

Ball copra production and marketing

B. Augustine Jerard, S. Sumitha, P. Subramanian, Jagadeesha, G.S. Chandrasekhar and Sudhrashan G.K

ICAR – All India Co-ordinated Research Projects on Palms (AICRPP), ICAR- CPCRI, Kasaragod, Kerala



Ball copra from coconut fruits is described as a substance formed within a fully matured whole nut due to natural dehydration of coconut water. When coconut is in its tender stage, its cavity is filled entirely with coconut water. During the different stages of maturity, water inside the cavity undergoes various biochemical changes to help build up the white coconut meat on the surface of the cavity. When the nut reaches its full maturity, the volume of the nut water in the cavity gets reduced creating an air gap inside. The air gap inside the cavity would be expanded when the nut water gets reduced during the post harvest storage of coconut (Thampan, 1982; Banzon and Valesco, 1982). Unless the nuts are used for processing, the above changes inside the cavity of nuts may continue uninterrupted for several months until the whole nut water inside the cavity is fully absorbed by the kernel. Upon reaching this stage, kernel inside the cavity may have become partially dried-copra and within weeks of time the dried kernel inside the cavity could slowly get-detached from the coconut shell leading the formation of ball copra. This stage could be well-recognized with a sound inside the cavity upon shaking.

The copra made in India may be classified into two groups, that is edible copra and milling copra. The edible copra is the superior class copra which is used for various food

preparations and is consumed as such, while the milling copra is used for extraction of coconut oil. The edible copra is made both in the form of balls and cups while milling copra is extracted in the form of cups only. In India, manufacture of ball copra is concentrated in the states of Kerala and Karnataka and to limited extent in Lakshadweep, Andaman and Nicobar Islands and in some parts of Tamil Nadu and Andhra Pradesh. In North India, particularly during the winter and festival season there is a heavy demand for ball copra. Table 1 depicts the price variation in ball copra in Tiptur market. In the last 10 years, the Government has increased MSP for ball copra from Rs 5,500 per quintal in 2014-15 to Rs.12,000 per quintal in 2024-25, registering a growth of 118 percent. In India ball copra is made both on a commercial scale as well as on a household process. The ball copra is broken into small pieces without removal of the testa (brown outer skin) and eaten either as it is or with jiggery (coconut sugar) or cane sugar. In Sri Lanka, in the rural coconut areas ball copra is consumed occasionally as “sambol” by grating and then mixing with hot peppers

Description of the process

For the manufacture of ball copra, only selected nuts are used. The coconuts which are fully mature, ripe and have commenced drying when harvested or nuts which have

Table 1. Monthly Highest Price of Ball copra at major markets in Karnataka, Tiptur

Sl. No.	Months	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	January	12,050	6,666	13,400	16,400	11,800	15,400	17,800	11,511	9,000
2	February	11,100	8,204	13,550	16,800	11,600	14,785	18,000		10,000
3	March	9,817	9,100	13,200	15,600	10,200	15,200	17,300	11,000	9,600
4	April	9,164	8,350	13,000	16,500		16,000	17,650	10,606	9,100
5	May	9,520	8,426	14,500	16,500		16,400	17,250	9,200	9,400
6	June	8,292	8,166	16,100	16,500	10,800		17,000	9,800	9,000
7	July	7,606	7,900	16,100	15,000	9,500		14,300	8,800	9,009
8	August	7,735	9,108	17,000	13,800	9,400	16,200	14,500	9,800	9,450
9	September	7,523	12,500	16,900	13,800	10,100	16,500	14,400	9,400	12,000
10	October	7,235	13,500	16,500	13,600	11,500	16,500	14,000	8,400	-
11	November	6,800	13,000	16,800	13,000	11,800	16,700	14,000	8,700	-
12	December	6,666	13,200	16,600	12,500	12,600	17,200	13,000	8,500	-

Source : CBD, Kochi

fallen naturally are used without husk. Such nuts have the outer skin turning to dark brown due to drying. A husked coconut is not good for more than a few days as spoilage occurs. Furthermore, even unhusked nuts which are not fully mature (green colour) also should not be used, as spoilage occurs after one or two months. Manufacture of ball copra is possible only in hot and dry areas of the coconut regions. When fully mature unhusked nuts are kept for long period in humid areas or during the rainy season, germination tends to take place. Ball copra cannot be made if the coconut germinates. The selected unhusked coconuts are loaded into the compartments of the ball copra store and allowed to dry naturally for 8 to 12 months. In all cases the coconuts are placed on an elevated platform. This helps in keeping the coconut away from germinating. Supply of moisture either from the ground or the atmosphere promotes germination. In very humid regions it is not possible to make ball copra due to this reason. In the dry, hot areas where ball copra is made, the rainy season tends to promote germination. Therefore, the coconuts are smoked occasionally by burning a slow fire using traditional fuels on the ground floor. The fuels commonly used are paddy husk, coconut husk, dry leaves or cheap firewood. Smoking the coconuts is also carried out occasionally even during non-rainy periods, to slightly accelerate the process of drying out the coconut. In the case of very small-scale operators who have wooden platforms over the kitchen fireplace, there is no problem of germination during the rainy season

due to the regular (daily) smoking caused by the daily cooking in the household.

Although the manufacture takes 8 to 12 months, the coconuts must be inspected to assess the extent of drying after about 6 months of storage. At this time, all the nut water would have dried out causing a shrinkage of the kernel inside. This release the kernel in a ball shape from the hard coconut shell. The inspection is by shaking each nut. All nuts which have dried out properly would give a rattling sound caused by the loose ball shaped kernel. From this stage, further drying for about 2 months is necessary. After a total of 8 to 12 months, the coconut shell is cracked to remove the ball copra. It is necessary to remove the ball copra without damage during the deshelling operation. Complete, undamaged ball copra fetches good price in the market.

