

## ***Nutrients in Moringa***

Extensive analyses have identified over 90 verifiable nutrients in moringa.<sup>1,2,3</sup> That is a whole lot of nutrients working together in a synergistic manner to support your well-being. Here is a list of some of the most notable nutrients as well as historical averages of nutrients per 100 grams of plant material according to published research (see table below):

- **Amino Acids.**

*Alanine, Arginine, Aspartic Acid, Cysteine, Glutamine Glutamic-Acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Proline, Serine, Threonine, Tryptophan, Tyrosine, and Valine*

- **Anti-inflammatory Phytochemicals.**

*Arginine, Beta-Sitosterol, Caffeoylquinic Acid, Calcium, Chlorophyll, Copper, Cystine, Omega Fatty Acids, Fiber, Histidine, Indole Acetic Acid, Indoleacetonitrile, Isoleucine, Kaempferol, Leucine, Magnesium, Oleic Acid, Phenylalanine, Potassium, Quercetin, Rutin, Selenium, Stigmasterol, Sulfur, Superoxide Dismutase, Tryptophan, Tyrosine, Vitamin A, Vitamin B1 (Thiamin), Vitamin C, Vitamin E (Alpha-Tocopherol, Delta-Tocopherol, Gamma-Tocopherol), Zeatin, and Zinc*

- **Antioxidants.**

*Alanine, Alpha-Carotene, Arginine, Beta-Carotene, Beta-Sitosterol, Caffeoylquinic Acid, Campesterol, Carotenoids, Chlorophyll, Chromium, Delta-5-Avenasterol, Delta-7-Avenasterol, Histidine, Indole Acetic Acid, Indoleacetonitrile, Kaempferol, Leucine, Lutein, Methionine, Myristic-Acid, Palmitic-Acid, Prolamine, Proline, Quercetin, Rutin, Selenium, Superoxide Dismutase, Threonine, Tryptophan, Vitamin A, Vitamin B, Choline, Vitamin B1 (Thiamin), Vitamin B2 (Riboflavin), Vitamin B3 (Niacin), Vitamin B6 (Pyridoxine), Vitamin C, Vitamin E (Alpha-Tocopherol, Delta-Tocopherol, Gamma-Tocopherol), Xanthophyll, Neoxanthin, Violaxanthin, Zeatin, Zeaxanthin, Zinc, Carotenoids (Alpha-Carotene, Beta-Carotene)*

- **Vital Nutrients (Carbs, protein, fat, vitamins, minerals).**

*Alpha -Carotene, Arachidic Acid, Behenic Acid, Beta-Carotene, Biotin, Calcium, Carotenoids, Choline, Chromium, Cobalt, Copper, Cystine, Essential Fatty Acids, Poly- and Monounsaturated Fatty Acids, Fiber, Flavonoids, Florine, Folate, Glutamine, Glutamic-Acid, Iodine, Iron, Isoleucine, Leucine, Lignoceric Acid, Lithium, Lutein, Lysine, Magnesium, Manganese, Methionine, Molybdenum, Myristic Acid, Palmitic Acid, Palmitoleic Acid, Phenylalanine, Phosphorus, Potassium, Protein, Selenium, Silicon, Stearic Acid, Sulfur, Threonine, Tryptophan, Valine, Vitamin A, Choline, Vitamin B1 (Thiamin), Vitamin B2 (Riboflavin), Vitamin B3 (Niacin), Vitamin B6 (Pyridoxine), Vitamin C, Vitamin E, Zeaxanthin, Zinc, and Zirconium*

- **Flavonols.**

*Kaempferol, Quercetin, Selenium*

- **Glycosides.**

*4-(alpha-L-Rhamnosyloxy)benzyl Isothiocyanate, 4-(4'-O-acetyl-alpha-L-rhamnosyloxy)-benzyl Isothiocyanate, Niazinin A & B, Niaziminins A & B, Niazimicin, and Rutin*

- **Plant Sterols and Stanols.**

*28-Isoavenasterol, Beta-Sitosterol, Brassicasterol, Campestanol, Campesterol, Clerosterol, Delta-5-Avenasterol, Delta-7,14-Stigmastanol, Delta-7-Avenasterol, Ergostadienol, Stigmastanol, and Stigmasterol*

