

Sausage recipes of the “Halal” category with the use of new diary-protein concentrates and vegetative fats are worked out.

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Key words: meat products of the “Halal” category, mutton, vegetative fats, diary protein-carbohydrate concentrate “Lactobel-ED”.

Summary

Sausage recipes and technologies of the “Halal” category, developed on the rational combination basis of the raw materials of animal and plant origin are highlighted. Perspective and urgency of vegetative fatty components and diary protein-carbohydrate concentrate “Lactobel-ED” use in sausage production are shown.

Introduction ВВЕДЕНИЕ

Analysis of meat products enables us to think that there are a lot of favorable economical, social and political reasons for the development of halal industry in Russian Federation. Enterprises are very interested in halal production as the price of such products is much higher in comparison with the price of traditional ones. “Halal” becomes a global symbol that guarantees quality and says about the choice of lifestyle; it also gives some competitive advantages in the sphere of product marketing.

It is not allowed to use pork, lard, blood, by-products and etc. in the process of halal production. Meat of animals, raised in ecologically clean areas is used as raw material. According to the demands of Islam canons, animal slaughtering should be done without preliminary stunning. That is why mutton is supposed to be the most suitable raw material for such purposes.

Authors have developed sausage recipes and technologies on the mutton basis, which contain diary components and vegetative fats instead of animal ones with the aim of substitution of mid-back and spine speck and also of balanced improvement between amino acid and fatty acid compounds.

Research Methods Методы исследований

Determination of mass fraction of moisture, determination of mass fraction of moisture, determination of mass fraction of protein, Determination of mass fraction of fat, determination of mass fraction of ash, determination of peroxide value, determination of acid number, iodine number, determination of organoleptic quality, determination of fatty acid composition, determination of water absorbing capacity (UPU), the definition lipophagic ability (ZHPS) determination of emulsifying capacity of protein drugs, determination of emulsifying capacity of minced systems that determine the stability of emulsion, determination of amino acid composition, determination of the concentration of hydrogen ions, determination водосвязывающей способности, determination of the limit shear stress, determination water-holding capacity of protein drugs, determine the degree of penetration, determination of the yield of finished product

Определение массовой доли влаги, Определение массовой доли белка, Определение массовой доли жира, Определение массовой доли золы, Определение перекисного числа,

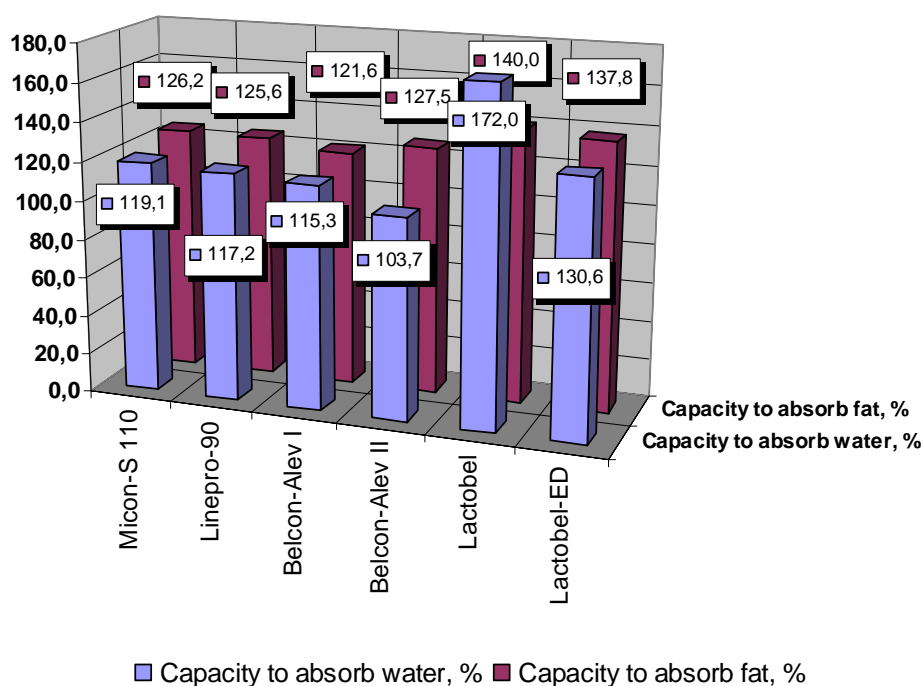
Определение кислотного числа, Определение йодного числа, Определение органолептических показателей, Определение жирнокислотного состава, Определение водопоглощающей способности (ВПС), Определение жиропоглощающей способности (ЖПС), Определение эмульгирующей способности белковых препаратов, Определение эмульгирующей способности фаршевых систем, Определение стабильности эмульсии, Определение аминокислотного состава, Определение концентрации ионов водорода, Определение водосвязывающей способности, Определение предельного напряжения сдвига, Определение водоудерживающей способности белковых препаратов, Определение степени пенетрации, Определение выхода готового продукта.

