

Consumer Acceptance of Different Flavoured Cashew (*Anacardium occidentale* L.) Butter Made from Blanched and Roasted Cashew Nuts with Olive Oil or Margarine

S.A.S.P. PERERA, M.D.K. VITHANA and S.J.B.A. JAYASEKERA

Department of Horticulture and Landscape Gardening, Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka, Makandura, Gonawila (NWP)

ABSTRACT

A study was carried out to evaluate the consumer acceptance of non flavoured, coffee flavoured and cocoa flavoured cashew (*Anacardium occidentale* L.) butter made from roasted and blanched cashew nuts with either olive oil or margarine. A sensory evaluation was carried out using a panel of 20 non trained tasters to check the consumer acceptance of taste, colour, smell, texture, overall quality and purchasing intention using a five point hedonic scale. The data were analyzed using non parametric Friedman test with Minitab 15 statistical package. Non flavoured butter made from roasted cashew nuts with olive oil and from blanched cashew nuts with margarine showed the highest acceptance.

KEYWORDS: *Anacardium occidentale*, Cashew nut butter, Sensory evaluation, Consumer acceptance

INTRODUCTION

Cashew is held with great esteem in many customs and cultures. Its value can be estimated from a question that appeared on the household census in Mozambique that asked whether the house owned any cashew trees. Cashew is known by many names. It is offered at wedding ceremonies as a token of fertility and is considered by many to have aphrodisiac properties (Azam-Ali *et al.*, 2001).

Vietnam now accounts for about 6 percent of total Asian production, and is the third largest cashew producer in Asia (Azam-Ali *et al.*, 2001). Sri Lanka has a very small share (around 2-2.5 percent) of the Asian cashew production market. Some of the cashews are processed locally while the remainder are exported to India for processing (Azam-Ali *et al.*, 2006)

The cashew kernel is considered to be of high nutritive quality (Ohler, 1979). The overall composition of the kernel is; protein 21%, fat 46% and carbohydrates 25%. The fat and oil content of cashew nut contributes substantially to its energy content and consists mostly of glycerides of oleic acid (73.8%) and linoleic acids (7.7%) (Ohler, 1979). The vitamin content of cashew nut kernels are given as 0.5 to 1.4 mg of thiamin per 100g and 0.58 mg of riboflavin per 100 g, a good proportion of vitamin E and traces of other vitamins (Kurup, 1989).

The primary product of cashew nuts is the kernel, which is the edible portion of the nut and is consumed in three ways: directly by the consumer, as roasted and salted nuts, in confectionery and bakery products, for

example, finely chopped kernels are used in the production of sweets, ice creams, cakes and chocolates, both at home and industrially and as paste to spread on bread. The relative importance of these uses varies from year to year and country to country, but it is estimated that at least 60 percent of cashew kernels are consumed as salted nuts. Separately packed cashew nuts are a good selling line, mainly as an appetizer to cocktail drinks. Cashew nuts are generally considered a luxury product and an element of their appeal may lie in this status (Azam-Ali *et al.*, 2006).

However, cashew nut production is hindered by a number of constraints such as low production levels of farmers, ineffective marketing, pricing and taxation policies and low and fluctuating market prices of raw nuts. Another major constraint which discourages smallholder farmers to increase production of nuts is lack of standards which harmonize with international standards (Anon, 2003).

One area that deserves special attention is the development of value added products for export. Opportunities exist for processors to penetrate these markets (Azam-Ali *et al.*, 2006).

Although good quality cashew nuts possess a high value in the market, broken pieces do not receive the same price. Therefore, this study was carried out to see the possibility of adding value to cashew nut pieces by making butter using different methods. This effort aims to encourage small holder cashew nut growers who find it difficult to produce high quality cashew nuts.

MATERIALS AND METHODS

Location

The study was carried out at the Department of Horticulture and Landscape Gardening of the Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka, Makandura, Gonawila from January to April, 2013.

Sample Collection

Cashew nut pieces were purchased from small holder farmers in Giriulla area.

