

# Sweet Coconut Chips - a New Coconut Kernel Based Product

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The coconut palm (*Cocos nucifera* L.) has characteristics as a regular and consistent food supplier to mankind throughout the year which no other tree crop could be said to possess. The fresh kernel of ripe coconut constitutes an essential ingredient in the recipes of diverse food preparations in the households as well as in food industries of different countries. In the household food preparations, fresh kernel is used extensively in the grated, paste or milk form. When the gratings as such or in the form of ground paste are used in food preparation, there is no loss of nutrients present in the kernel or wastage of kernel.

As coconut is not grown in all places it is transported to the regions where it is not cultivated either as whole coconut or in partially dehusked form. Desiccation of kernel, germination, damages due to stress, crack development and the high cost of transport are the major disadvantages of transporting and/or storing coconut as whole or in partially husked form. This can be overcome by preparing the dehydrated coconut chips of intermediate moisture coconut kernel. Intermediate moisture coconut kernel is the mature coconut kernel after removing the moisture content of the kernel partially by osmotic dehydration by using various osmotic media. The dehydrated coconut chips is in ready-to-eat form and can be used as snacks. It could also be used at any time just like fresh kernel after rehydration of the chips.

Fruits and vegetables artificially dried by the use of conventional tray dryers or vacuum dryers are wholesome, nutritious and palatable in its own right. But they have not gained popular acceptance, as they do not have the flavour, colour and texture of the original material even after rehydration. Freeze drying of fruits and vegetables results in good quality of dried material and of long storage stability but cost of processing is very high. Hence a new method of drying on the basis of osmosis, in which partial dehydration of fruit either whole or in sliced form is brought about by dipping them in sugar solution followed by hot air drying. This is claimed to result in products with better flavour than freeze dried fruits at comparatively lesser cost. Utilizing this technology, a process has been developed for producing sweet coconut chips by osmotic dehydration followed by hot air drying.

## Process for the production of the sweet coconut chips

Fresh kernel of matured coconut containing reasonable amount of water is to be used for this process. Important

steps involved in the production of sweet coconut chips are dehusking, removal of shell, removal of shell, slicing of kernel, blanching of slices, osmotic dehydration of slices, drying of osmotically dehydrated slices in hot air dryer and then packaging in aluminium foil. Cane sugar used is of commercial grade. For the small scale industry, agitation of the syrup during osmotic dehydration is not required. The time of osmotic dehydration will be one hour. For the large scale industry, agitation of the syrup during osmotic dehydration is required. The time of osmotic dehydration will be 40 minutes only. Drying time in hot air dryer is about 2-3 hours. The conversion ratio of dehusked coconut to sweet coconut chips is given in Table 1.

The quantity of chips obtained is about 50 per cent by weight of the kernel. On an average about 150 g of chips can be obtained from a coconut.

## Drying of osmotically dehydrated slices in microwave oven

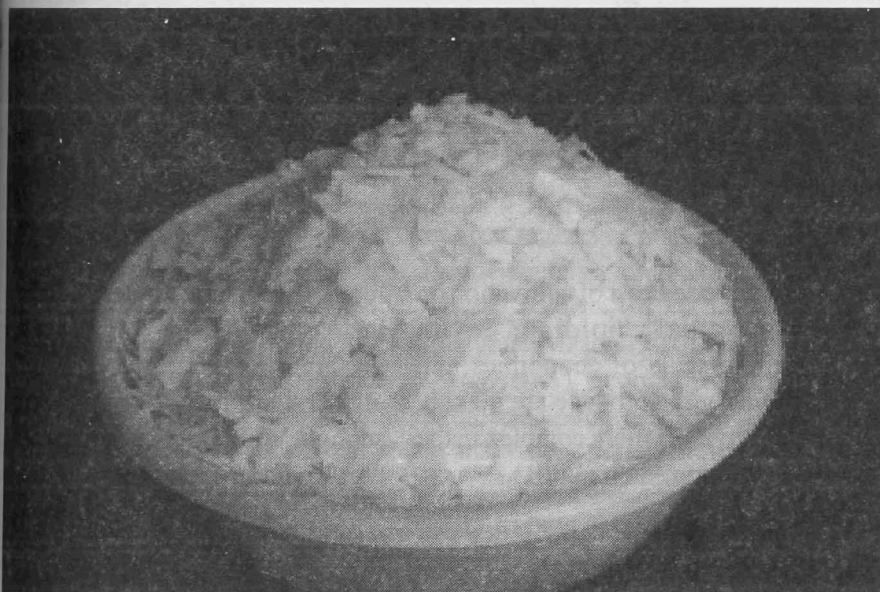
After osmotic dehydration of coconut slices, instant sweet coconut chips can be prepared by drying in

Table 1. Conversion ratio from coconut to chips

	Weight (Per cent)					
	Kernel	Testa	White Kernel	Slices	Slices after OD	Chips
With respect to whole coconut (%)	32.0	2.5	29.2	28.7	25.5	16.2
With respect to kernel (%)	31.8 (g/coconut)	7.9	91.8	90.3	80.2	51.0

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Sweet coconut chips

better than that of desiccated coconut powder. Rehydration of the chips is done by immersing the sweet coconut chips in hot water.

**Cost analysis**

**Capital expenditure**

Cost of the dryer (Rs.) : 20000.00

Cost of other tools and vessel (Rs) : 1000.00

**For processing of 40 coconuts/day**

Cost of coconuts : Rs. 4.00 x40

Cost of ingredients (Rs) : Rs. 12.00

Labour requirement (Nos) : 2

No. of working days : 300 days

Quantity of chips from

40 coconuts @ 150 g/nut: 6000 g

Total cost/day : Rs. 191.25

Cost analysis is done on the basis of cottage industry setup. The cost of production will be further less for the small and large scale industries.

**How to get the technology**

Technical know - how may be obtained

micro-oven. Osmotically dehydrated coconut slices can be dried in the microwave oven within 5 minutes. The crispness of the chips is very good when compared with that obtained by drying in the hot air oven.

**Reuse of soak solution**

The strength of the osmotic medium will decrease after the completion of the osmotic dehydration of the slices which can be brought up by adding the necessary ingredients. After the repeated use of the medium, it can be concentrated by heating in steam jacketed vessel or in vacuum jacketed vessel. By any of these methods, the off-flavour of the osmotic medium, developed during the osmotic dehydration, can be eliminated.

**Packaging of chips**

The sweet coconut chips is hygroscopic in nature. If the relative humidity is more than 75 percent, it will absorb moisture and lose its crispness. Hence the chips must be packed in aluminium foil laminated with LDPE pouches which will maintain its flavour and crispness upto six months without

affecting its microbial and biochemical qualities. To avoid the breakage of the chips during transportation, it may be packed as billow packet using gases like nitrogen or carbon dioxide.

**Use of sweet coconut chips**

The sweet coconut chips is crispy in nature and ready-to-eat form. No frying is required before consumption. It is

Details	Quantity of chips/packet		
	50 gram packet	75 gram packet	100 gram packet
Number of packets from 40 nuts	120	80	60
Cost of production of chips/packet (Rs.)	1.60	2.40	3.20
Cost of coconut for one packet of chips (Rs.)	1.30	2.00	2.70
Cost of laminated aluminium foil (Rs.)	0.90	1.00	1.10
Net cost/packet	3.80	5.40	7.00

having its own good coconut flavour as no oil is used for frying. It can be used as snacks. After rehydration of the chips, it can also be used as fresh kernel. The rehydration character of the chips is

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