

OBTAINING OIL FROM RECYCLED MATERIALS AND ITS USE IN THE FOOD INDUSTRY

¹ Xayrullo Qanoatov Murodullayevich

candidate of Technical Sciences, Namangan Institute of Engineering Technology, 7 Kosonsoy street, Namangan city, 160115, The Republic of Uzbekistan. E-mail: kanoatov8086@mail.ru

² Dilorom Saribayeva Akramjanovna

Namangan Institute of Engineering Technology, 7 Kosonsoy street, Namangan city, 160115, The Republic of Uzbekistan. diloromsariboyeva@mail.ru

³ Umidjon Rahimov Yunusjonovich

Namangan Institute of Engineering Technology, 7 Kosonsoy street, Namangan city, 160115, The Republic of Uzbekistan. rumid8887@mail.ru

³ Omon Mansurov Abduvaliyevich

Namangan Institute of Engineering Technology, 7 Kosonsoy street, Namangan city, 160115, The Republic of Uzbekistan. omansurov1990@gmail.com

Abstract - According to the analysis of the chemical composition of secondary raw materials during tomato processing, substances containing lycopene and unsaturated fatty acids in tomato have proven anticancer properties and are also used for atherosclerosis and ischemic diseases of the heart. Medical tomato oil, its use in various types of salad, dishes and canned meat contributes to normal digestion.

Keywords - unsaturated fatty acids, lycopene, the chemical structure of tomato oil, secondary raw materials.

I. INTRODUCTION

President of Uzbekistan Shavkat Mirziyoyev signed a decree "On measures to further ensure food security of the country" on January 16, 2018.

To assure market saturation of quality, safe and cheap food products, development of agrarian complex, introduction of effective mechanisms of public and private partnership, timely elimination of threats to food market stability, favorable customs tariff regulation of import of food products. The law "On food security" will be developed and submitted to the Cabinet of Ministers. The Ministry of Development of Information Technologies and Communications of the Republic of Uzbekistan jointly with the State Customs Committee, State Tax Committee and other interested agencies within two weeks will report to the Department of Fighting remote access to databases. Agriculture is an important sector of Uzbekistan's economy. The oil and fat industry occupies a leading position in the food industry of Uzbekistan. This sector contributes to the improvement and deepening of integration processes in the agricultural sector of the country and plays an important role in improving the quality and range of products, full and effective use of raw materials, ensuring the needs and employment of the population. Increase in the production of oilseeds is directly related to the high yield of oil-bearing plants, the construction and reconstruction of existing ones, and the increased demand for their products in the domestic market. Of the 39 companies operating in the industry, there are small businesses producing cotton and

sunflower, margarine, mayonnaise, household and perfume and other products. In the first quarter of 2018, these enterprises produced more than 64,93 thousand tons of vegetable oil, 11.2 thousand tons of margarine, and 15,16 thousand tons of household soap. [1]

II. METHOD OF RESEARCH

In recent years, great attention is paid to the cultivation and processing of tomatoes and grapes. When processing tomatoes and grapes, a certain part of them is released, which is important because of the low content of fat in the seeds of tomatoes and grapes. Seeds of tomato make up 0.3- 2.5% and grape seeds 3-5%.

Tomato seeds are predicted to be 17.0-33.5%, grape seed 10-15%. Tomato and grape seed oil are valuable medicinal properties and can be used in the food, perfumery and confectionery industry. In addition, various drugs can be produced on their basis. The fat content of these seeds is 87.6 - 89.0% of unsaturated fatty acids, which further increases the biological significance of these oils.

At present, the vegetable oil is mostly produced from cotton seeds. Due to declining cotton production, the amount of oil produced from cotton seeds does not always meet the food industry's demand for Asiatic oils. That is why the demand for some essential oils is met by imported sunflower, soy, palm and olive oil.

One of the most pressing problems today is the processing of waste from the production of canned fruits and vegetables. These wastes are important in the storage of nutrients in their contents, and by their processing, they are obtained by supplementary products used in the food industry.

Tomato paste production waste - waste in equipment for separation and grinding of seeds consists of 3.5% pulp, 0.5% seeds, peel, fibrous parts and stalks.

The pulp can be separated from the waste by hot water, wiping and pressing. The extract is added to the tomato mass for evaporation. Tomato seeds with a moisture content of 75% are dried until the moisture content drops to 10%. Depending on the tomato variety and the month of ripening, tomato oil in the seeds is 19-29%.

