

Hemp oil production technology

Hemp (*Cannabis sativa* L.) is a well-known crop that has been used for centuries. Its processing can yield a range of products, but the interest in growing this plant subsided in recent past. The main reason for the low current production of hemp is the content of psychoactive substances, cannabinoids (mainly THC). The EU legislation bans growing of hemp with THC content higher than 0.2 %.

Currently there are more than 50 varieties of hemp with THC content below 0.2 %. Hemp is a versatile crop and its most important products are oil and proteins, which are useful for food and feed production.

An all-purpose plant

Hemp fibers are a great material for paper and textile industries. The seed is valuable for its content of fat (25 – 35 %), protein (20 – 25 %), fiber (10 – 15 %) and a number of minerals.

Hemp oil contains polyunsaturated fatty acids, including several essential fatty acids such as linoleic and alpha-linolenic acids. Thanks to its balanced fatty acid content the oil has a positive effect on patients with rheumatoid arthritis, atopic dermatitis, and allergies. This makes hemp oil ideal for cold dishes.

Since hemp oil is readily absorbed through the skin, it is also a convenient ingredient for creams and lotions. It contains tocopherols, which lower the risk of cardiovascular diseases, as well as that of cancer and age-related macular degeneration.

Oil production

In procedures for oil production where it is essential to yield maximum nutritional value, mechanical extraction by a screw press is the technology of choice.

The most common method is single-stage cold pressing, which is a natural means of obtaining a high-quality 'virgin' oil. This process takes place inside the screw press, where changes in the shape of the screw flight or also narrowing at the outlet of the press cause a gradual compaction of the material. The associated friction leads to an increase in temperature, which, however, must not exceed 50 C during cold pressing.

The pressing machinery contains holes through which the expelled oil can flow out. Thus there is no need for chemical solvents at any stage of the process. As the oil obtained in this way contains solid particles that came in the seeds (the so-called solids), subsequent filtration is necessary. For oil filtration, plate filters are commonly employed. In this setup, the solids are used as a filtration medium for the process.

Interested in hemp pressing?

The company Farmet a.s., which has an extensive experience with research, development and production of oilseed technologies, is registering an increased interest in hemp pressing.

For this purpose we offer our small-capacity presses UNO and DUO, which allow processing of 8 to 24 kg of seeds per hour and are specially developed for minor oilseeds. Besides hemp, these include poppy seeds, artichoke, grapeseed, sea buckthorn, amaranth and others.



For pressing of these crops, the presses are regularly equipped with a frequency changer of the main drive, which allows optimization of the screw revolutions, depending on the properties of the pressed oilseed. This year we have introduced a new special heat sleeve, which helps maintain a constant temperature in the press chamber, thereby further facilitating the optimization of pressing parameters.



The pressing shop Compact

There is an increased interest in the pressing of minor oilseeds also at middle-scale capacities. We meet this demand with a modular press shop 'Compact', which offers a performance of 300-600 kg of seeds per hour. The equipment works with a wide range of seeds and allows an easy transfer between the crops. We offer variable configurations with different arrangements of the presses: single-stage pressing is the most careful method when maintain the nutritional value of the oil is the priority.

We also offer a two stage pressing configuration, whereby the oilseed is pre-pressed first and the remaining material is pressed again in the final press. This configuration is still very careful and natural (it is still cold-pressed); its advantage is a higher oil yield. The third configuration is the so-called extrusion pressing. In this setup, there is an extruder placed in between the pre-press and the final press. Extrusion heats up the seeds and disrupts cellular structures in order to achieve the highest oil yields. These yields are comparable to high-capacity technologies of hot pressing.



Conclusion

Pressing of minor oilseeds such as hemp seed is gaining in popularity and importance. Hemp oil is a powerful food supplement with proven positive effects on human health. The oil is valued as a source of polyunsaturated fatty acids and essential fatty acids, but only using a careful pressing technique will yield oil of desirable nutritional values and properties. The press cakes (the remains after pressing of hemp seeds) are a rich source of amino acids and readily digestible proteins; they are thus a convenient resource for food and feed industry.

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