

Breadfruit (*Artocarpus altilis*)

[Description](#) [Nutritional aspects](#) [Nutritional tables](#) [References](#)

Click on the "Nutritional aspects" tab for recommendations for ruminants, pigs, poultry, rabbits, horses, fish and crustaceans



Common names

Breadfruit, breadnut [English]; arbre à pain [French]; árbol del pan, fruta de pan [Spanish]; fruta pão [Portuguese]; kuru [Cook Islands]; broodboom [Dutch]; mei [Federated States of Micronesia, Kiribati, Marshalls, Marquesas, Tonga, Tuvalu]; uto, kulu, buco [Fiji]; Brotfruchtbaum [German]; Αρτόκαρπος [Greek]; 'ulu [Hawai'i, Samoa, Rotuma, Tuvalu]; sukun [Indonesian]; albero del pane [Italian]; mos [Kosrae]; kulur, kuro [Malaysia]; meduu [Palau]; kapiak [Papua New Guinea]; rimas [Philippines]; 'uru [Society Islands]; bia, bulo, nimbalu [Solomon Islands]; Ekmek ağacı [Turkish]; xa kê [Vietnamese]; beta [Vanuatu]; فاكهة الخبز [Arabic]; 麵包樹 [Chinese]; עץ הלחם [Hebrew]; パンノキ [Japanese]; 빵나무 [Korean]; [Malayalam]; Хлебное дерево [Russian]; [Tamil]; สาคู [Thai]

Species

[Artocarpus altilis \(Parkinson\) Fosberg \[Moraceae\]](#)

Synonyms

Artocarpus communis J. R. Forst. & G. Forst., *Artocarpus incisus* L. f., *Radermachia incisa* Thunb., *Sitodium altile* Parkinson

Taxonomic information

Artocarpus altilis generally refers to the seedless trees typical of Polynesia but it may also refer to *Artocarpus camansi* Blanco, a seeded species naturally found in New Guinea and the Moluccas, sometimes called breadnut ([Ragone, 1997](#)). Breadnut and breadfruit are considered different species by GRIN ([USDA, 2015](#)) and breadnut is considered a progenitor of breadfruit ([Ragone, 2011](#)).

Feed categories

- Fruits and by-products
- Other forage plants
- Plant products and by-products

Related feed(s)

- Jackfruit (*Artocarpus heterophyllus*)

Description

Breadfruit tree (*Artocarpus altilis* (Parkinson) Fosberg) is an evergreen multipurpose and traditional agroforestry species. Its starchy fruits are a staple food in the Pacific Islands. The name breadfruit is due to the flavour of the fruit after being cooked which reminds of freshly cooked bread ([Ragone, 2011](#)).

Morphological description

Breadfruit is an evergreen tree that reaches 15-20 m in height. The trunk ranges between 60 and 120 cm in diameter and produces branches over 4 m high. The bark is smooth. The crown is conical in shape in the first years of growth and becomes more rounded with maturity. The leaves are alternate, dark green and smooth on their upper side, lighter green and with reddish hairy veins on the lower one. They are very variable in shape, ranging from obovate to ovate entire lobes to very pinnately dissected lobes. They are about 45 cm long but can range from 15 to 90 cm depending on variety. *Artocarpus altilis* is monoecious and bear male and female flowers on the same tree. Male flowers are borne on club-shaped spikes that can be as long as 45 cm. Female inflorescences are globose clusters of about 1500-2000 reduced flowers. Once pollinated, the flowers develop into a spherical to cylindrical, honeycombed smooth to rough-skinned fruit of 10 to 30 cm in diameter and 0.25 to 6 kg in weight. It has a yellow to green rind and a starchy creamy white to yellow pulp (starch content ~20%). Fruits may contain seeds or not, depending on the variety ([Ragone, 2011](#); [Ragone, 1997](#)).

Utilization

Artocarpus altilis is a multipurpose tree mainly grown for its fruits. The fruit is nutritious and a valuable staple food in most Pacific Islands. The mature fruits are eaten raw or cooked, steamed, fried, made into flour and baked, roasted or freeze-dried, or traditionally fermented. Breadfruit can be eaten at all stages of growth ([Sikarwar et al., 2014](#); [Ragone, 1997](#)). It is canned and sold in the Caribbean and in the USA, Europe and Canada ([Ragone, 2011](#)). Young immature fruits can be boiled and are comparable in flavour to artichoke hearts. Breadfruit seeds of breadfruits are edible. Sometimes referred to as breadnuts, they are eaten boiled or roasted ([Duke et al., 1993](#)). Breadfruit trees provide valuable fuelwood and timber that has low density, flexibility and is resistant to termites ([Ragone, 2011](#)). The fibrous parts are used to make traditional clothes, ropes and fishnets. The latex is used as a chewing gum and adhesive and for the caulking of canoes. The burning of dried male flowers repels mosquitoes and other flying insects. The breadfruit tree is an ornamental tree in Hawaii. It also provides shade, mulch and can be interplanted with other tropical crops ([Ragone, 2011](#)). Breadfruit has many ethnomedicinal uses ([Duke et al., 1993](#)).

