

Quality Control of Virgin Coconut Oil

Overview

Virgin coconut oil (VCO) is the purest and finest grade of coconut oil. By repute, it has hundreds of medicinal benefits and is used in many cosmetic and food preparations. VCO is increasingly gaining the reputation of being the most versatile oil, due to its myriad of uses.



Health Benefits

Coconut oil is naturally rich in lauric acid, which is also found in high levels in breast milk. When ingested, lauric acid turns to monolaurin, a chemical compound which is believed to improve immunity against bacteria, parasites, viruses, fungus and other pathogens.

VCO also helps to increase the body's metabolic rate which can aid in weight loss and assists diabetics in regulating sugar. Apart from the regulation of sugar, VCO helps maintain proper functioning of the thyroid, preventing cancerous cells growth in the colon, skin, liver, and breast.

VCO can be administered in situations where patients have risk of high cholesterol levels. It also aids in fat soluble vitamin absorption and can help speed up healing from bruises, burns, cuts and can improve dry hair condition, lice infestations and dandruff problems while nourishing the skin and scalp. VCO also makes a good mouthwash and helps relieve sore throat, toothaches and cracked lips.

Production Process

The main difference between ordinary coconut oil and VCO is the process of extraction. VCO is produced using the cold process; as such no heat is applied during extraction. The absence of heat during extraction is very important, because this preserves the lauric acid and the medium chain triglycerides content of the oil.

VCO is extracted from mature coconuts without the

use of deodorization, heat, bleaching, additives or any other chemical processing, making it natural.

Initially, coconuts are shelled followed by paring and dewatering. Pared coconuts are then shredded through a coconut cutter with sieve plate.

Fresh coconut milk is extracted from the shredded coconut gratings using a screw/hydraulic press. The coconut milk is subsequently filtered and passed through a high speed centrifuge in which the coconut oil gets separated from the coconut milk.

Color Appearance

VCO is pure, hence it is transparent and almost water like in color. It also has a sweet coconut smell to it. Regular coconut oil on the other hand is yellowish in color.

Although VCO and regular coconut oil are slightly different, this difference cannot be made with the naked eye. This differentiation is largely due to the presence of certain colloidal particles and moisture within it.

Ideally, VCO should be clear as water. However, its color may change slightly depending on its manufacturing process.

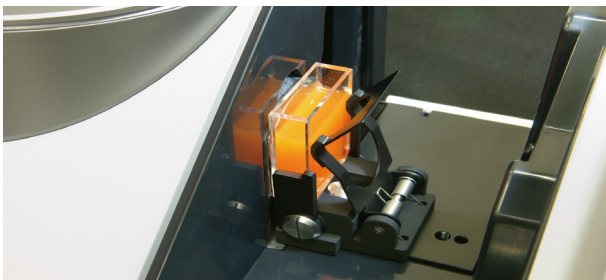
Quality Control

To test and quantify the clarity of the VCO, the transmitted color of the VCO can be determined by using a spectrophotometer that comes with a transmittance chamber. One such spectrophotometer is the CM-5 which can be used as a stand-alone model.

Calibration of the CM-5 is required, prior to any transmittance measurements. For 0% calibration, the zero calibration plate that comes with the instrument must be used and for 100% clear calibration, it uses a

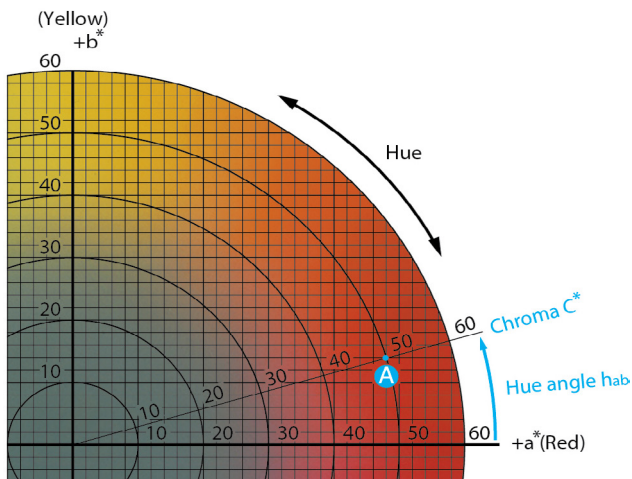
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10mm light path cuvette filled with pure distilled water. Steps would be shown on the CM-5 screen to guide users through the calibration process. After which, the 10mm light path cuvette can be filled with the VCO samples and placed into the transmittance chamber of the CM-5 using the necessary cell holder for measurements.



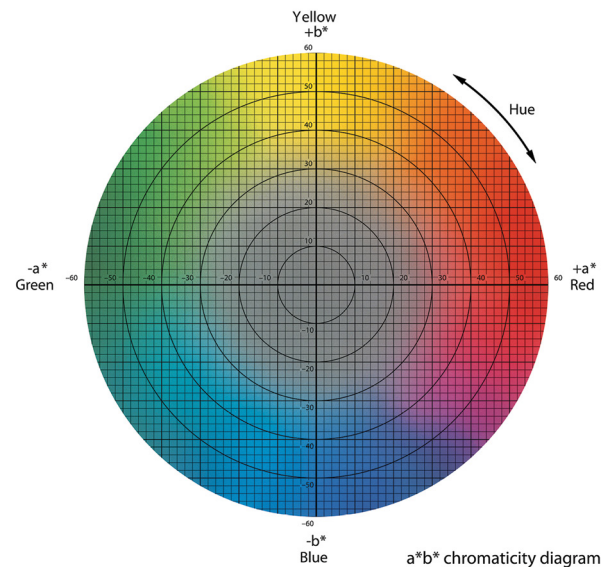
Cuvette in the transmittance chamber

An instrument setting of D65 illuminant and a standard observer of 10° is recommended for the measurements. Measurements of the production batches can then be compared to the reference VCO.



Below is a general guide on when to accept or reject a sample VCO. Do note that this is only a guide and the final acceptance data value still depends on individual producers and market preferences.

Color Data $\Delta E_{a^*b^*}$	Accept / Reject	Action
0.0 to 0.5	Accept	Ready for packaging
0.51 & above	Reject	Reprocessing required



The above test procedures are just recommendations for food technologists or R&D scientists to look into and study the options available or to help them speed up their testing process.

For more information on the [Spectrophotometer CM-5](#) and the [SpectraMagic NX Pro Software](#), kindly visit the following web sites for more information.

Alternatively, you can email to us at ssg@gcp.konicaminolta.com or call us at 65 6895 8685 to find out more from our color & light specialists.