For commercial scale operations in India, "Ball copra stores" are constructed. They are two storied brick and mortar buildings; the upper floor and the four sides of the upper section being made of hard timber bars spaced 3 to 4 inches (75 to 100 mm) apart. The upper floor (platform) and the four upper sides are sometimes made of bamboo or arecanut stem wood. The size of the store varies according to the scale of operation. It is common to find 5 or 6 compartments, each having 12 feet * 12 feet (3.65 m) in plan. The height of the lower and the upper storey's is 6 feet (1.8 m) each. One upper compartment of 12 feet * 12 feet * 6 feet height can hold about 4000 to 5000 nuts. (These are small whole unhusked nuts).

Construction material/ process of ball copra	Traditional method	GI Pipes	Poly house with GI structure (green house concept)
Duration of ball copra process	9-12 months	9- 12 months	6 months
Germination /spoilage	Germination is noticed as the shed is close to the ground	No germination	No germination
Storage	1000-2000 nuts	4000 to 5000 nuts	1.5- 2.5 lakhs nuts
Smoking	Yes	No	No
Height from ground level	1 feet	2- 3 feet	2- 3 feet
Ventilation	Poor	Good	Good
Model	Fig 1	Fig 2	Fig 3



Fig 1



Fig 2



Fig 3

Terminology used in Indian standard for grading for copra for table use and for oil milling

- 2.1 Ball Copra** - The kernel of coconut fruit, the kernel being intact and in the form of a ball.
- 2.2 Black Kernels** - These shall include all balls or cups in which more than 5 percent of the inner surface is dark brown to black in colour.
- 2.3 Chips** -These shall include pieces of kernel which are smaller in size than the cup size, broken cups and balls, and which also carry the other defects stated under 2.2, 2.9 and 2.10.
- 2.4 Cup Copra** - The kernel of coconut fruit which has been cut into approximately two equal pieces forming a cup shape.
- 2.5 Diameter** - In the case of ball copra, this is the axis perpendicular to the height, and is the maximum girth. In case of cup copra, it is the maximum width on a circular rim.
- 2.6 Height** - For cup copra, it is defined as the perpendicular distance from the circular rim to the top-most point on the hemisphere of the cup. For ball copra it is defined as the maximum girth at the perpendicular axis; it shall be the diameter passing through the tip of the ball.

- 2.7 Impurities** - Foreign bodies other than kernel or part thereof, which could consist of sand, mould, straw, shell and other foreign bodies.
- 2.8 Kernel**- Soft body enclosed by the shell which carries the oil, sometimes termed as meat.
- 2.9 Mouldy Kernels** - These shall include all balls or cups in which more than 5 percent of the inner surface is covered with mould.
- 2.10 Wrinkled Kernels** - These shall include balls or cups that are shrunk out of normal shape, or

Table 3. Grade designation and definitions of quality of ball copra for edible use

Grade	Size (Diameter) in mm	Foreign matter % by weight maximum	Mouldy & black kernels % by counts maximum	Wrinkled kernels % by count maximum	Moisture % by weight maximum	Chips % by weight maximum
Grade 1	85	0.2	2.0	10.0	7.0	1.0
Grade II	75	0.2	2.0	10.0	7.0	1.0
Grade III	60	0.2	2.0	10.0	7.0	1.0



are not fully matured or developed, or have a rubbery structure, and uneven surface. Such kernels are often, discoloured.

Types and Grades

There shall be three types of copra, namely:

Type 1 - ball copra for table purpose,

Type 2 - cup copra for table purpose, and

Type 3 - milling copra for oil extraction only.

Several grades and qualities of ball copra are recognized in the trade circles. These are named after the places where the ball copra is made or after the names of the markets in which different grades or qualities are in demand. The ball is graded according to the size, weight, colour and cleanliness. Three grades of ball copra are available on weight basis, viz., large, medium and small depending on the numbers of copra required for a weight of 4 kg (< 20 for large, 20 - 40 for medium and > 40 for small). And as per the ISO

There shall be three grades of ball copra, namely, Grade 1, Grade 2 and Grade 3 The moisture content shall in all cases be below 7 %. The copra is classified into different grades according to size by visual assessment only and not by any definite size criteria.

Table .2 - Ball copra grades and Major markets

States	Grades	Market
Karnataka	Mysore, Madras, Ras and Barik	Tiptur and Mangalore
Tamil Nadu	Dil pasand, Office copra, Kola copra, Kamal copra or Kachal copra	Thanjavur
Kerala	Calicut copra	Badagra and Calicut
Andhra Pradesh	Madras	Ambajipeta

Ball copra produced in the Lakshadweep Island is comparatively smaller in size as compared to the copra from the mainland but considered as very superior and fetches a premium price in the main land markets. The ball copra from Andhra Pradesh is better than Calicut copra (Kerala) but not as good as Mysore of Karnataka state. The entire quantity of ball copra produced in Karnataka is disposed off at Tiptur market which is the biggest market for ball copra in India. Tiptur copra is regarded as one of the finest varieties in the country. Ease of transportation and huge demand in North India are said to be the two important factors that have made the Tiptur market buoyant.

Ball copra is packed in new gunny bags. Sometimes double bags are used, the outer one being new and the inner one old. Polythene lined bags are often used for extra protection against insect damage. Ball copra is consumed in North Indian states where coconut is not grown and it is economical to transport copra rather than coconuts. The copra besides being eaten raw as such or mixed with other dry fruits is used in the preparation of sweets and as a garnish in many dishes. It is also used as religious offerings and is an essential item during ceremonial occasions. ■