A STUDY INTO THE INFLUENCE OF BIOLOGICALLY ACTIVE SUBSTANCES USED FOR COOKED-&-SMOKED SAUSAGES PRODUCTION

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Physico-chemical, biochemical and organoleptical characteristics of cooked-&-smoked sausages with starter cultures added were studied. The studies were aimed at quality improvement and meat raw material saving.

Bacpreparations dosages and technological regimes of cooked-&-smoked sausages production were tested. The optimum bacpreparation level for sausage meat addition was determined.

It was found that temperature regime during settling influenced product quality characteristics.

The advantage of starter cultures use for cooked-&-smoked sausages produced was shown.

A high nutritional value of meat and meat products is stipulated by their biologically important components content, taste and flavour properties. The physical and chemical methods, used for accelerated meat products manufacturing, are low efficient as related to flavour and taste.

Flavour and taste developing compounds present in a product itself or are being formed from precursors as the result of their interactions during heating.

The present paper studies the effect of starter cultures on physico-chemical, biochemical and organoleptical characteristics of cooked-&-smoked sausages, determines the technological regimes and optimum dosage of bacterial yeast inoculated into sausage meat.

Studies were made in production conditions with various levels of a bacterial preparation added and at temperature settling.

The following parameters served as the evaluation criterion: pH value; content of lactic acid, volatile fatty acids, carbonyl compounds and product organoleptical characteristics.

In the USSR there are developed and made under production conditions bacterial preparations of dry, liquid and frozen form. They consist of acidophilic lactobacilli (Acid-SK-1), acidophilic lactobacilli and lactoacid streptococci (Acid-SK-2), mixture of lactobacilli and denitrifying micrococci (PB-SK) for raw-smoked sausages. Bacterial yeast improvement allowed to develop a principally new bacterial preparation for cooked-&-smoked sausages. It consists of lactic and microbial protein, vitamins, microelements and microorganisms metabolism products. It possesses the same properties as the bacpreparation Acid-SK. But due to its good functional peculiarities it is possible to use it for meat replacement in equivalent amounts.

Bacterial preparations contain high level of microbial cells (from hundreds of millions up to tens of milliards-possess a pronounced acid-forming capacity and produce a significant amount of carbonyl compounds, volatile fatty acids, lactic acid, diacetyl, acetoine that develop product taste and flavour. Beside, they possess antagonistic properties in relation to sanitary-demonstrative microflora (Mikhajlova et al., 1983; Mikhajlova et al., 1985).

Bacterial preparation dosage was determined under laboratory conditions using model tests. It was inoculated in the amount of 3-10% to sausage meat weight as a beef replacer.

The results showed that up to 7% addition of the new bacterial preparation to sausage meat did not effect its quality as compared to the controls (without bacpreparations and with Acid-SK).

Based on the model tests, cooked-&-smoked sausages with bacpreparations were made under production conditions at "warm" and "cold" settling. "Warm" settling was two times shorter than "cold" one. "Warm" settling was necessary for starter cultures being able to display their enzymic ability in sausage meat.

Physico-chemical and biochemical characteristics are shown in Table 1.

It is seen from Table 1 that the studied characteristics of cooked-&-smoked sausage without bacpreparation adespite the regime of settling, were on the same level.

However, tasters preferred samples made at "warm" settling. The use of Acid-SK promoted the increase of lactic acid, volatile fatty acids and carbonyl compounds level. 5% replacement with the new bacterial preparation allowed to make a product organoleptically corresponding to the samples with Acid-SK and better than the control ones (Table 2). At the same time there was a significant increase of taste-flavour complex constituents (Table 1). e.g. content of lactic acid increased by 37.9%, of volatile fatty acids - twice as much, and of carbonyl compounds by 73.9% as compared to the control samples without bacpreparations.

Based on the investigations a positive influence of starter cultures on the development of product taste-flavour and consistency-forming substances was found out. It was shown that it is purposeful to manufacture cooked-&-smoked sausages with bacpreparations using "warm" settling with two times shortened cycle. The optimum dosage of beef replacement with a new bacterial preparation was determined. It equals to 5%.

Table I.

Bacpreparation	Temperature regime of settling	Parameters						
		pH value	titratable acidity(mg%)	Lactic acid (mg%)	volatile fatty acids (mg%)	total carbonyl compounds (mg%)	moisture (%)	fat (%)
Without bacpreparation	"Cold"	6.4	277.2	482.0	32.8	0.23	44.1	33.4
Without bacpreparation	"Warm"	6.4	283.5	488.7	39.3	0.24	44.4	33.1
Acid-SK-I	"Warm"	6.3	298.2	540.0	63.3	0.29	44.4	33.4
Acid-SK-2	"Warm"	6.3	289.2	511.7	40.3	0.33	44.2	33.3
New Bacpreparation	"Warm"	6.2	312.5	587.3	88.3	0.40	45.0	31.7

Table 2.

Bacterial preparation	temperature regime of settling	Product evaluation by a5-scale system				
		colour	flavour	consistency	taste	total evaluation
Without bac-preparation	"Cold"	4.5	4.0	4.1	4.1	4.2
Without bac-preparation	"Warm"	4.6	4.3	4.2	4.3	4.3
Acid-SK-1	"Warm"	4.6	4.4	4.4	4.4	4.4
Acid-SK-2	"Warm"	4.6	4.2	4.4	4.4	4.4
New bac-preparation	"Warm"	4.6	4.3	4.3	4.4	4.4

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