

SECTION XVI. PRODUCTION ET TECHNOLOGIE ALIMENTAIRES

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INFLUENCE OF BEE HONEY ON WATER ACTIVITY INDICATORS AND MODEL PH SAMPLES IN THE PROCESS OF DRYING-MATURATION OF FERMENTED MEAT PRODUCTS

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A feature of modern sausage production is the intensification of technological processes. Given the dynamics of the decline in the purchasing power of the population of Ukraine, which coincides with the global trend, the development of innovative products and recipes for meat products with improved organoleptic properties is becoming increasingly important. This primarily applies to delicacies of meat products, namely fermented meat products (smoked and cured sausages), which differ from other types of sausages in dense consistency, specific aroma, pleasant taste, have high biological and energy value, retain high quality for a long shelf life.

The process of making these types of sausages is time consuming and requires special attention, because the technology of their production does not involve heat treatment, and the readiness of the product is achieved as a result of prolonged maturation and drying. Smoked and cured sausages acquire specific properties as a result of complex enzymatic and physicochemical reactions that take place during their maturation. Recently, to accelerate the technological process, more and more companies-manufacturers of sausages use in the production of fermented meat products starter cultures (bacterial leavens) Under the influence of microbial enzymes and enzymes of meat tissues in minced meat are biochemical processes products.

Carbohydrates, on the one hand, are a nutrient medium for lactic acid bacteria, and on the other - are actively involved in the formation of organoleptic properties: color, taste, aroma. Disaccharides play an important role in the technology of smoked

and cured sausages: sucrose (cane sugar), lactose (milk sugar) and less often maltose, as well as some oligosaccharides (dextrins, dry starch molasses) [1]. The level of their introduction into the stuffing, depending on the type of sausage is from 0.2 to 3-4%. Choice used in the production of smoked and cured carbohydrate sausages is also associated with their level of sweetness. If the sweetness of sucrose is taken as 100%, then fructose is 170%, glucose - 75%, galactose - 70%, and lactose - from 20 to 40% and lactulose - from 48 to 62%. This fact largely led to the exclusion of fructose from the recipes of meat products, limited the introduction of sucrose at 0.1-0.5% and at the same time allowed the use of lactose in the technology of fermented sausages in higher concentrations - up to 0.7-1, 0%, and in some cases up to 2-3% without significant change in taste.

In the technology of meat products, the use of bee honey is little known, mainly due to the high level of sweetness of fructose - about 1.7 times higher than sucrose [2].

The aim of the study was to determine the optimal concentration of bee honey, which is added to smoked and cured sausages instead of sugar. Four model samples were made, which differ from each other only in the ratio in the recipe of sugar and honey: the control sample was made with the introduction of 400 g of sugar, and in the experimental samples №1 made 200 g of sugar and 200 g of honey, №3 – 300 g of honey and 100 g of sugar, №3 – 400 g of honey. According to the recipe as auxiliary raw materials in the product were made: honey, black pepper, ground nutmeg, sugar, salt, sodium nitrite. The bacterial preparation Bactoform™ F-1 from Ng was used in all experimental samples. Nansen is a fast-fermenting bacterial culture that contains strains of *Lactobacillus sakei* and *Staphylococcus carnosus*, which promotes intensive color formation of sausages [3].

As a sausage casing for model samples in all experiments used an artificial permeable casing with a diameter of 45 mm. The cooked minced meat was subjected to maturation in a refrigerator at a temperature of 0-4 ° C during the day. Then the stuffing was filled with the shell and the resulting loaves during the day were subjected to precipitation at $t = 20-22$ ° C. After that, the loaves were sent to the climate chamber, where the sausages were subjected to a long process of drying and ripening. The process of cold smoking was carried out for 3 and 5 days ($t = 20-22$ ° C, $T = 1$ g). The full technological cycle of preparation of this product took 25 days. The end of the process - when the water activity index reaches 0.87-0.86. In the process of maturation-drying of the model samples, physicochemical studies were performed, in particular, the active acidity and activity of water were determined. The research results are presented in table 1.

Table 1

Change in water activity and pH of model samples during drying-maturation

Stages	Physico-chemical parameters							
	Sample 1		Sample 2		Sample 3		Sample 4	
	A _w	pH	A _w	pH	A _w	pH	A _w	pH
5 times	0,9165	5,81±0,05	0,9153	5,79±0,05	0,9133	5,75±0,05	0,9105	5,71±0,05
10 times	0,9037	5,56±0,05	0,9029	5,47±0,05	0,9001	5,34±0,05	0,8963	5,29±0,05
15 times	0,8887	5,35±0,05	0,8867	5,15±0,05	0,8837	5,08±0,05	0,8801	4,94±0,05
20 times	0,8705	5,21±0,05	0,8749	4,89±0,05	0,8743	4,81±0,05	0,8695	4,71±0,05
25 times	0,8591	5,25±0,05	0,8563	4,95±0,05	0,8518	4,85±0,05	0,8454	4,74±0,05

[author's development]

From the literature it is known about the ability of bee honey to emit a sour taste. As can be seen from the results of research (table 1), when increasing the amount of bee honey from 0% (sample №1) to 0.4% (sample №4), the pH of the minced meat decreases from 5.81 to 5.71. This dynamics is maintained throughout the drying-ripening period, increasing until the end of the process. In the finished product, the pH of sample №1 is 5.25, sample №4 - 4.74.

Thus, the increase in the proportion of bee honey in the recipe affects the value of active acidity both in the minced meat and throughout the process. Bee honey, along with other carbohydrates, can purposefully adjust the pH, using it if necessary as an additional technological barrier.

The water activity index in the finished product has the highest value of 0.8593 in the sample №1 (0% honey), and the lowest 0.8457 in the sample №4 (0.4% honey).

Conclusion. The use of honey increases the biological value of the product (as the technological scheme of production of fermented sausages does not involve high-temperature heat treatment and, consequently, the decomposition of honey), the drying ripening process is reduced, the fermentation process is faster.

References:

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