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PROMISING TECHNOLOGICAL TRENDS OF INCREASING CONSUMPTION OF POULTRY ON THE WORLD MARKET

The meat and meat market is an important component of the food industry.

The market of meat and meat products is one of the most important parts of the food industry. Its constant development makes it possible to provide its population with quality goods, as well as to receive significant income from exports. Accordingly, the development of this industry is a priority position in the state policy.¹

The last few years have been particularly difficult for the entire population of the planet, and for Ukraine in particular. Since 2019, we have faced the global problem of COVID-2019, which has made adjustments to our way of life and led to a decrease in economic activity and production in many branches of industry and agriculture, a decrease in the income of the population and, as a result, consumer demand.²

Since February 24, 2022, martial law has been in force in Ukraine, our state defends its territorial integrity, sovereignty and independence. All this has an incredibly negative impact on the psychological and physical health of the population.

Scientists have proven that under the influence of long-term stress, the body becomes exhausted and vulnerable to various diseases. Therefore, it is very important in such a difficult time to create useful, functional and, no less important, quick-to-prepare products that will support the body and its vital activities.³

From the point of view of nutrition physiology, poultry meat is a very important source of protein in the diet of both healthy and sick people. In

1 Scientific achievements in solving urgent problems of production and processing of raw materials, standardization and food safety»/ Development of low-temperature preparation of indiced fillet with enriched mineral composition // Beznosko A., Tishchenko L., Pilipchuk O., 2020 (nubip.edu.ua)

2 Ibid.

3 Actual issues of development of economy, food technologies and commodity studies/ I. A. Komurko, I. C. Choni higher educational institution of the Union «Poltava University of Economics and Trade, 2018 collection of theses students_2018.pdf (puet.edu.ua)

terms of the amount of unsaturated fatty acids and the low level of saturated fat, chicken meat has better indicators than pork and beef. Depending on the species origin and production technologies, this raw material contains 15–22 % protein, 5–39 % fat, mineral salts, extractive substances, as well as vitamins A, D, PP, group B.⁴

The basis in the processing meat industry is satisfaction of the needs of the population in high-quality meat products, expansion of the range of products and introduction of resource saving technologies (Fig. 1), aimed at reducing the cost of production and solving the problem of food for the population.⁵

Source:⁶

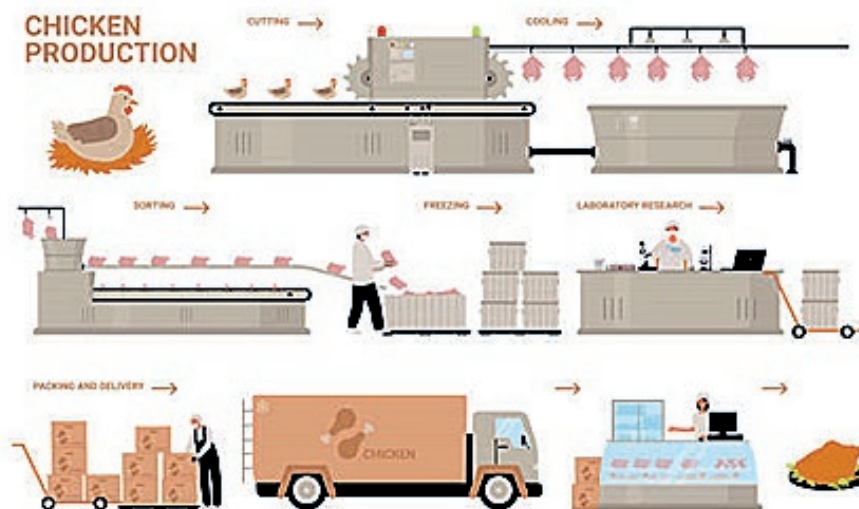


Figure1. Meat production from poultry

World poultry production, unlike other meat types, grew by 1,3 % in 2020 against the previous year. However, this growth has been the smallest since 1960.⁷

According to FAO UN data, 337,2 million tons of meat of all kinds in the mass, which is close to the indicator of the previous year.⁸ Of these, 39,75 % were produced in Asia, 32,71 % in America, 19,35 % in Europe, 6,22 % in Africa and

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5 Scientific achievements in solving urgent problems of production and processing of raw materials, standardization and food safety»/ Development of low-temperature preparation of indiced fillet with enriched mineral composition // Beznosko A., Tishchenko L., Pilipchuk O., 2020 (nubip.edu.ua)

6 Stages of the production process of farm chicken, the multiplied line of the processing factory. Stages of production of chicken vector/ CanStock (canstockphoto.com)

7 Bozhko, N., Tishchenko, V., & Pasichniy, V. (2017). Cranberry extract in the technology of boiled sausages with meat waterfowl. Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies. Series: Food Technologies, 19(75), 106-109.

