



CASHEW BASED PRODUCTS







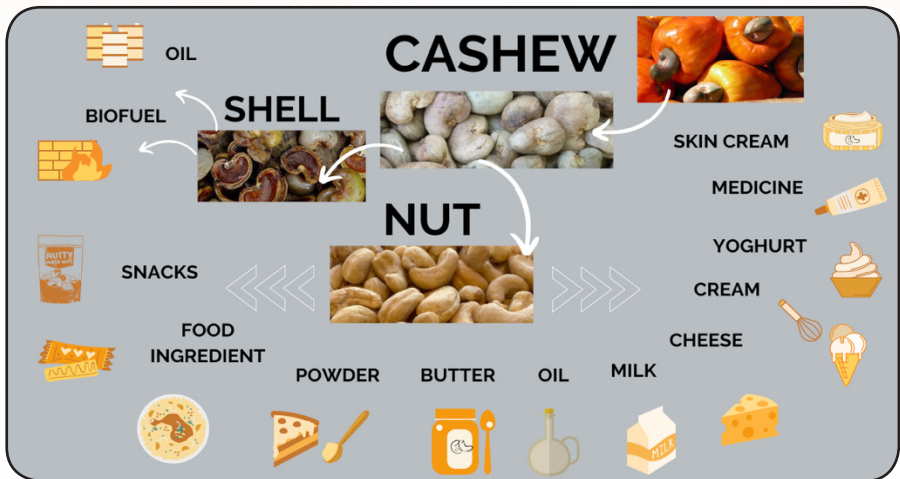
INTRODUCTION

Cashew is produced from a tropical evergreen tree, native to north-eastern Brazil. The tree is known to have existed since the 16th century and was brought to India by the Portuguese. It is now cultivated in 28 countries that have a tropical climate. The fruit and the nut of the tree are both considered edible and have high nutritional value with a delightful taste. The fruit of the tree is called the cashew apple. Trade of the edible nut produced from this tree ranks second in the international market. The nut hangs below the fruit and is curved in shape. The cashew tree cannot tolerate frost and cold climatic conditions for an extended period. The lifespan of a cashew tree is almost 60 years. Cashew nut farming was initially practiced to control soil erosion, but later emerged as a major product for international trade. Years ago, cashew nuts were mostly used as a plain nut for consumption. In recent years, however, various types of products derived from the cashew tree (both edible and non-edible) made from the kernels and the cashew apple have emerged. Recently, cashews have become popular worldwide for their special flavor and extraordinary health benefits. Cashews are a good vegetarian source of copper, providing more of the mineral than most other non-meat sources. The nuts contain heart-healthy monounsaturated fats, including oleic and palmitoleic acids.



CASHEW NUT-BASED PRODUCTS

Several products can be made from both the cashew nut and the apple, as well as the cashew nut shell.



Source: TOSK Global Ventures, Cashew nut and shell products and uses.

Among the different cashew-based products that can be made from cashew nuts include the following:

Snacks

Cashew nuts are considered a healthier alternative to other savory snacks, such as crisps and extruded snacks believed to have more health benefits than peanuts in most major consuming countries. It is possible to purchase raw, roasted, or cashews that have been seasoned with various savory or sweet flavorings such as chili, paprika, honey, spicy and sweet.



Source: <https://stock.adobe.com/images>

Food ingredients

Cashew nuts are also used as ingredients in various foods and functional food products such as breakfast cereals, fruit and nut bars, and chocolate products containing cashew nuts. Additionally, they blend well as additions to salads, smoothies, stir-fries, and other dishes, enriching the meals.

Cashew Milk

Cashew milk is a healthy alternative to traditional dairy milk. Made from cashews and water, it contains more minerals than traditional dairy milk and is highly digestible. Although delicious, cashew milk is more expensive than almond milk. However, it is higher in protein and healthy fats, making it a healthier choice.

Benefits of cashew milk

1. Cashew milk is a vegan, dairy-free, and lactose-free alternative to cow's milk.

2. High in calcium and vitamin D and contains no cholesterol or saturated fat.
3. A good source of protein, with about 5 grams per cup.
4. The healthy choice for people who are watching their weight.
5. Cashew milk has a creamy texture and a mild, nutty flavor that makes it a popular choice for smoothies, coffee drinks, and baking.
6. Easy to digest and may be a good choice for people who are lactose intolerant or have a dairy allergy.
7. A good source of antioxidants and nutrients that are beneficial for the heart and brain.



Source: <https://stock.adobe.com/images>

Cashew Butter

Cashew butter contains a lot of healthy fats, with a slightly higher concentration of monounsaturated fats compared to peanut butter. Cashew butter also contains high concentrations of iron, magnesium, vitamin B6, and calcium. The butter is usually made from raw or baked cashews, and it has a rich, creamy flavor. Raw cashew butter seems to be better at retaining all the nutritional properties of the cashews after processing, making it more favorable.



