



Salted meats – keeping contamination under control

A French manufacturer of salted meats has called on LCB food safety experts to give its sausages a facelift by keeping background contamination under control. The modest sized business with 200 employees has been undergoing rapid expansion and specialises in dried sausages using traditional methods.

The production process comprises several stages: receipt and preparation of meats, mixture preparation, skin preparation and filling, draining, then stoving, drying, and packaging.

Food safety is a strategic objective and so manufacture takes place within a very demanding quality system.

The company's QA department is both IFS and BRC certified. It has its

own internal laboratory that can carry out microbiological checks.

Despite all the measures undertaken to protect the product from contamination, the company began to notice yellow-orange staining for the first time on its sausages, making them unsaleable in that state.

With this quality level proving too inconsistent for the consumer, and with a real danger of its product being dropped by the supermarkets, the company was seriously worried about its financial stability.

The manufacturer wanted to know what fungal flora existed around the production site and to identify the contaminant so it could be isolated.

After reproducing the phenomena observed in manufacturing in their

laboratory, LCB food safety experts understood the mechanism by which the staining appeared on the manufacturer's sausages.

They revealed the responsible strains and confirmed in which stage of the production process the contamination developed.

The manufacturer was able to reinforce the quality system thanks to the literature provided (reservoirs, modes and conditions of development, dissemination methods, etc).

The programme of microbiological checks was revised (air-surfaces-input materials), notably by means of the Air-Test aero-biocollector, and the disinfection plan was exposed and adapted in line with the check results (Ultradiffusion air-

borne surface disinfection treatment).

Since then, the background contamination has disappeared, as have the customer complaints about the sausages' appearance.

LCB food safety were able to offer their expertise to the client in the following ways:

- Specific laboratory identification (fungal).
- Perfect knowledge of the industrial sausage process.
- Partnership between the customer and LCB food safety.
- Analysis method adapted to the issue – reproduction of the phenomena observed in manufacturing in their laboratory and understanding of the mechanisms.
- Dedicated team of experts. ■

Test method

The objective was to identify the responsible contaminant causing problems in the sausage appearance (yellow-orange staining).

- LCB food safety knew that the contaminants were fungal/yeast, bacterial and that several strains in the production environment might be responsible for the sausage appearance (see Table 1).
- Strain selection to inoculate on sausages.

The yeasts and moulds to inoculate were selected according to the following parameters:

- High percentage of presence in the environment, in the air as well as on the surfaces.
- Identified yeasts or moulds as potentially responsible in the sausage appearance.
- Sample preparation. Preparation of micro-organisms to inoculate. Handling in sausages.
- Producing the control samples (without inoculation of contaminants).

- **Step 1:** Stoving. Beginning of development of technological flora on the net and on the skin
- **Step 2:** Floration.
- **Step 3:** pre-drying.

Observations

Penicillium sp. covered the whole surface of the sausage after three days of pre-drying; experimental conditions enabled acceptable reproduction of the flora development conditions of the sausages.

The specific identification service gives precise information on the strain producers want to know about. The strain is determined according to its genus and species.

The report is completed by literature on the identified contaminant:

characteristics of the strain, reservoir, substrate type, development conditions, liability of producing mycotoxins.

The analysis report gives precise information to allow producers to deal with the matter on their own and reach their own interpretation of the results of the checks.

In order to prepare the laboratory operation that simulates the process, a feasibility study is conducted by experts in the LCB food safety laboratory.

The assessment engineer is a dedicated contact for gathering all the necessary details to conduct the study: process parameters, checks the producer has already made themselves etc.

Needless to say, all these data are kept strictly confidential. ■

Table 1. Distribution of fungal flora in the production environment.

Yeast/mould (%)	Surface sample controlling point			Air sample
	1	2	3	
Yeast A	25	4	54	0
Yeast B	50	67	0	79
Yeast C	0	0	0	1
Yeast D	0	0	8	0
Yeast E	0	0	2	0
Yeast F	0	14	0	0
Mould A	0	0	9	0
Mould B	0	1	5	0
White penicillium sp (technological flora)	25	14	22	20

Table 2. Yeast inoculation on sausages.

Inoculated yeast	Result on sausage appearance
Yeast A	Heterogeneous development of technological flora; no problem with appearance
Yeast D	Heterogeneous development of technological flora; no problem with appearance
Mould A	Slow white Penicillium development with beginning of appearance problem