8 Bozhko, N., Pasichniy, V., & Bordunova, V. (2016). Meat-containing cooked sausage containing the meat of a duck. Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies, 18(2 (68)), 143-146

1,96 % in Oceania. In terms of meat, 39,52 % of poultry fell by species, 32,30 % of pork, 21,17 % of beef, 4,83 % of mutton.⁹ Compared to 2019, the share of poultry meat increased by 0,50 %, while the share of all other species decreased: Pork by 0,35 %, beef by 0,30 %, lamb by 0,02 % (Table 1).

In Ukraine (according to FAO data) in 2020 meat of all kinds was produced 2567 thousand tons (in 2019, 2521 thousand tons), poultry meat – 1468 thousand tons (in 2019, 1410 thousand tons), pork – 722 thousand tons (in 2019, 708 thousand tons), beef – 343 thousand tons (in 2019, 370 thousand tons). In 2020, there was a certain reduction in world production of pork and beef.¹⁰ However, this decrease was almost entirely offset by an increase in poultry meat production.

Table1.

**World production, trade and consumption
of meat by species, thousand tons**

Type of meat	Production		Import		Export		Consumption	
	2019	2020	2019	2020	2019	2020	2019	2020
Poultry	131562	133266	12451	12501	14241	14226	129754	131596
Pork	110095	109200	9101	11574	9553	11889	109493	108955
Beef	72410	71408	10627	10560	11335	11193	71718	70739
Lamb	16214	16276	1045	977	1049	981	16210	16270
All kinds	337209	337182	33630	35999	36611	38694	334077	334572

The total world exports of meat in 2020 were 38,7 million tons, which was 11,48 % of its total production and 5,7% more, as compared to 2019. 36,77 % of all exports fell to poultry, 30,73 % of pork, 30,57 % of beef, 2,87 %. However, the whole increase in exports was achieved by increasing the export of pork by 24,45 %.¹¹ (table2) Meat imports were close to the export figures, as expected. Imports of meat of all kinds increased by 7,0 % in 2020. Almost all the growth was due to pork, whose import increased by 24,17 %. Imports to Asia increased by 15,8 % to more than 22 million tons, which was 63 % of world meat imports, mainly due to the continued impact of the AFM on the production of pig meat in East Asia. As a result of the shortage of meat in the domestic market, China's

⁹ Topical issues of development of economy, food technologies and commodity studies of use of plant raw materials in the technology of sweet sauces Sokolenko I., Khomich G., Levchenko Yu., Poltava, 2018

¹⁰ Bozhko, N., Pasichniy, V., & Bordunova, V. (2016). Meat-containing cooked sausage containing the meat of a duck. Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies, 18(2 (68)), 143-146

¹¹ Actual issues of development of economy, food technologies and commodity studies/ I. A. Komurko, I. C. Choni higher educational institution of the Union «Poltava University of Economics and Trade, 2018 collection of theses students_2018.pdf (puet.edu.ua)

imports increased by 57,6 per cent (to 11,7 million tons). Most of all, China imported pork and poultry meat.¹²

The second largest importer of meat in 2020 was Japan (3516 thousand tons), the third point was by the USA (2246 thousand tons) and Mexico (2174 thousand tons). Meat imports by all other regions (Africa, Central America and the Caribbean Basin, Europe, Oceania and South America) have decreased, reflecting economic difficulties, restrictions in foreign currency and internal accumulations of stocks.¹³ The wide decline in imports is evidenced by the fact that in 2020 meat imports of 14 of the 20 largest importing countries, including such large ones as Vietnam, Japan, the European Union, The OAU, the Republic of Korea and Mexico. Ukraine also reduced meat imports in 2020. If in 2019 the country imported 171 thousand tons, in 2020 it imported 161 thousand tons. Despite the fact that world meat production in 2020 remained practically at the same level as in 2019, its consumption by means of the use of transitional stocks increased by 1,5 %, which compensated for the increase in the population of the planet over the last year by 1,2 %.¹⁴

