami) produced by the firms in Brasov (Luca, Lefrumarin, Sergiana) .

The residual nitrite levels are present in the table 1.

Table 1: The residual nitrite levels in raw-dry products

No	Analysed Range	Producing firm	Fermentation	Residual Nitrites mg%
1	Home salami	Luca	GdL	0,002
2	Raw- dray salami	Luca	GdL	0,067
3	Luca salami	Luca	C.s.	0,197
4	Tâmpa salami	Luca	GdL	0,203
5	Braşov salami	Luca	GdL	0,456
6	Bănăţean salami	Luca	GdL	0,276
7	Baciu salami	Lefrumarin	GdL	0,328
8	Săcelean salami	Lefrumarin	GdL	0,276
9	Chorizo salami	Lefrumarin	GdL	0,220
10	Timis salami	Lefrumarin	GdL	0,356
11	Poiana Mărului salami	Sergiana	GdL	0,760
12	Bardaş salami	Sergiana	GdL	0,198
13	Plaiul Foii sausages	Sergiana	GdL	0,214
14	Piatra Craiului sausages	Sergiana	GdL	0,342
15	Cracauer sausages	Sergiana	GdL	0,422

GdL = glucono- δ - lactona, Cs = starter cultures

The residual nitrite levels from finite products were all reduced, being under the level of 1.0 mg/100g. (0,002.....0.760 mg/).

For heavy metals (Pb, Cd) parallel determinations were made on analysed product samples as well as those samples from raw material used for sausage formulations. The following results are their arithmetical mean. (table 2).

On analyzing the obtained results it can be observed that the products do not jeopardize the customers' health in any way.

All the obtained results were reported to the laws regarding the levels of contamination and food additives (Order. 438/2002 of Family and Safety Ministry and Agriculture, Foods and Woods Ministry; Order. 97/ 2005 ANSVS.) (table3).

Table 2: The standard values and the Pb and Cd content in meat and raw-dry products

Name product	Pb ppm	Cd ppm
Pork	0,00874	0,00
Beef	0,00702	0,00
Home salami	0,00899	0,00
Raw- dray salami	0,00455	0,00
Luca salami	0,007785	0,00
Tâmpa salami	0,00323	0,00
Braşov salami	0,00230	0,00
Bănăţean salami	0,00832	0,00
Baciu salami	0,00798	0,00
Săcelean salami	0,00010	0,00
Chorizo salami	0,00684	0,00
Timis salami	0,00776	0,00
Poiana Mărului salami	0,00438	0,00
Bardaş salami	0,00623	0,00
Plaiul Foiî sausages	0,00286	0,00
Piatra Craiului sausages	0,00386	0,00
Cracauer sausages	0,00288	0,00
r^2	0,997	1,00

r^2 - The determination coefficient of Pb and Cd

Table 3: The maximum values of the determinations

Types of determination	Nr. Order	The maximum value
Nitrites	438/2002	5,0 mg/Kg
Pb	97/2005	0,1 ppm
Cd	97/2005	0,05 ppm

On analyzing the obtained values it can be stated that the products are not harmful for the consumers in terms of nitrites or heavy metals (Pb is within accepted limits and Cd was not detected in any sample). Practically in the bough case: Pb, Cd are absents in all the analyses.

Conclusions

- Respecting the fabrication recipes is an essential condition for the making of high-quality products.
- All types of the analysed raw salami had very low residual nitrite levels, stimulated by the GdL addition or lactic bacteria starter culture, which favoured the pH value reduction of salami compositions under 0.5 and the nitrite's conversion into nitrogen oxide

- The reduced residual nitrite level associated with reduced values of water activity have secured the microbial and oxydative stability for the analysed products.
- The equipping of the fabrication lines with modern items that do not react with the meat composition, does not imply changes in the products' content in terms of heavy metals: Pb si Cd.

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