

History and innovation in pate technology

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Abstract. Analysis of the history of the pates creation has shown significant prospects of the product at the present time. Model samples of meat and vegetable pates have been developed by introducing a mixture of powders from rosehip and nettle leaves in an amount of 5, 8 and 10% and a cereal filler made from oatmeal. In terms of organoleptic quality indicators, the sample with the addition of 8% of a mixture of meal powders turned out to be the best. The technological process of the production of meat-vegetable pates includes both traditional operations and the preparation and introduction of herbal ingredients. The developed pate samples were stored at a temperature of $4 \pm 2^\circ\text{C}$ for 7 days, and the quality indicators were assessed. The pastes "Young Strength" and "Willpower and Strength of Mind" are the best. Their highest score is 4.96. It has been established that the consumption of 100 g of "Powerful Strength" pate will provide the daily requirement of men and women of elderly and old age in vitamin B6 by 25.3%, iron by 28.1 and 15.6% (respectively). "Willpower and Strength of Mind" will cover the satisfaction of the daily need for vitamin B6 by 17.8% of men and women of the elderly and old age, in iron by 22.9% for men. And with the use of "Young Strength" pate the daily need of older people for vitamin B6 will be satisfied for 17.8%, in iron by 20.8% in men of this age category. The use of meat-containing non-meat components with high nutritional value in pate technologies allows us to class them as functional products.

1 Introduction

The history of the creation of pate is rooted in the gastronomic delights of Ancient Rome. Then, in the development of the traditions of French cooking, it appears at the end of the 18th century. In the format of Russian noble cooking, we learn about pate from literary sources. A.S. Pushkin in the work "Eugene Onegin" mentions the Strasbourg pie, which was used by nobles in the Russian Empire at the beginning of the 19th century. It was a very expensive and inaccessible dish, the recipe of which included delicious foreign truffles. It is noteworthy that pate was not prepared in Russia during this period. The canned dish was brought from France (therefore, A.S. Pushkin calls it imperishable) [2]. To ensure the transportation of the pate, it was baked in a dough, poured with lard and placed in a deep dish. Additional safety was provided by ice between the packages of the cake. The dish was distinguished by a vividly seasonality - it was prepared during the fall - early winter. The late version of the cake was considered a special delicacy, because the aroma of truffle mushroom that was part of the recipe was revealed only during the first frosts.

Currently, pates are products, the recipe of which includes boiled meat ingredients with the addition of non-meat ingredients (filler from cereals, onions), prepared in a certain way, and salted edible broth; with the addition of food additives, spices, seasonings. Ready-made pates are packed in food artificial casings and subjected to subsequent heat treatment until cooked [3].

In developing pates considering out their purpose, so often is carried out the replacement of the part of raw meat plant components: fillers from cereals and powders of marks of vegetable raw materials rich by vitamin and mineral composition and food fiber. They provide the functional orientation to the finished product, and they are an integral part of the diet for elderly people [1].

In order to determine the optimal recipe composition of meat-and-vegetable pate with the introduction of a mixture of powders from rosehip fruit meals and nettle leaves (in a ratio of 5: 3), we have developed model samples of minced pate with cereal filling from oatmeal. They have the least pronounced specific taste and smell with insertion of 5, 8 and 10% of a mixture of powders from vegetable raw. Organoleptic evaluation of model samples of pates is given in table 1.

Table 1. The results of the organoleptic evaluation of model samples of meat and vegetable pates with a mixture of powders from marc of vegetable raw

Indicator name	Samples of Pate Mince with Food Fortifier		
	5 %	8 %	10 %
Appearance	5.0	5.0	5.0
Consistency and sectional view	5.0	5.0	4.7 ± 0.1
Color	4.9 ± 0.2	4.9 ± 0.3	4.8 ± 0.2
Smell and taste	4.8 ± 0.3	4.9 ± 0.1	4.7 ± 0.1
Shape and size	5.0	5.0	5.0
Total Points	24.7	24.8	24.2
Average score	4.94	4.96	4.84

2 Results and discussion

According to organoleptic quality indicators, the sample with the addition of 8% of a mixture of marc powders turned out to be the best. It scored a larger number of points - 4.96. Other samples had the worst result in terms of color, smell and taste, and the sample with 10% of the mixture had an insufficiently smeared and slightly crumbling consistency (4.84 points).

