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TIGERNUTS OIL

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TIGERNUTS OIL PROFILE

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1 Introduction of the product (TIGERNUTS):

To be able to understand what "Tigernut Oil" is made of, we should first of all clarify that the Tigernut is not a "nut" but a "TUBER". This tuber was discovered more then 4000 years ago and has been cultivated ever since, in more or less quantities, depending on the local demand in a reasonably remote area along the Mediterranean coast, specifically Valencia, and some Arabian countries. Its health and nutritious values have remained the same through out the years, but only recently, demand has increased tremendously, because of its nutritive values.

Brief description of the product (TIGERNUTS):

Dimensions: From 8 mm. – 16 mm, smaller sizes are not used for human consumption.

Shape: Long or round shaped. Properties however remain the same and are equally nutritious.

Colour: Brown

Cut (When eating):

- When hydrated it has a smooth tender, sweet and refreshing taste.
- When dehydrated it's slightly harder (nut texture), but with a rather more intense and concentrated taste.

Flavour: Sweet and intense.

Cultivation period: From March to December

Characteristics:

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- As explained before, the Tigernut is a tuber, which means it grows in the soil.
- Being cultivated through continued irrigation, and they have to be properly dried before storage. The drying process is completely natural, meaning "sun-dried", which process can take up to one month. The dehydrating process ensures a longer shelf time, prevailing rot or any other bacterial infection, securing therewith their quality and nutrition levels.
- Unfortunately, the dehydration process makes the Tigernuts skin wrinkled.

2 Production process

The production process of the Tigernuts Oil, is quite easy and completely natural (cold pressing), but we will explain easier all the steps in the following diagram.

The surface part of the Tigernut plant, looks like a grass, and this is scorched during the harvest.

↓

A machine then comes along and lifts the Tigernut out of the ground, sieving the mixture to get rid of the earth and leave the actual nuts/tubers.

↓

Immediately after finishing the harvest, the Tigernuts are washed with water in order to eliminate the sand and small stones that are mixed with the Tigernuts.

↓

Once the Tigernuts are cleaned, they are dried out in order to remove their humidity.
This is a natural process that requires a minimum of 3 months, and is carried out at a carefully monitored temperature and humidity level. The Tigernuts are turned over every day to ensure uniform drying. The drying process is critical to have a high quality product.

↓

Only the highest quality Tigernuts are selected for preparing oil. The low quality Tigernuts (small or damaged) are eliminated by an automatic air blasting process.

↓

After the best Tigernuts quality is selected, we prepare flour milling by means of a special mill prepared for milling products with high levels of fats.

↓

The obtained flour is put into 4 big presses which squeeze slowly the flour, making it sweat in a first cold extraction of the oil (The quality that we use)

↓

This extracted oil is collected in big barrels

↓

The oil is filtered slowly with special reinforced filters before put it into the final packaging
(300 Lt. barrels or 25 Lt. decanters)

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3 Product profile

Tigernut oil has a gold colour and a nutty taste, which makes it ideal for different uses, as much that we are still continuously investigating further developments of our products. We strongly believe in the benefits of this oil for health reasons, through various analyses. It's proven that the product is highly recommended for cosmetic use, massages, bio-diesel, and human consumption….

- Because of its content in oleic acid and polyunsaturated fatty acids
    - Reduces bad cholesterol (LDL-cholesterol) and increases the good cholesterol (HDL-cholesterol), transporting the cholesterol placed in the arteries to the liver for its destruction.
    - Reduces triglycerides level in blood.
    - Beneficial effects on the digestive secretions (gastric, pancreatic, biliary), because the oleic acid it's the most powerful stimulator for the liberation of Colecistokinina (responsible of digestive secretions).
    - Its beneficial for eczema and other alterations on skin because of its content in Vitamin E. The Vitamin E increases the blood circulation, assuring a better alimentation to the tissue and improving the elasticity of the skin, reducing wrinkles.
- Highly recommended for childhood and old age, and also for persons on diets to lose weight.
- It's tasteful and stable oil.
- More appropriate than any other oil for deep frying because it's more resistant to chemical decomposition at high temperatures, impregnating the food with less fat, creating a crust in the surface that increases the digestibility of them and reduces the caloric value.
- The oil content is very high in Gamma-Tocopherol. Which means it's an oil with a high resistance to oxidation and perfect for the cosmetic industry.