Cashew nut Butter Preparation

Roasted/Blanched

Shelled cashew nut pieces were heated for 13 minutes to an internal temperature close to 145 °C to obtain the proper roasted flavour. The cashew nuts were then quickly cooled to stop the cooking at a definite point to produce a uniform product. Next, a part of roasted cashew nuts were blanched to produce blanched cashew nut butter. Roasted and blanched cashew nuts were then separately ground to a coarse texture and salt (2%) and sugar (6%) were added. Flavours were added according to the treatments (coffee flavour and cocoa). Oil separation of cashew nut butter was prevented by adding heated olive oil or margarine separately at levels of 5%; it was controlled further by keeping the product at 100°C. The desired textures were produced by final grinding.

Experiment 1: Evaluation of the Consumer Acceptance of flavoured Cashew nut Butter and Non Flavoured Cashew Nut Butter

Flavoured and non flavoured butter made from above mentioned methods were used for this experiment.

Experiment 2: Evaluation of the Consumer Acceptance of Roasted Non Flavoured Cashew Nut Butter and Blanched Non Flavoured Cashew Nut Butter

Roasted and blanched non flavoured butter made from above mentioned methods were used for this experiment.

Experiment 3: Evaluation of the Consumer Acceptance of Olive Oil Added Cashew Nut Butter and Margarine Added Cashew Nut Butter

Roasted cashew nut butter and blanched cashew nut butter were prepared by adding olive oil (15ml/100g) and margarine (15g/100g) separately.

Experiment 4: Evaluation of the Consumer Acceptance of Crunchy Cashew Nut Butter and Smooth Cashew Nut Butter

Crunchy and smooth butter made from above mentioned methods were used for this experiment.

Eight treatments were used for experiment 1 (Table 1).

Table 1. The treatments of experiments

Treatments	Descriptions
T1	Roasted/ margarine added/ non flavoured
T2	Roasted/ olive oil added/ non flavoured
T3	Blanched/ margarine added/ Non flavoured
T4	Blanched/ olive added/ Non flavoured
T5	Blanched/olive oil added/ Coffee flavoured
T6	Blanched/ Margarine added/ Coffee flavoured
T7	Blanched/ Olive oil added/ Cocoa flavoured
T8	Blanched/ Margarine added/ Cocoa flavoured

Sensory Evaluation

A panel of 20 non-trained tasters carried out the acceptance tests for both experiments 1 and 2. Sensory evaluation was conducted by hedonic rating scale, where the panelists were asked to rate colour, smell, taste, texture, overall quality and the purchasing intention using a structured five point hedonic scale (Peryam and Pilgrime, 1957). The Scale of acceptance was not 5 – strongly like, 4- like, 3-dislike nor like, 2-dislike 1-strongly dislike.

Selection of Most Accepted Treatments for Further Improvements

According to the consumer acceptance, four treatments were selected and improved for the second and third consumer acceptance tests (Table 2).

Table 2. Selected and modified treatments for second and third consumer acceptance tests

Treatments	Descriptions
T9	Roasted/ olive oil added/ crunchy
T10	Roasted/ olive oil added/ smooth
T11	Blanched/ margarine added/ crunchy
T12	Blanched/ margarine added/ smooth

RESULTS AND DISCUSSION

Median of acceptance ranks of each treatments were pooled and the grand median of acceptance rank was taken (Table 3).

Experiment 1: Evaluation of the Consumer Acceptance of Flavoured and Non Flavoured Cashew Nut Butter

There was a significant difference in the overall quality among all treatments. T2 and T3 showed highest median rank that is 4 (4 - like). Therefore, roasted non flavoured and blanched non flavoured cashew nut butters were selected and developed further (Table 3).

A significant lowest rank was recorded in all treatments for the smell at the first evaluation. According to the results panelists preferred roasted cashew nut smell. For colour a significant highest rank was recorded in T1 as most panelists preferred cream colour. According to the results both roasted cashew nut butters recorded better median ranks.

Experiment 2: Evaluation of the Consumer Acceptance of Roasted Cashew Nut Butter and Blanched Cashew Nut Butter

There was no significant difference in the preference for texture in any of the treatments. However, the overall quality of T2 and T3 was significantly better than the other treatments. Although not significant the highest median value of acceptance for the texture was received by blanched olive oil added butter. However, when all the parameters were considered; the highest purchasing intention was achieved by roasted olive oil added

cashew butter (Table 3). As there was no any significant difference it was assumed that both roasted and blanched butters were equally accepted by the panelists.

