Agricultural Economics Research Review
Vol. 20 January-June 2007 pp 171-176

Research Note

Grade Development and Study of Price-Quality Relationship of Cashew Nut in North District of Goa[1]

Naik Amita Namdeo[2], K. Koulagi[2] and L.K. Wader[3]

Abstract

The grade standards have been developed for ascertaining the quality of cashew nuts and quality-price relationship has been studied in the North District of Goa, based on the data collected through personal interview for the year 1999-2000. Laboratory analysis, indexing, stepwise multiple regression analysis and tabular presentation have been employed for data analysis. Laboratory analysis consisted of generating data on qualitative variables, namely (i) number of nuts per kg, (ii) extraneous matter, (iii) void nuts, (iv) broken and damaged nuts, (v) oozing of liquid from cashew nut shell, (vi) cutting test, (vii) floating test, (viii) length, (ix) width, (x) thickness, (xi) moisture percentage, and (xii) recovery of kernels. By assigning appropriate weightages to these qualitative variables, scores have been worked out by adding the 12 quality parameters multiplied by the respective weightage. The total score so obtained has constituted the basis for grades. Five grade standards have been developed for cashew nut, based on composite index. It has been found that the number of nuts per kg, moisture percentage and cutting test reduce the prices and these factors could explain 98 per cent variations in price. All variables have been found to have the expected signs and only three variables, namely number of nuts per kg, floating test, and length have been observed significant in price determination. These results could be used as a guide by the farmers for fetching better price in the market, and by buyers for getting product of ascertained quality.

---

[1] Part of MABM post-graduate thesis submitted to the Department of Agricultural Marketing, Co-operation and Agribusiness Management, University of Agricultural Sciences (UAS), Dharwad, Karnataka

[2] Research Scholars, Department of Economics, Karnataka University, Dharwad.

[3] Professor, Department of Agricultural Marketing, Co-operation and Agribusiness Management, College of Agriculture, UAS, Dharwad, Karnataka.

The authors are grateful to the referee for his suggestions.

Introduction

Cashew, botanically known as *Anacardium occidentale,* was introduced to India by the Portuguese about 400 years ago. The importance of cashew in the Indian economy has been as a foreign-exchange earner and employment generator. The processed kernels are highly nutritious as they are rich in fats, proteins, carbohydrates, minerals and vitamins. The kernels have fat-soluble vitamins like A, D, E and K. In the year 1999–2000, the export of cashew kernels from India was of 92,461 tonnes, valued at about Rs 2450 crores. The major consumers of Indian cashew kernels are: United States (37%), Netherlands (24%), Japan (8%), UK (6%), Australia (4%) and UAE (3%). India is the largest producer, processor and exporter of cashew in the world.

The quality of cashew, brought to the market by the farmers, varies considerably from lot to lot. Therefore, it is highly essential to evolve a grading system for cashew nuts on a scientific basis to get remunerative prices. This grading should be based on 'objective evaluation of quality aspects' so that sellers are able to describe the quality of their produce and buyers understand what is being offered to them. Hence, the present study was undertaken to develop grade standards for cashew nut and to study the price- quality relationship of cashew nut.

Methodology

The North District of Goa state was selected for the study, because it ranked first in area, production and productivity of cashew nuts with 42 cashew processing units. For the development of grade standards for cashew nuts, the samples were collected from 15 cashew processing units.

Initially, from each processing unit, a sample of 5-kg was drawn from a lot at different spots and then by using hand halving method, a final sample of l-kg was drawn from these samples. Thus, l5 representative samples were drawn from 15 processing units. These samples were analyzed in the laboratory for their physical and chemical qualitative variables, as described below.

Qualitative Variables

A brief description of these variables is given below:

Number of Nuts: The number of nuts per kilogram were counted. Higher the number of nuts per kilogram, poorer was their quality.

Extraneous Matter: Dust, dirt, stones, earth, chaff, straw and any other impurity mixed with the nuts, were termed as extraneous matter. It was regarded as a discounting quality factor of grade and price.

Void Nuts: Nuts in which there were no kernels (No./kg).

Broken and Damaged Nuts: Nuts which were broken/internally-damaged or discoloured affecting the quality (No./kg).

Cutting Test: Raw cashew nuts in sample of 5-kg were collected from different bags and mixed together. One kilogram raw nuts were taken from the bulk and cut open using hand-cutting tool. Based on the kernel, appearance as white, shriveled, dotted or reject, the percentage of good kernel was calculated.

Floating Test: One kilogram of sample was put in a vessel containing water, after continuous stirring floaters were collected and counted. Immature nuts due to low density than water, improperly filled nuts and deteriorated nuts floated. Higher the percentage of floaters, poorer was the quality of cashew nuts. It was a discounting factor for both quality and price

Size: It was determined with the help of length, width, and thickness of the nut. Bigger the size, better was the quality.

Moisture: The moisture (%) in cashew nuts inversely affected the price and grade.

Recovery: Out of 1-kg of raw nuts with husk and without husk were weighed and percentage of nuts without husk was calculated. Higher the percentage, better was the quality of cashew nuts. It is a factor contributing to higher price and higher grade for cashew nuts.

In order to determine the importance to each of these variables, appropriate weightages were assigned. The weightages were obtained by interviewing research experts, processors, traders, dealers, and farmers and also by obtaining correlation coefficients to get ranking for a particular variable. The variable which was most important among the variables, got the highest weightage. The weightages were assigned as follows: (i) Number of nuts (0.26), (ii) Extraneous matter (0.05), (iii) Void nuts (0.06), (iv) Broken and damaged nuts (0.06), (v) Oozing of liquid from the cashew nut shell (0.07), (vi) Cutting test (0.09), (vii) Floating test (0.15), (viii) Length (0.04), (ix) Width (0.04), (x) Thickness (0.04), (xi) Moisture percentage (0.10) and (xii) Recovery of kernels (0.04). Thus, a composite index for each sample of cashew nut included in this study was worked out. The composite index was prepared by multiplying the quality parameters with their respective weightages and were added together to get the composite index number. Like this, the composite index was calculated for all the samples, which is presented in Table 1.

