

Quality Of Poultry Meat Boned In A Machine With An Elastic Working Part For Its Further Utilization In Sausage Production

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SUMMARY: To obtain ground meat with muscle tissue integrity there was used a machine with an elastic working part "Farsh-4-500". Such type of Meat is the intermediate raw material between meat of manual and mechanical boning because ground meat is better than mechanically deboned due to its content of fullvaluable protein. Combined use of the abovementioned meat types will lead to extension of sausage products assortment. For ground meat production there were studied rational parameters of the process and its functional properties.

INTRODUCTION: Rational and maximum utilization of all possible proteins sources is an important direction in researchers' work and practical activity of meat industry specialists. One of this problem part is to extend the possible use of meat on bones after manual boning and rational dressing, poultry carcasses boning.

Poultry processing industry has a task to enlarge products assortment from poultry. The most significant factors inhibiting the industry development are relatively high labour-consuming production, limit in products assortment. Development and industrial introduction of machines for carcasses mechanical boning influenced greatly increase of poultry products manufacture, especially sausages. Such machines allow to process nonstandard carcasses and their parts. Mechanical boning of whole carcasses is hardly purposeful as it causes mincing of breast(white) and thigh(red) muscles that are mostly valuable for their nutritional value.

According to the technology of rational processing white and red muscles are used for manufacturing of natural ready-to-cook products, ham products and preserves; such parts as neck, back-blade with wings are not suitable for manual processing. An elastic working organ mounting allows to get ground meat from these parts.

"Farsh-4-500" was used for this purpose. It had been previously used for fish boning. Its working parts are perforated drum with 5mm holes and elastic flexible ribbon. For poultry boning "Farsh-4-500" is not suitable as poultry skeleton structure differs from fish one and while using perforated drum with 5mm holes bone particles size in ground meat was higher than the standard one.

To determine rational parameters for poultry boning there were made and used removable screen with 0.8-5mm holes and a knife for carcass and its parts grinding. A gauge was mounted for force regulation of ribbon clamping to drum.

While using removable screens with 0.8-1.3mm holes muscle integrity is being broken. That is why for ground meat production screens of 1.3mm and more were used. The aim of the work was to study quality of poultry meat after its boning in "Farsh-4-500" machine and the possibility of its use for sausage production.

MATERIALS AND METHODS: Broilers meat production increases in total volume of poultry meat that is why carcasses of II category broilers, back-blade, neck, wings serve as raw materials for ground meat manufacturing.

This problem is a new one for this country industry and it causes some questions connected with study into rational parameters of ground meat manufacturing and its quality, functional properties and yield, its utilization for sausage-and-culinary products manufacture.

Ground meat quality was tested according to chemical analysis, size and amount of bone particles. Fat and moisture content of ground meat was determined by standard methods; nitrogen - by Nessler; yield - by weighing; bone residue content - by KOH precipitation; connective tissue content - by oxyproline according to the method proposed by Neuman R.P. and Logan M.A. and modified by Zaydes A.P.

RESULTS AND DISCUSSION:

The obtained data analysis showed that ground meat is intermediate raw material, concerning its grade, between meat after manual boning and mechanical one, using "Poss-Meyn" machine (Holland). Ratio of proteins of muscle and connective tissues serves as the main criterion of meat quality. Bearing in mind that qualitatively these proteins differ it is better to compare the content of fullvaluable and nonfullvaluable proteins in meat (Table 1). Obtained data testify to a high quality of meat after manual boning and to a lower quality of mechanically boned meat. As it can be seen from the table fullvaluable protein content for ground meat is approximately close to the data on manually boned meat. It reveals that the machine with elastic working part not only separates meat from bones but also desinews it.

Table 1.

Type of boning	P r o t e i n, %			Pure protein % from total
	total	oxyproline	pure protein	
Manual	21.17	2.00	19.17	85.32
Mechanical, "Farsh-4-500"	15.81	2.32	13.49	83.35
Mechanical, "Poss Meyn"	13.97	5.15	8.82	66.38

While using ground meat or mechanically boned for poultry products manufacturing it is necessary to take into account bone particles form and size as their threshold of sensitivity is 0.5mm. Bone particles content higher than the threshold can cause injury of gastrointestinal tract.

The given data show that bone particles size and amount rise proportionally to increase of drum holes diameter and ribbon pressure (Table 2).

Table 2.

Type of meat	Pressure, Pa	Holes diameter, mm			
		1.2	2	3	5
		bone particles size, mcm			
ground	$10 \cdot 10^5$	30.3	44.89	53.95	69.74
	$30 \cdot 10^5$	39.7	65.54	129.28	143.93
	$60 \cdot 10^5$	46.45	90.53	172.74	217.14

In order to determine rational parameters of ground meat production process there was studied the influence of ribbon pressure and of drum holes size on the yield and quality of meat. The data are given in Table 3. They allow to conclude that at pressure and holes diameter rise yield increases as well as mass fraction of bone particles.

For tests there was used raw material of $0-4^\circ\text{C}$. After its processing on "Farsh-4-500" machine temperature does not change and depend on pressure and holes size.

CONCLUSIONS: 1. Use of the machine with elastic working part for poultry boning allows to utilize the whole carcass more effectively. 2. Ground meat contains less connective tissue than mechanically boned on "Poss-Meyn" machine. 3. Rise of drum holes diameter and pressure causes increase of ground meat yield and mass fraction of bone particles. 4. Use of ground meat in combination with manually and mechanically boned meat for poultry products manufacturing allows to enrich the assortment of sausage-&-culinary items.

Table 3.

Type of meat	Pressure, Pa	Holes diameter, mm	Yield, %	Bone particles, %
Ground	$10 \cdot 10^5$	1.2	38.24	0.3673
		2.0	46.67	0.6987
		3.0	51.28	0.7245
		5.0	59.09	0.9890
	$30 \cdot 10^5$	1.2	50.87	0.5081
		2.0	52.13	0.8150
		3.0	61.90	0.8488
		5.0	71.09	1.5450
	$60 \cdot 10^5$	1.2	61.08	0.8082
		2.0	68.06	0.9206
		3.0	74.38	1.0618
		5.0	76.11	2.6596

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