The growth of poultry meat production, higher than the average, was observed in Africa (2,27 %), Oceania (2,04 %) and Asia (1,41 %), and at the same time lower than the average in America (1,13 %) and Europe (0,91 %). In 2020, 37,79 % of the world's poultry production fell to Asia, 39,21 % to America, 16,73 % to Europe, 5,07 % to Africa and 1,20 % to Oceania.¹⁵

Among large producers, the largest increase in poultry meat production (5,31 %) was in China. A significant increase in poultry production in this country was due to high domestic demand due to relatively low prices for this product, a shortage of pork and significant investments that have recently been made in this sector. Poultry meat production in the USA increased by 1,15 % to 23 million tons. This sector also received some benefit from the state's «Coronavirus Food Aid Program» (CFAP), which stimulated demand.¹⁶

Despite the increased costs of raw materials and the complexity of international trade due to COVID-19, poultry production in Brazil increased by 1,6 % to 14 million tons. Brazilian producers have benefited from increased imports from a number of countries, mainly from Asia. Sufficient consumer purchasing power was also supported by various government support programs related to

12 Topical issues of development of economy, food technologies and commodity studies of use of plant raw materials in the technology of sweet sauces Sokolenko L., Khomich G., Levchenko Yu., Poltava, 2018

13 Pasichniy, V& Sabadash, P. (2007). Food additives in food production. Food and ingredients, 4, 27–29.

14 Meat-containing semi-finished poultry meat from the meat of the raised food value / V. Pasichnyi, G. Simakhina, A. Geredchuk, V. Zadorozhnyi // Scientific Bulletin of Lviv National University of Veterinary Medicine and Biotechnology named after S. Zadorozhnyi. H. Gzhytskyi. – 2014. – T. 16 (NO. 2), H. 4. – WITH. 149-155.

15 Actual issues of development of economy, food technologies and commodity studies/ I. A. Komurko, I. C. Choni higher educational institution of the Union «Poltava University of Economics and Trade, 2018 collection of theses students_2018.pdf (puet.edu.ua)

16 Research of properties of meat mince systems // Krizhova Yu., Wenglyuk O., symu.pdf (nuft.edu.ua)

the COVID-19 pandemic. Poultry production in the European Union has also increased, albeit less than in 2019, reflecting a decrease in domestic demand.¹⁷

Table 2.

**World poultry production, trade and consumption
by geographical regions and selected countries**

Region, country	Production		Import		Export		Consumption	
	2019	2020	2019	2020	2019	2020	2019	2020
Asia	49669	50367	6476	6836	2871	2739	53309	54475
China	21195	22321	1415	2189	655	583	21955	2327
India	4232	3821	-	-	6	3	4226	3819
Indonesia	3539	3150	-	-	2	2	3527	3148
Iran	2292	2326	5	1	55	20	2242	2316
Japan	2298	2360	1321	1239	10	10	3616	3620
Republic of Korea	951	965	204	12	52	58	1093	1089
Malaysia	1717	1731	73	71	56	52	1734	1751
Saudi Arabia	800	930	618	521	47	35	1371	1416
Singapore	105	106	180	207	18	30	267	283
Thailand	1775	1748	3	2	1212	1174	613	566
Turkey	2202	2266	44	45	536	572	1710	1738
Africa	6568	6758	1962	1872	117	114	8412	8516
Angola	49	49	279	229	-	-	328	378
PAR	1816	1965	540	486	57	57	2299	234
Central America and the Caribbean Basin	5279	5399	1873	1804	31	42	7121	7162
Cuba	25	25	299	248	-	-	324	273
Mexico	3515	3617	1040	1001	11	12	4544	4606
South America	22030	22263	377	356	4588	4498	17820	18121
Argentina	2248	2261	5	7	265	227	1989	2041
Brazil	14137	14363	5	5	4133	4080	10009	10288
Chile	769	782	139	130	180	181	728	730

In Ukraine, according to FAO, the production of poultry meat in 2020 increased by 4,11 % (which, however, does not coincide with the data of the State Statistics Committee of Ukraine). On the contrary, poultry production in India

¹⁷ Actual issues of development of economy, food technologies and commodity studies/ I. A. Komurko, I. C. Choni higher educational institution of the Union «Poltava University of Economics and Trade, 2018 collection of theses students_2018.pdf (puet.edu.ua)

(almost 10 %) and Indonesia (10,9 %) has decreased significantly, reflecting a decline in domestic demand as a result of a decrease in the purchasing power of the population and restrictions on its movement during the pandemic. In addition to these countries, poultry production in Thailand (by 1,51 %), Canada (by 2,93 %) and several other countries decreased.¹⁸