Source: <https://stock.adobe.com/images>

Cashew Cheese

Cashew cheese can come in various forms, including soft cheese for use as a bread spread or hard cheese as well. It remains purely vegan (vegetarian) and can meet many dietary requirements, making it a healthy snack option with olives and grapes or a topping for sandwiches, toasts, and pizzas. Cashew cheese can easily be made



at home. All you need to do is puree cashews, add some nutritional yeast, and homogenize the mixture. Then, leave the mixture for a couple of hours. High-quality cashew cheese lasts about a week in the refrigerator. Additionally, cashew cheese is rich in *B vitamins, calcium, protein, and fiber*. It contains more vitamins and minerals than milk and does not have the saturated fats that increase cholesterol and the risk of heart disease and stroke like other types of cheese.



Source: <https://stock.adobe.com/images>

Cashew Cream

Cashew cream has a consistency similar to regular cream and can be added to a variety of sweet or savoury dishes as a healthy vegan substitute for heavy whipping cream. It is commonly used in foods such as ice cream, sauces, soups, stews, puddings, some custard bases, and is also used for making cakes.



Source: <https://stock.adobe.com/images>

Cashew Yoghurt

Cashew yogurt is made from unsalted raw cashew nuts. Unlike dairy-based yogurt, cashew yogurt has low sugar and many health benefits as it is an ideal source of protein and fats. Furthermore, cashew yogurt contains plant-based unsaturated fats, suitable for health.



Source: <https://stock.adobe.com/images>

Medicinal Products

Cashew nuts find various applications in the manufacturing of medicines within the pharmaceutical industry. Given their efficacy in addressing conditions such as diabetes, heart disease, high cholesterol, skin problems, stomach and intestinal disorders, numerous syrups and medications incorporate cashew nuts as active ingredients for treating these ailments. Moreover, some individuals directly apply cashew nuts to their skin as a skin stimulant, aiding in the healing of ulcers, corns, and warts.

Cashew Powder

Cashew powder has gained popularity in gluten-free cooking and baking. It serves as a versatile substitute for almond flour and can be seamlessly incorporated into recipes for cookies, muffins, and quick bread. Additionally, cashew flour boasts natural sweetness without the bitterness commonly associated with almonds.



Source: <https://stock.adobe.com/images>

Cashew Oil

Cashew oil is widely recognized as a high-quality cooking oil, often esteemed for its health benefits compared to other types of cooking oils. These exotic nuts undergo an initial process of shelling and drying. The skins are then taken out, and the nuts are pressed to produce the oil.



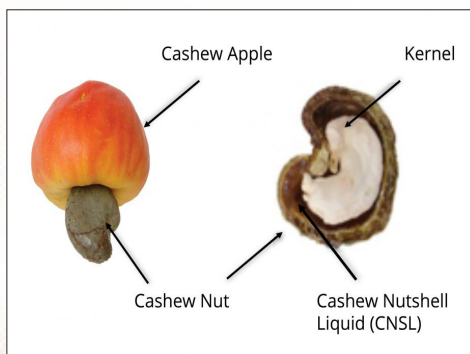
Source: <https://stock.adobe.com/images>

CASHEW NUT SHELL PRODUCTS

Cashew shells are processed to ensure that no part of the raw cashew goes to waste. Two valuable products can be obtained from the cashew shells: cashew nut shell liquid (CNSL) and cashew nut bio-fuel.

Cashew Nut Shell Liquid (CNSL)

Cashew Nut Shell Liquid is a versatile by-product of the cashew industry. The nut has a shell about 0.3 cm thick, inside which is a soft honeycomb structure containing a dark reddish-brown viscous liquid called cashew nut shell liquid. In other words, cashew nut shell liquid is the pericarp fluid of the cashew nut. It is often considered a superior and more cost-effective material for industrial use. The liquid has numerous applications in polymer-based industries, such as friction linings (brake linings), paints and varnishes, laminating resins, rubber compounding resins, cashew cements, polyurethane-based polymers, surfactants, varnishes, and chemicals and intermediates for the chemical industry.



Source: Sciencedirect.com



Biofuel

Cashew nut shells can provide energy in different ways and forms, both solid and liquid. In their raw state, they can be processed into bio-crude, known as cashew nut shell liquid, as well as a solid cake. Cashew nut shell liquid is a significant and potent bio-oil, with a calorific value comparable to petroleum oils. Additionally, when extracted, the oil can yield a cake with slightly lower energy content than the raw shells but still suitable for energy generation as a solid fuel.

CASHEW APPLE PRODUCTS

Apart from the cashew nut, which serves as the primary product, the cashew tree also yields the cashew apple, considered a by-product. The cashew apple holds significant nutritional potential, being rich in vitamin C, carotenoids, dietary fibers, vitamins, sugars, and essential mineral elements for human nutrition. Furthermore, the cashew apple offers technological advantages, with the edible portion of the fruit being 85% to 100% higher than that of other traditional tropical fruits. Its juicy, seedless, and sweet flesh makes it appealing. Additionally, the cashew apple is readily available in large volumes, presenting a promising opportunity for commercialization.



