

Process evaluation by expert ranking described for production of cooked sausages type

Frankfurter

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SUMMARY: For the production of cooked sausages type Frankfurter there was carried out an evaluation of the influence of process details and process steps on sensoric and hygienic properties, compound, price and costs, respectively by expert ranking. For all aspects of survey frequency and seriousness of faults were determined. The resulting data were combined to a new parameter - "scale of risk - R" ($1 \leq R \leq 30$). Finally, a total scale of risk was designated for the production process of cooked sausages type Frankfurter.

The results showed that selection and combination of raw materials represent the most important reserves of production management. Filling and expedition of sausages are of minor risk.

INTRODUCTION: The marketability of foodstuffs is an important base for success of their producers. It depends on several sensoric and hygienic properties, compound, price and costs of products, respectively. These parameters are determined by the type of the product, but at first by several technical, technological and organizational aspects of production management. From this point of view complete control, evaluation and optimization of products and processing have an increasing importance on the strength of rentability. In meat industry, characterized as a middle-class branch in a lot of countries, instruments for evaluation of processing and management from other branches of industry for instance commodity income statement, expert-analysis, portfolio-matrices and others are only in few exploitation or were introduced in after years, till now (KLEEBERG, 1989; LORENZ, 1991).

It is necessary that a strategy of enterprises is orientated by highest quality of products, high flexibility in production and minimal costs to be successful in the market. Sale of meat and meat products as trade mark or with quality seal, how it is used recently, is distinct expression for this tendency. The right to bear a trade mark or quality seal demands from the producer of meat products fixed guarantees for organizational aspects, quality of products and processing (BRANSCHIED, 1990). These facts made necessary for the producer to analyse constantly the production management and processing. In practice it is possible to check the production process in the field of hygiene for instance by exploitation of Hazard Analysis Critical Control Point-System (LEISTNER, 1990) or economical problems by utilization of several methods to analyse costs. Proceeding on these reasons in this work the author wants to show how it is possible in enterprises of meat industry to create a base for decision to correct production process by low expense with intention to advance rentability and marketability for the production of cooked sausages type Frankfurter.

MATERIALS and METHOD: A team of 8 experts determined the importance of sensoric and hygienic properties, compound and price of cooked sausages type Frankfurter for the marketability by ranking (HARTUNG,1989;TODORINOV,1982). The correspondence of results of the experts was checked by "Chi-square-test" (TODORINOV,1982). For each of the mentioned parameter-complexes on this base a coefficient of specific weight for the marketability of cooked sausages typ Frankfurter (K_S, K_H, K_Z, K_K) was determined. To analyse the production process of these sausages, it was splitted into 9 aspects and processing steps (table 1). The experts gave a ranking (1-9) for possible frequency of faults (FH) for all aspects with reference to sensoric and hygienic properties, compound and costs. For minor frequency of faults experts gave minor rank, but for major frequency of faults major rank. Results were checked by Chi-square-test. After estimation of frequency of faults experts evaluated the possible seriousness of faults (FS) in the following manner:

- Factor: 1 - non significant faults of final product
 2 - significant, but from the market and consumer, respectively still accepted faults of final product
 3 - from the market and consumer non-accepted faults of final product

table 1: checklist for identification of critical aspects in production of cooked sausages type Frankfurter by expert ranking

mentioned aspect	sensorics		hygiene		compound			costs				
	FH	FS	R_S	FH	FS	R_H	FH	FS	R_Z	FH	FS	R_K
preparation of raw materials (1)												
state of machines (2)												
personal (3)												
combination of raw materials (4)												
mincing of meat and corning (5)												
cutting and mixing (6)												
filling (7)												
smoking, cooking and cooling (8)												
expedition (9)												

legend: R_S - scale of risk for possible sensoric faults
 R_H - scale of risk for possible hygienic faults
 R_Z - scale of risk for faults in compound
 R_K - scale of risk for extra costs

For identification of critical aspects in production of cooked sausages type Frankfurter with reference to the mentioned parameter complexes there was initiated a new parameter for evaluation of production processes—"scale of risk-R". It was defined as follows:

$$R = \frac{FH \times FS}{n} \times 10$$

legend: FH - rank for frequency of possible faults ($1 \leq FH \leq n$)

FS - factor for seriousness of possible faults ($1 \leq FS \leq 3$)

n - number of aspects, which must be ranked by experts

Therefore the defined reach for "R" is determined as follows: $1 \leq R \leq 30$

For better clearness all dates which must be estimated by experts for the surveyed example were represented in table 1.

Results for scale of risk of all experts are combined by striking average.

Finally on the base of the medium scales of risk for sensoric and hygienic properties, compound and costs and their specific weight for marketability a total scale of risk (R_T) for each of the mentioned aspects was designed.

$$R_T = R_S \times K_S + R_H \times K_H + R_Z \times K_Z + R_K \times K_K$$

RESULTS and DISCUSSION: Medium scales of risk for sensoric and hygienic properties, compound and costs and their specific weight for marketability of cooked sausages type Frankfurter are represented in table 2:

table 2: scales of risk for several aspects of production of cooked sausages type Frankfurter

Parameter	specific weight	1	2	3	4	5	6	7	8	9
sensorics	0,33125	20,83	9,23	9,58	15,9	10,28	14,38	5,21	21,73	3,33
hygiene	0,2375	21,39	17,01	16,39	7,43	10,9	7,01	9,31	13,75	10,35
compound	0,2	24,17	5,1	11,15	24,3	10,0	11,53	4,06	8,61	2,05
costs	0,23125	20,69	5,07	12,36	19,17	6,74	14,17	8,06	16,81	7,5
all		21,59	9,29	12,15	16,32	9,56	12,01	6,61	16,08	5,7

Results make it possible to utilize them in product-economical and process-economical way. The results for production of cooked sausages type Frankfurter showed, that experts estimate that the highest risk for sensoric properties is based on cooking, smoking and cooling and on selection of raw materials. For hygienic properties the biggest faults are expected by the state of machines, motivation and qualification of personal, but minor faults are expected by all technological steps. The greatest influence for compound of the final product is proceeding on the selection and combination of raw materials. The same is estimated for extra costs. The results for total scales of risk showed, that

selection and combination as well as the complex of smoking, cooking and cooling represent the most important influence for marketability of cooked sausages type Frankfurter. Filling and expedition of sausages are of minor risk.

The process-economical way of utilization shows, that the checked aspects selection and combination of raw materials influence in highest degree the compound of final product in comparison to sensoric and hygienic properties and costs. The state of machines, motivation and qualification of personal as well as technological steps mincing and corning, filling and expedition" represented the most important risk of hygienic properties. For cutting and mixing as well as smoking, cooking and cooling it was estimated, that these aspects contain the biggest reserves for possible sensoric faults.

CONCLUSIONS: The studies and their results give reason for the following major conclusions:

1. The parameter "scale of risk" is a suitable criterium quickly to manipulate for evaluation and quality identification of critical aspects in production of foodstuffs.
2. For the example of production of cooked sausages type Frankfurter for their marketability in the following sequence are significant: sensoric properties, hygienic properties, price and compound
3. The investigated total scales of risk showed, that selection and combination of raw materials as well as smoking, cooking and cooling represent the most important reserves of production management. Filling and expedition of sausages are of minor risk.

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