Automatic translation

Sélectionner une langue

Feed categories

All feeds

Forage plants

- ▶ Cereal and grass forages
- ▶ Legume forages
- ▶ Forage trees
- ▶ Aquatic plants
- ▶ Other forage plants

Plant products/by-products

- ▶ Cereal grains and by-products
- ▶ Legume seeds and by-products
- ▶ Oil plants and by-products
- ▶ Fruits and by-products
- ▶ Roots, tubers and by-products
- ▶ Sugar processing by-products
- ▶ Plant oils and fats
- ▶ Other plant by-products

Feeds of animal origin

- ▶ Animal by-products
- ▶ Dairy products/by-products
- ▶ Animal fats and oils
- ▶ Insects

Other feeds

- ▶ Minerals
- ▶ Other products

Latin names

Plant and animal families

Plant and animal species

Resources

Broadening horizons

Literature search

Image search

Glossary

External resources

- ▶ Literature databases
- ▶ Feeds and plants databases
- ▶ Organisations & networks
- ▶ Books
- ▶ Journals

The parts of the fruits that are discarded can be used to feed animals as a source of energy (due to the presence of carbohydrates) and protein ([Ragone, 2011](#)). Leaves are valuable fodder for cattle ([Duke et al., 1993](#)).

Distribution

Breadnut (*Artocarpus camansi*), the seeded ancestral form of *Artocarpus altilis*, originated from New Guinea, Indonesia and the Philippines. *Artocarpus altilis* was domesticated 3000 years ago in the western Pacific. It is now widespread and cultivated in most Pacific Islands (except in New Zealand and Easter Island). It was introduced into the Caribbean during late 1700s by French and English slaveowners who were seeking cheap food for slaves. Breadfruit is also cultivated in Central and South America, Africa, Madagascar, the Maldives, the Seychelles, India, Sri Lanka, Indonesia, South-East Asia, and Australia ([Ragone, 2011](#)).

Artocarpus altilis can grow between 17°N and 17° S and it can grow on higher latitudes under maritime climates. It grows better from sea level up to an altitude of 1550 m and where annual rainfall ranges from 1500 to 3000 mm with summer rains. *Artocarpus altilis* grows better in place where temperatures range from 15°C to 40°C with optimal growth between 21 and 32°C. It has no tolerance of frost but it can withstand some dry season. However, dry spells will compromise fruit harvest. *Artocarpus altilis* does well on light or medium, fertile and well-drained soils with pH ranging from neutral to alkaline. Breadfruit has some tolerance to salinity and can grow on coralline soils and atolls ([Ragone, 2011](#)).

Processes

Preservation

Fresh breadfruit matures in 1-3 days after harvest and is highly perishable. Shelf life can be extended by careful harvesting and pre-cooling fruit with chipped ice. Long term storage for shipment requires low temperatures (12-15°C) which is difficult to achieve under tropical conditions, where transportation to urban market centres may result in produce losses above 70% ([Ragone, 2011](#); [Oladunjoye et al., 2012](#)). Use of fresh breadfruit for animal feeding is possible only in the vicinity of producing areas, otherwise the product must be dehydrated.

Detoxification

Processing by cooking and soaking reduced the concentration of oxalate and tannins while trypsin inhibitors and haemagglutinin were completely eliminated by cooking. Phytic acid was reduced by soaking but not by cooking ([Oladunjoye et al., 2012](#)). In another study, cooking for 20 min reduced tannins, phytate and α -amylase inhibitor activity ([Oulai et al., 2014](#)).

Forage management

Artocarpus altilis is a fast growing tree. Once established, the tree is long-lived and remains productive for decades. Seedless varieties are vegetatively propagated from roots or cuttings and they start bearing fruits only 3-6 years after planting. During their early stages of development, the tree requires watering during the dry season. Older trees are tolerant on dry spells. There may be one or two harvests a year. Main harvest occurs during the hot wet season and second harvest 3-4 months later. Average fruit yield is 5.5 t/ha under traditional agroforestry system on Pohnpei (Micronesia) and ranges as high as 16 to 50 t/ha under orchard conditions ([Ragone, 2011](#)).

