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PRODUCTION OF TECHNOLOGY FOR OBTAINING OIL FROM PEANUT KERNELS AND REFINING THE OIL OBTAINED IN SHORT CYCLES

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Abstract: In this article, the extraction of oil from peanut kernels by pressing method, the production of reduced cycle refining technology in the case of choosing the necessary refining methods, and the selected oil of Rakhbar, Salamat , Mumtoz , Qibra-4 varieties according to the quality indicators of the obtained oil according to the standard requirements. the amount varies from 42.5% to 55.3% and was found to contain oleic (35.10%-42.66%) and linolenic acid (30.53%-40.86%). At the same time, it contains a large amount of α -, γ - and δ -tocopherol and β -sitosterol, stigmasterol, campesterol. The physicochemical parameters evaluated were as follows: acid value (0.11-2.74 KOHg/ mg) and peroxide value (1.94-5.55 mmol/kg) analysis is detailed

Keywords: degumming, deacidification, bleaching, deodorization. a -, g - and d -tocopherol and b -sitosterol, stigmasterol, campesterol , refining.

Introduction. According to the production method, oil extraction from peanut seeds is divided into the following methods:

- Obtained by the method of pres
- Obtained by extraction method

Pressing method Oil pressing technology equipped with a universal filtering line with an oil press with a heating and distribution system includes the following steps:

Delivery of raw materials to the peanut oil press. Installed on metal structures. The cake from the oil press is transported to the warehouse using an aspiration screw conveyor for cooling. Using the knives on the conveyor, the cake is partially crushed.

This continuous peanut butter processing line is designed for continuous operation. Continuous peanut oil processing always includes the following sections: degumming, deacidification, bleaching, deodorization[1-3]. In the process of peanut oil processing, there are many processing such as crude peanut oil storage tank, phosphoric acid tank, centrifugal equipment, polishing column, vacuum filter, deodorization column, FFA holder, steam boiler, heat transfer oil equipment is used.

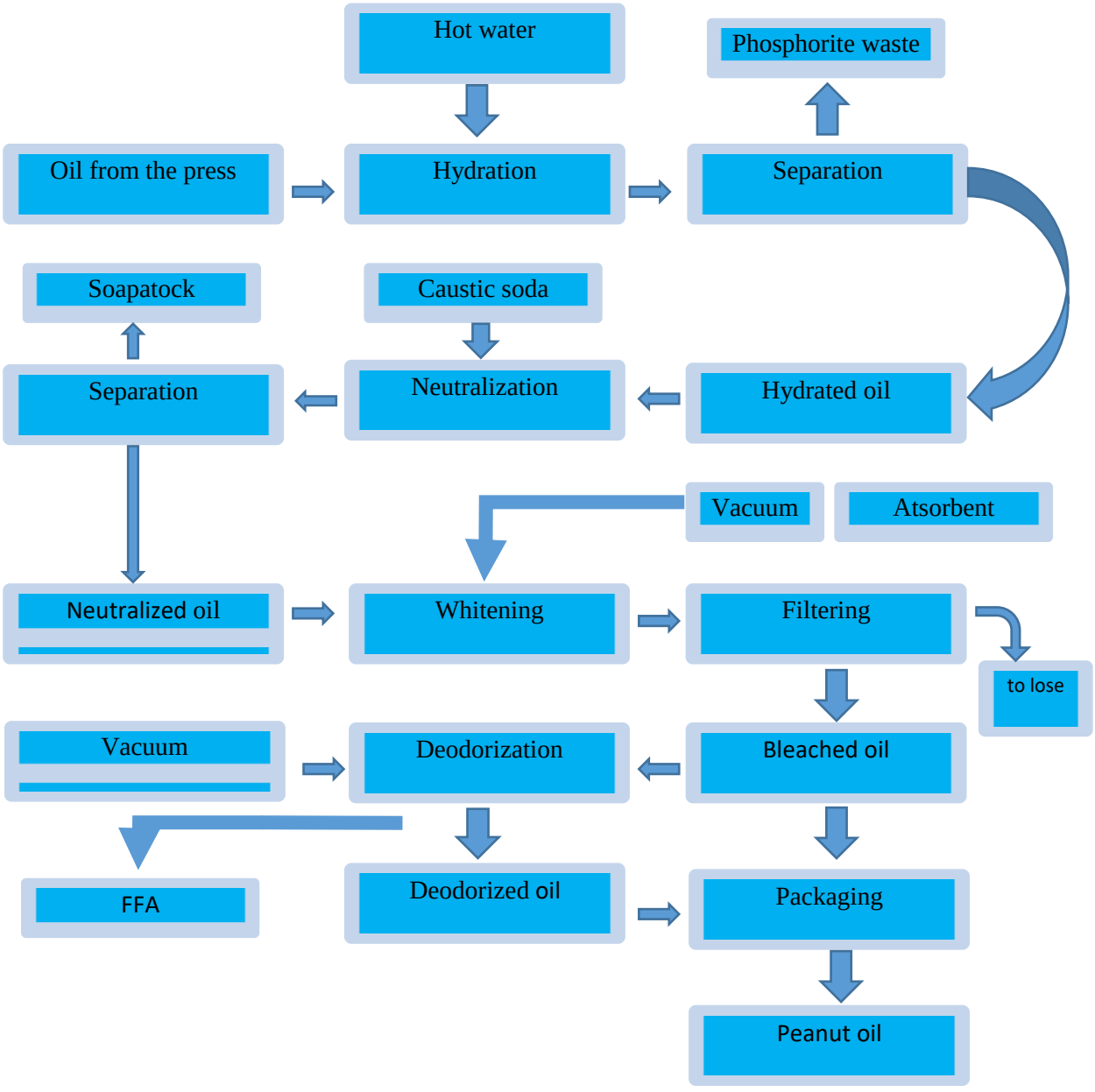
It is very important that the crude oil obtained from the peanut oil press shop and solvent extraction shop is purified before direct use in vegetable oil processing plants. The process of continuous peanut oil refining that we recommend removes unpleasant odors and impurities from the oil, giving it color uniformity and attractive quality[4-8].