Studies Результаты исследований

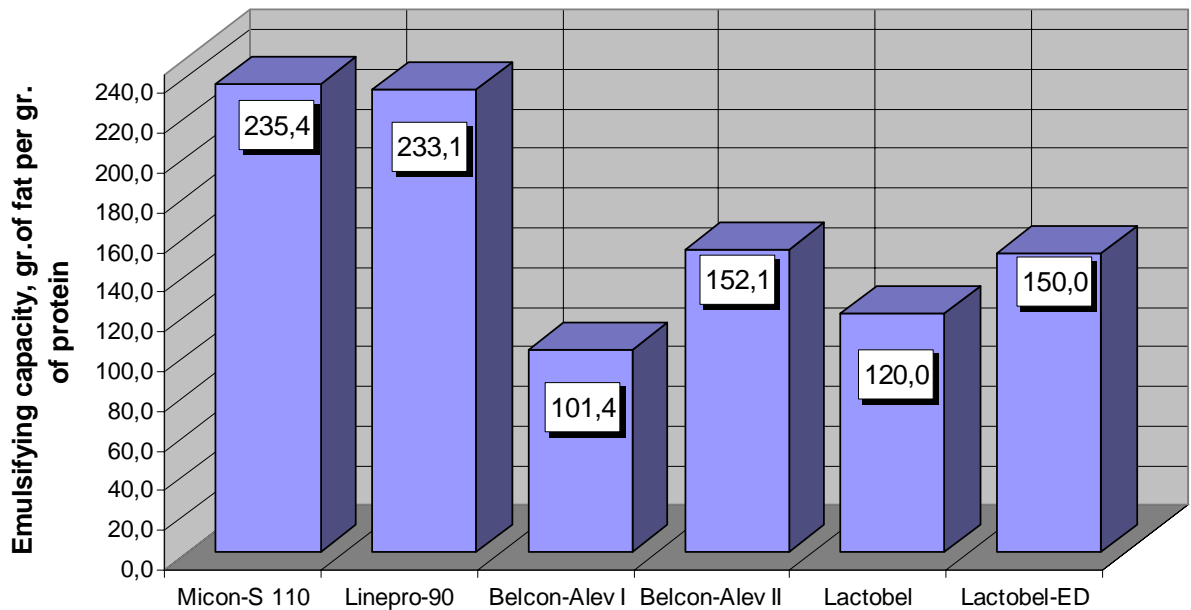
On the research basis of vegetative fats (organoleptic indicators, fatty acid compounds, dynamics of oxidation and hydrolytic processes, quality indicators) refined, odorized oil was chosen as the fatty component of sausage recipe of “halal” category. The main criterion for the choice of fatty ingredient was its wide usage, price, storage properties.

Diary protein-carbohydrate concentrate “Lactobel-ED” was chosen as emulsifier. It contains bifidofactor – lactulose, which is considered one of the best prebiotics, restoring micro flora of digestive tract. Besides, it has hepatoneuroprotection and antiandotoxin effect.