Wastes from the production of tomato juice account for an average of 35%. These wastes are wiped and used in production. When rubbing the tomatoes themselves, the waste is 4%, and when rubbing the tomato mass from the line it is $4 * 100/35 = 1.4\%$. [5]

Of these additives, that is, oil extracts, it is important to extract essential oils. Tomatoes can be boiled, juice, tomato sauce and other canned goods. Tomato seeds, which are the secondary raw material used, are used as compound feed in livestock production. Tomato wastes - when used in the production of postcolonial and semen content, it was found to contain cellulose, protein, minerals, unsaturated fatty acids and other substances. About 25% of the tomatoes are the seeds and seeds. Tomato seeds contain up to 17-33,5% of fat.

Seed oil meets the population's need for healing, nutritious, and oily oils and helps to increase the range. This is because it contains healing oils because it contains a lot of unsaturated fatty acids.

Table 1: In the following table the chemical compounds of the seed of tomato.

№	Indicators	Quantity
1	Oil quantity	17,0-33,5 %
2	Humidity	7,0- 8,0 %
3	protein	25-30 %
4	fiber	16-25 %
5	Menirals	2,5-5,5 %
6	Weight of 10000 seeds	1,0-3,5 g
Size, mm		

1	Lenth	3,0
2	width	2,0
3	Thickness	1,5

Table 2: Saturated fatty acids in tomato oil

№	Saturated fatty acids	Quantity
1	Miristic acid	1%
2	Palmitate acid	10-20 %
3	Stearinate acid	5-6 %
4	Arachinic acid	5,7 %

Table 3: Unsaturated fatty acids in tomato oil

№	Unsaturated fatty acids	Quantity
1.	Oleinate acid	13-20 %
2.	Linoleic acid	35-62 %
3.	Linolenic acid	1,7-2,5 %

As we know, lipids in the body perform the following functions:

- The main source of energy for the body;
- is a source and carrier of fat-soluble vitamins (A, D, K, E),
- Provides normal metabolism in the body;
- one of the substances that make up the cell structure;
- Protects the body against cold;
- Protects internal organs from various external influences (beating, shaking);
- The skin lubricant and other functions.

Fatty acids in fat are divided into two groups:

- Burn fatty acids;
- Unsaturated fatty acids.

Overdose of fatty acids in the body causes disruption of fat metabolism and increased cholesterol content in the blood.

Unsaturated fatty acids regulate cholesterol metabolism, oxidize it, and release it from the body, increasing the body's resistance to various infectious diseases and radiation exposure.

To extract the oil from the seeds of tomato the following scheme is recommended.

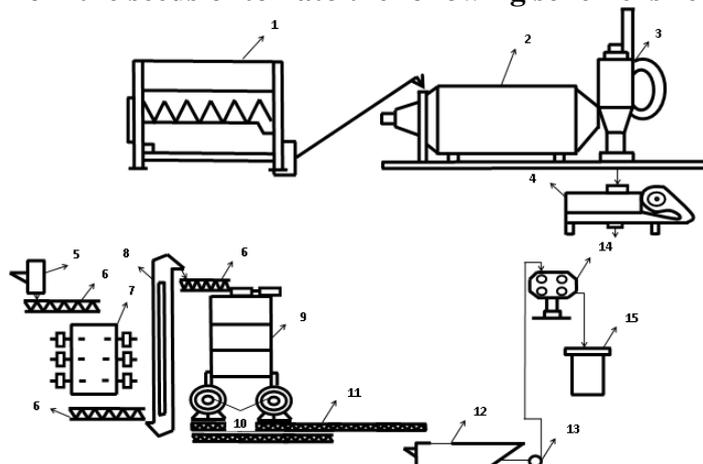


Figure 1: Technological scheme of extracting oil from the seeds of tomato thorough pressing method.