[9]Features of continuous peanut oil refining:

The process of refining peanut oil can remove various impurities from the crude oil

Flow process of continuous peanut oil refining process technological line:

1. Crude peanut oil degumming process
2. Crude peanut oil deacidification / neutralization process
3. Process of decolorizing crude peanut oil
4. Crude peanut oil deodorization / distillation (deodorization unit) process



[10] Scheme 3.4.1 Continuous peanut oil refining process technological section:

1> Hydration: Degumming to remove impurities in preparation for subsequent cleaning processes.

2> Neutralization: Deacidification removes FFA (free fatty acid) from crude oil.

3> Decolorization: Decolorization removes pigments from crude oil by adding adsorbents that can improve oil quality.

4> Deodorization: Deodorization removes the odor from the crude oil which can improve the taste, stability, color and quality of the oil[11-14].

Methods. Peanut fruits [15-20] The above varieties for growing in Pop district of Namangan region were separated by cold press. The obtained oils were first studied for their physical and chemical characteristics.

Extracting oil from seeds and determining the composition of the obtained oils

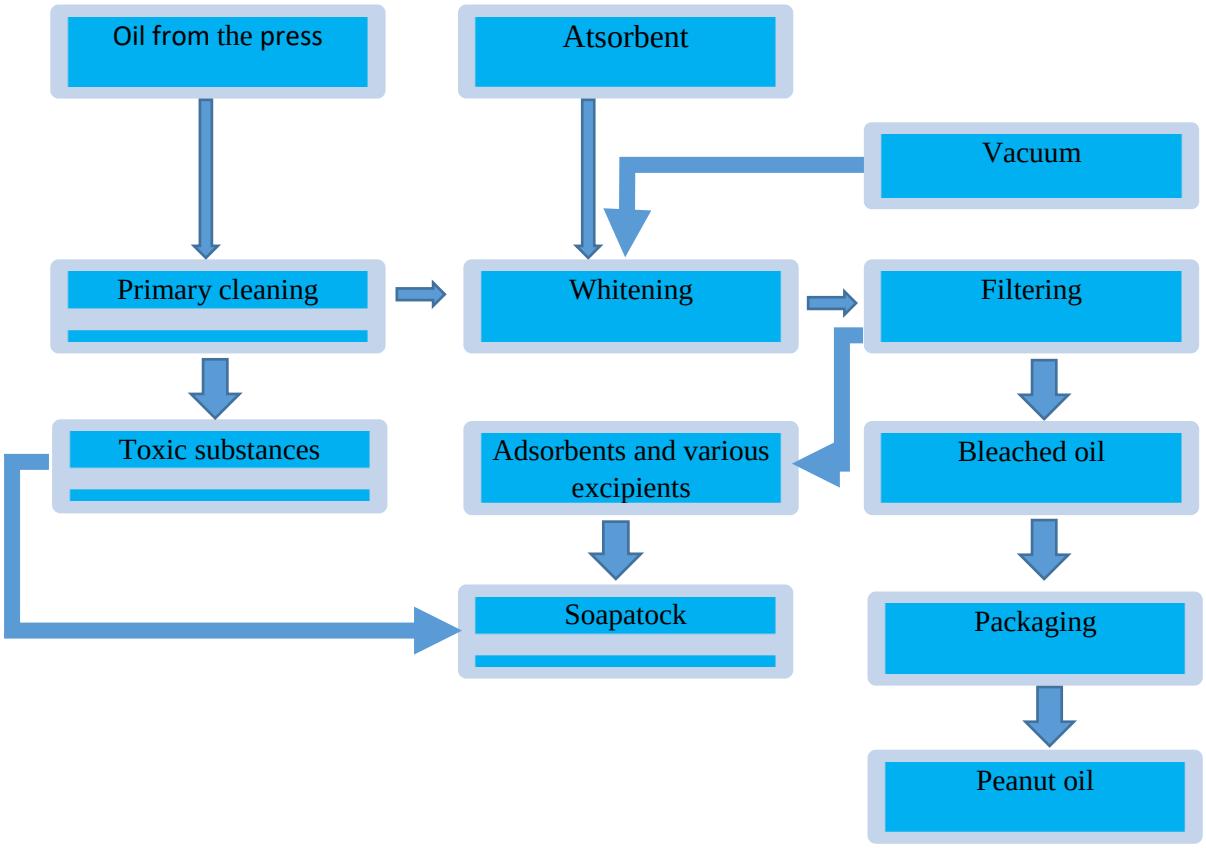
Dry peanut seeds (100 g) were obtained by cold extraction of AOAC14 oil. First, the seeds are shaken with n-hexane for 24 hours at room temperature. The solvent was then removed from the oil using a rotary evaporator. Finally, the oil was placed in a glass container at ambient temperature to remove residual solvent. The obtained oil samples are kept at a low temperature of 1 to 5 °C during the analysis

Physical properties of peanut seed oil

