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IN COOPERATION
WITH OUR MEMBERS:

Digital devices and technologies
have penetrated the social and professional life
of people everywhere.
What are the implications of the digital
transformation for education,
especially vocational education?
How can new technologies help prepare
professionals for a life
in the digital world?

The task of teachers today is not only to collect and provide relevant information about the opportunities and challenges of the modern world, but most importantly, to help students develop competencies for new jobs that do not even exist today.

Innovation requires that higher education institutions adapt the way they teach. Providing courses in the online format has become a mandatory attribute of any curriculum, especially in the vocational education. New technologies are transforming the learning process.

New scientific discoveries, technological changes, the emergence of innovative fields of activity occur at such an unprecedented pace that learning throughout life is no longer a choice but a moral imperative.

«Skills increase profitability,» says David Lister, a member of the Board of Directors of the UK innovation skills platform. Representatives of industry and government participate hand in hand in the work of this platform. Its goal is to help the UK citizens keep up with the necessary digital skills to stimulate economic growth. David Lister draws attention to the fact that 12% out of all graduates of technological universities remain unemployed six months after graduation. Thus, it is one more proof of the existence of a gap between the skills and competencies needed in the real sector of the economy and those the traditional education system can provide.

Therefore, it is necessary to constantly update skills and knowledge through participation in the distance learning and online courses, MOOCs, virtual learning networks. These formats allow make classes flexible, attractive, and more adapted to the needs of students. Students are no longer required to be in the classroom. They can watch video lectures whenever and wherever they are. Modern learning platforms allow students and teachers to interact with each other, upload and download study materials, complete assignments online, and much more.

Learning becomes a journey into the world of fascinating knowledge and new skills. At the centre of this journey, is a student. And teachers serve as conductors, facilitators, assistants.

The modern trend of lifelong education shows that the concept of professional development is not relevant anymore. Professional education takes its place. What is the difference between those two notions?

Professional development is often provided in a form of the traditional lectures or workshops that are designed to help professionals continue to grow in their careers. This is the format of passive learning. Moreover, traditional professional development implies providing information, while we know that active formats or learning with the use of innovative methods are paramount.

Professional education is based on the same ideas and goals as professional development. However, active and interactive learning strategies prevail over the passive development methods.

According to statistics of the CompTIA – The Computing Technology Industry Association, the use of digital technologies and methods in education can reduce time for understanding and mastering material up to 50% and increase the information retention time up to 75%.

Ekaterina Tsaranok

Director

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DEVELOPMENT OF SAUSAGE WITH PROTEIN SUPPLEMENTS

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Abstract

In this article is presented the technology of meat production products combined dietary and therapeutic and prophylactic purpose with an optimal calcium and iron.

In modern conditions the development of market economy and the development of a balanced and functional food products is an important social objective, so its decision will affect not only the extension of human life, but also an increase in active, creative period of life, the preservation of health, vitality and capacity for work.

In this regard, it becomes extremely important to develop a new direction for the improvement of meat-based multi-technology product functionality in order to improve the human diet, thus expanding the range of specialized products and more efficient use of the resources of the meat industry.

The purpose of this work is to provide a sausage for people suffering from iron deficiency and calcium with mineral and organic additives.

Keywords: unctional food, sausages, food safety, calcium , supplements.

Research methods. Mass fraction of moisture, protein, lipid was determined by conventional techniques; designing formulations was performed by the method of NN Lipatov; the safety parameters were determined in accordance with SanPiN 2.3.2.1078.01; organoleptic assessment is on a 5 point scale in accordance with GOST 8756.1-70.

In developing the initial evidence is based requirements for the composition and quality of special sausages for people suffering from iron deficiency and calcium, guided by the norms of physiological needs for nutrients and energy, as well as the concept of a balanced and functional foods.

According to the theory of a balanced diet analysis of representations about the specific metabolic processes and physiological characteristics of the individual categories of people allowed to formulate a list of science based requirements for recruitment and the ratio of nutrients:

- correlation protein: fat should be 1: 1-1.2;
- correlation of saturated and polyunsaturated fatty acids in the product should be 3: 1;
- mass protein share should be 12-16%;
- The product must be balanced in mineral and vitamin content.

Designing recipes products was carried out with the use of computer modeling of the balance system and quality evaluation of multicomponent food systems, allowing to develop food products with the required combination of properties, predetermined level of adaptation to the specific metabolism of consumers with a variety of physical and physiological status [1, c.33]).

As a source of protein in developing products using lamb and horse meat monosort first grade, to ensure rational use of the resources provided for the use of meat skimmed milk powder, blood plasma and isolated soybean protein.

Table 1. **Formulation of experimental sausage**

Name of raw materials, spices and materials	Sausages	
	Formulation 1	Formulation 2
Unsalted raw kg to 100 kg		
Lamb monosort	50,0	50,0
Horse meat 1 grade	25,0	27,0
Powdered milk	2,0	10,0
blood plasma	5,0	5,0
Eggs	3,0	3,0
soy isolate	15,0	5,0
Spices and materials, g. per 100 kg		
kitchen salt	2200	2200
sodium nitrite	7,5	7,5
Sugar	120	120
Black pepper	120	120
Allspice	60	60
Cardamom	40	40
calcium chloride solution	500	500

According to microbiological indicators and indicators of food security of the product corresponded to «Hygienic requirements for quality and safety of food raw materials and food products.

