

Sensory Evaluation of Different Flavoured and Textured Cashew (*Anacardium occidentale* L.) Butter Made from Cashew Nut Pieces

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Abstract

A study was carried out to develop and to evaluate the consumer acceptance of non flavoured, coffee flavoured and cocoa flavoured cashew butter from roasted and roasted and partially cooked cashew nut pieces with either olive oil or margarine. A sensory evaluation was carried out using a panel of 20 untrained panelists to check the consumer acceptance of taste, colour, smell, texture, overall quality and purchasing intention. The data were analyzed using non parametric Friedman test. Sensory data revealed that non flavoured butter made from roasted cashew nut pieces with olive oil and, from roasted and partially cooked cashew nut pieces with margarine showed the highest acceptance compared to coffee and cocoa flavoured butter. Both smooth and crunchy textures were equally accepted.

Key words: Butter, Cashew nut pieces, Sensory evaluation

Introduction

Cashew (*Anacardium occidentale* L) is becoming an important cash crop in Sri Lanka where there is a great potential for increased production for the local and export markets. The total extent of cashew in 2011 was about 30,000 ha and it has high potential for growing in the dry areas of the island due to its tolerance to moisture stress over long periods (Surendra, 2012).

Cashew kernel is consumed as a snack or used for confectionaries. Cashew kernel curry is also famous in Sri Lanka as a tasty traditional dish. A range of value added cashew products such as garlic coated, salted, roasted, spicy, devilled, burned, cashew toffees and cashew cookies and Cashew wine (Cazsholeena) from cashew apples have been developed by Sri Lanka Cashew Cooperation (Surendra, 2012).

Cashew nut is highly nutritious and provides a substantial amount of energy. The kernel contains 21% protein, 46% fat and 25% carbohydrate. A good proportion of vitamin E and traces of other vitamins are

also present in cashew (Ohler, 1979). The fats and oils in cashew nuts are 54% monounsaturated (18:1), 18% polyunsaturated (18:2), and 16% saturated (9% palmitic acid [(16:0) and 7% stearic acid (18:0)]). These fats and oils contribute substantially to the energy content. Cashews, as with other tree nuts, are a good source of antioxidants. Alkyl phenols, in particular, are abundant in cashews. Cashews are also a good source of dietary trace minerals copper, iron and zinc (Anon, 2013).

Although cashew nuts obtain a high value in the market; broken pieces of different sizes do not receive the same price. Therefore, this study was carried out to add value to cashew nut pieces by making butter. Cashew butter is particularly known for calcium, iron, protein, magnesium, "B" vitamins and zinc and can be used in place of peanut butter or as an ingredient in cookies, spreads or other dishes. Thus, this study was aimed at diversification of value added products from cashew nuts to encourage small scale entrepreneurs who find it difficult to maintain a high standard of quality in nut production.

Materials and Methods

Preparation of cashew nut butter

1. Using roasted or roasted and partially cooked cashew nut pieces

Shelled cashew nut pieces were roasted for 13 minutes at 145 °C in an oven. The cashew nut pieces were then quickly cooled to room temperature using suction fans, to prevent the nuts from over cooking and to ensure that the natural oils remain (Dera, 2010). A portion of roasted cashew nut pieces were partially cooked by boiling them in water for 7 minutes to soften the nut pieces with the objective of producing a smoother texture. Roasted and partially cooked cashew nut pieces and only roasted cashew nut pieces were separately ground to a uniform coarse textured paste using a warring commercial blender (Model number: IS 4250, Serial number: 400818/318, India). Then 2% Salt and 6% sugar were added to cashew nut paste respectively and mixed thoroughly.

2. Using olive oil or margarine

Hydrogenated vegetable oil is considered a stabilizer as it keeps the natural cashew nut oil from separating from the butter and rising to the top of the jar (Dera, 2010). Thus, oil separation of cashew butter was prevented by adding olive oil or margarine separately at the level of 5% each; according to the treatments of experiment 1 and 2 (Table 1). Oil separation was controlled further by keeping the product under refrigeration conditions. The

desired textures were produced by mixing butter further using a commercial blender.

