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Cotton Seed Milk and Its Products

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She has attended numerous National seminars, symposiums and International conferences and has 20 research articles, book chapters in international and national journals and 22 NCBI Gene bank accession numbers to her credit.

Introduction

Cotton is primarily cultivated for its lint. Cotton seeds, linters, hull, seed oil, seed cake are the by-products that have industrial uses. As we all know, cotton seed oil is traditionally used worldwide for salad dressing, frying vegetables, meat, mayonnaise, salad dressing and similar products because of its flavour stability and also for medicinal purpose. This article provides an

overview about a lesser known edible product - cotton seed milk - and the value-added products derived from it. Cotton milk is a unique product

that has not been exploited widely as a food product. Cotton milk is an extract of seeds, which contains lipids, proteins and sugars as an emulsion. The gossypol atoxic terpenoid compound having anti-nutritive value, present in the cotton seeds, must be removed to make cotton seed milk fit for human consumption. This can be done by chemical treatment, liquid or air separation. The de-gossypolised seeds can then be used to prepare cotton seed milk.



GUEST COLUMN

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To extract milk, cotton seeds are soaked in water for 12 hours and then ground. On an average 100 gm of cotton seed contains 23.1 g protein, 22.9 g fat, 43.2 total carbohydrates, 7.3g water, 3.5g ash (minerals). Several edible products include tamucurd, cheese, curd, yogurt, ice-creams, sausage type meet, cotton seed soup, chocolates, biryani and halwa.

In South India, Tamil Nadu, some households served cotton seed milk as a welcome drink. It is believed to flush out bad cholesterol, reduces body heat, and ensures good functioning of pancreas, bone marrow, nervous system and improves blood circulation and digestion. Palm

jaggery is usually added for sweetness. Cotton seed milk becomes an innovative health drink if added with palm jaggery/sucrose (2%) and sodium chloride (0.2%) which help in improving the taste. The milk from the cotton seed can be pasteurised by heating at 70° C for 10 minutes with continuous stirring, and then cooled rapidly in an ice bath. Butter or strawberry essence (0.05% each) can also be added to the pasteurised milk to increase the flavour. Compared to dairy milk the total solid content, acidity and viscosity is higher and pH is lower in the cotton seed milk. The cotton seed milk can be consumed as such or can be mixed with powdered full cream cow's milk in a proportion of 1:3 to 1:1 and preserved for consumption later. The mixed milks can be consumed as such. The physicochemical property and sensory characteristics are acceptable and comparable with the commercial powdered cow's milk. The total solid content in cotton seed milk ranges from 11.8% to 13%, acidity varies from 0.17% to 0.19% (lactic acid g/100ml), pH ranges from 6.5 to 7.1, and viscosity from 2.8 to 3.4 cP.

Recently, cotton seed milk has also been used in the cosmetic industry for making moisturising lotions, shampoos, conditioners; skin creams, herbal medicine, etc. and these products are available commercially in the market.



Cotton seed milk is an innovative health drink served in households of Tamil Nadu

Cotton milk products: As mentioned earlier several value-added products can be prepared using cotton seed milk. A brief description of these products is given below.

- (1) **Tamucurd:** It is a tofu-like product, prepared from glandless cotton seed milk and has a bland flavour.
- (2) **Cheese:** It is a by-product with glandless cottonseed milk. It can be used as a substitute for cream cheese in cooking. Glandless cotton seed flour is used to prepare processed cheese.
- (3) **Curd:** It can be prepared by adding lactic acid (10%) to cotton seed milk and at pH 4.5 it

precipitates the constituents in milk into curd.

- (4) **Yoghurt:** It can be prepared from cotton seed milk by heating at 85° C for 30 minutes and then cooling to 43° C. The product is then mixed with a 2% yoghurt starter and incubated for three to four hours at 40° C. After coagulating, the yoghurt refrigerated at 4° C overnight.
- (5) **Ice-cream:** In vanilla-flavoured ice cream, 10% of defatted glandless cotton seed milk can be added to replace non-fat milk solids and also 15% of defatted glandless cottonseed milk can be added in chocolate ice creams.
- (6) **Sausage-type meat:** Cotton seed flour milk can be used in the preparation of a links sausage-type meat-substitute product and as a substitute for cream cheese.
- (7) **Cotton seed milk soup:** Cotton seed milk soup is a famous dish in Nigeria. This milk is prepared by soaking the cotton seeds overnight. The seeds are then mixed with ginger and Nigerian walnut (*Plukenetia conophora*) seeds in warm water. The cotton seed milk is then squeezed and seasoned with vegetables and cooked meat to make a soup.



Cotton seed soup

- (8) **Biryani :** Cotton seed milk is an ingredient in a biryani recipe in Tamil Nadu and regularly used in other food preparation by farmers of this region.
- (9) **Cosmetic industry:** Cotton seed milk is used in the cosmetic industry for making moisturising lotions, shampoos, conditioners, skin creams. These are available in the market.



Moisturising Handwash

Other lesser known cotton food products:

Although not a milk product, cotton buds or squares (of pin head, match head and candle stage) can be used as a vegetable in making the Chinese dish Manchurian vegetables.

Indian roti: The defatted glandless cotton (that contains less than 0.03% free gossypol) seed flour can be used in preparing rotis. The glandless cotton seed flour protein has a lighter colour and blander taste and can be used for making rotis and the digestibility is 91%.

Conclusion

Cotton seed milk is indeed a novel product that can be commercialised in India. This versatile product has immense potential in the prevention of malnutrition in children and adults. It can also help to lower the cost of animal milk in countries like India where there is immense shortage of animal protein sources. Cotton seed flour can be used to supplement wheat flour and other minor millet flours in preparing food, thereby improving the vegetable protein intake.

(The views expressed in this column are of the authors and not that of Cotton Association of India)