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4 Analysis

Acidity : 0,40

Acidity index: 1,10

Peroxids Index (meg O_2/Kg): 3,80

ISaponification index: 192,50

Yield: 15 %

FATTY ACIDS COMPOSITION

Miristic Acid	0,08
Palmitic Acid	15,50
Palmitoleic Acid	0,40
Margaric Acid	0,10
Margaroleic Acid	0,05
Estearic Acid	5,40
Oleic Acid	68,83
Linoleic Acid	12,70
Linolenic Acid	0,20
Araquic Acid	0,64
Gadoleic Acid	0,23
Behenic Acid	0,13
Lignoceric Acid	0,19

STEROLS COMPOSITION

Cholesterol	0,27
Brasicasterol	0,17
24-Metilencolesterol	0,06
Campesterol	14,83
Campestanol	0,17
Estigmasterol	15,48
D7-Campesterol	0,84
D7-Estigmasterol	5,61
D7-Avenasterol	2,55
D5-Avenasterol	2,95
Clerosterol	0,82
Beta-Sitosterol Real	54,67
Sitostanol	0,62

INFORMATIVE AVERAGE RATES

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5 Security Sheet for Tigernuts Oil

Product name:
Aceite de Chufas (Tigernuts Oil)

Supplier:
TIGERNUTS TRADERS, S.L.
Plaza País Valenciano, 7
46183 L'Eliana (Valencia)
ESPAÑA
Tel. 962 740 932
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Dangers Identification:

Dangers for Human Health:
No dangers have been found in the normal use of the oil

Dangerous reactions:
None

Allergies :
Non have been found so far.

First Aid:

General:
No important measures required

First Aid - Inhalation:
No important measures required

First Aid- Skin:
No important measures required

First Aid - Eyes:
Rinse with abundant water. Try to have the eyelid away from the eyeball to ensure the rinse.
Follow the advice of the doctor.

First Aid - Intake:
No important measures required

Measures in case of fire:

Extinction Ways:
This is not flammable oil

Inappropriate Extinction Ways:
This is not flammable oil

Special Exposition Dangers:
Tigernuts Oil is not considered as flammable oil.

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Measures in case of accidental spill:

Personal Caution:
Take care in slippery floors.

Environmental Caution:
Prevent spill or leak. Prevent its extension or the entrance in waste pipes, ditch or rivers by using sand or appropriate docks.

Cleaning Methodology:
Absorb or contain the liquid in sand or control material. Put in a convenient container, clearly identified.

Handling and Storage:

Storage:
Keep the container completely well closed. Avoid from direct sunlight, heat sources and strong oxidation agents.
Store it at temperature between 10º - 15º.
The oil can be frozen without problems and will last for more time.

Exposure Controls / Personal Protection:

Exposure rules:

Respiratory protection:	None
Hands protection:	Security gloves
Eyes protection:	Protective goggles
Skin protection:	None

Physical & Chemical Properties:

Shape:	Liquid
Colour:	Gold
Odour:	Perceptible & Characteristic
Fusion Area:	Unknown
Boiling Point:	Unknown
Inflammation Point:	Unknown
Ignition Point:	Unknown
Explosive Properties:	Unknown
Soluble in:	Ethanol 96º, chloroform & ether

Biodegradable product

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6 Comparison with similar oils

Tabla 1: Quimic composition of the oils (Lipidic composition)

