PRODUCTION OF BALL COPRA BY HEAT TREATMENT

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The conventional way of preparing ball copra is by storing the fully matured coconuts on a raised platform inside a shed or in the attic for a period between nine and 12 months (Thampan, 1981). The partially dehusked nuts were also reported to be used for ball copra preparation (Nair and Joseph, 1987). Heat is sometimes provided to hasten the drying process. However, to overcome the poor quality of the product and the longer periods required for drying a procedure has been standardised to produce ball copra in a short period using an agricultural waste based dryer.

Two hundred and fifty fully matured nuts of West Coast Tall variety were partially dehusked and dried in a drier developed by CPCRI (Patil, 1983) for small coconut growers using agricultural waste as fuel. Drying was done at a temperature of 55° to 60°C for eight hours daily for three days and then stored outside in gunny bags for 10 days. Intermittent heating was continued till all the nuts were converted to ball copra. Four trials were conducted one each initiated in June, 1989 (P_1) October, 1989 (P_2) January, 1990 (P_3) and May, 1990 (P_4). Two hundred and fifty partially dehusked nuts stored in the attic served as control. The weight of kernel and ball copra produced were recorded and drying characteristics were studied.

Partially dehusked puny nuts (300 numbers) were also used for another set of trials. The first trial with puny nuts was initiated in June, 1990 and the second trial in January, 1991.

The coconut oil extracted from the experimental treatments was subjected to qualitative tests, namely, acid value (AV), iodine value (Anonymous, 1963), freely fatty acid (FFA) content (Tribolt and Aurand, 1963) and peroxide value (PV), (AOAC, 1970). Soxhlet extraction method was followed for estimating the oil content using petroleum ether (AOAC, 1984).

All the nuts under heat treatment became ball copra within six months whereas there was only 15 to 25 per cent conversion in control. In control 96 to 98 per cent conversion took place only from the tenth month onwards and about 2 to 4 per cent of the nuts were germinated. Following the method described in this paper it is possible to prepare up to 11 batches of ball copra in a year compared to one batch in the conventional way. The conversion of ball copra and rate of drying were slow during the period June to August. The present study suggests October to May as a suitable period for preparation of ball copra.

Similarly the puny nuts under heat treatment were transformed into ball copra within three to four months as against the control taking five to six months. The conversion of nuts into ball copra was faster during January to May when compared to June to November period.

Ball copra samples prepared by providing intermittent heat in a dryer had significantly low population of bacteria, fungi and lipolytic microorganisms when compared to that produced in the conventional way. There was a three-fold reduction in the counts of bacteria and two-fold reduction in the counts of fungi and lipolytic microorganisms in the heat treated samples. A comparison of the population at different seasons revealed significantly low population in samples dried during October to May.

The oil from the heat treated samples and low levels of free fatty acids (0.131 per cent), acid value (0.620) and peroxide value (1.48 m. eq peroxidase/kg) a higher iodine value (11.12) as compared to control which recorded 0.317 per cent, 1.20, 2.01 m eq peroxidase/kg and 7.63 for FFA, AV, PV and IV respectively. For WCT nuts a similar trend was recorded for puny nuts experiment also. An increase in the level of FFA, AV and PV in any oil is indicative of its deterioration. Since the primary stage of deterioration of coconut oil is hydrolytic in nature the quality is better judged by the levels of FFA. Here the lower values of FFA and AV in the heat treated ball copra samples suggest that ball copra preparation by intermittent heating in the drier developed by CPCRI for small coconut growers gives a better quality oil. However, the levels of FFA which were higher in the samples prepared during the monsoon period in both the treatments may be due to high relative humidity (85 per cent) during this season.

There was no significant variation in the oil percentage between treatments. The present cost of fabrication of CPCRI Small Holders' Copra Dryer is worked out to be Rs. 2,700. The cost of production of one kg of ball copra using CPCRI dryer was calculated as Rs. 3.65. The comparative study of the preparation of ball copra using the drier and by conventional way was also worked out (Table 88.1). A net profit of Rs. 2,845 per annum can be obtained by this method.

Table 88.1: Comparative study of the cost analysis of preparing ball copra by heat treatment and by conventional way

A. By heat treatment		
1.	Cost of ball copra as on III week of October:	Rs. 3600/q
2.	Ball copra production capacity of CPCRI Small Holders' Dryer:	440 kg pa
3.	Cost of production of ball copra:	3.65/kg
4.	Production of ball copra in half year:	220 kg
5.	Cost of 220 kg of ball copra:	7920
6.	Interest gained in a year @ 10%:	396
7.	Earnings by selling ball copra in a year:	Rs. 15840
8.	Totai earning (6 + 7):	Rs. 16236
9.	Total cost of production (3 × 2):	Rs. 1606
10.	Net earnings:	Rs. 14630
B. By conventional way		
1.	Production capacity in the same volume of space:	80 kg
2.	Cost of production:	Nil
3.	Earnings by selling ball copra @ Rs 3600:	2880/q
4.	Earnings by selling the remaining 2250 coconuts and by way of interest:	8905
5.	Total earnings (3 + 4):	Rs. 11785
	Net profit (A_{10}–B_5):	Rs. 2845

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