Because of the development of experimental kinds of pates with the indicated ingredients with the following study of organoleptic and physicochemical quality indicators three kinds of recipe were identified, which formed the basis of the normative and technical documents developed by us.

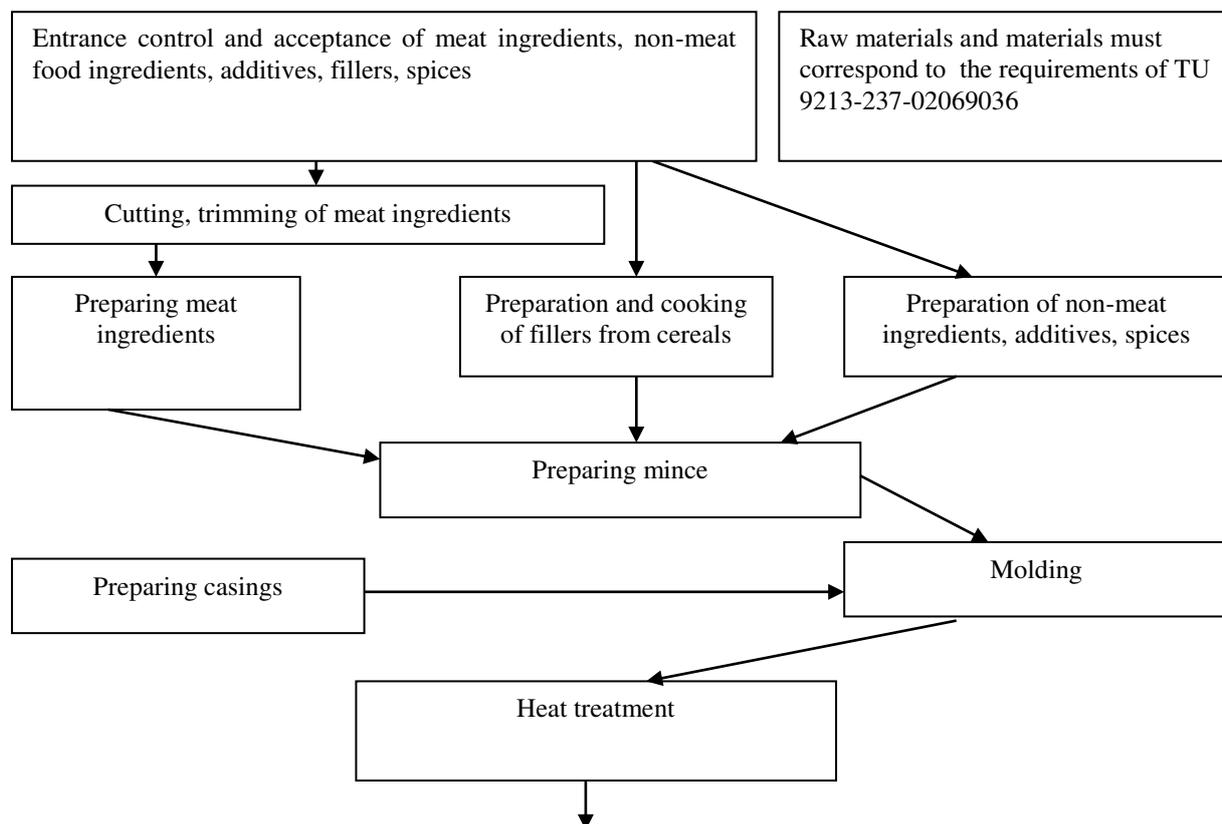
The technological process of manufacturing meat-and-plant pates comprises the following operations: input control and acceptance of raw materials; preparation of food ingredients, additives and spices materials; preparation and cooking of cereals fillers;

preparation of meat ingredients; cutting, deboning and trimming of meat ingredients; heat treatment of meat ingredients; preparation of mince; lending of pates; preparation of pates for heat treatment; heat treatment; quality control of finished products; marking; packaging; acceptance of finished products; transportation and storage.

The scheme of the technological process of meat-containing pates production is shown in Fig 1.