Artocarpus altilis can be intercropped with yam (*Dioscorea* spp.), taro (*Colocasia esculenta*), cassava, banana, citrus, noni (*Morinda citrifolia*), papaya (*Carica papaya*), coffee and cocoa or legume cover crop as it is tolerant of shade in its early stages of growth and then provides shade to its companion species ([Ragone, 2011](#)).

Environmental impact

Soil enhancement and nurse species

Artocarpus altilis has spreading surface roots that stabilize the soil on the steep hillsides in Micronesia. Its dense canopy provides shade and reduces temperature. The trunks can be used as trellises for vines and the regular dropping of their leaves provide mulch to the soil thus improving growing conditions of intercropped species ([Ragone, 2011](#)).

Wildlife

Breadfruit trees host and feed many birds and bats. The pollen and the latex are collected by honeybees ([Ragone, 2011](#)).

Datasheet citation

Heuzé V., Tran G., Hassoun P., Bastianelli D., Lebas F., 2016. Breadfruit (*Artocarpus altilis*). Feedipedia, a programme by INRA, CIRAD, AFZ and FAO. <http://www.feedipedia.org/node/523> Last updated on September 30, 2016, 22:08

Image credits

- Forest & Kim Starr
- Forest & Kim Starr
- Valérie Heuzé (AFZ)
- US Pacific Basin Agricultural Research Center

[+](#) Share / Save [f](#) [t](#) [i](#)



Breadfruit (*Artocarpus altilis*)

[Description](#) [Nutritional aspects](#) [Nutritional tables](#) [References](#)

Nutritional attributes

Fresh breadfruit is rich in water (65-72%). The flesh of the fruit is rich in starch (63-74% DM) and low in fibre (crude fibre < 8% DM) and protein (< 6% DM). It is palatable and a good source of energy for all classes of livestock ([Göhl, 1982](#)).

Potential constraints

Breadfruit contains several antinutritional factors: oxalate, tannins, phytic acids, trypsin inhibitors, α -amylase inhibitor, haemagglutinin and saponins. These substances result in lower performance in pigs and poultry fed large amounts of breadfruit, and it is recommended to process breadfruit by before using it as feed ([Oladunjoye et al., 2012](#); [Ortiz et al., 2011](#); [Oulai et al., 2014](#)). The reported value for antitrypsin activity (> 20 TIU/mg; [Oladunjoye et al., 2012](#)) is of the same order of magnitude as that of raw soybean seeds.

Ruminants

In humid tropical countries, breadfruit is a source of carbohydrates (starch) used as an energy supplement for small ruminants. Breadfruit must be supplemented with a protein source due to its low protein content.

Sheep

In Cuba, sheep managed on tropical pasture and supplemented or not with 12 or 20 g/kg body weight of a mixture of breadfruits and leaves of breadfruit tree had higher daily weight gain (113 g/d) with the highest level of breadfruit supplement than the lower level (97g/d) or no supplement (67g/d). Breadfruit supplementation did not modify carcass characteristics or meat quality. Adding breadfruit leaves increased the protein content of the supplement ([Leyva et al., 2007](#)).

Goats

In Samoa, whole breadfruit flour included at 43% into a complete diet fed to young growing goats resulted in daily weight gain of 69 g/d ([Aregheore, 2005](#)). Flour of peeled breadfruit included at 57% into the concentrate diet of growing goats led to better weight gain and digestible energy than cassava ([Aregheore, 2000b](#)). The flours of whole breadfruit, peels or pulp offered as a supplement to growing goats fed with forage had no adverse effect on animal performance. Breadfruit pulp flour gave the best results in terms of daily weight gain (175 g/d) compared with whole breadfruit (82 g/d) and breadfruit peels (114 g/d) although DM digestibility was higher with breadfruit peels. Breadfruit pulp gave the best feed conversion ratio (feed/gain) with 4.8 compared to 8.8 and 7.4 for whole breadfruit and breadfruit peels respectively ([Martin et al., 2003](#)). In Nigeria, increasing levels of breadfruit (5 to 49.5%) with Guinea grass hay does not change total DM intake but increases DM digestibility from 62 to 73% ([Bosman et al., 1996](#)).

