Marula-KING

PRODUCT INCI NAME	Marula (Sclerocarya Birrea) seed oil
PLACE OF ORIGIN	Namibia
EXTRACTION METHOD	Cold press
PART OF PLANT	Seeds
CAS number	68956-68-3
EC number	273-313-5

MARULA OIL PROPERTIES

It is a clear, pale, yellowish-brown colour and has a pleasant nutty aroma. The main properties of the oil include:

- High nutritional value (See Table 1)
- Extraordinary oxidative stability
- Antioxidant action
- Free radical scavenging properties
- Moisturizing properties

Nutritional Content of Marula Kernels	
Moisture	4.0
Ash	3.8
Protein (g/100g)	28.3
Fat (g/100g)	57.3
Fibre (g/100g)	2.9
Carbohydrates (g/100g)	3.7
Energy Values (KJ/100g)	2703
Ca (mg/100g)	118
Mg (mg/100g)	462
Fe (mg/100g)	4.87
Na (mg/100g)	3.81
K (mg/100g)	601
Cu (mg/100g)	2.81
Zn (mg/100g)	5.19
P (mg/100g)	808
Thiamine (mg/100g)	0.42
Riboflavin (mg/100g)	0.12
Nicotinic Acid (mg/100g)	0.72

(Source: Arnold et al, 1985)

Table 1. Nutritional content of Marula kernels

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Oil Composition

The fatty acid profile of Marula Oil has been found to be similar to that of olive oil. The high mono-unsaturated content (C18:1 of 72%) suggests that the oil should have a good oxidative stability. The stability of plant oils is influenced by the fatty acid composition (e.g. C18:1 / C18:2 ratio) and the presence of natural antioxidants of which the tocopherols are the most important. The tocopherol content showed that the main component is g-tocopherol (average 22 mg per 100 g oil).

Although Marula oil contains a similar fatty acid composition to olive oil, it is nearly 10 times more stable to oxidation.

Oxidative Stability of Marula Kernel Oil compared with different oils

Oil Sample	Induction period (h) **
Marula oil *	34.2
Olive oil	4.6
Sunflower oil	1.9
Cottonseed oil	3.1
Palmolein oil	8.5

* Average taken from different marula oil samples
** Measured by Rancimat at 120 C and 20 l/h airflow
(Source: Burger et al, 1987)

Typical Properties

Acid Value	<5 mg KOH/g
Peroxide value	<15 meqO_2/kg
g-tocopherol	22mg/100 g oil
Rancimat (120°C, 20L/h)	20-45
Specific gravity (15oC°)	0.915-0.92
Refractive Index	1.455-1.465
Iodine value	70-76 g I_2/100g
Saponification value	188-196 mg KOH/g
Flash Point	230°C
Heavy Metals	<20ppm
• Arsenic	<1
• Antimony	<5
• Cadmium	<1
• Chromium	<1
• Lead	<2

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Fatty Acid Composition (Range of values)

Saturated fatty acids		Unsaturated fatty acids	
Myristic Acid	< 0.2%	Oleic acid (omega 9) (C18:1)	70-80%
Palmitic acid (C16:0)	10-13%	Linoleic acid (omega 6) (C18:2)	4-9%
Palmitoleic acid (omega 7)	< 1%	α-linolenic acid (omega 3) (C18:3)	< 1%
Stearic acid (C18:0)	6-8%		

Marula-KING Specification

Acid Value	<2 mgKOH/g
Peroxide Value	<0.5 mEq/kg
g-tocopherol	24mg/100 g oil
Eschericia coli	Not detected
Mould	< 10 cfu/g
Yeast	< 10 cfu/g

APPLICATIONS

- Skin care products: Moisturizing lotions, body butters, body and facial oils
  - Protection against photo-aging - neutralizing free radicals
  - Helps build healthy collagen
  - Provides antioxidant protection
  - Possesses anti-inflammatory properties
  - A good massage oil
  - Can be used around the eyes
  - Anti-aging properties
- Hair care products: Leave-in treatment, scalp conditioners, hair lotions
- Make-up formulations: Eye shadow, lip treatment
- Food: antioxidant properties for the nutraceutical industry

Can Replace Avocado, Olive, Almond Oil

Natural and earthy

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	Marula oil	Avocado Oil	Olive oil	Almond Oil
Oleic acid (omega 9)	73 - 81%	60 - 80%	55 - 83%	62 - 86%
Linoleic acid (omega 6)	4 - 9%	7 - 20%	3.5 - 21%	7 - 30%
α-linolenic acid (omega 3)	1 - 3%	0.2 - 1%	≤ 1.5%	≤ 0.2%
Palmitic acid	10 -13%	10 - 25%	7.5 - 20%	4 - 9%
Saponification value (mg KOH/kg)	188 - 196	180 - 195	184 - 196	190 - 200

Linoleic acid (omega-6, which your body does not naturally produce) vs. Oleic acid (omega-9, a monounsaturated fatty acid): Linoleic acid is lightweight and thinner than oleic acid, which means it is able to be absorbed by the skin more easily.

Oleic acid is thicker and feels rich, benefitting those with dry or aging skin. Oils high in oleic and low in linoleic acids are heavier than high linoleic oils and take longer to absorb. Oleic acid comprises antioxidant compounds that help fight free radical damage caused by environmental aggressors like UV rays, the top trigger of premature aging. By minimizing free radicals in skin, so too is the manifestation of wrinkles, fine lines, dark spots, sagging and other unwanted features. Oleic acid replenishing lost moisture that naturally comes with age, it can restore this oil—without clogging pores.

The fatty acids omega-3s and omega-6s are the building blocks of healthy cell membranes. These polyunsaturated fats also help produce the skin's natural oil barrier, critical in keeping skin hydrated, plumper, and younger looking.

Palmitic acid can act as an emollient, softening the skin and help retain moisture by forming an occlusive layer. Two main functions of palmitic acid are to act as an emulsifier and surfactant. The low surface tension of palmitic acid allows water to combine with the oil and dirt molecules and wash them away. As a result, palmitic acid helps to remove dirt, sweat, and excess sebum from the skin and hair. This makes it a useful ingredient in cleansers, body washes, shampoos, and bar soaps.

Saponification value number represents the number of milligrams of potassium hydroxide required to saponify 1g of fat under the conditions specified. It is a measure of the average molecular weight of all the fatty acids present. Saponification value refers to the amount of esters that can be hydrolysed and turned into soap.

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HEALTH AND SAFETY AND NON-GMO STATEMENT

- Ionization: Product did not undergo any ionizing treatment & does not contain any ingredient/additive treated by ionization.
- Pesticides: Product conforms with regulation 396/2005 EC and its last amendments.
- Heavy Metals: Product conforms with regulation 1881/2006 EC and its last amendments.
- Non-GMO: Raw materials were not subject to any Genetic Modifications.

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