Viscosity was determined using a viscometer apparatus according to the method described by Akpan et al.

The specific gravity of groundnut seed oil was measured according to Akpan et al. Then, the refractive index of the oil was determined using a refractometer.

Results. The research conducted in the laboratory showed that we recommend a technological system for simplifying the technology of extracting oil from peanut kernels and refining the obtained oil.



Scheme 3.4.2. Technological section of short-term refining technology of peanut kernel oil

Cleaning by filtration. The peanut oil is filtered to separate small particles that remain unburnt. Fabrics made of cotton, nylon or kapron thread are used as a filtering barrier in the filtering device .

The bleaching process is carried out under vacuum in the contact range of 353-393 ° K (80-120 ° C) for 20-40 minutes. Usually, processing is carried out under a slight vacuum to avoid increased oxidation due to oil dispersion in the ground particles.

The amount of adsorbent used is from 0.1 to 3 g/100 g, depending on the quality of crude oil. However, other high-percentage polishing materials may be used to meet final color requirements.

The pretreated oil is heated under vacuum to 363-383K (90-110°C) and then vigorously mixed with an adsorbent (bleaching earth and/or activated carbon) in a bleacher. After a holding time of 20-40 minutes, the oil-adsorbent mixture is filtered. Only filters were used in oil-adsorbent separation.

Discussion. In the research conducted by us, we analyzed the physico-chemical parameters of the oil extracted by the simplified refining technology of the oil extracted using a peanut oil press using a number of analytical methods.