Pigs

Over-ripe fruits of breadfruit are given to pigs in Micronesia (Merlin, 2016). Breadfruit meal could be used to replace maize grain in growing and fattenig pigs diets in Cuba ([Brea et al., 2013](#); [Ortiz et al., 2011](#)). In growing pigs, it was found that up to 15% (dietary DM) breadfruit meal could be fed to animals without compromising feed intake or animal performance (liveweight gain, feed intake, feed conversion ratio, quality of meat) ([Brea et al., 2013](#)). In fattening pigs, inclusion levels higher than 10% resulted in decreased animal performance, which was attributed to the presence of tannins and saponins. However 20% and 30% breadfruit meal in fattening pigs diet significantly reduced feed costs ([Ortiz et al., 2011](#)).

Poultry

Breadfruit meal

Several studies showed that breadfruit meal could be used at moderate levels (10%) in broiler diets without adverse effects on growth performance and feed efficiency ([Adekunle et al., 2006](#); [Ravindran et al., 1995](#)). At higher inclusion levels, some authors observed a degradation of growth performance with raw breadfruit meal ([Adekunle et al., 2006](#)) while other obtained good results at 20% breadfruit meal and above ([Valdivié et al., 2003](#); [Ravindran et al., 1995](#)). Cooking breadfruit improved performance at high inclusion levels ([Adekunle et al., 2006](#)). This beneficial effect could be due to the destruction of some antinutritional factors ([Oladunjoye et al., 2010](#)). It is concluded that breadfruit meal can be used in poultry diets at levels of 10%. Higher levels could be tested, with care on feed formulation and meal preparation.

Breadfruit seed meal

Breadfruit seed meal reduced growth performance and feed conversion of broiler starters when included at levels of 3.5% and the negative effect was very strong above 10% ([Nwokoro et al., 2006a](#)). Feed intake was less affected at moderate levels of breadfruit seed meal, but decreased at levels above 10%. Similarly in broiler finishers, growth performance decreased linearly with increasing levels of breadfruit seed meal, and feed efficiency decreased ([Nwokoro et al., 2006b](#)). It is therefore not advisable to use breadfruit seed meal in poultry feeds.

Rabbits

For rabbits, sun-dried *Artocarpus altilis* fruit is a potential source of energy. Though the protein content is low, protein digestibility is relatively high: 72 % (Leyva et al., 2012). As In Nigeria, breadfruit meal could be introduced up to 10-20% in substitution for maize grain in a complete diet without significant alteration of growth performance (Oladele Oso et al., 2010). When introduced at 25% of a balanced diet, the nutritive value of breadfruit meal fed to growing rabbits was higher when the

Automatic translation

 Sélectionner une langue

Feed categories

All feeds

Forage plants

- ▶ Cereal and grass forages
- ▶ Legume forages
- ▶ Forage trees
- ▶ Aquatic plants
- ▶ Other forage plants

Plant products/by-products

- ▶ Cereal grains and by-products
- ▶ Legume seeds and by-products
- ▶ Oil plants and by-products
- ▶ Fruits and by-products
- ▶ Roots, tubers and by-products
- ▶ Sugar processing by-products
- ▶ Plant oils and fats
- ▶ Other plant by-products

Feeds of animal origin

- ▶ Animal by-products
- ▶ Dairy products/by-products
- ▶ Animal fats and oils
- ▶ Insects

Other feeds

- ▶ Minerals
- ▶ Other products

Latin names

Plant and animal families

Plant and animal species

Resources

Broadening horizons

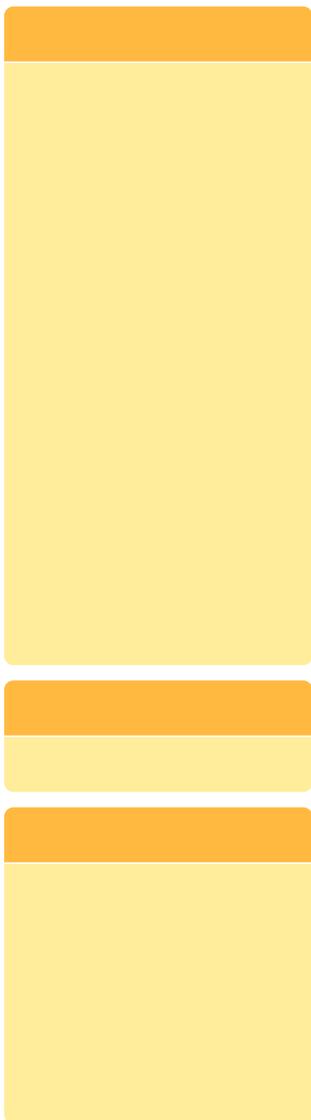
Literature search

Image search

Glossary

External resources

- ▶ Literature databases
- ▶ Feeds and plants databases
- ▶ Organisations & networks
- ▶ Books
- ▶ Journals