World poultry exports in 2020 remained practically at the same level as in the previous one. About 10,7% of all poultry meat produced were exported. Brazil exported the most – 4080 thousand tons (28,68% of world exports), the second step in the rating of the largest exporters was taken by the USA (3914 thousand tons, 27,51 %), the third – the EU (1687 thousand tons, 11,86 %), and the fourth – Thailand (1174 thousand tons, 8,26 %). At the same time, other countries with the same four countries, except the USA, reduced their poultry exports in 2020. The rest of exporters followed them with a great margin.¹⁹

Ukraine with volumes of 436 thousand tons (3,06 % of world volumes) took the seventh step of the rating. Ukraine's exports increased by 4,56 % in 2020, which can be considered a good indicator under current conditions. The domestic poultry exports were affected by both the COVID-19 pandemic and avian flu outbreaks recorded in 2020 in some regions. In 2020, the world-wide volume of poultry meat imports remained virtually unchanged. Remaining at the current level of these volumes allowed for a significant increase in imports of China (by 54,7 % compared to 2019), which reached a record 2,2 million tons. This import was provided by many countries, including Brazil, the USA, Thailand, Argentina, EU and Chile. On the other hand, many countries, especially the EU, Saudi Arabia, the OAU and Japan, have reduced imports, reflecting the economic downturn, the decline in the purchasing power of the population, limited foreign exchange reserves or an increase in domestic production.²⁰ The current state of Ukraine's economy creates an environment for chicken producers, characterized by high levels of competition and search for new markets for products. In such an economic environment, special attention should be given to enterprises to create strong competitive advantages, which requires development of effective mechanisms and approaches that would allow to increase production efficiency and ensure competitiveness of products in the consumer market.²¹

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19 Topical issues of development of economy, food technologies and commodity studies of use of plant raw materials in the technology of sweet sauces Sokolenko I., Khomich G., Levchenko Yu., Poltava, 2018

20 Actual problems and perspective directions in meat and meat products technology of Muzyka V. G., Aloschichev I.V..

21 Food safety and food processing technology influence of modified fats on the biological efficiency indicators of poultry semi-finished products Shvedyuk D., Pasichnyi V., Radzievska I., 2017

The chicken market in Ukraine has all signs of its saturation, but continues its steady growth. At the same time, consumer prices for chicken meat have increased significantly in recent years. Therefore, the task of choosing the right strategy of the company for chicken production in Ukraine is especially important.¹³ World meat prices, measured by the United Nations Food and Agriculture Organization's (FAO UN) meat price index, were 95,5% on average in 2020 compared to 2019 and reflected a decline in prices for all kinds of meat. Prices for poultry meat (-9,8 %), lamb (-5,7 %), pork (-3,6%) and beef (-1,4%) fell the most. The average annual price of poultry meat for 1 tons decreased from \$1374 in 2019 to \$1239 due to the fact that export opportunities exceeded global demand, which in many countries was adversely affected by the COVID-19 pandemic.²²

Monitoring of fresh meat market in Ukraine shows the absolute advantage of chicken consumption. This is due to the low purchasing power of our country's population, because chicken meat is the most affordable. For example, the average citizen of Ukraine consumed 36 kg of chicken, 10 kg of pork and 2 kg of beef during 2021, while in neighboring Poland the ratio is 29 kg, 38 kg and 4 kg, and in Romania – 19 kg, 39 kg and 5 kg. accordingly.²³ (fig.2)

