CONTRIBUTION FOR THE KNOWLEDGE OF THE MICROBIOLOGICAL CHARACTERISTICS OF MANUFACTURED TURKEY MEAT PRODUCTS

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SUMMARY

The manufacturing industry of turkey meat has been suffering a significant development in Portugal for the last years. The increased number of products demands its microbiological knowledge to permit the control of the technological process in order to guarantee the quality as well as the consumer safety.

In this study the different types of products have been grouped in three big groups : raw products, smoked products and cooked products.

The results obtained allow to verify the high contamination of the crude products, even when they are prepared under conditions considered as "Good manufacturing practices", and the significant decrease of the microbiological parameters, especially in the cases of *Escherichia coli, Staphylococcus aureus* and *Salmonella*, whenever the products are subject to smoking or cooking. We still verify that the reduction of manipulation in cooked products, hams, reduces to good levels the contamination which before was very high.

INTRODUCTION

The consumption of and the demand for turkey meat and products manufactured from this meat, has increased a great deal in Portugal, since the 1970s, owing to greater knowledge of the dietetic features of these products, with high protein value and low caloric content, when compared with similar products produced in our country, normally from pork.

We know it is highly likely that this meat is contaminated by several microorganisms, some of them pathogenic, resulting from current processes of slaughter, evisceration and preparation of the carcasses and of the pieces.

However, the nationwide situation is unknown, particularly that of manufactured products, whether they are products which are heated by cooking, smoking, etc. or they are those which are sold raw but nevertheless undergo several handling processes.

MATERIAL AND METHODS

Material

We have grouped the different types of products into three main groups:

- **Raw products** - those which are not heated, but which require considerable handling of raw material for their production. These products are always cooked before consumption. Steak, spit, etc.
- **Smoked products** - these are heated and smoked and are only later handled when packed. Smoked leg and breast.
- **Cooked products** - products in which cooking represents the essential stage of the microbiological improvement, though in some cases they can be handled later on.

We focused our studies on cooked hams. We dealt with two groups of products that are handled in this way: Group A with handling in the last part of the process, Group B without this handling.

The working conditions of the Industrial Companies where these products were manufactured can be considered good (good manufacturing practices).

Methods

- ISO 4833 (rev. 1986) - General Guidance for Enumeration of Microorganisms - Colony Count Technique at 30C (Reference Method)
- NP 2164 (1983) - General Guidance for Detection of Coliforms
- NP 2308 (1986) - General Guidance for Detection of *Escherichia coli*
- NP 2262 (1986) - General Guidance for Detection of Spores of Sulphite-reducers *Clostridia*
- ISO 6888 (1983) - Microbiology - General Guidance for Enumeration of *Staphylococcus aureus* - Colony Count Technique
- NP 1933 (1982) - General Guidance for Detection of *Salmonella*
- ISO/DIS 7954 (1986) - Microbiology - General Guidance for Enumeration of Yeast and Moulds - Colony Count Technique at 25°C.

Raw Products

Samples	Colony Count at 30°C /g	Coliforms /g	*E. coli* /g	*Clostridium* spores SH^+2/g	*Staphyl. aureus* /g	*Salmonella* /25g	Mycological content /g
18	$4,2 \times 10^4$	10^3 to 10^4	10^2 to 10^3 3 Neg.	1 to 10 9 Neg.	< 100 5 Neg.	4 Pos.	$2,0 \times 10^3$

Smoked Products

Samples	Colony Count at 30°C /g	Coliforms /g	*E. coli* /g	*Clostridium* spores SH^+2/g	*Staphyl. aureus* /g	*Salmonella* /25g	Mycological content /g
11	$3,4 \times 10^4$	10^3 to 10^4 (1) 10 Neg.	Neg.	Neg.	Neg.	Neg.	$1,4 \times 10^3$

Cooked Products

Group A

Samples	Colony Count at 30°C /g	Coliforms /g	*E. coli* /g	*Clostridium* spores SH^+_2/g	*Staphyl. aureus* /g	*Salmonella* /25g	Mycological content /g
6	$5,3 \times 10^5$	10^2 to 10^3	Neg.	Neg.	1 Pos.	Neg.	$1,0 \times 10^3$

Group B

Samples	Colony Count at 30°C /g	Coliforms /g	*E. coli* /g	*Clostridium* spores SH^+_2/g	*Staphyl. aureus* /g	*Salmonella* /25g	Mycological content /g
14	<250	Neg.	Neg.	Neg.	Neg.	Neg.	<50

RESULTS

See the tables listing results for raw, smoked and cooked products.

CONCLUSIONS

1 - Raw products

We noticed very high microbic contents of mesophylls and of Coliforms.

Undesirable values for *E.coli* were attained very frequently.

We have found 22% of the samples with *Salmonella* in 1 g. We identified 3 *Salmonella enteritidis*, 2 *Salmonella typhimurium* and 2 *Salmonella larochelle.*

2 - Smoked products

The values of the microbiological analysis only with significant Mesophyll, Coliform and Mycological levels suggest a contamination posterior to the treatment and arising from handling.

3 - Cooked products - Cooked hams.

The difference between the results obtained for Group A and for Group B shows clearly the importance of the contamination introduced by the final handling, even when carried out under hygienic conditions.

The type of the contaminants found in Group A is suggestive of the influence of handling on contamination.

The results of Group B point in favour of processes in which there is no handling after heating, in order to obtain products of high microbiological quality, even from very contaminated raw materials.

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