fruits were cooked (30 min at 100°C) before sun-drying and even higher when they were fermented 5 days in water ([Oladunjoye et al., 2012](#)). In Cuba, a 90-day study with growing rabbits showed that the average daily gain of rabbits was reduced by only 4% when they received only breadfruit meal + forage of perennial soybean (*Neonotonia wightii*) containing 19% crude protein in the DM. In a third group of rabbits, growth rate was reduced by only 11% when they received a pelleted diet composed of breadfruit meal (40%) + breadfruit tree leaves (58%) + minerals and vitamins (2%). In this study the relatively high content of breadfruit tree leaves (19% DM) compensated the low protein content of the fruit. The DM and crude protein digestibility of this "all breadfruit" diet are high: 82% and 72% respectively ([Leyva et al., 2012](#)).

The calcium and phosphorus content of breadfruit are generally low and cover respectively only 8-10% and 30% of the requirements of growing rabbits ([Lebas, 2013](#)).

Datasheet citation

[Heuzé V., Tran G., Hassoun P., Bastianelli D., Lebas F., 2016. Breadfruit \(*Artocarpus altilis*\). Feedipedia, a programme by INRA,](#)

Image credits

- Forest & Kim Starr
- Forest & Kim Starr
- Valérie Heuzé (AFZ)
- US Pacific Basin Agricultural Research Center

[+](#) Share / Save [f](#) [t](#) [↗](#)



Breadfruit (Artocarpus altilis)

[Description](#) [Nutritional aspects](#) [Nutritional tables](#) [References](#)

Tables of chemical composition and nutritional value

- Breadfruit tree (Artocarpus altilis), fruit, whole, dehydrated
- Breadfruit tree (Artocarpus altilis), fruit, whole, fresh

Avg: average or predicted value; SD: standard deviation; Min: minimum value; Max: maximum value; Nb: number of values (samples) used

Breadfruit tree (Artocarpus altilis), fruit, whole, dehydrated



Main analysis	Unit	Avg	SD	Min	Max	Nb
Dry matter	% as fed	89.4	3.5	84.9	94.3	7
Crude protein	% DM	4.7	0.8	3.2	5.8	8
Crude fibre	% DM	6.0	1.2	5.0	7.9	5
NDF	% DM	19.5	8.5	11.7	27.8	4
ADF	% DM	12.0	4.6	8.1	17.7	4
Lignin	% DM	2.6				1
Ether extract	% DM	2.7	1.5	0.9	5.0	5
Ash	% DM	5.5	3.1	3.1	11.6	7
Starch (polarimetry)	% DM	66.1		63.0	69.2	2
Gross energy	MJ/kg DM	17.4	1.1	13.6	17.4	4 *

Minerals	Unit	Avg	SD	Min	Max	Nb
Calcium	g/kg DM	0.9	0.3	0.6	1.2	3
Phosphorus	g/kg DM	1.4	0.3	1.0	1.6	5
Iron	mg/kg DM	74				1

Pig nutritive values	Unit	Avg	SD	Min	Max	Nb
Energy digestibility, growing pig	%	80.6				*
DE growing pig	MJ/kg DM	14.0				*
NE growing pig	MJ/kg DM	10.9				*

Poultry nutritive values	Unit	Avg	SD	Min	Max	Nb
AMEn cockerel	MJ/kg DM	13.0				1

Rabbit nutritive values	Unit	Avg	SD	Min	Max	Nb
Energy digestibility, rabbit	%	61.9				*
DE rabbit	MJ/kg DM	10.8				1
Nitrogen digestibility, rabbit	%	71.5				1
ME _N rabbit	MJ/kg DM	10.6				*

The asterisk * indicates that the average value was obtained by an equation.