Preparation of flavoured cashew nut butter

Powdered coffee and cocoa were added in the amount of 2% each to cashew butter made using above methods according to the treatments in the experiment 1 and 2 (Table1).

Sensory evaluation

Twenty untrained panelists carried out the acceptance tests for both experiments 1 and 2. Cashew butter developed under different methods spread on 2 cm² size pieces of bread were presented to the panelists. Sensory evaluation was conducted using the Hedonic scale on 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 (Five-Point Hedonic Scale)

5 - Like extremely, 4 - Like, 3 - Neither like nor dislike, 2 - Dislike, 1 - Dislike extremely

Selection of most accepted treatments for further improvements

According to the results of consumer acceptance test 1, four treatments were selected and improved for the second and third consumer acceptance tests (table 2).

Table 1. Treatments of experiment 1 and 2

Treatment	Sample
T1	Roasted/margarine added/non flavoured
T2	Roasted/olive oil added/non flavoured
T3	Roasted and partially cooked /margarine added/non flavoured
T4	Roasted and partially cooked /olive oil added/non flavoured
T5	Roasted and partially cooked /olive oil added/coffee flavoured
T6	Roasted and partially cooked /margarine added/coffee flavoured
T7	Roasted and partially cooked /olive oil added/cocoa flavoured
T8	Roasted and partially cooked /margarine added/cocoa flavoured

Table 2. Selected and improved treatments from the 1st consumer acceptance test

Treatment	Sample
T9	Roasted/non flavoured/olive oil added/crunchy
T10	Roasted/ non flavoured/olive oil added/smooth
T11	Roasted and partially cooked / non flavoured/margarine added/crunchy
T12	Roasted and partially cooked / non flavoured/margarine added/smooth

Results and Discussion

Experiment 1: Evaluation of the consumer acceptance of roasted, non flavoured cashew butter and roasted and partially cooked different flavoured cashew butter

Medians of acceptance ranks of each treatment were pooled and the Grand median of acceptance rank was taken. There was a significant difference in the overall quality among all treatments (Table 3).

Experiment 2: Evaluation of the consumer acceptance of olive oil added cashew nut butter and margarine added cashew nut butter

According to the consumer acceptance results, olive oil added roasted cashew nut butter and margarine added partially cooked cashew nut butter were accepted. When the median rank of acceptance was considered; olive oil added treatment showed a slightly higher median rank than margarine added cashew nut butter for purchasing intention. However, margarine added treatments were also selected for further improvements as low cost options for small scale entrepreneurs.

Results revealed that roasted, olive oil added, non flavoured (T2) and roasted and partially cooked, margarine added, non flavoured (T3) butter were the most preferred showing a median rank of acceptance 4 (like). They were of a lighter colour than the flavoured butter. Coffee and cocoa powder changed the creamy colour of cashew butter into a darker brown, which was not preferred by many. The lower acceptance of flavoured butter showed that the panelists preferred original cashew flavour over a combination of flavours (cashew + cocoa and cashew + coffee). Therefore, T2 and T3 were selected and their textures were improved further according to the comments made by the panelists (Table 2). Crunchy butter was developed by mixing partially ground cashew nut pieces with cashew nut paste and smooth textured butter was developed by further grinding the paste until it becomes very smooth.

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

Table 3. Probability values of acceptance of all treatments of consumer acceptance test 1 and 2

Acceptance test	Color	Smell	Taste	Texture	Overall quality	Purchasing intention
1	0.0000*	0.009	0.0000*	0.0009	0.0000*	0.0578
2	0.025*	0.049*	0.009*	0.017*	0.321	0.181

(* Significantly different at 0.05 level)

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