A study into the process of finely dispersed meat-&-bone pastes preparation

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MDM is complexly analyzed. It is found that when beef and pork bones are pressed by the press hydrosystem 15-28 MPa, MDM composition is characterized by the following parameters (Table 1)

Table 1

Parameters	Beef Bone	Pork Bone
Total moisture	56,05 ÷ 58,31	51,00 ÷ 52,30
Fat content, %	26,0 - 29,80	25,60 ÷ 26,90
Protein content, %	9,90 ÷ 12,50	10,10 ÷ 12,30
Ash content, %	5,22 ÷ 6,55	6,70 ÷ 7,30
Bone inclusions content, %	0,40 ÷ 1,12	0,6 ÷ 0,79

The decisive factor for the MDM quality estimation and its functional technological properties is their size rather than the total content of bone inclusions.
Fractional (size) composition of MDM bone inclusions is studied experimentally in two aspects
The first aspect. The threshhold of perceptibility of bone inclusions size in sausages and ground meat products is determined. It was found that the 0.1 - 50 mm particles were non-detectable in products organoleptically and do not reduce the organoleptical parameters of the product quality. When the size of bone inclusions, added to sausages and ground meat products, increase over 50 mm, their organoleptical parameters reduce considerably because of the appeared "sandy" taste.
The second aspect. The ratio of groups of fractions (I - to 50 mm and II over 50 mm), contained in MDM is determined (Table 2)

Table 2;

Group of inclusions	Pressure in press hydrosystem, MPa						
	Bone inclusions group content, %						
	15	18	20	22	25	26	28
Bone inclusions are non-detectable	87,3	87,7	92,2	92,6	57,7	79,6	86,4
Bone inclusions are detectable organoleptically	12,7	12,3	7,8	7,4	42,3	20,4	13,6

The analysis of the data given in Table 2 allowed to determine that presence of bone inclusions from group II (over 50 mm) in MDM do not permit its utilization for the production of sausages and ground meat products. The results got allow to give foundations for the necessity of finely dispersed MDM grinding.
The main constructive and operation characteristics of the apparatus for re-grinding of bone inclusions, contained in MDM down to 50 mm, are scientifically based.
A re-grinder of bone inclusions has been designed and commercially implemented. The design of the re-grinder is recognized as an invention. It consists of two grinding blocks. The first block includes a cutting pair knife - grille where the initial grinding of bone inclusions and cutting of long fibre structures of muscular and connective tissues take place.
The second block is two conjugated cones: mobile and immobile, between which grinding of bone inclusions with the formation of finely dispersed meat-&-bone pastes take place.
The parameters of the re-grinder operation are studied experimentally (Table 3).

Table 3.

A number of rotor rounds, round/min	Bone inclusions content, % From 1 to 16 mm	From 16 to 50 mm	From 50 to 300 mm	Temperature of MDM at the outlet from the grinder	Productivity, kg/hr
400	70,4	20,7	8,9	17	1360
300	73,9	20,2	5,9	14,3	1300
200	83,7	12,8	3,5	13,0	1220
100	89,7	9,7	0,6	11,2	1050
90	97,1	2,9	-	10	970
80	97,2	2,8	-	9	950

The analisis of data given in Table 3 allows to note that the best re-grinder operation parameters are provided at the speed of rotation of 80-90 rounds/min when there are no MDM bone inclusions over 50 mm in size, the temperature of MDM increases by 0.5-1°C in comparison with the initial temperature and the productivity is provided.
The process of finely dispersed meat-&-bone pastes preparation consists of producing MDM by presses and its further re-grinding by the re-grinder designed.
Finely dispersed meat-&-bone pastes allow to replace 15-25 % of meat in sausages and ground

meat products.
The quality of sausages and ground meat products with finely dispersed meat-&-bone pastes does not really differ from the quality of control products prepared without MDM.