References

Aregheore, 2005; Bosman et al., 1996; Brea et al., 2013; Devendra et al., 1970; Leyva et al., 2012; Oladunjoye et al., 2010; Oladunjoye et al., 2012; Valdivié et al., 2003

Last updated on 16/09/2016 19:21:59

Breadfruit tree (Artocarpus altilis), fruit, whole, fresh



Main analysis	Unit	Avg	SD	Min	Max	Nb
Dry matter	% as fed	31.1	2.6	27.5	35.2	6
Crude protein	% DM	4.8	0.7	3.9	5.7	6

Automatic translation

Sélectionner une langue

Feed categories

All feeds

Forage plants

- ▶ Cereal and grass forages
- ▶ Legume forages
- ▶ Forage trees
- ▶ Aquatic plants
- ▶ Other forage plants

Plant products/by-products

- ▶ Cereal grains and by-products
- ▶ Legume seeds and by-products
- ▶ Oil plants and by-products
- ▶ Fruits and by-products
- ▶ Roots, tubers and by-products
- ▶ Sugar processing by-products
- ▶ Plant oils and fats
- ▶ Other plant by-products

Feeds of animal origin

- ▶ Animal by-products
- ▶ Dairy products/by-products
- ▶ Animal fats and oils
- ▶ Insects

Other feeds

- ▶ Minerals
- ▶ Other products

Latin names

Plant and animal families

Plant and animal species

Resources

Broadening horizons

- ▶ Literature search
- ▶ Image search
- ▶ Glossary

External resources

- ▶ Literature databases
- ▶ Feeds and plants databases
- ▶ Organisations & networks
- ▶ Books
- ▶ Journals

Crude fibre	% DM	5.3	1.8	3.3	7.9	5
NDF	% DM	9.7		8.1	11.3	2
ADF	% DM	5.9		5.6	6.2	2
Lignin	% DM	0.2		0.1	0.3	2
Ether extract	% DM	1.2	0.5	0.7	2.0	5
Ash	% DM	5.4	3.4	3.1	11.7	6
Starch (polarimetry)	% DM	68.4		62.9	74.0	2
Total sugars	% DM	2.4				1
Gross energy	MJ/kg DM	17.1				*

Minerals	Unit	Avg	SD	Min	Max	Nb
Calcium	g/kg DM	0.8	0.4	0.3	1.2	4
Phosphorus	g/kg DM	1.3	0.2	1.1	1.5	4
Potassium	g/kg DM	10.7				1
Magnesium	g/kg DM	0.9				1

Pig nutritive values	Unit	Avg	SD	Min	Max	Nb
Energy digestibility, growing pig	%	81.8				*
DE growing pig	MJ/kg DM	14.0				*
MEn growing pig	MJ/kg DM	13.6				*
NE growing pig	MJ/kg DM	10.8				*

The asterisk * indicates that the average value was obtained by an equation.

References

CIRAD, 1991; Devendra et al., 1970; Gonzalez-Garcia et al., 2009; URZ, 2009; Valdivié et al., 2003

Last updated on 16/09/2016 19:25:18

Datasheet citation

Heuzé V., Tran G., Hassoun P., Bastianelli D., Lebas F., 2016. Breadfruit (*Artocarpus altilis*). Feedipedia, a programme by INRA, CIRAD, AFZ and FAO. <http://www.feedipedia.org/node/523> Last updated on September 30, 2016, 22:08

Image credits

- Forest & Kim Starr
- Forest & Kim Starr
- Valérie Heuzé (AFZ)
- US Pacific Basin Agricultural Research Center

[+](#) Share / Save [f](#) [t](#) [r](#)



Breadfruit (*Artocarpus altilis*)

[Description](#)
[Nutritional aspects](#)
[Nutritional tables](#)
[References](#)

