Baobab

The SuperTree from Africa
BFCS
about us
Baobab Fruit Company Senegal (BFCS)

Worldwide Pioneer and Leader in Baobab Fruit production and marketing

Baobab Fruit Company Senegal was founded in 1999 by Mauro Ottaviani, an Italian food engineer.

Today BFCS is worldwide leader in the transformation of Baobab Fruit into a range of semi-processed materials for use in the cosmetic, food and nutraceutical market, with no part of the fruit going to waste.
Harvesting, Production & Distribution
BFCS Senegal & BFCS Italy

Baobab Fruits are harvested in Senegal, in the region of Tambacounda and processed in Thiès, about 50 km from the city of Dakar.

The Italian Company, based in Mantua, is responsible for warehousing, transformation and distribution of bulk products.
Base Raw Materials from Baobab

BFCS Senegal’s facilities harvest and process the pulp, seeds, leaves and funicles.
BFCS Italy, an affiliate of BFCS Senegal, provides warehousing, distribution, marketing & sales in the U.S., Europe, and in 18 other countries.
About Q.A. and Q.C.
Quality Assurance

Quality Assurance is applied throughout the process to ensure the highest quality as possible.
An example of different Baobab Fruit Pulp qualities 5 minutes after mixing
Quality Control

QUALITY ASSURANCE AND QUALITY CONTROL GUARANTEE

FULL TRACEABILITY
FULL TRACEABILITY

BFCS Senegal has full production process and control in West Africa, from harvesting to finished bulk products.

To the best of our knowledge no other company currently does the same.
Research & Development
R&D

Research and development is carried out by both BFCS Senegal and BFCS Italy. R&D is focused on all of the Baobab’s tree components, i.e. the powder, funicles, seeds, bark, roots, leaves and the fruit’s shell. Investment in R&D is a high share of the yearly turnover.
R&D aims to evaluate all parts of the Super Tree to find out all the contents of the components by measuring their quantity and concentration to determine their nutritional value, health and medical properties.
R&D – Antioxidant Activity

Antioxidant capacity compared to other fruits (data by FDA / Neotron – 2010)

To achieve optimum health, USDA recommends an intake of 5,000 ORAC units per day. Daily food consumption for an average person attains only about 20% to 30% of this recommendation.

10 grams a day of Baobab Fruit Pulp = 50% of daily Antioxidant Intake
Baobab Red Funicle

...where anti-oxidants concentrate...

The structure of the Red Funicle is very much like a vascular system.

As such it carries all substances directly to the seeds and subsequently to promote the development of the powder.

It is intuitive how the Red Funicle retains major quantities of substances, in particular polyphenols, anti-oxidants, as shown in the previous slide.
Partnership and R&D

The partnership with Physion, a company leader in the drug delivery medical business, is in place for more than 8 years. Both companies benefit from the development of innovative medical treatments. Extracts are developed, researched and tested to prove innocuity and safety for the patient and are submitted to MOHs or regulatory bodies for approval.
ongoing clinical studies carried out in Italy show proof of efficacy. Novel treatments in **gynaecology, oncology, dermatology, mouth diseases, urology** and others are now ready for marketing in Europe, in partnership with the Pharmaceutical industry. Clinical studies on Baobab extract have also demonstrated the non toxic nature of the product. This is an important factor to consider in the day to day use of Baobab in nutrition and cosmetics.
The Baobab Super Tree

(Adansonia Digitata L.)
Family: Bombacaceae
Genus: Adansonia L.
Species: Adansonia digitata Lin.

Symbol of Africa, also known as «Magic Tree» or «Chemist Tree», because of the plurisecular use in local nutritional uses and medical applications
The Super Tree & The Super Fruit
Geography and History

The Baobab Super Tree is one of the oldest trees on the planet dating back thousands of years. Each component of the tree has been used for years in Africa especially for nutritional and medical purposes.
The Water Technology of the Baobab Super Tree

The incredible water technology and management

Retention, storage and distribution along seasons.

The lymphatic process that takes place and completes its cycle.

The final transformation into vitamins, anti-oxydants, essential aminoacids, fibers and other nutritional factors takes place to over satisfy food and cosmetic requirements and expectations.

THE LAST PROCESS OF TRANSFORMATION TAKES PLACE THROUGH THE RED FUNICLE VASCULAR SYSTEM.
Where water is retained and stored

"Bottle Tree"
The Baobab Tree: A SUPERTREE?
YES!

The Supefruit definition was coined by marketing.
We suggest it is time to give specific value to this definition by values and standards to be specifically defined.