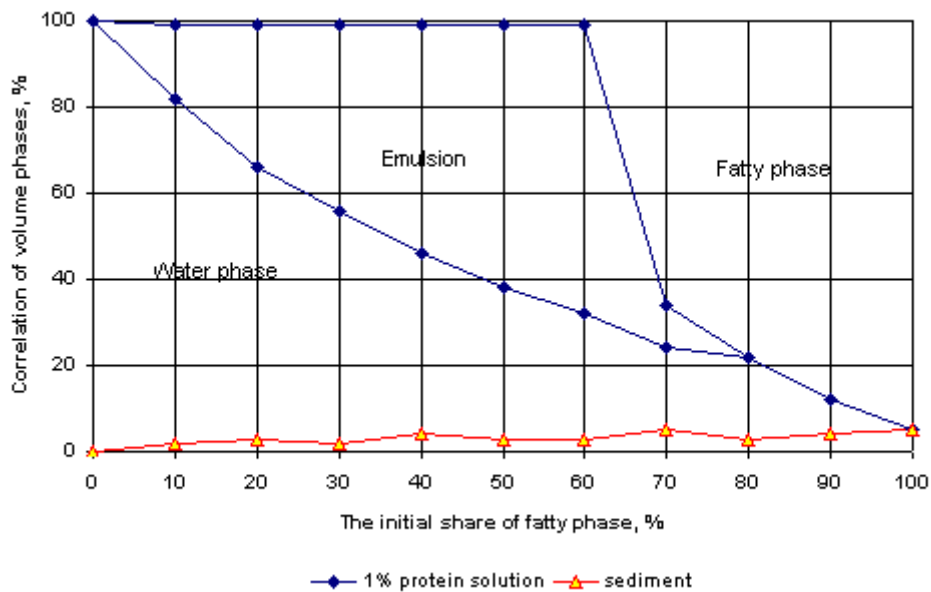
Diary protein-carbohydrate concentrate “Lactobel-ED” (Technical Requirements 9229-001-79993300-2006) was developed on the basis of concentrate “Lactobel” in order to create protein preparation which is rich in reduced sugar contents and doesn't contain many mineral substances. Hydration of protein preparation was made in correlation 1:1. Oil researches as fatty phase during the definition process of emulsifying capacity of diary protein-carbohydrate concentrate “Lactobel-ED” have shown that in the process of introducing the concentrate up to 60 %, it formed stable emulsions. Adding 60% of fat emulsifying capacity of concentrate was 150 g. of fat per 1g. of protein (pictures 2,3). Resistance of stabilized emulsions increases with the growth of fatty phase concentration in the system, reaching its climax at the initial fat share in the system 60%.



Picture 1 – Capacity of protein preparations to absorb water and fat



Picture 2 – Emulsifying capacity of protein preparations



Picture 3- Stability diagram of emulsion “Lactobel ED” in the system “fatty phase (oil) – internal phase “Lactobel ED”.

The influence of suggested types of fatty-protein emulsions on physico-chemical ones, structural and mechanical characteristics of introduced farce systems before and after thermal treatment, chemical compound and also organoleptic indicators of the final product were studied in the process of recipes employment. Trial samples of introduced farce systems were made from the mutton of the best quality. Cooked sausage “Favorable”, made of mutton was taken as control sampling.

Table 1

Physico-chemical, structural and mechanical indicators of introduced farce systems of cooked sausages