Acceptance of raw meat, including entering for importation, fulfil in accordance with the current scientific and technical specification. When accepting raw meat compliance with the accompanying documents is checked.

When accepting the non-meat food ingredients, additives, spices and materials is determined by date of production and period of storage up to the production of income, the presence on the label of data on the composition (for non-meat food ingredients and additives), the manufacturer's recommended bookmark rates (for multi - component food additives).



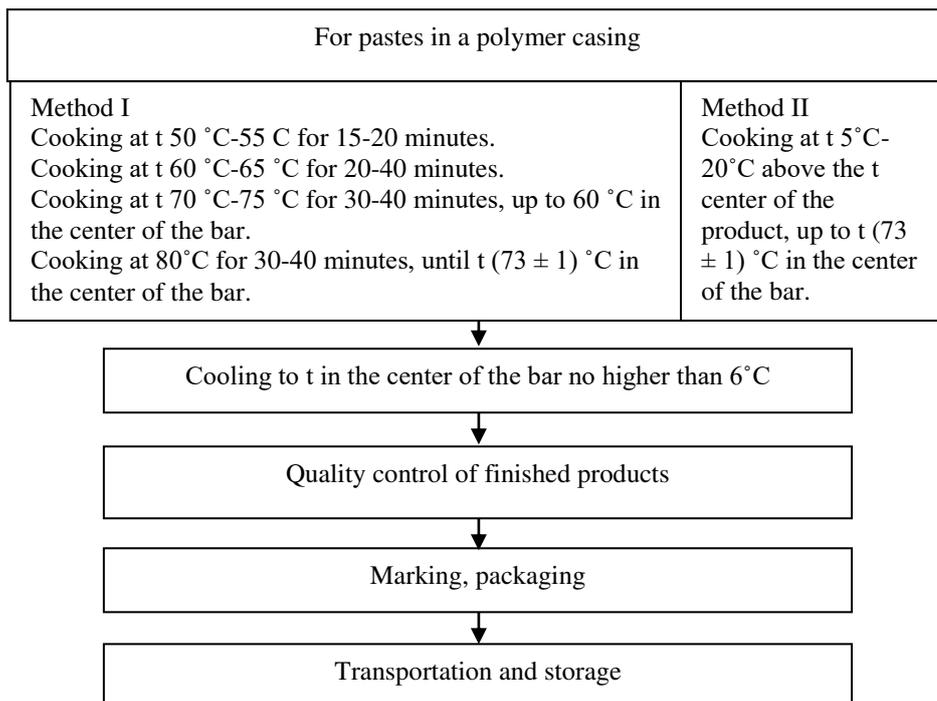


Fig. 1. The scheme of the technological process of meat-containing pates production.

The hot meat ingredients reduced to fragments by grinding and cooled in the chamber not higher than 12 ° C.

Cereals fillers are weighed in accordance with the recipe for the mince preparation of non-meat and minced meat food ingredients: additives, spices, food broth.

Pate’s mince is recommended to cook on a cutter. After stuffing cutter mince with a homogeneous structure, treat in the machines of delicate growing. More than that, the cutting duration is reduced to 3-5 minutes. It is necessary to treat the mince in the mixer processing machines of delicate growing. The temperature of the ready mince should be no higher than 14 ° C. The pH value of the finished mince t should be between 5.6 and 6.2.

Preparing pates for heat treatment they were hung into thin sticks with intervals between sticks avoid slips and placed on the frame. Formed sticks pates put to thermal treatment.

Cooking was made in the term cells at a temperature of heating surrounding (steam, water) 75 ° C-80 ° C at a humidity of 100% until the temperature will be (73 ± 1) ° C in the centre of the stick.

After the end of cooking pates immediately are cooled by cold water with supply system with the temperature not higher than 15 ° C. Then should be further treatment in rooms with temperature from 0 ° C to 6 ° C and a relative humidity of 75% until the

temperature at the center of sticks not more than 6 ° C. After that, the technological process is finished and the product is ready for realization. The duration of cooling the pates in the casing was no more than 5 hours.

Freshly produced samples of meat and vegetable pates were put into storage at a temperature of 4 ± 2 °C. The expiry date of pates is no more than 7 days from the end of the technological process. Organoleptic assessment and study of physicochemical quality indicators were carried out in fresh samples and at the end of the expiry date.