Source: ²⁴

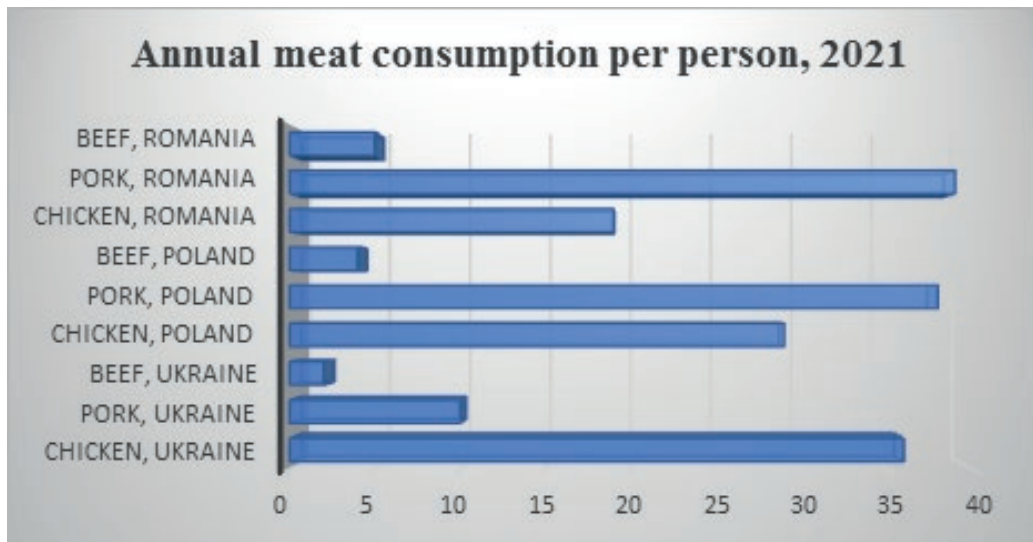


Figure 2. Annual meat consumption per person, 2021

²² Bozhko, N., Pasichniy, V., & Bordunova, V. (2016). Meat-containing cooked sausage containing the meat of a duck. Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies, 18(2 (68)), 143–146

²³ Scientific achievements in solving urgent problems of production and processing of raw materials, standardization and food safety»/ Development of low-temperature preparation of indiced fillet with enriched mineral composition // Beznosko A., Tishchenko L., Pilipchuk O., 2020 (nubip.edu.ua)

²⁴ Scientific achievements in solving urgent problems of production and processing of raw materials, standardization and food safety»/ Development of low-temperature preparation of indiced fillet with enriched mineral composition // Beznosko A., Tishchenko L., Pilipchuk O., 2020 (nubip.edu.ua)

A significant share of the currency for the budget of Ukraine in 2020 was provided by the enterprise of PrJSC «MHP» – 510,3 million USD, having exported more than 386,6 thousand tons (Table 3). In this connection, there are actual and perspective researches aimed at influence of plant raw materials in the structure of marinades on technological properties of meat semi-finished products, development with their use of technology of preliminary processing of raw materials and substantiation of rational choice of raw materials and food additives traditional for meat products, which are used for preparation of finished semi-finished products and sausage products.²⁵

Table 3.

Largest exporters of chicken from Ukraine, 2020²⁶

Rating	Name of the company	Export of chicken, 2020		Share of export market, %
		Thousand tons	Million. usd	
1	PrJSC «MHP»	386,6	510,3	90,9
2	LLC«Dniprovsky»	15,4	20,9	3,6
3	LLC«Agro-Aries»	6,8	7,0	1,6
4	LLC «AG» Pan Kurchak»	3,5	3,6	0,8
5	LLC«Western Trading Resource»	2,5	2,6	0,6
6	PrJSC «Vladimir-Volyn poultry factory»	1,2	1,6	0,3
7	LLC «Agro-Ros»	1,3	1,5	0,3

Pickling goes along with the salting process, ensures the formation of the necessary technological (moisture-binding capacity, elasticity, resistance to destruction, tenderness) and consumer (taste, aroma, color, consistency) properties in raw materials and finished products²⁷.

Food acids, interacting with the components of raw materials, give the product a pleasant specific taste and aroma, partially break down proteins and fats which makes it softer and tastier. The usage of food acids in the product can be the reason for their introduction into the food system during the technological process to adjust its pH. In this case, food acids are used as technological food additives²⁸. Thus, the introduction of acids into the food system provides: provision of certain organoleptic properties

25 Effectiveness of use of marinades on the basis of rape oil in the technology of semi-finished poultry meat // Shtonda O.a., Tkanka M.O., 2017 (sworld.education)

26 Scientific achievements in solving urgent problems of production and processing of raw materials, standardization and food safety»/ Development of low-temperature preparation of indiced fillet with enriched mineral composition // Beznosko A., Tishchenko L., Pilipchuk O., 2020 (nubip.edu.ua)

27 Ibid.

28 Effectiveness of use of marinades on the basis of rape oil in the technology of semi-finished poultry meat // Shtonda O.a., Tkanka M.O., 2017 (sworld.education)

(taste, aroma, color) characteristic of this product; influence on colloidal properties, which determine the formation of consistency; preservative effect. Meat for barbecue (pork, beef, chicken, etc.) is made in marinated form. The technological scheme of production of marinated semi-finished poultry products is given in Fig.3²⁹.