References

- Adekunle, K. S. A.; Fanimu, A. O.; Abiola, S. S.; Akegbejo-Samsons, Y., 2006. Potential of breadfruit meal as alternative energy source to maize in diet of broiler chickens. *J. Poult. Sci.*, 43 (3): 241-249
- Aregheore, E. M., 2000. Crop residues and agro-industrial by-products in four Pacific Island countries: availability, utilisation and potential value in ruminant nutrition. *Asian-Aus. J. Anim. Sci.*, 13 (Supplement B): 266-269
- Aregheore, E. M., 2000. Nutritive value of breadfruit (*Artocarpus altilis*, Park) and cassava (*Manihot dulcis*) in concentrate supplements of goats fed a basal diet of batiki grass. *J. Anim. Feed Sci.*, 9 (4): 615-623
- Aregheore, E. M., 2005. Evaluation and utilization of Noni (*Morinda citrifolia*) juice extract waste in complete diets of goats. *Livest. Res. Rural Devlop.* 17 (4): Art. #39
- Aregheore, E. M., 2006. Utilization of concentrate supplements containing varying levels of copra cake (*Cocos nucifera*) by growing goats fed a basal diet of napier grass (*Pennisetum purpureum*). *Small Rumin. Res.*, 64 (1-2): 87-93
- Bosman, H. G.; Ademosun, A. A.; Koper-Limbourg, H. A. G., 1996. Goat feeding practices and options for improvement in six villages in southwestern Nigeria. *Small Rum. Res.*, 19 (3): 201-211
- Brea, O.; Ortiz, A.; Eliás, A., 2013. Utilization of the fruit meal from the breadfruit tree (*Artocarpus altilis*) in diets for pre-fattening pigs. *Cuban J. Agric. Sci.*, 47 (4): 395-399
- Brea, O.; Ortiz, A.; Eliás, A.; Herrera, F.; Motta, W., 2014. Utilisation of breadfruit flour (*Artocarpus altilis*), fermented in solid state in diets for growing post weaned pigs. *Rev. Cubana Cienc. Agric.*, 48 (4): 391-398
- Chedly, K.; Lee, S., 1999. Silage from by-products for smallholders. *FAO Electronic Conference on Tropical Silage*
- Devendra, C.; Göhl, B. I., 1970. The chemical composition of Caribbean feedingstuffs. *Trop. Agric. (Trinidad)*, 47 (4): 335
- Duke, J. A.; duCellier, J., 1993. *CRC Handbook of Alternative Cash Crops*. CRC Press
- Göhl, B., 1982. *Les aliments du bétail sous les tropiques*. FAO, Division de Production et Santé Animale, Roma, Italy
- Gonzalez-Garcia, E.; Alexandrine, Y.; Silou-Etienne, T.; Archimède, H., 2009. *In situ* degradability of conventional and unconventional starch sources for ruminants, and factors determining their washable fraction: methodological. *J. Sci. Food Agric.*, 89 (11): 1918-1926
- Lebas, F., 2013. Feeding strategies for small and medium scale rabbit units. 3rd Conf. Asian Rabbit Prod. Association - Bali Indonesia - 27-29 August 2013
- Leyva, C. S.; Ortiz, A.; Valdivie, M., 2007. Sustainable production of sheep meat from the fruit and leaf meal of the breadfruit tree (*Artocarpus altilis*). *Pastos y Forrajes* 30 (3): 373-380
- Leyva Téllez, C. S.; Motta Ferreira, W.; Valdivié Navarro, M.; Anchieta Ramirez, M.; Ortiz Milán, A., 2012. Use of leaves and fruits flour of the breadfruit (*Artocarpus altilis*) in the fattening of New Zealand White rabbits. Taller internacional de extensión, innovación y transferencias de tecnologías para la producción animal, Mayabeque, Cuba, 14-16 Nov. 2012 Sesión N°22
- Martin, A. E.; Gibson, S., 2003. Nutritive value of breadfruit (*Artocarpus altilis*, Park.) in concentrate supplements of growing crossbred Anglo-Nubian goats. *Thai J. Agric. Sci.* 36 (2): 121-128
- Nwokoro, S. O.; Obasuyi, J. O. I., 2006. Partial substitution of soyabean meal with breadfruit (*Artocarpus altilis*) seed meal in broiler starter diets: effects on performance, water consumption and carcass characteristics. *Int. J. Poult. Sci.*, 5 (3): 296-300
- Nwokoro, S. M.; Obasuyi, J. O. I., 2006. Effects of partial replacement of soyabean meal with bread fruit (*Artocarpus altilis*) seed meal in broiler finisher diets on their performance, water consumption, nitrogen retention and carcass characteristics. *Int. J. Poult. Sci.*, 5 (5): 404-407
- Oladunjoye, I. O.; Ologhobo, A. D.; Olaniyi, C. O., 2010. Nutrient composition, energy value and residual antinutritional factors in differently processed breadfruit (*Artocarpus altilis*) meal. *Afr. J. Biotechnol.* 9 (27): 4259-4263
- Oladunjoye, I. O.; Ojebiyin, O. O., 2012. Nutritional value of differently processed breadfruit (*Artocarpus altilis* Forsberg) meal for grower rabbits. *Asian J. Anim. Sci.*, 6 (5): 220-229
- Oladele Oso, A.; Faboro, R.; Isah, O.; Oni, A.; Bamgbose, A.; Dele, P., 2010. Potential of bread fruit (*Artocarpus altilis*) an ecologically forest based feed resource in rabbit nutrition. *Trop. Subtrop. Agroecosyst.*, 12(1): 99-108
- Ortiz, A; Martí, O.; Valdivié, M.; Leyva, C., 2011. Utilization of the breadfruit tree (*Artocarpus altilis*) meal in fattening swine diets. *Cuban J. Agric. Sci.*, 45 (2): 145-149
- Oulai, S. F.; Koné, F. M. T.; Amedée, A. P.; Gonnety, J. T.; Faulet, B. M.; Kouamé, L. P., 2014. Impact of cooking times on some nutritional and anti-nutritional factors of Ivorian breadfruit (*Artocarpus altilis*) flour. *Int. J. Rec. Biotech.*, 2 (3): 34-46
- Ragone, D., 1997. Breadfruit. *Artocarpus altilis* (Parkinson) Fosberg. Promoting the conservation and use of under utilized and neglected crops. 10. *Inst. Plant Gen. Crop Plant Res.*, Gatersleben/IPGRI, Rome, Italy
- Ragone, D., 2011. Farm and forestry production and marketing profile for breadfruit (*Artocarpus altilis*). Elevitch, C.R. (ed.). *Specialty Crops for Pacific Island Agroforestry*. Permanent Agriculture Resources (PAR), Holualoa, Hawai
- Ravindran, V.; Ravindran, G.; Sivalogan, S., 1994. Total and phytate phosphorus contents of various food and feedstuffs of plant origin. *Plant Chemistry*, 50: 133-136
- Ravindran, V.; Sivakanesan, R., 1995. Breadfruit (*Artocarpus communis*) meal: Nutrient composition and feeding value for broilers. *1995 J. Sci. Food Agric.*, 69 (3): 379-383