## Superfoods Comparison

	Moringa <sup>4</sup> (Fresh leaves)	Moringa <sup>5</sup> (Dried leaves)	Moringa <sup>6,7</sup> (Raw Seeds)	Moringa <sup>8</sup> (Raw Seed Powder)	Fruit <sup>9</sup> (Dried Fruit)	Goji <sup>10,11</sup> (Fruit)	Noni <sup>12,13</sup> (Juice)
<b>Protein</b>	6.7 g	6.8 g	35.97 mg	18.86 mg	<b>54.30 g</b>	<b>11 g</b>	0.2-0.5 g
<b>Fat</b>	1.7 g	0.5 g	38.67 mg	13.35 mg	<b>10.2 g</b>	1 g	0.1-0.2 g
<b>Carbohydrates</b>	12.5 g	41.2 mg	8.67 g	53.36 mg	20.92 g	<b>21 g</b>	9.0-11.0 g
<b>Fiber</b>	0.9 g	19.2 g	--	5.03 mg	<b>28.03 g</b>	8 g	0.5-1.0 g
<b>Vitamins</b>							
<b>Carotene (Vitamin A)</b>	6.78 mg	<b>18.9 mg</b>	--	--	--	2.7 mg	< 1.5 mg
<b>Thiamin (B1)</b>	0.06 mg	<b>2.64 mg</b>	0.05 mg	--	--	0.1 mg	0.003-0.01
<b>Riboflavin (B2)</b>	0.05 mg	<b>20.5 mg</b>	0.06 mg	--	--	1.3 mg	0.003-0.01
<b>Niacin (B3)</b>	0.8 mg	<b>8.2 mg</b>	0.20 mg	--	--	--	0.1-0.5 mg
<b>Vitamin C</b>	<b>220 mg</b>	19.3 mg	4.5 mg	--	--	19.2 mg	3.0-33.7 mg
<b>Minerals</b>							
<b>Calcium</b>	440 mg	<b>1530 mg</b>	751.67 mg	128.33 mg	375.95 mg	100 mg	18-22 mg
<b>Copper</b>	0.07 mg	0.6 mg	<b>54.2 mg</b>	0.63 mg	--	2.0 mg	--
<b>Iron</b>	0.90 mg	<b>126.2 mg</b>	5.2-12.77 mg	7.33 mg	19.44 mg	9.0 mg	0.1-0.3 mg
<b>Magnesium</b>	42 mg	255 mg	<b>45.0-261 mg</b>	26.33 mg	14.85 mg	--	3.0-12.0 mg
<b>Manganese</b>	--	36.5 mg	<b>95.4 mg</b>	--	--	--	--
<b>Phosphorus</b>	70 mg	158 mg	<b>525-635 mg</b>	103.33 mg	--	--	2.0-7.0 mg
<b>Potassium</b>	260 mg	170 mg	48.2-75.0 mg	52.33 mg	<b>902.67</b>	840 mg	30.0-150.0 mg
<b>Selenium</b>	16.5 mg	11.8 mg	--	--	--	<b>63.7 mg</b>	--
<b>Sodium</b>	--	--	25.01 mg	<b>295.1 mg</b>	19.54 mg	24.0 mg	15.0-40.0 mg
<b>Zinc</b>	0.16 mg	3.3 mg	0.05-1.54 mg	--	<b>15.89 mg</b>	2.7 mg	--
<b>Essential Amino Acids</b>							
<b>Histidine</b>	149.8 mg	<b>615 mg</b>	--	1.93 mg	--	1.97-2.84 mg	4.0-6.0 mg
<b>Isoleucine</b>	299.6 mg	<b>1,500 mg</b>	--	4.23 mg	--	2.21-2.99 mg	7.0-11.0 mg
<b>Leucine</b>	492.2 mg	<b>1,995 mg</b>	--	3.83 mg	--	4.22-5.32 mg	10.0-22.0 mg
<b>Lysine</b>	342.4 mg	<b>1,300 mg</b>	--	0.31 mg	--	5.55-6.68 mg	7.0-11.0 mg
<b>Methionine + Cysteine</b>	117.7 mg	<b>470.23 mg</b>	--	1.99 mg	--	2.1-2.45 mg	8.0-15.0 mg
<b>Phenylalanine + Tyrosine</b>	310.3 mg	<b>1,390 mg</b>	--	5.8 mg	--	5.8-6.94 mg	11.0-22.0 mg
<b>Threonine</b>	117.7 mg	<b>1,255 mg</b>	--	3.02 mg	--	2.0-2.33 mg	8.0-11.0 mg
<b>Tryptophan</b>	<b>107.0 mg</b>	--	--	--	--	--	1.0-3.0 mg
<b>Valine</b>	<b>374.5 mg</b>	--	--	1.08 mg	--	4.29-6.41 mg	10.0-22.0 mg