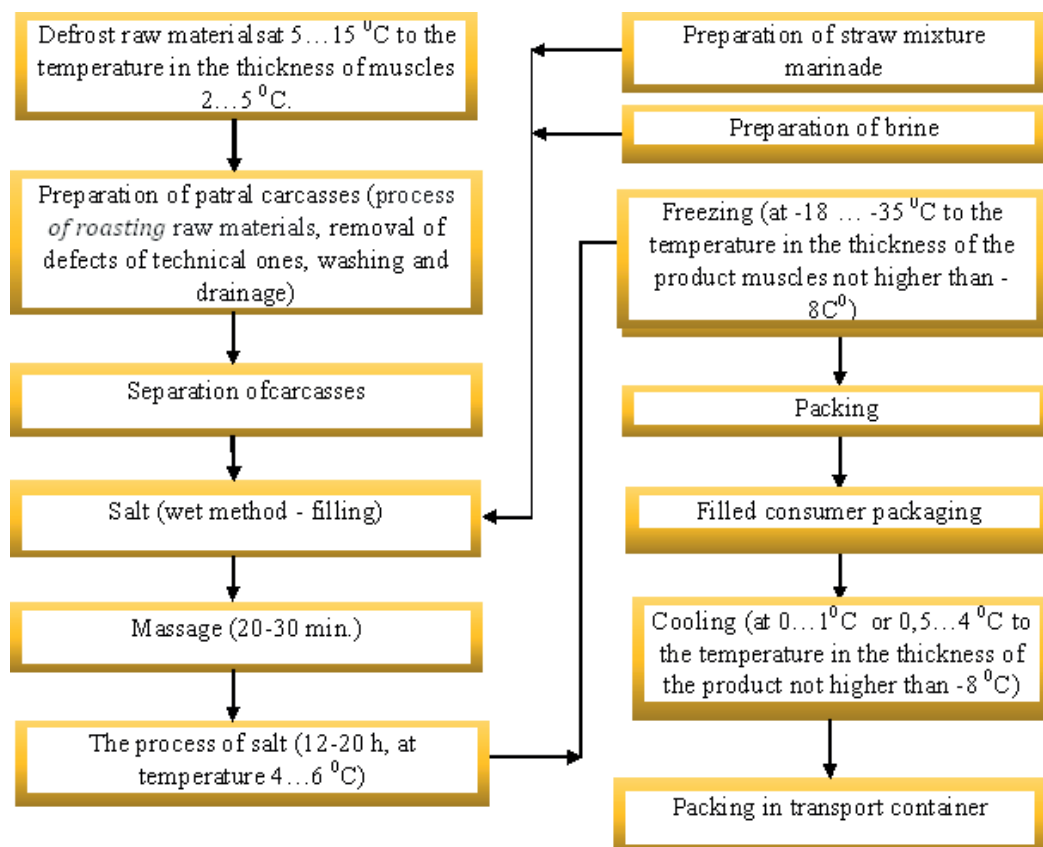


Figure 3. Technological scheme of marinated semi-finished poultry meat products

The main process in this technology is the pickling process, which depends on the pickling method, temperature conditions and the composition of the marinated mixture. According to classical technology (TU 9214-326-23476484 – 01), the following components are included in the marinade: onion, 3 % solution of citric (acetic) acid and table salt.³⁰

29 Actual issues of development of economy, food technologies and commodity studies expediency of enrichment of meat paints with natural essential substances Krupskaya (Šerdechenko) A., Oliynyk L., Poltava, 2018

30 Study of chemical composition of the sunflower seeds for use in the technology of production of semi-finished products / I. Veretynska, Yu. Sukhenko.// Scientific reports of the National University of Biological Resources and Natural Resources of Ukraine. 2013. No. 2. Access mode: http://nbuv.gov.ua/UJRN/Nd_2013

The range of semi-finished products can be expanded by using different marinades. Pickled semi-finished products differ from ordinary natural products not only in their look but also in taste. Pickled semi-finished products have a long shelf life (up to 3 weeks) and even longer shelf life during heat treatment.³¹

The composition of marinades includes spices, herbs, salt, flavorings, enzymes, various additives, vegetable oil, means for preserving freshness. Marinades are produced in liquid and dry form. They are mixed with drinking water for having a dry form. Marinades are suitable for marinating all types of meat, including poultry.³²

Large pieces of meat are injected with marinade, and then mixed for 10–30 minutes, depending on the type of machine. The total mass of semi-finished products increases due to which their cost price decreases. Small pieces of meat for stews, kebabs, roasts, and beef stroganoff are mixed with marinades and kept in non-corrosive material containers at a temperature of 2–4 °C for 8–12 hours.³³ One of the most important directions in the development of the food industry and restaurant industry in the 21st century, which requires an immediate solution is the development of technologies for the production of new safe food products based on natural raw materials.