Oil content is an important characteristic of groundnut seed evaluation and can vary from 37% to 64% depending on variety, season and maturity. In this study, the effects of different origins on the oil content of groundnut were highlighted, with the aim of providing a reference for further selection of high oil seed materials. Due to its reference value, the amount of oil in the Rakhbar, Salamat , Mumtoz , Kibrai-4 varieties of peanuts grown in the republic is from 42.5% to 55.3%, at a statistically significant level (Table 1).

Table 1. Physico-chemical composition analysis of refined SPU oil from four varieties of peanuts grown in our country.

Varieties	Fat content (g/100g)	Acid value (mg KOH/g)	Peroxide value (mmol/kg)
Leader	48, 1	0.15	3, 5
Hello	47.03	0.2 2	3.1
Classic	4 6,5	0.31	3, 4
Qibray-4	47.8	0.2 3	5.8

Physico-chemical analyzes represent the parameters related to oil storage and quality. Nowadays, it is receiving more and more attention from manufacturers, researchers and consumers. These indices indicate the oil's preservation status based on the effects of the main environmental oxidizers such as heat, light and oxygen, which accelerate the breakdown of glycerides, develop rancidity and cause the formation of free fatty acids in the oil.

Determination of fatty acids in peanut oil

Contains peanut oil The main fatty acids present were palmitic acid (C16:0), oleic acid (C18:1) and linolenic acid (C18:2). In addition, palmitic acid (C16:1), stearic acids (C18:0) and longer chain fatty acids such as arachidic acid (C20:0), gadoleic acid (C20:1), behenic acid (C22:0) , lignoceric acid (C24:0), was present in small quantities. The relative (%) concentration of oleic acid in total samples revealed that the highest amount varied from 36.10% to 47.66%, followed by linolenic acid and palmitic acid from 30.53% to 40.86% and 10.17 % -12.61% in less amount. The sum of these three fatty acids is 88.46%-90.60% of the total fatty acids. As the main components of oils and fats, fatty acids in different varieties of peanut oils were evaluated and determined (Table 2).

Table 2. The content of fatty acids obtained from four varieties of peanuts grown in our republic and the content of average SPU refined oil (%).

Varieties	Palmitic acid	Palmitoleic acid	Stearic acid	Oleic acid	Linolenic acids	Arachidic acid	Gadoleic acid	Behenic acid	Lignoceric acid
Leader	12.04	0.26	3.38	38.6	39.7	1.41	0.77	2.43	1.34
Hello	10.47	0.22	2.83	45.14	35.00	1.37	1.07	2.51	1.41
Classic	10.74	0.32	3.32	45,28	34.60	1.41	0.87	2.32	1.16
Qibray-4	11.82	0.24	3.83	39.80	37,48	1.61	0.95	2.72	1.57

The percentage and ratio of unsaturated fatty acids and saturated fatty acids in the tested samples were calculated as described in the table. Refining done It was observed that the fats have an average value of 79.24% unsaturated and 20.76 % saturated fatty acids , which indicates that peanut oils have antioxidant properties, lower cholesterol and even reduce the risk of heart disease.

Conclusion. Refinement technology of peanut kernel oil recommended a simplified process scheme. That is, pretreated oil is heated under vacuum to 363-383K (90-110 °C) and then vigorously mixed with an adsorbent (bleaching earth and/or activated carbon) in a bleacher. After a holding time of 20-40 minutes, the oil-adsorbent mixture is filtered. Only filters were used for oil-adsorbent separation.

The oil content of peanuts in the Rakhbar , Salamat , Mumtoz , Kibra-4 varieties grown in the republic varies from 42.5% to 55.3% and contains oleic (35.10%-42.66%) and linolenic acid (30, 53% -40.86%) rich. At the same time, it contains a large amount of α -, γ - and δ -tocopherol and β -sitosterol, stigmasterol, campesterol. The evaluated physicochemical parameters were as follows: acid value (0.11-2.74 mg KOH/g) and peroxide value (1.94-5.55 mmol/kg). It was also found to have strong oxidation stability with an induction period of over 7 hours through a new simplified refining technology.

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