«Technological process. Raw after veterinary inspection, stripping and wet toilet undress in rooms where the temperature 10-120C and relative humidity above 70%.

Cutting, deboning and trimming meat produced in accordance with the current technological instruction. Trimmed meat is weighed and exposed to salt [2, c.16-18]).

In our experiments, we used the method of salting meat in particulate form (fineness of 6 mm) with concentrated brine density of 1.201 g / cm3 containing 26% NaC1.

To prepare a concentrated solution of salt per 100 kg of cold water take 35 kg of salt, stir thoroughly, the solution was allowed to stand for settling impurities and the density is checked using a hydrometer.

The solution was filtered prior to use through a layer of cheesecloth and cooled to a temperature not higher than 4C.

100 kg of raw material is added 8.5 kg of concentrated solution of the salt (normal salt is 2.2 kg , water is 6.3 kg).

Stirring of meat with brine in the mixers produce for 2-3 minutes and allowed to uniformly distribute the total absorption of salt and its meat.

During salting and sodium nitrite is added in an amount of 7.5 g per 100 kg of raw beef in a solution concentration of not more than 2.5%. Duration of salting is 8-10 hours. Egg components prepared as follows: fresh washed and split, egg powder is hydrated in a mixer at a ratio of 1: 3 with water. Soy protein and milk powder are hydrated immediately before cooking minced in 1: 2 ratio with cold water [3, c.116]).

Table 2. **Chemical composition of the finished product**

Component name	Finished products		Control
	Formulation 1	Formulation 2	
Protein in%	16,5	16,7	13,9
Lipids in%	18,5	18,1	21,5
Carbohydrates,%	0,4	0,4	0,2
Water %	64,5	64,6	64,2
Mineral substance in mg per 100 g			
Calcium	180,5	181,7	123,9
Magnesium	26,6	26,8	25,7
potassium	120,2	121,7	119,9
Sodium	79,3	79,7	78,1
phosphorus	185,5	184,7	187,3
Chlorine	20,8	21,4	21,7
Iron	2501,0	2531,1	1645,1
Iodine	165,1	164,3	162,4
Fluorine	15,8	16,3	9,1
Vitamins, in mg per 100 g			
A (Retinol)	0,01	0,01	0,01
B_1 (Thiamin)	0,30	0,31	0,27
B_2 (riboflavin)	0,11	0,10	0,12
B_6 (Pyridoxine)	0,23	0,27	0,21
E (Tocopherol)	0,24	0,23	0,12

For the preparation of minced meat and other raw material ingredients are weighed according to the formulation

Minced meat cooked on the cutter, with the beginning of the process horsemeat and mutton gradually adding other components, and the duration is 10-12 minutes of cutting. Further process is conventional.

Table 3. **The content of amino and fatty acid composition of the finished products**

Name	Norm FAO / WHO	Finished products		Control
		Formation 1	Formation 2	
Amino acids g / 100 g protein				
Isoleucine	4,0	4,5	4,7	4,4
leucine	7,0	7,7	7,8	7,1
lysine	5,5	7,0	7,2	5,9
Phenylalanine + tyrosine	6,0	8,2	8,7	8,2
Tyrosine	6,0	8,3	8,8	7,1
Methionine + cystine	3,5	3,8	3,5	3,1
Threonine	4,0	4,3	4,2	3,9
Tryptophan	1,0	1,2	1,1	1,1
Valine	5,0	5,3	5,8	5,4

As can be seen from the above tables 2 and 3, developed sausages compared with the control have a higher quality of the chemical composition, as well as in terms of the minimum amino acid close to the ideal product (reference FAO / WHO).

Mathematical modeling of preferred prescription ingredients provided to set the initial requirements of the quality indicators of the finished product.

Our experiments have shown that the protein and mineral supplements allow their use as additives that enrich meat product essential mineral components such as calcium and iron, as essential amino acids and unsaturated fatty acids.

On the body affects not only the quantity but also the ratio of these components (calcium and iron), their optimal ratio is 1: 1 or 1: 1.5, and it creates better conditions for the assimilation of calcium.

Microstructural studies of experimental and control batches of sausages showed that beef is composed primarily of mechanically crushed to a fine grained protein mass of muscle tissue containing large fragments of muscle fibers and connective tissue, which is the average size of 350-400 microns.

Not destroyed particles retained typical morphological characteristics of the feedstock, which can be judged on ingredients stuffing.

The fat released during chopping of disrupted cells, distributed in the stuffing in the form of fat droplets in the vacuoles, and in the fine grain size of the protein mass of from 5 to 60 microns.

Minced mass of relatively compact, permeated by vacuoles and capillaries with clearly defined boundaries, sometimes merging with one another, the average size of 150-170 microns.

The microstructure of the pilot batches of sausages characterized by a relatively compact mass of minced meat, which includes in its membership the large fragments of muscle and connective tissue, spice particles as fat droplets. In this form of fat drops of up to 50 microns uniformly distributed in the mass of fine meat, what appears to affect protein and mineral supplement [4, c.28-29]).

Thus, as a result of the study we demonstrated the possibility of using the protein-mineral supplements when creating specialized sausages intended for the regulation of calcium metabolism of iron deficiency and correction of unsaturated fatty acids.

Optimizing the number of supplements at the same time having a positive impact on the balance of the mineral composition provides a favorable ratio of calcium and iron in the finished product.

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