	TIGERNUTS OIL	OLIVE OIL	MAIZE OIL	SUNFLOWER OIL	SOYA OIL
Fatty Acids (g/100g)					
Palmitic Acid	14.8-15.5	11-14	10.5-12	5.9-6.8	10.3-11.0
Margaric Acid	0.1	0.00	0.07		
Estearic Acid	5.3-5.4	2-2.5	1.8-2.2	4.5-4.7	3.8-4.0
Araquic Acid	0.6	0.4-0.9	0.1-0.4	0.4	0.3
Behemic Acid	0.1-0.2	0.13	0.00		
Palmitoleic Acid	0.4	1.1-1.2	0.1	0.0-0.1	0.1-0.2
Oleic Acid	68.8	71-72	27-27.5	18.6-19.5	22.8-23.4
Gadoleic Acid	0.2	0.30	0.13		0.2
Linoleic Acid	10.6-12.7	9-10	53.5-57.0	65.7-68.2	51-53.2
Linolenic Acid	0.2-0.3	0.6-0.8	0.9-1.15	0.0-0.5	6.8-7.8

Tabla 2: Quimic composition of the oils (Vitamin E).

	TIGERNUTS OIL	OLIVE OIL	MAIZE OIL	SUNFLOWER OIL	SOYA OIL
Antioxidants (mg/100g)					
alpha-Tocopherol	16.1	14.35	14.30	41.08	9.21
Beta-Tocopherol		0.11			
delta-Tocopherol	<50	0.00			
gamma-Tocopherol	31.3	0.83			

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Tabla 3. Main differences between Tigernuts oil against olive oil and other oils (Maize, Sunflower, Soya)

	Tigernuts Oil	Olive Oil	Other Oils
Oxidative Stability	++++	+++	+
Therapeutic properties			
↓ LDL-cholesterol ↑ HDL-cholesterol	++++	++++	+++
↓ Triglycerides	+++	+++	++++
↓ Cardiovascular risk	++++	++++	+++
Eczema Treatment	++++	+++	+++
Age delay	++++	+++	+++
Inhibition of skin inflammations and scars	++++	+++	+++
Nutritive properties			
Oil quality for the extraction process	++++	++++	+
Good for deep frying	++++	++++	+
Cold consume	++++	++++	++++
Monounsaturated contribution	++++	++++	+++
Poliunsaturated contribution	+++	+++	++++
Alpha-tocopherol contribution	++++	+++	+++
Gamma-tocopherol contribution	++++	++	+

+: very low / null
++: low
+++: normal
++++:high

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7 Conclusions

It's important to mention the technological novelty, a pressed cold Tigernuts Oil means, with the finality of retaining all its nutritive properties (content in monounsaturated fatty acids, polyunsaturated & vitamin E). For these reasons the Tigernuts Oil its considered a high quality oil.

Its use for culinary purposes reinforces the own flavour of the ingredients. Tigernuts Oil can be used naturally with salads or for deep frying. In high temperatures, Tigernut oil does not show any important change in its structure, preserving better than others the dietetic properties. This oil creates a crust in the surface of the food product used, which prevails oil absorption, and preserving product flavour.

The Tigernuts Oil can be used in prevention and therapy of some cardiac and intestinal pathologies, because of its high content in monounsaturated fatty acids (oleic acid). The oleic acid and antioxidant substances (Vitamin E) are the reason why this oil is so beneficial. Moreover we can ascribe to this oil some cardio-protective effects, because of its content in polyunsaturated fatty acids, which help to reduce the blood coagulum's risk.
From a healthy point of view, improves in general the metabolism, and consuming it in a conscious way, can help in different ways to your heath.

An other line of usefulness of Tigernut oil is in the cosmetic industry. As the Tigernut oil is an antidioxide (because of its high content in vitamin E-), helps to slow down the ageing of the body cells. The vitamin E-content in cosmetic creams, favour the elasticity of the skin and reduces skin wrinkles.

It is possible to develop a complete line of natural derma-cosmetic products, based on Tigernut-oil, thanks to the therapeutic virtues (anti- inflammatory, humidifying, and regenerating values of the skin): body crème or lotion, facial crèmes, both day or night, for dry or greasy skin; eye surroundings, facial cleansers, shampoo, natural soap, etc…
The above product uses are based on the fact that the Tigernut-oil properties, protect, and balance the humidity necessary to establish a well balance corporal effect, incorporating high levels of vitamin e-, and protecting therewith the skin against any radical skin disorders.

After some tests we have determined that this oil is good for BIO-DIESEL.