

# WORKING OUT THE TECHNOLOGY OF USING PIG HEADS IN THE MANUFACTURE OF HIGH-GRADE SAUSAGE PRODUCTS

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## INTRODUCTION

The rational use of all the products of agricultural animals has a great importance in increasing the volume of meat production. It is possible to manufacture biologically valuable meat products not only by combining muscle and fat tissues but also using other components of a carcass, namely, pig head tissues. It is advisable in the economical sense and it is necessary for wholesome diet from the medical point of view based on the conception of integrity and indivisibility of meat raw materials. (1.2.) When carcass components used are properly combined biological characteristics of raw materials are fully revealed. The food becomes less refined, more enriched with natural components, which ensure normalization of metabolism in a human body. Pig head tissues are known to contain such components.

## MATERIALS AND METHODS

The investigation was carried out in three factories. The procedure begins at the meat shop. When heads are cut off, cheek meat remains on the carcass. Skin is not stripped off pig heads during any treatment of hog carcass. Pig heads are scalded, dehaired of bristles at special machines. Then the heads are cleaned of the rest of burnt hair, epidermis and washed. They are chopped into two halves without damaging brains and hypophysis. If the heads are not chopped the hypophysis can be taken out with the help of hypoeextractor (special

pincers) put into the neck foramen under the remainder of spinal cord trunk. Brains and hypophysis are put in one raw on pans and taken to the cooling chamber. With the purpose of rational use of pig head tissues we developed the technology of producing protein mass. Pig heads are subjected to boiling, boning, grinding on a mincer and cutter with adding whole blood, starch, salt and broth. Such mass contributes to increasing economical indices improving flavour, odour, consistence and marketable appearance of the product. It also improves its quality, the keeping quality without disguising low-grade raw materials or low sanitary-hygienic level of production. The worked out technology of producing a mass of pig head tissues ensures the uniform fat distribution in sausage meat. Fat is known to be an important meat constituent with high energy value. It imparts the meat products good flavour properties being a source of vital lipid components. With the existing technology of production the uniform distribution of fat in sausage meat composition is not always afforded, therefore the finished products are not tender enough, juicy and of needed consistence. Taking it into consideration we added protein mass to the finely minced meat for even fat mixing with sausage meat composition. For control of the influence of protein mass on the quality and output of sausage products, raw sausage meat and finished products of boiled the 1st grade Alma-Ata sausage were chosen (3). The 1st grade horse meat (60%) and semi-fat pork (40%) were used as raw materials. Such choice is based on the fact that horse meat is one of the main components of the majority of sausage products, the binding component in sausage meat composition. The structure and structural-mechanical characteristics of both raw and boiled sausage meat as well as the qua-

lity and output of production depend on the quantity of horse meat and changing its properties in the process of technological treatment. Defrosted meat was used in this work. The samples were produced by adding 10%, 15% and 20% of the mass instead of semifat pork. Water content, plastic viscosity, relative-instant modulus of shear, stickness, water-binding capacity of raw and boiled sausage meat were investigated. Coefficient of compression, relative elastic strain, residual strain shear force were also studied.

## RESULTS

Table I shows that the mass in its composition and functional properties is similar to sausage meat.

Indices	: Horse meat	: Pig heads : meat	: Mass of pig heads : tissues
Moisture %	74,42	66,5 ± 1,35	72,1 ± 1,34
Protein %	19,16	16,8 ± 1,34	14,04 ± 0,33
Fat %	4,03	15,4 ± 1,34	12,30 ± 0,21
Ashes %	1,04	1,20 ± 0,12	1,00 ± 0,06
Water-binding capacity	59 ± 1,3	84,6 ± 1,9	96,4 ± 1,3
Fat-binding capacity	32,5 ± 0,35	38,4 ± 0,48	76,2 ± 1,7

Characteristics	: Planned : variant	: Experimental samples			
		: Quantity of added mass			
		: 10	: 5	: 20	
		Raw	Sausage	Meat	
Moisture content %		76,3	76,5	76,8	76,9
Spot size cm <sup>2</sup>		4,45	4,15	4,05	4,00
Viscosity $10^{-4} \frac{\text{m} \cdot \text{sec}}{\text{m}^2}$		0,85	0,82	0,95	0,94
Modulus of shaar E 10 <sup>-2</sup> n m <sup>2</sup>		1,38	1,44	1,51	1,54
Relaxation period		55,4	57,4	59,8	60,1
Relative plastic strain %		74,8	75,8	76,1	75,9
Stickness n m <sup>2</sup>		48,8	49,3	52,3	52,6

## BOILED SAUSAGE MEAT

Moisture content %	69,5	69,8	70,1	69,7
Spot size of weakly <sub>2</sub> binded moisture cm	.3,5	10,3	9,35	9,85
Coefficient of com- pression %	29,5	31,3	32,1	32,3
Relative elastic strain %	31,3	30,8	30,6	30,4
Modulus of elasticity %	14,3	14,6	14,8	14,9
Shear force n m	430	430	430	430
Moisture losses in ther- mal treatment	8,45	7,63	7,64	7,85

As it is seen from Table 2 fat content of the studied sausages increases in proportion to the quantity of added protein mass. The uniform distribution of fat in sausage meat composition im- parts good structural-mechani- cal characteristics: tenderness, juiciness, thick monolithic struc- ture with good particles bond of finished products (Table 2). The use of protein mass emulsi- on of pig heads tissues makes it possible to produce more plastic sausage meat high stick- ness and fluidity. Thanks to this the finished product with considerably more moisture has no fat and broth swellings and is tender, juicy and tasteful. The samples of studied sausages had higher moisture-holding ca- pacity than the planned ones. It is because the mass of pig heads tissues contains a great quantity of collagen proteins. It is clear that collagen boi- ling in heat treatment of heads results in changing some of its important properties, it becomes more accessible to the action of proteases, pepsin and trepsin, for instance. As a result of this, fibres length diminishes and the fibres thickness increases so that the fibres volume increases as a whole. The structure of collagen fibres loosens. Simultaneously water-binding capacity increases a little, separation of polysac- charides and formation of gluten take place. Gluten plays some role in forming monolithic structure of finished products, contributes to

holding water in sausage meat consistence.

### CONCLUSION

This work shows that the accep- table technology of producing protein mass of raw materials: pig heads, blood, starch, salt, broth has been developed. Pos- sibilities of using this mass in the manufacture of boiled sausage products instead of the main raw materials have been shown.

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