Regarding the quality of food products, the usage of innovative technologies allows to increase the nutritional value, microbiological safety, achieve stable and high quality of the produced products, and increase the shelf life of culinary products compared to traditional cooking technology.³⁴

As world and Ukrainian experience shows, poultry meat is increasingly used in various meat dishes, replacing expensive pork and beef in traditional recipes. The use of cheaper poultry meat for barbecue has contributed to the growing demand for picnics among young people. However, a certain part of the population considers such a kebab less tasty, not thinking about the fact that the marinade gives the chicken kebab an amazing taste, unique aroma and softness. (table 4–5)³⁵

31 Study of chemical composition of the sunflower seeds for use in the technology of production of semi-finished products / I. Veretynska, Yu. Sukhenko.// Scientific reports of the National University of Biological Resources and Natural Resources of Ukraine. 2013. No. 2. Access mode: http://nbuv.gov.ua/UJRN/Nd_2013

32 Effectiveness of use of marinades on the basis of rape oil in the technology of semi-finished poultry meat // Shtonda O.a., Tkanka M.O., 2017 (sworld.education)

33 Actual problems and perspective directions in meat and meat products technology of Muzyka V. G., Aloshichev I.V.

34 Levchenko Yu., Vardanyan N., higher educational institution of the Union «Poltava University of Economics and Trade», Poltava, 2021 IDoHarIf_2021_DonNUET_Levchenko_Vardanyan_Arcebasova.pdf (puet.edu.ua)

35 Shtonda, O. Prospects of using fruit and berry raw materials in the technology of meat natural semi-finished products / O. Shtonda, V. Pasichnyi // Scientific works of the National University of Food Technologies. Kyiv : Nut, 2019. T. 25, No. 6. C. 194-200

Table 4.

Orthological composition of poultry carcass parts

Part of the carcass	Contents, %		
	Muscle tissue	Skins	Bone
Breast (with keel)	65,6	19,1	13,6
Femoral	54,3	17,9	26,0
Spine-scapular	35,6	20,6	43,8
Wings (cut at the shoulder joint)	34,8	19,0	42,1

Table 5.

General chemical composition of poultry muscles

Bird species	Type of muscles	Contents, %			
		Water	Protein	Fat	Ashes
Broilers	Chest	74...76	21...23	1...3	1,0...1,1
	Leg	75...76	19...21	3...6	1,0...1,1
Chickens	Chest	73,0	24,9	1,4	1,1
	Leg	74,5	21,6	3,4	1,0

The effect achieved in the pickling process is:

- reduction of heat treatment time;
- increasing the output of the finished meal (reducing losses during heat treatment);
- obtaining new consumer characteristics;
- expansion of the assortment of the specified group of products.³⁶

As well as a positive point when using marinades is the possibility of using various ingredients in their composition, which can be constantly varied taking into account trends that arise and change under the influence of market conditions.

It should be noted that marinades are divided into:

- purpose (for marinating meat, poultry, fish or vegetables);
- place of production (industrial and domestic);
- peculiarities of the recipe composition and technological process of production (oil, emulsion);
- consistency (liquid and dry);
- temperature of use (cold, heated).³⁷

Scientists and technologists began to develop compositions from various types of raw materials for solving the problem of canning and pickling.³⁸

36 Scientific achievements in solving urgent problems of production and processing of raw materials, standardization and food safety // Development of low-temperature preparation of indiced fillet with enriched mineral composition // Beznosko A., Tishchenko L., Pilipchuk O., 2020 (nubip.edu.ua)

37 Scientific research student of the LNUUVMBT named after S.z. Gzhytskyi Volume/ enrichment of galaxies with calcium and food fibers // Krizhova Yu.P., Kyshenko I., Topchiy O. // 2014, Enriching of galantiniv by calcium and food fibres.pdf (nuft.edu.ua)

38 Actual issues of development of economy, food technologies and commodity studies/ I. A. Komurko, I. C. Choni higher educational institution of the Union «Poltava University of Economics and Trade, 2018 collection of theses students_2018.pdf (puet.edu.ua)