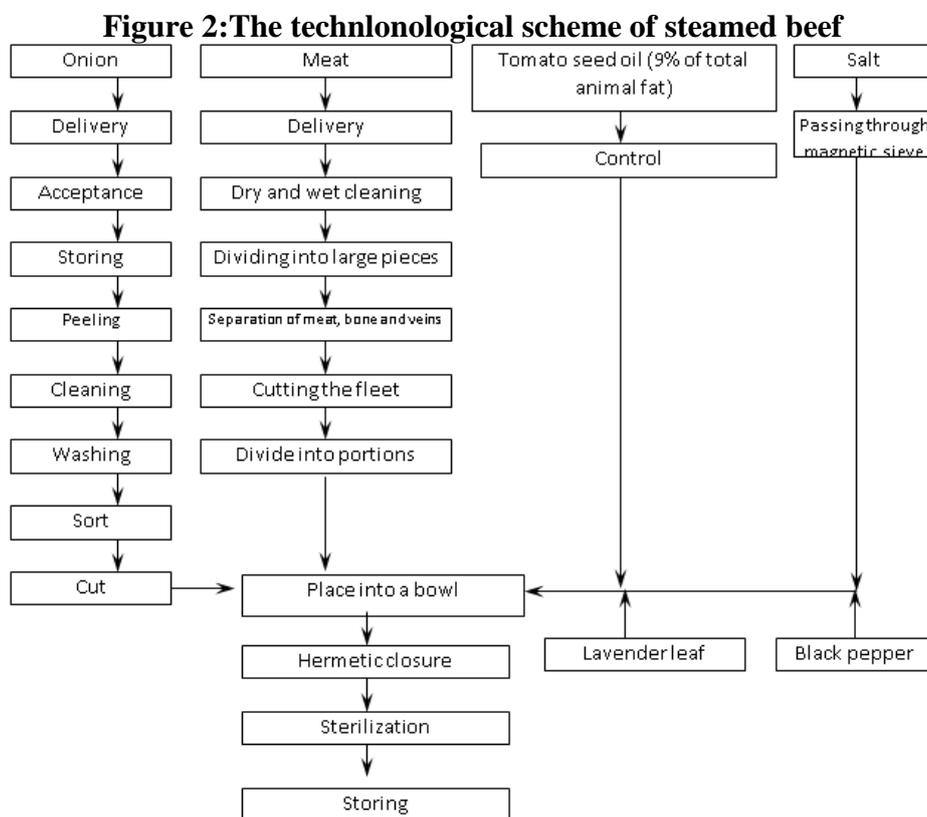
1-tomato radish harvesting capacity; 2 - drum dryer; 3 - Cyclone; 4 -separator; 5 - disk carrier; 6 - Screw transporter; 7 - welding; 8 - Norwegian (hoist elevator); 9 - roasting boiler; 10 - press; 11 is a screwdriver; 12 - fuzzy handle; 13 - pump; 14 - filter; 15 - oil burner.

Tomato seeds imported for oil are contaminated with various mineral and organic impurities during their storage and transportation, and the seeds are purified in ZSM type separators to remove these impurities. The metal impurities in the seed are purified by magnetic separators. This can cause the uranium to break down, grind, or press the metal. In most cases, the moisture content of the tomato seed that has been processed is higher than the norm. In this case, the seed is not well-grounded and hence the seeds are dried to 11-12% to normalize their moisture content. In the uranium, the fat is mainly concentrated in the ointment, and the seeds need to be milled to get the maximum fat content. Tomato seed milling is done on a disk-crushing machine. At the same time, the tomato seed is crushed. To divide the oil in large quantities and easily, it is necessary to grind these cell tissues. This process is performed on a 5-volt roller. The process of wetting, heating and roasting crumbly oil is easy.

Before crunching in crushed crust and raisin boilers, the process sheet should be soaked up to 16% black and heated to 75-80 ° C.

Warming process of granulation using sharp steam and condensate welding is performed on a humidifier. Roasting tomato seed is done in three-pot jar. During the roasting, heat and moisture ripen under the influence of steam, making it easy to separate from the oil. The extracted butter serves as a biological supplement to canned fried products, added to margarine, mayonnaise, and traditional vegetable oils to increase their productivity. Studies have shown that 9% of the fatty acids in the production of canned beef are replaced by tomato seed oil. Through this, we reduce the cholesterol content in our products and produce safe food for the human body.

It is recommended to prepare the product according to the following technological scheme.



Raw materials used in the production of canned stewed beef.

Bow. To prepare this canning, a ripe (100–200 g) peninsular onion variety is used. The smell of onions is caused by the essential oil in its composition, the main of which is thio alcohol $C_6H_{12}C_2$.

Beef. The amount of fat in animal meat varies greatly depending on the body weight of the animal, and this is 2-40%. Fat has a big impact on the taste and energy of meat. Meat with the same amount of protein and fat (about 20% each) is the highest in terms of nutritional value, because such meat has a pleasant taste and is well absorbed by the body. Fats contain mostly saturated fatty acids.

Extractives are divided into nitrogen and non-nitrogen extractives in meat. Nitrogen-free extractives include glycogen and its cleaved lactic acid, maltose and glucose. Nitrogen extractives include creatine, creatine phosphate, carnosine, glutamic acid, and others. The content of these substances in meat is about 1%.

The extract gives meat a unique taste and aroma, stimulates appetite and promotes digestion.

Meat also contains water-soluble and fat-soluble vitamins. The main water-soluble vitamins in meat are vitamins B1, B2, B6, B12, PP and C. Adipose tissue of meat contains mainly fat-soluble vitamins A, D and E.