Source: <https://stock.adobe.com/images>

Among the products that can be made from the cashew apple are juice, syrup, wine, alcohol, dietary fiber extracts, and animal feed. However, inadequate technologies and skills for postharvest handling and value addition have led to a considerable loss of cashew apples, contributing to pronounced food and nutrition insecurity.

Cashew nut apple juice

Cashew nut apple juice, rich in vitamin C even more than mangoes and citrus fruits, is highly perishable. Processing it into juice will enhance consumption and increase its shelf life for improved nutrition.



Source: Internet

Cashew apple jam

Cashew apple jam is prepared from ripe cashew apples. Fresh apples are picked from the trees and taken to the processing facility where they are washed and peeled off the outer skin. They are then cut into small pieces and blended. The resultant pulp is then mixed with sugar/honey with other flavoring compounds and then heated to boiling point and maintained at that temperature for 5 minutes before they are cooled and packaged. Mango apple jam is a high value product that

fetches better prices in the market and hence increases the household incomes of farmers as well as creating employment.



Cashew apple jam.

Source: Internet

Cashew apple wine

The cashew apple wine is prepared from ripe cashew apples. It is made by fermenting cashew apple juice by adding wine yeast and sugar as per the outlined process below:

- Wash and clean the cashew fruits.
- Cut it into small pieces and press the fruit to extract the juice.

- Soak it in water and repeat the process till all the flavors and sweetness is extracted from the fruit.
- Add sugar and yeast and allow it to ferment under an airtight condition.
- After a week, fermentation will stop.

Cashew apple wine is one of the most valuable high value product that can be obtained from the cashew tree.



Cashew Apple Wine. **Source:** Internet

Cashew Apple Flour

The Cashew Apple Flour is made from dried and milled cashew apples. The cashew apples are normally sorted after proper washing, slicing and dried at 65°C. Thereafter, it is milled using a blender to produce cashew apple powder (CAP). The CAP can be used at different levels of whole wheat flour substitution to produce composite flours in different ratios to process various food products.



Cashew apple flour. **Source:** Internet

Cashew apple syrup

Cashew apple syrup is made by mixing one litre of apple juice with 2 kg of sugar and kept under moderate heat conditions until the sugar dissolves completely. The mixture is then stirred continuously so that there will be no improper mixing. Thereafter, 15 g of citric acid is

dissolved with a small quantity of the prepared syrup taken in a bowl and then dissolved into the large quantity and stirred continuously.



Cashew apple syrup. Source: Internet

Animal feeds from cashew apple

The recent high costs of feed ingredients in particular have brought about the need to look inwards for alternatives to the conventional feed resources. It is therefore imperative to explore other feed materials that are not useful to humans. The limited supplies of raw materials for the feed industry have resulted in a continuous increase in the cost of production, causing a considerable rise in the unit cost

of products. At the same time, the increase in the cost of grains has been related to its scarcity as a result of competing for these feed ingredients. To depend on alternative sources of feeds, especially for those materials that have less competition with human food, may help a lot if the alternative is sufficiently available. In an effort to reduce the cost of rabbit production, rabbit nutritionists have tried to harness and utilize by-products and wastes that are not directly utilized by man. The use of dried edible cashew apple in rabbit enhances early maturity of the rabbits and better monetary returns. Therefore, dried cashew apple could be recommended in rabbits ration at 50, 100 and 150% respectively. Again cashew apple meal can be included upto 15% in diets of growing ducks without adverse effect on body weight gain. The cashew apple fruit silages on the other hand can replace whole crop maize silage in rations for fattening cattle without any losses in body weight gain, potentially reducing feeding costs as well as environmental pollution.

Chemical composition of cashew apple waste

(CAW), cashew apple (CA) and of poultry litter (PL)

	CAW	CA	PL
Dry matter, %	22.5	12.37	86.5
Content in DM, %			
N*6.25	13.7	12.5	17.5
Crude fibre	11.8	3.54	15.8
Ash	1.4	1.62	22.34
Calcium	0.25	0.03	3.32
Phosphorus	0.34	0.07	1.66
Total sugars	26.5	54.7	Nd

Soluble N, % total N	10.9	25.6	26.7
N-NH ₃ , % total N	1.82	2.07	7.14
pH	4.1	4.00	Nd

***Nd:** Not determined

Source: <https://www.fao.org>

Cashew nut meal as livestock feed

Cashew nut meal, a by-product from cashew nuts kernels, is a promising feed to ruminant supplementation of lambs. Their high protein and lipid content can help farmers to improve the nutrient supplementation to low-quality forages for the herds in tropical regions.



Cashew nut meal. Source: <https://www.feedipedia.org>







For more Information, Contact:

Director
Industrial Crops Research Institute
P.O Box 16-80109, Mtwapa
E-mail: director.icri@kalro.org

Compiled by: F.N. Pole, F.K Muniu, M. Menza, S. Mwashumbe, K.K. Lewa., and C. Nekesa

Editors: Nyabundi K.W., Mukundi K.T., Maina P., Wanyama H.N. and Omondi S.P

Design and Layout: Odipo S.N.

KALRO/NAVCDP/ Cashew / Pamphlet No. 080/2024