Automatic translation

Feed categories

All feeds

Forage plants

- ▶ Cereal and grass forages
- ▶ Legume forages
- ▶ Forage trees
- ▶ Aquatic plants
- ▶ Other forage plants

Plant products/by-products

- ▶ Cereal grains and by-products
- ▶ Legume seeds and by-products
- ▶ Oil plants and by-products
- ▶ Fruits and by-products
- ▶ Roots, tubers and by-products
- ▶ Sugar processing by-products
- ▶ Plant oils and fats
- ▶ Other plant by-products

Feeds of animal origin

- ▶ Animal by-products
- ▶ Dairy products/by-products
- ▶ Animal fats and oils
- ▶ Insects

Other feeds

- ▶ Minerals
- ▶ Other products

Latin names

Plant and animal families

Plant and animal species

Resources

Broadening horizons

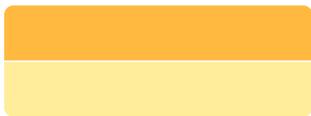
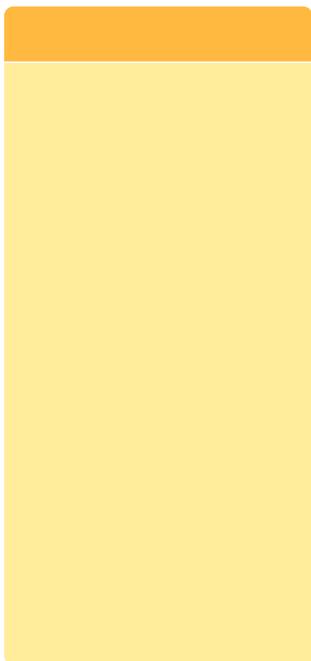
Literature search

Image search

Glossary

External resources

- ▶ Literature databases
- ▶ Feeds and plants databases
- ▶ Organisations & networks
- ▶ Books
- ▶ Journals



Roberts-Nkrumah, L. B., 2007. An overview of breadfruit (*Artocarpus altilis*) in the Caribbean. *Acta Horticulturae* 757: 51–60 

Sikarwar, M. S.; Boey Jia Hui; Subramaniam, K.; Valeisamy, B. D.; Ling Kar Yean; Balaji, K., 2014. A review on *Artocarpus altilis* (Parkinson) Fosberg (breadfruit). *J. Appl. Pharmaceut. Sci.*, 4 (08): 91-97 

USDA, 2015. GRIN - Germplasm Resources Information Network. National Germplasm Resources Laboratory, Beltsville, Maryland 

Valdivié, M. ; Alvarez, R., 2003. Note on the use of the breadfruit (*Artocarpus communis*) in broilers. *Rev. Cub. Ciencia Agric.*, 37 (2): 169-172 

32 references found

Datasheet citation



Heuzé V., Tran G., Hassoun P., Bastianelli D., Lebas F., 2016. *Breadfruit (Artocarpus altilis)*. Feedipedia, a programme by INRA, CIRAD, AFZ and FAO. <http://www.feedipedia.org/node/523> Last updated on September 30, 2016, 22:08

Image credits

- Forest & Kim Starr
- Forest & Kim Starr
- Valérie Heuzé (AFZ)
- US Pacific Basin Agricultural Research Center