Experiment 3: Evaluation of the Consumer Acceptance of Olive oil Added Cashew nut Butter and Margarine Cashew nut Butter

According to the results, olive oil added roasted cashew nut butter and margarine added blanched cashew nut butter were accepted by the panelists (Table 3).

Although not significant the panelists have given equally high ranks for all the parameters (taste, texture, smell...etc.) for both olive oil added and margarine added cashew nut butter.

The results show that margarine added cashew nut butter has obtained 3.6875 as the median rank for purchasing intention and olive oil added treatment has obtained a median rank of 3.9375 (Table 4).

Therefore, margarine added treatments were also developed further as a low cost option for small scale entrepreneurs (Table 2). Grand median values of all the parameters tested in margarine added butters were only slightly different from the olive oil added treatments (Table 4). Therefore margarine added treatments were developed for the consumer acceptance tests.

Table 3. Grand median and probability values of consumer acceptance of eight treatments

Treatments	Colour	Smell	Taste	Texture	Overall quality	Purchasing intention
T1	4.0156*	3.0000	4.0938*	3.0625	3.9531	3.5313
T2	3.7031*	3.0000	4.1563*	2.9375	4.0156*	3.6563*
T3	3.3281	3.0000	4.0313*	3.0625	4.0156*	3.5938*
T4	3.5781	3.0000	3.9688	3.1875*	3.8906	3.5313
T5	2.7656	3.0000	3.7188	3.0625	3.5781	3.3438
T6	3.0781	3.0000	3.9688	3.0625	3.8906	3.5313
T7	3.2656	3.0000	4.3438*	3.0625	3.8906	3.5313
T8	3.3906	3.0000	3.9688	3.0625	3.8906	3.5313
Grand median	3.3906*	3.0000	4.0313*	3.0625*	3.8906*	3.5313*
PV	0.0000*	0.8010	0.0150*	0.0790	0.0310*	0.0190*

Median values are significantly different at 0.05 levels

Table 4. Grand median and probability values of treatments of second consumer acceptance test

Treatments	Colour	Smell	Taste	Texture	Overall quality	Purchasing intention
T9	3.1250	4.0000*	4.5000*	3.7500	4.0625*	3.9375*
T10	3.8750*	3.2500	3.5000	3.7500	2.9375	3.6875
T11	4.0000*	3.7500	3.5000	3.7500	3.1875	3.4375
T12	3.0000	4.0000*	3.5000	3.7500	3.5625	3.6875
Grand median	3.5000	3.7500	3.7500	3.7500	3.4370	3.6875
PV	0.0000*	0.0090*	0.0000*	0.9540	0.0000*	0.0578

Median values are significantly different at 0.05 level

Table 5. Grand median and probability values of treatments of second consumer acceptance test

Treatments	Colour	Smell	Taste	Texture	Overall quality	Purchasing intention
T9	3.562	4.1250*	4.4375*	3.8750	4.1250*	4.0625*
T10	4.1875*	4.0000*	3.9575	4.1250*	3.8750	3.9375
T11	4.0625*	3.8750	3.6875	4.0000*	3.8750	3.9375
T12	3.9375	4.0000*	3.6875	3.5000	3.6250	3.8125
Grand median	3.9375	4.0000	3.9375	3.8750	3.8750	3.9350
PV	0.0250*	0.0490*	0.0090*	0.0170*	0.3210	0.1810

Median values are significantly different at 0.05 level

Experiment 4: Evaluation of the Consumer Acceptance of Crunchy Cashew nut Butter and Smooth Cashew nut Butter

Significant differences were shown for colour, taste and the overall quality in all treatments. The highest median ranks of colour were shown in T10 and T11; 3.8750 and 4 respectively as the natural roasted cashew nut colour was preferred by the majority of the panelists. Therefore, addition of artificial colouring can be avoided. T9 and T12 showed the highest median ranks for the smell (Table5). A significantly high median rank was recorded for the overall quality of T1 as (4-like). The reasons could be for this more roasted taste and crunchy texture.

CONCLUSIONS

Non flavoured butter made from roasted cashew nuts with olive oil and from blanched cashew nut with margarine showed the highest acceptance. Both smooth and crunchy textures were equally accepted.

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