A comparison table of different superfruits by their contents and nutritional values:

<table>
<thead>
<tr>
<th>Mmol Trolox x 1 g</th>
<th>Source: FDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>18</td>
<td>27</td>
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<td>245</td>
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<td>105</td>
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<td>148</td>
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<td>236</td>
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<td>240</td>
<td>750</td>
</tr>
<tr>
<td>245</td>
<td>1.583</td>
</tr>
</tbody>
</table>

Source: FDA
National Geographic’s citation on August 2010 edition: Baobab is a Vitamin Tree!

*Women in Malawi gather for export baobab fruits that once might have rotted on the ground.*

**BAOBAB PRODUCTS**
The succulent white interior of the fruit can be used as an ingredient in many foods.

- **Jams**: Rich in pectin, it also works as a thickener for gravy or smoothies.
- **Fruit drinks**: Just mix in water and a sweetener.
- **Hot sauces**: It adds tangy flavor to fiery baobab.

**Vitamin Tree**
Within the velvety shell of its coconut-size fruits, Africa’s iconic baobab packs a huge amount of nutrition. Its fruit contains six times as much vitamin C as oranges, twice as much calcium as milk, and plenty of B vitamins, magnesium, iron, phosphorus, and antioxidants. Until very recently those nutrients were enjoyed only by locals who ate the fruit fresh or crushed the emulsy pulp to stir into porridge and drinks. Few beyond the continent have been able to taste the baobab’s distinctive tart flavor, described by Lucy Wenslow, of Phyto Trade Africa, as “somewhere between grapefruit, pear, and vanilla.” Now baobab is headed to stores in Europe and the United States as an ingredient in jams and juice drinks and, eventually, canned teas and smoothies.

The European Union has approved the sale of baobab food products. Already, women in Malawi are harvesting the fruit for commercial use and earning enough cash to pay children’s school fees. Will baobab ever be as trendy as the acai berry? Experts estimate the potential size of the international market at a billion dollars a year. “Baobab is moving from separate industry into the mainstream,” says Malcolm Riley, of the Yaoua jam company in England. He now counts a large chain of British food stores among his customers. “It’s got mass potential.” –Karen E. Lange
## Nutritional Values of Baobab Fruit Pulp

<table>
<thead>
<tr>
<th>Component</th>
<th>Value/100g</th>
<th>% RDA</th>
<th>RDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energetic Value [Kcal/KJ]</td>
<td>131 / 555</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein [g]</td>
<td>5,3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbohydrates [g]</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fat [g]</td>
<td>0,15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietary Fiber [g]</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ca [mg]</td>
<td>280</td>
<td>33</td>
<td>800</td>
</tr>
<tr>
<td>P [mg]</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fe [mg]</td>
<td>7</td>
<td>50</td>
<td>14</td>
</tr>
<tr>
<td>K [mg]</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Na [mg]</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin A [mcg]</td>
<td>200</td>
<td>25</td>
<td>800</td>
</tr>
<tr>
<td>Thiamine (B1) [mg]</td>
<td>0,48</td>
<td>40</td>
<td>1,2</td>
</tr>
<tr>
<td>Riboflavin (B2) [mg]</td>
<td>0,28</td>
<td>17</td>
<td>1,6</td>
</tr>
<tr>
<td>Vitamin B6 [mg]</td>
<td>2,13</td>
<td>106</td>
<td>2</td>
</tr>
<tr>
<td>Niacine (PP) [mg]</td>
<td>3</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Vitamin C [mg]</td>
<td>300</td>
<td>500</td>
<td>60</td>
</tr>
</tbody>
</table>

- **Fat**: very few
- **Fibers**: 30 times more than lettuce
- **Calcium**: about twice as milk
- **Vitamin C**: 6 times more than orange
Inside the coconut-sized shell, the fruit powder dehydrates naturally. No need for processing like heat extraction or freeze drying is required. BFCS uses a simple, exclusively mechanical process to obtain the fruit pulp.

Water content in ripe fruit (dry powder): 8-10% - pH (sol.10%) :3,2
BAOBAB PRODUCTS
Organic Baobab Dried Fruit Pulp
Organic Baobab Fruit / Soluble Fiber Extract
Organic Baobab Seed Endocarp Micronised

100% Organic / N.O.P.
Novel Food Certified
G.R.A.S. status approved
Health Benefits Provided By The Baobab Fruit Pulp

- Antioxidant
- Source of soluble fibers and their prebiotic activity
- Easy availability of micronutrients
- Traditional uses cited in the African and Indian Pharmacopoeia show anti-inflammatory, analgesic, antipyretic, anti-dysentery and anti-constipation properties
The Baobab Fruit Pulp contains multiple antioxidant compounds:

- High concentration of Vitamin C (300 mg/100g)
- Bioflavonoids
- Phenols and Poliphenols
- Provitamin A

These compounds work synergistically.
Antioxidant capacity compared to other fruits:

Mmol Trolox x 1 g

- Baobab Fruit Pulp: 1.583
- Baobab Red Funicle: 750
- Baobab Red Funicle SD Extract: 245
The Baobab Fruit Pulp contains about 44% of fibers:

- 22% insoluble fibers
- 22% soluble fibers

The soluble fibers trigger the prebiotic activity of the Pulp

Source: University «Sacro Cuore» in Piacenza
In vitro activity: the promotion of symbiotic bacterial growth

Bifidobacterium bifidum A3

Abs

0
0,2
0,4
0,6
0,8
1

h 0 h 5 h 10 h 25

time

TPY: Basal
B: Baobab 2%
GLU: Glucose 2%

Source: University «Sacro Cuore» in Piacenza
In vitro activity: the promotion of symbiotic bacterial

**Bifidobacterium infantis**

Source: University «Sacro Cuore» in Piacenza

TPY: Basal
B: Baobab 2%
GLU: Glucose 2%
Health benefits of the Pulp: Prebiotic Fibers

*In vitro* measurement shows no effect on the promotion of clostridia growth

Source: University «Sacro Cuore» in Piacenza
In vitro activity on the promotion of lactobacilli growth

Source: University «Sacro Cuore» in Piacenza
Baobab Fruit Pulp is used in Africa traditionally as anti-inflammatory, analgesic and antipyretic

*In vivo* studies on rats and mice showed that:

500 mg/kg of Baobab Fruit Pulp corresponds to 15 mg/kg of phenylbutazone and to 50 mg/kg of acetylsalicylic acid

The effect is due to the contents of sterols, saponins and triterpenes

Baobab Fruit Pulp may be used as a side help for chronic inflammatory diseases in Africa

Baobab Fruit Pulp is used to treat diarrhea in African children

A clinical study on 160 children age 8 months showed efficacy treating diarrhea

Other studies confirmed this mechanism of action

* Olive Kenne Fopa, Contribution à l'étude de l'activité antidiarrheique de la pulpe de fruit de Adansonia digitata L (Bombacaceae), dissertazione università di Dakar 8.07.1994
Health benefits of the Pulp:

Effects on intestinal tract are due to:

- tannins (astringent), mucilages (absorbent), cellulose against dysentry
- the prebiotic effect of soluble fibers
- the softening effect of the insoluble fibers

In a study carried out by Tal-Dia et al. in 1997, the efficacy of a traditional local solution made up of Baobab Fruit Pulp with water and sugar was compared to the World Health Organisation (WHO) standard solution used to treat children with acute diarrhoea.
Baobab Fruit Pulp is a natural source of nutrients and micronutrients

- **Vitamin C**, B1, B2, B6, PP (Nyacine)
- **Bio-available calcium** (owed to the presence of Vitamin C)
- **Iron**, magnesium, potassium, zinc and phosphorus
- **Essential aminoacids**, glucose and fructose
- **Low sugar in contents**, by comparison


* Obizoba IC, Anyika JU. Nutrition value of baobab milk (gubdi) and mixtures of baobab (Adansonia digitata L.) and hungry rice, acha (Digitaria exilis) flours. *Plants Foods Hum Nutr*, 46(2):157-165, 1994

Health benefits of the Pulp:

Suggested use as an excipient...

Baobab Fruit Pulp has good lubricating, binding and diluting activity

In some studies it was used as hydrophilic excipient for the joint preparation of paracetamol and theophylline tablets

Baobab Fruit Pulp could be used as an excipient in natural products


Baobab Seeds and Seed Endocarp

- An innovative low temperature extraction process obtains the exclusive Seed Endocarp, rich in sterols, fatty acids and proteins.
- The residues of the seed pressing are an excellent food, rich in proteins, calcium and vitamins for cattle feeding.
- Seeds are used to extract a golden-yellow oil that has a slight nutty aroma. It is rich in palmitic acid, oleic acid and linoleic acid. Interesting quantities of stearic and cyclopropenoid acids are present. For use in the cosmetic market.
Ingredients for Cosmetics Formulations

Natural Powders

- Baobab Pulp
- Baobab Leaves Micronised
- Baobab Funicles Micronised
- Baobab Seed Epicarp Exfoliant
Baobab Pulp

- **Properties**: rich in Amino Acids and essential Fatty Acids; Minerals – calcium, iron, potassium; Vitamins – C, A, B1, B2, B6, PP; Fibers

- **Benefits**: nourishing, anti-oxidant

- **Cosmetic applications**: facial and body masks, creams.
Baobab Leaves Micronised

- **Properties:** rich in Vitamin C, uronic acids, tannins, potassium, tartrate and catechins.

- **Benefits:** astringent, anti-inflammatory

- **Cosmetic applications:** lotions and tonics, creams.
Baobab Funicles Micronised

• **Properties:** rich in Polyphenols – anthocyanins, gallic, tartaric acids, phenols and flavonoids.