-- Not listed in study or not detectable.  
Zija's SuperMix and SmartMix combines the moringa leaf powder, seed cake, and fruit powder. Nutrients are per 100 grams of superfood. Nutrients in bold indicated that botanical has the highest value for that nutrient among botanicals tested.

<sup>1</sup> Anwar F, Latif S, Ashraf M, et al. Moringa oleifera: a food plant with multiple medicinal uses. *Phytother Res*. 2007 Jan;21(1):17-25.

<sup>2</sup> Coppin J, Simon J, Lavoie E, et al. A study of the nutritional and medicinal values of Moringa oleifera leaves from sub-Saharan Africa: Ghana, Rwanda, Senegal and Zambia. Masters Thesis. Available at: <https://rucore.libraries.rutgers.edu/rutgers-lib/24288/#citation-export>.

<sup>3</sup> Freiburger CE, Vanderjagt DJ, Pastuszyn A, et al. Nutrient content of the edible leaves of seven wild plants from Niger. *Plant Foods Hum Nutr*. 1998;53(1):57-69.

<sup>4</sup> Thuber MD, Fahey JW. Adoption of Moringa oleifera to combat under-nutrition viewed through the lens of the "Diffusion of Innovations" theory. *Ecol Food Nutr*. 2009 May;48(3):212-25.

<sup>5</sup> Mensah JK, Ikhajagbe B, Edema NE, et al. Phytochemical, nutritional and antibacterial properties of dried leaf powder of Moringa oleifera (Lam) from Edo Central Province, Nigeria. *J Nat Prod Res*. 2012;2(1):107-12.

<sup>6</sup> Olagbemide PT, Alikwe PCN. Proximate analysis and chemical composition of raw and defatted Moringa oleifera kernel. *Adv Life Sci Tech*. 2014;24:92-99.

<sup>7</sup> Compaore WR, Nikiema PA, Bassole HIN, et al. Chemical composition and antioxidative properties of seeds of Moringa oleifera and pulps of Parkia biglobosa and Adansonia digitata commonly used in food fortification in Burkina Faso. *Curr Res J Biol Sci*. 2011 Jan;3(1):64-72.

<sup>8</sup> Ijarotimi OS, Adeoti OA, Ariyo O. Comparative study on nutrient composition, phytochemical, and functional characteristics of raw, germinated, and fermented Moringa oleifera seed flour. *Food Sci Nutr*. 2013 Nov;1(6):452-63.

<sup>9</sup> Verma KS, Nigam R. Nutritional Assessment of Different parts of Moringa oleifera Lamm collected from Central India. *J Nat Prod Plant Resour*. 2014;4(1):81-6.

<sup>10</sup> Self Nutrition Data. Goji Berries (Tibetan). Available at: <http://nutritiondata.self.com/facts/custom/280160/1>.

<sup>11</sup> Guo M, Shi T, Duan Y, et al. Investigation of amino acids in wolfberry fruit (Lycium barbarum) by solid-phase extraction and liquid chromatography with precolumn derivatization. *J Food Comp Analysis*. 2015;42:84-90.

<sup>12</sup> University of Hawaii. Nutritional analysis of Hawaiian Noni (Pure noni fruit juice). Available at: [http://www.ctahr.hawaii.edu/noni/nutritional\\_analysis\\_juice.asp](http://www.ctahr.hawaii.edu/noni/nutritional_analysis_juice.asp).

<sup>13</sup> PhilNoni. Composition profile of Noni (Morinda citrifolia). Available at: [http://www.pmei.comoj.com/philnoni\\_compProfile.html](http://www.pmei.comoj.com/philnoni_compProfile.html).