The mineral content in meat is from 0.8% to 1.3%. The main minerals are potassium and phosphorus. The meat also contains calcium, magnesium, iron, copper, alcohol and other elements.

Salt. Consists of pure crystals of sodium chloride (NaCl) from natural sources. The content of sodium chloride in pure table salts is 97.0-99.7%. Sodium chloride contains 39.4% sodium and 60.6% chlorine. In addition to flavoring the product, the salt also has an antiseptic effect. [3]

The raw materials used in the production of canned meat must meet the following requirements of the standard.

Meat	
Name of indicator	Characteristic feature of meat
Surface color	Pale pink or pale red; thawed red
Sectional muscles	Slightly wet, do not leave a wet spot on filtered paper; color from light red to dark red
Consistency	The cut meat is dense, elastic; the hole formed by pressing with a finger quickly aligns
Smell	Specific, typical of fresh meat

Salt		
Name of indicator	Grade characteristics	
	extra and higher	first and second
Appearance	Crystalline bulk product. The presence of extraneous mechanical impurities not associated with the origin and method of salt production is not allowed.	
Taste	Salty, no extraneous taste	
Colour	White	White or gray with shades depending on the origin and method of salt production
Smell	No odors	

Bulb onions	
Name of indicator	Characteristic and norm
Appearance	<p>Bulbs are ripe, healthy, clean, whole, sprouted, without damage by agricultural pests, typical for the botanical variety of shape and color, with dry outer scales (shirt) and a dried neck with a length of 2 to 5 cm, inclusive.</p> <p>Bulbs with tears of dry scales that open juicy scales to a width of not more than 2 mm are allowed, bifurcated, located under common dry outer scales, with dry roots no more than 1 cm long</p>
Smell and taste	Peculiar to this botanical variety, without any odor or taste

III. CONCLUSION

1. Fatty acids from canned secondary raw materials in the canning industry have been found to have higher fatty acids than their traditional nutrients and nutrients.

2. The technological scheme of industrial production of tomato seed oil was developed on the basis of research.

3. Prepared for canned food, roasted and steamed from the oils and in addition to traditional oils, a safe food for the human body has been developed.

REFERENCES

- [1] Mirziyoev Sh.M. Together we will build a free and prosperous, democratic Uzbekistan. - Tashkent: NMIU "Uzbekistan", 2017. - 56 p.
- [2] President of the Republic of Uzbekistan on Strategy of actions for further development of the Republic of Uzbekistan 2017 Decree of February 7, 2014 No. PF-4947.
- [3] Dodayev Q.O. Konservatsion oziq-ovqat mahsulotlari texnologiyasi. Book. Tashkent "Noshir", 2009. -387p.
- [4] Halimova U.H. Technology for the production of vegetable oils// - Tashkent: "Teacher", 1996. - 252 p.
- [5] Kadyrov Y. Production technology of oil and fat products// - Tashkent. "Sharq", 2007. - 240 p.
- [6] V.M. Kopeikovskiy, A.K. Mosyan et al. "Laboratory workshop on the production technology of vegetable oils". Textbook M. Agropromizdat, 1990.-192 p.
- [7] Sherbakov V.G., Lobanov V.G. "Biochemistry and commodity unity of oilseeds." Textbook. M.: Kolos., 2012.-392 p.
- [8] Y. Kadyrov, A. Rozibaev Methodical instructions on laboratory work on a subject "Technology of production of vegetable oils". Study guide. –T.: Publisher. -2013.-146 p.
- [9] Y. Kadyrov, D. Ravshanov, O. Yunusov "Technology of vegetable oil production". Study guide. –T.: Iqtisod- Moliya.-2014, -316 p.
- [10] Neelam Khetarpaul, Vipul Khetarpaul. Lipid Chemistry – Daya Publishing House a Division of Astral International Ltd. India, 2013, 356 pages.

- [11] I.B. Sapaev, E Saitov, N Zoxidov and B Kamanov. Matlab-model of a solar photovoltaic station integrated with a local electrical network// IOP Conf. Series: Materials Science and Engineering 883 (2020) 012116. doi:10.1088/1757-899X/883/1/012116.
- [12] B. Sapaev, A.S. Saidov, I.B. Sapaev, Yu.Yu. Bacherikov, R.V. Konakova, O.B. Okhrimenko, I.N. Dmitruk, N.P. Galak. Spectroscopy of $(\text{Si}_2)_{1-x}(\text{ZnS})$ //Semiconductor Physics, Quantum Electronics & Optoelectronics, 2005. V. 8, N 3. P. 16-18.