Indicators	Samples							
	Control	Trial oil samples						
		1	2	3	4	5	6	7
		Level of "Lactobel ED" introduction						
	2,0	2,5	3,0	3,5	4,0	4,5	5,0	
pH, un.	5,88 ± 0,01	5,95 ± 0,01	6,02 ± 0,01	6,04 ± 0,03	6,07 ± 0,03	6,09 ± 0,03	6,12 ± 0,01	6,13 ± 0,01
Moisture content, %	68,2 ± 0,3	67,5 ± 0,3	67,7 ± 0,2	67,1 ± 0,2	67,5 ± 0,3	67,4 ± 0,2	67,8 ± 0,2	68,3 ± 0,3
Moisture binding capacity, % to the whole moisture amount	97,8 ± 0,5	99,5 ± 0,5	99,7 ± 0,5	99,6 ± 0,3	100,0 ± 0,5	100,0 ± 0,3	100,0 ± 0,5	100,0 ± 0,5
Penetration degree, Pa	570,3 ± 4,1	442,6 ± 4,1	449,5 ± 4,3	465,4 ± 4,1	470,4 ± 4,1	485,2 ± 4,4	488,3 ± 4,2	494,0 ± 4,3

According to the researches that have been made, concentrate level in emulsions as well as chemical and physical indicators of farce systems as raw material improve in comparison with control sampling.

The increase of water binding capacity of farce systems for cooked sausages at 2% is indicated. It is connected with pH removal into the area of increased indicators from myofibrillar protein isopoint, increasing its capacity to solution and its hydration level.

Analyzing the results of structural and mechanical characteristics of introduced farce systems, it was proved that penetration degree of trial oil samples reduces on average at 99,5 Pa. It may be explained by the reduction of myofibrillar proteins share, but at the same time improve tenderness and juiciness of the final product.

Researches of emulsifying capacity of diary protein-carbohydrate concentrate "Lactobel-ED" have shown that after 60% of the concentrate has been introduced, its emulsifying capacity is 150 gr. of fat per 1gr. of protein.

Maximum level of emulsifying capacity for trial oil samples is 25,50% at emulsion stability 93,68% and 24.75%.

As for samples with thermal treatment, it is shown that increasing the level of "Lactobel-ED" introducing, there is the tendency to increase pH, moisture retardation indicators.

Functional, technological and structural-mechanical properties of samples with thermal treatment of introduced farce systems for cooked sausages

Indicators	Samples
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	Control	Trial oil samples						
		1	2	3	4	5	6	7
		Level of "Lactobel ED" introduction						
		2,0	2,5	3,0	3,5	4,0	4,5	5,0
pH, un.	5,99 ± 0,03	6,05 ± 0,01	6,06 ± 0,01	6,07 ± 0,01	6,08 ± 0,02	6,13 ± 0,01	6,14 ± 0,03	6,16 ± 0,02
Moisture content,%	62,5 ± 0,6	62,2 ± 0,3	62,3 ± 0,5	62,3 ± 0,3	62,9 ± 0,3	64,5 ± 0,5	64,6 ± 0,5	63,1 ± 0,1
moisture retardation capacity, % to the whole moisture amount	67,7 ± 0,5	70,4 ± 0,6	70,5 ± 0,6	70,6 ± 0,6	71,3 ± 0,5	71,7 ± 0,6	71,9 ± 0,8	69,7 ± 0,5
Penetration degree, mm	5,4 ± 0,2	6,3 ± 0,3	6,1 ± 0,2	6,3 ± 0,3	6,4 ± 0,2	6,5 ± 0,2	6,6 ± 0,2	6,2 ± 0,3
Outlet, % to the mass of raw material	104,8 ± 2,1	106,5 ± 2,1	107,2 ± 2,3	107,5 ± 2,8	109,3 ± 2,1	110,7 ± 2,2	112,2 ± 2,3	113,6 ± 2,1
Organoleptic estimation, point	4,4 ± 0,1	4,6 ± 0,1	4,8 ± 0,2	4,8 ± 0,2	4,4 ± 0,1	4,7 ± 0,1	4,8 ± 0,2	4,5 ± 0,1

Conclusion **Заклучение**

Degustation evaluation of sausages proved guaranteed possibility to use refined odorized oil in emulsions as their distinguished characteristics are tenderer consistency and more intensive coloring.

On the research basis the improvement of "Halal" recipes has been achieved with the help of "Optmix" program. Recommended level of introducing diary protein-carbohydrate concentrate "Lactobel-ED" in the form of emulsion is 4,5%.