The study of three variants of experimental samples of pates showed that they have high organoleptic quality indicators. Use in cereal fillers and powders from plants raw in pastes recipe gave to final products soft, spreadable, homogeneous consistency pretty meat taste, good form.

Organoleptic evaluation of freshly produced pates was carried out in accordance with the generally accepted method using a five-point differentiated rating scale, according to appearance, texture, aroma, taste, color and at the end of the expiry date.

On tasting meetings, the samples of developed meat vegetable pates were presented. The results of organoleptic quality valuation of submitted samples were obtained on the basis of tasting cards of commission members and after mathematical treatment are presented in consolidated tables 2.

Table 2. The results of the organoleptic assessment of the quality of meat of vegetable pate.

Name of indicator	Powerful strength	Young strength	Willpower and strength of mind
Freshly produced			

Appearance	4.85 ± 0.2	4.95 ± 0.2	5.0
Consistency	4.9 ± 0.1	5, 0	5.0
Fragrance	4.9 ± 0.1	4.9 ± 0.1	4.9 ± 0.3
Taste	4.6 ± 0.1	4.95 ± 0.1	4.9 ± 0.1
Color	4.7 ± 0.1	5, 0	5.0
Total points	23.95	24, 8	24.8
Average score	4.79	4.9 6	4.96
At the end of the expiration date			
Appearance	4.8 ± 0.2	4.9 ± 0.2	4.9 5 ± 0.3
Consistency	4, 85 ± 0,1	4.9 5 ± 0.1	4.9 ± 0.2
Fragrance	4.9 ± 0.1	4.9 ± 0.1	4.9 ± 0.3
Taste	4.6 ± 0.1	4.9 ± 0.1	4, 85 ± 0,1
Color	4.7 ± 0.1	5.0	4.8 , 0
Total points	23, 8 5	24, 65	24, 4
Average score	4.7 7	4.9 3	4, 88

According to the results of this examination, we can conclude that the meat vegetable pate " Young strength" and "Willpower and strength of mind" are the best in terms of the consistency and color. These pates received the highest amount of marks - 4.96. It indicates a high consumer qualities. The pate "Powerful strength" is the second according the organoleptic characteristics (4.79 points). After 7 days of storage, meat and vegetable

pates also had high organoleptic characteristics. At the same time, in all samples of pates, a slight compaction of consistency was observed due to the loss of a part of free moisture, while the total score remained quite high.

Meat-containing pates made from raw meat and non-meat components have a high nutritional value and functional properties. The results of calculating the nutritional and energy value are given in table. 3.

Table 3. Nutritional and energy value of 100 g of pate

Name of the pate	Protein, g, not less	Fat, g, no more	Carbohydrates, g, not more	Energy value, kcal
" Powerful strength "	8.2	15.5	12.5	229
" Young strength "	8.4	16.0	12.4	234
"Willpower and strength of mind"	8.0	16.3	9.2	222

To substantiate the use of meat-containing pates as functional food products in the diet of the elderly, the percentage of satisfaction of the daily requirement for individual of functional food ingredients (FFI) was calculated with the using of 100 g of the product (Fig. 2).

It was found that 100 g of pate consumption of «Willpower and strength of mind" will provide the daily needs of elder men and women for vitamin B₆ at 25.3%, iron by 28.1 and 15.6% (correspondingly).

Consumption of 100 g of "Willpower and Strength of Mind" pate will cover the satisfaction of the daily need for vitamin B₆ by 17.8% of men and women of elderly and old age, correspondingly, in iron by 22.9% for men. In addition, when using the pate and "Young strength "- the daily requirement of the elderly for vitamin B₆ will be satisfied by 17.8%, in iron by 20.8% for men of this age category.



Fig. 2. Percentage of satisfaction of the daily need for individual FFI of people over 65 years old when consuming 100 g of pate

3 Conclusion

Thus, the use of meat-containing non-meat components with high nutritional value in technologies of pates makes it possible to classify them as functional products necessary for the feeding of elderly and old people, because of the high content of vitamin B₆ will promote the metabolism activation in the brain tissues, increasing its performance, improving memory. A significant iron content increases the physicochemical processes leading to the energy production in the body of the elderly.

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