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RECOMMENDED PRACTICES FOR SELECTING BLEACHING SOIL

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Abstract

It is contained in the seeds and gives color to the oil during the oil separation process. Mainly carotenes and xanthophylls are found. They dissolve well in extraction solvents, so the amount of these substances in the extracted oil is higher than in the oil obtained by the pressing method. Carotenoids are found in the form of α- and β-carotenes in palm, flax, seed, soybean, sunflower, corn oils and are considered provitamin A. Among carotenoids, γ-carotenoid is found in oil and seeds in very small amounts or not at all. Soybean oil contains xanthophylls (lutein). The green color of rapeseed, soy, and palm oils is caused by the chlorophyll pigment they contain. The oil obtained from immature soybeans has a high content of chlorophyll pigment. Coloring substances are separated by adsorption method.

Introduction. When choosing a new soil, it is necessary to take into account the following indicators.

Flowability – Poor flowability prevents the soil from yielding.

Dustiness - This factor is important in keeping the soil loose. It also causes respiratory problems for workers.

Soil quality. Each batch of soil must have a quality certificate and be checked by the consumer on the spot in the manner of the supplier.

Spontaneous fire. All unprocessed soils are inherently flammable. Therefore, it is necessary to moisten the soil from the press.

Filtration. A good soil should ensure uniform filtration when filling the upper surface of the press. This ensures that the pressure builds up slowly and that the sieves do not overflow.

One of the important factors when choosing soil is the type of filters used.

The essence of the bleaching process. The bleaching process consists of a series of operations, consisting of mixing neutralized oil with soil, heating to a certain temperature and filtering.

Methods. Dosing the soil. Often, the amount of soil used depends on whether the oil color will be reduced to the specified level.

For soybean oil, the ground content is determined by reducing the peroxide value of the bleached oil coming out of the press to zero. For unrefined oil of normal quality, its content is 0.3 to 0.6%.

Periodic bleaching at atmospheric pressure. Initially, during the bleaching process, a certain amount of soil was mixed with dry oil in an open tank and heated to 110-1200 C, after cooling for 20-30 minutes, it was cooled at a temperature of 70-800 C and filtered.

Operations performed in this process are carried out in accordance with bleaching technology. Accordingly, oil and soil are mixed at a temperature below the boiling point of water, which means that the soil contains a certain amount of moisture.

As a result of the heating of the oil and soil at the beginning of the mutual bonding process, the water is released and the soil begins to work. The effectiveness of dry soil is low, and when added to boiling oil, its effectiveness decreases even more. When applying the periodic bleaching method at atmospheric pressure, air should not enter during the feeding or mixing of the soil. For this, there should be a properly designed mixer and special barriers, and the soil should be given in the form of a suspension.

After the fermentation is completed, the mixture of oil and soil is cooled to 70-800C and quickly filtered. Filtered oil must be cooled and stored in a non-oxidizing, peroxide-free environment. The advantage of the method of periodic bleaching at atmospheric pressure is the low cost of the equipment, as well as the complete and uniform processing of the oil. Disadvantages of the process are that the oil is exposed to air at high temperatures and requires a highly skilled operator to control the temperature and time.

Periodic bleaching under vacuum. This process does not require operator skill and the oil does not mix with air. The process is similar to the above except that the high temperature is reduced as a vacuum is applied. The soil is given at a temperature lower than the boiling temperature of water. Typical indicators of periodic bleaching process under vacuum are absolute vacuum of 50 mm Hg, maximum temperature from 100 to 1100 C, soaking time can last from 20 to 30 minutes.

Continuous bleaching under vacuum. This method is considered one of the modern bleaching methods of soybean oil. More efficient than the continuous method, the oil is sparged in a vacuum.

The continuous bleaching process can be combined with modern continuous neutralization, hydrogenation, and semi-continuous and continuous deodorizers.

Oil and soil are mixed to form a slurry at low temperature, then deaerated and heated to bleaching temperature. The mixture is sprayed in a mixing apparatus and then filtered after being fed to a heat exchanger for cooling..

The efficiency of the continuous bleaching method under vacuum is that bleaching is done without air, the production can be automated and mechanized. The disadvantage is that the mixing is done inside the apparatus and some of the oil is over-bleached and some is under-bleached, depending on the mixing.

Filtering. All of the developed bleaching earths have an adverse effect on the hydrogenation and deodorization process when applied to bleached oils.

In addition to catalyzing oxidation reactions, both processes also contaminate the surface of equipment with soil particles.

The polishing or straightening filters studied under the main press are not protected. The mixture of oil and soil is recirculated from the bleaching apparatus in order to form the required layer in the filter-press. The dish is made in a reciprocating system.

The clean one is given to the next patient, for the treatment or after my appearance. At first glance, the observer can see the particles.

Insulating or polishing filters - an additional automated section of the continuous filtering process is calculated.

The creation of a particle detector is a perspective solution, which is necessary in recirculation to install

an automated boiler or the necessary accessories.

Bleaching efficiency in filter press. It is known that 30-40% of the bleaching process takes place in the filter press. This phenomenon is known as filter press bleaching efficiency and was studied by Henderson. It can be seen that the administration of sour and bleached sour oils shows lightening of color and reduction of peroxide number. This process can only be evaluated in factory conditions.

Wet bleaching. The process developed by Bazaldua was called wet bleaching. The neutralized and water-washed oil is loaded from the final centrifuge into an open collector, where bleaching earth (0.7-1.7%), citric acid (0.01-0.03%) and water (0.5-2.2%) are added and Stir at a temperature above 800 C for 20 minutes. Then the mixture is loaded into vacuum bleaching equipment, the temperature is raised to 1000 C and 50mm rt.st. kept under vacuum for 30-40 minutes. Then the oil is filtered in a simple way. Refined, bleached and deodorized oil obtained in this way has a stability of 18 hours under the influence of activated oxygen after deodorization and a shelf life of 16 months when packaged without nitrogen with the addition of 50 mg/kg of citric acid.

Conclusion. Henderson used neutral soil with 20 percent citric acid. He found that neutral soil is used 30% more than activated acidic soil. The combination of neutral soil with citric acid showed the same effect as acid-activated soil in reducing pigments, but was found to be ineffective in reducing peroxide number.

These results show that the application of acid-water-neutralized soil combination is equally effective as the application of acid-treated soil. How beneficial this will be depends on the cost of the reactors and the increase in neutral ground loss.

Based on the physico-chemical parameters of the soybean oil obtained for the experiment, the oil yield is presented in the table below.

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