Semi-finished products made from poultry meat are in high demand among the population, so research on the effectiveness of usage marinades in their production is relevant.³⁹

Pickled semi-finished products differ from ordinary natural products not only in their look, but also in taste. the use of modern approaches to the development of marinade recipes for poultry semi-finished products has a positive effect on the organoleptic and functional-technological properties of the finished product.⁴⁰

The influence of various factors on the technological properties of meat raw materials is shown, and it is determined that marinating meat for the preparation of semi-finished products is a rather effective technological means capable of improving the functional and organoleptic characteristics of such raw⁴¹ materials, especially when using meat with an increased content of connective tissue, therefore development of marinade technology for such semi-finished products is a promising direction of research.⁴²

Therefore, the use of modern approaches to the development of marinade recipes for semi-finished products from poultry has a positive effect on the organoleptic and functional-technological properties of the finished product.

To solve the problem of conservation and marinization, scientists and technologists began to develop compositions from different types of raw materials and natural antioxidants.⁴³

Actively developed compositions and semi-finished foods enriched with food fibers and caratinoids on the basis of nutmeg varieties.⁴⁴

The researches of meat raw materials and developed halantinis prove the expediency of development of semi-finished products with combination of meat of chicken, turkey and vegetable raw materials, namely sesame seeds, almonds and carrot fibers, give an opportunity to expand assortment of food products of preventive purpose, which are enriched with food fibers, protein, calcium, iron, magnesium and other macro- and microelements, vitamins, and contain a small amount of fat.⁴⁵

39 Ginda M. Trends of restaurant industry development. Collection of materials of the All-Ukrainian scientific and practical conference «actual problems of economy and management in the conditions of system crisis» (Kyiv Lviv, 29.11.2016). – Lviv : MAUP, 2016.

40 Topical issues of economic development, food technologies and commodity studies prospects of use of different types of marinades for meat semi-finished goods Komurko I., Choni I. Poltava, 2018

41 Topical issues of economic development, food technologies and commodity studies of the possibility of enrichment of meat products Krupskaya Kozlov M., Oliynyk L. Poltava, 2018

42 Ibid.

43 Technological aspects of production of semi-finished meat products frozen with the use of emulsifying systems: Monograph / M. Yancheva – Kharkiv : KhDUCHT, 2015. – 178 sec.

44 Enrichment of galaxies with calcium and food fibers // Krizhova Yu., Kyshenko I., Topchii O. // 2014, Enriching of galantiniv by calcium and food fibres.pdf (nuft.edu.ua)

45 Actual issues of development of economy, food technologies and commodity studies expediency of enrichment of meat paints with natural essential substances Krupskaya (Serdechenko) A., Oliynyk L., Poltava, 2018

Shtonda O.A., Baribenova N.A., presented studies on the use of vegetable oils in marinades for natural small-scale semi-finished products. Based on the study of functional and technological characteristics of marinated semi-finished products, optimal recipe compositions of marinade with the addition of oils have been established. The portioned meat semi-finished products, with the addition of the developed mixture, had the highest functional-technological, organoleptic properties.⁴⁶

I. A. Komurko, I. C. Choni comparing all kinds of marinades by experimental researches stopped on marinade in the composition of which the mustard in which there is, well softens hard meat. And also this product promotes better penetration inside of various spices and spices.⁴⁷ Greased mustard frozen shashlik almost not to distinguish from fresh. This option was chosen as one of the best. As a result of this processing meat acquires a gentle consistency, improved organoleptic parameters such as smell and taste, in addition more easily digested and better assimilated by the body, which is very important for people weakened and disturbed by the work of the gastrointestinal tract. The enzyme also discloses the elements of the connecting fabric, which also affects the quality of the meat and its nutritional properties. In the process of enzymatic tenderization the degree of its hydrostation (moisture content) is increased, which significantly influences such indicator of quality of finished meat products as juicy.⁴⁸

At present, the market of Ukraine offers a large number of new types of marinades and ways of their use, but still remains an open question about development of new ways of marinating, which would prolong the term of storage of products, increase their output and organoleptic characteristics.⁴⁹

Therefore, the meat market has its own characteristics, which distinguish it among other food markets and make it to choose a special strategy for the promotion of the industry. Among the peculiarities of the meat market one should not forget that the product of poultry farming and meat cattle breeding is the product of meat market, which is very dependent on how economic activity will be carried out.⁵⁰

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