This, in turn, was the basis for scientific grading of cashew nuts. Stepwise multiple regression analysis was used to study the relationship between the price and grades.

Results and Discussion

This study has been divided into three parts. Part I presents the grade standards developed for raw cashew nuts in the study area. Part II presents the grade and qualitative variables and their inter-relationship. Part III depicts the results of stepwise regression analysis, indicating the most important variables contributing to the price.

Part I: The samples whose score (refer to Table 1) was 52.01 to 56.0, were designated as Grade I. Samples whose score was 48.01 to 52.0, as Grade II and so on. The composite index of 36.01 to 40.00 was grouped as Grade V.

Part II: In this part, an attempt was made to establish true relationship between the 12 qualitative variables and the scientific grades by means of correlation coefficients. It can be seen from Table 2 that all the variables carried the signs as expected. The variable of number of nuts was not only significant at 1 per cent level but also carried the sign as expected. It gave

Table l. Development of grade standards for cashew nuts in the study area

S. No.	Composite index	Grade number
1	52.01-56.00	I
2	48.01-52.00	II
3	44.01-48.00	III
4	40.01-44.00	IV
5	36. 01 -40 00	V

Table 2. Correlation between grades and quality characteristics of cashew nuts

S. No.	Quality character	Correlation co-efficient
1	Number of nuts	-0.926**
2	Extraneous matter	-0.727**
3	Void nuts	-0.702**
4	Broken and damaged nuts	-0.719**
5	Oozing of liquid from cashew nut shells	-0.708**
6	Cutting test	-0.770**
7	Floating test	-0.813**
8	Length	0.647**
9	Width	0.602*
10	Thickness	0.538*
11	Moisture percentage	-0.817**
12	Recovery of kernels	0.587*

Notes: *Significant at 5%, and
** Significant at 1% level

the signal to the producers to grow cashew nuts which were bold and weighed lesser nuts per kilogram.

It is observed from Table 2 that all the characteristics were having correlation with the scientific grade. Among variables, the number of nuts, extraneous matter, void nuts, broken and damaged nuts, oozing of cashew nut shell liquid, floating test, cutting test, moisture percentage and length were highly correlated with scientific grade. However, the negative sign indicated that increase in the value will result in lowering of the scientific grade.

It could be seen from Table 3 that only three variables contributed to the price determination. The regression coefficient of number of nuts (-0.027) was significant at 5 per cent level. While the regression coefficients of floating test and length were –0.013 and 0.357, respectively and both were significant at 1 per cent level. The R^2 value was 0.98, indicating that 98 per cent of total variations in price were explained by the qualitative variables.

Table 3. Stepwise multiple regression analysis for quality characteristics of cashew nut samples (Dependent variable –price)

S. No.	Variables	Regression co-efficient	R^2
1	Number of nuts	-0.027* (2.14)	0.98
2	Floating test	–0.013* (4.159)	
3	Length	0.357** (3.39)	

Note: Figures within the parentheses indicate the '*t*'- value
*Significant at 5% level
**Significant at 1% level

Conclusions

The grade standards of cashew nuts have been developed to study their price-quality relationship. Laboratory analysis, indexing, stepwise multiple regression analysis and tabular presentation have been used for data analysis. Five grade standards have been developed for cashew nuts, based on their composite index. The results based on price-quality relation have revealed that the number of nuts per kilogram, moisture percentage and cutting test affect the prices and these factors could explain 98 per cent of total variations in prices.

References

Harinath, M. (2001) A study on quality, grading, and prices of cocoon and raw silk marketing in Karnataka. *MABM Thesis,* submitted to the Department of Agricultural Marketing, Co-operation and Agri-Business Management, University of Agricultural Sciences, Dharwad.

Murthy, C. (1995) Development of grade standards for groundnut and impact of grading on prices in regulated markets of Chitradurga district, Karnataka. *M.Sc. (AgMaco) Thesis*, submitted to the Department of Agricultural Marketing and Co-operation, University of Agricultural Sciences, Dharwad.

Murthy, C. (1996) Development of grade standards for groundnut in Chitradurga district of Karnataka. *Indian Journal of Agricultural Marketing*, **10(1):** 26-42.

Shingargop, M.P. (1982) Impact of grading on prices. *Ph.D. Dissertation,* Institute of Development Studies, University of Mysore.

Wader, L.K. (1992) A study on quality, grading and prices in cotton marketing in Kamataka, *Unpublished Ph.D. Thesis*, submitted to the Division of Agricultural Economics, IARI, New Delhi.

Wader, L. K. and C. Murthy, (1998) Development of grade standards for cotton in Raichur and Hubli cotton markets of Karnataka. *Bihar Journal of Agricultural Marketing*, **6(3)**: 302-313.

Erratum

In the advertisement of NABARD published on the back cover page of the Conference Issue (2006) of Agricultural Economics Research Review published by Agricultural Economics Research Association (India) containing proceedings of the Conference on "Sustainable Agricultural and Rural Livelihood", the matter printed within the box regarding 'Investment in NABARD Capital Gain Bonds' may be treated as deleted and not published. The inadvertant error is regretted. For correct version of NABARD advertisement, kindly read back cover page of this issue of the journal.

Editor