• **Benefits:** high antioxidant capacity

• **Cosmetic applications:** creams, lotions, body butters, skin care formulations
Baobab Seed Epicarp

- **Properties:** rich in Polyphenols – anthocyanins, gallic, tartaric acids, phenols and flavonoids.

- **Benefits:** exfoliating capacity

- **Cosmetic applications:** scrubs
Ingredients for Cosmetics Formulations

Oils and Liquid Extracts

Baobab Oil Cold Pressed
Baobab Oxy Oil
Hydroglyceric Extract Baobab Leaves
Glycolic Extract Baobab Leaves
Glycolic Extract Baobab Fruit Pulp
Organic Baobab Oil
Cold Pressed

- **Properties:** rich in Fatty Acids – Omega 6-9 – Vitamins A, E, F - and Sterols.

- **Benefits:** impressive moisturizing benefits for skin care, hair conditioner and nails strengthening. It absorbs quickly, improves elasticity and encourages regeneration of skin cells without clogging the pores. An important advantage over other oils is its stability during storage.

- **Cosmetic applications:** skin care products, exotic bath oils, hair care products, sun care products, foot balms. Excellent ingredient in formulations against eczema and psoriasis.
Fluid Glycolic Extract of Baobab Fruit Pulp

- **Properties:** rich in Alpha and Beta carotenes, calcium, mucilage, rubbers, uronic and glutamic acids, tannins and Vitamin C.

- **Benefits:** nourishing, refreshing

- **Cosmetic applications:** shampoos, lotions, creams, body emulsions, tonics.
Fluid Glycolic Extract of Baobab Leaves

- **Properties:** rich in Alpha and Beta carotenes, calcium, mucilage, rubbers, uronic and glutamic acids, tannins and Vitamin C.

- **Benefits:** nourishing, refreshing

- **Cosmetic applications:** shampoos, lotions, creams, body emulsions, tonics.
Fluid Hydroglyceric Extract of Baobab Leaves

- **Properties:** rich in Alpha and Beta carotenes, calcium, mucilage, rubbers, uronic and glutamic acids, tannins and Vitamin C.

- **Benefits:** nourishing, refreshing

- **Cosmetic applications:** shampoos, lotions, creams, body emulsions, tonics.
Baobab Leaves

- In Africa, fresh and dried Baobab Leaves are used in cooking like spinach and can also be used as forage.
- **Fresh Leaves**: rich in Vitamin C, uronic acids, rhamnose and other sugars, tannins, potassium, tartrate and catechins.
- **Traditional therapeutic properties**: diaphoretic, expectorant, astringent, antipyretic, antiasthmatic.
- **Traditional Applications**: kidney and bladder diseases, asthma, general fatigue, diarrhea, inflammations, insect bites, Guinea worm.
Baobab Fruit Pulp applications

- Food supplements
- Food ingredients
- Functional food ingredients
- Animal feed
- Cosmetics ingredients
Finished Products:

- Natural antioxidant products
- Prebiotic in association with probiotics
- Fiber source in weight-loss products
- Products for fitness
- Functional foods and beverages
- As an adjuvant for anti-inflammatory products
- Natural food supplements
- Natural excipient for different formulations
- Sun protection and anti-aging products
Marketing claims

- Totally natural
- Healthy
- G.R.A.S. and Novel Food approved
- NOP/Organic certified
- Exotic
- Supported by literature and hundreds-years-old traditional use
- The harvesting does not destroy the tree and its ecosystem
- Ethically harvested in support of local villages in Senegal
REGULATORY CERTIFICATES AND APPROVALS

- FDA G.R.A.S. Status: Approved

![Organic Certification](image1)
![USDA Organic](image2)
![Biosuisse](image3)
![Novel Food](image4)

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Bibliography

Vertuani S, Manfredini S, Braccioli G. Probiotici e prebiotici. Impieghi attuali e prospettive future Integratore Nutrizionale, 4, 26-32, 2001


Obizoba IC, Anyika JU. Nutritive value of baobab milk (gubdi) and mixtures of baobab (Adansonia digitata L.) and hungry rice, acha (Digitaria exilis) flours. Plants Foods Hum Nutr, 46(2):157-165, 1994


Bibliography


Odetokun SM. The nutritive value of Baobab fruit (Adansonia digitata). Riv Ital Sost Grasse, 73, 371-373, 1996


Bibliography


El-Kamali HH, El-Khalifa KF. Folk medicinal plants of riverside forests of the Southern Blue Nile district, Sudan. Fitoterapia, 70, 493-497, 1999


Sauberlich HE. Pharmacology on Vitamin C. Ann Rev Nutr, 14:371-391, 1994
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