Utilization of kolanut and cocoa in beverage production

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Keywords

Drinks industry, Taste, New product development

Abstract

An attempt to partially replace cocoa with kola in beverage production was investigated. This was achieved by varying the level of kola in the beverage at ratios of 10:0, 7.5:2.5, 5.0:5.0, 2.5:7.5, 0:10. These ratios of beverage were all characterised physicochemically as well as organoleptically and they have all proved satisfactory and acceptable; hence making kola-cocoa beverage a feasible instant beverage.

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Introduction

The kola tree (*Cola nitida*) and cocoa (*Theobroma cacao*) tree are native to West Africa. They are beverage crops grown in Nigeria which have gained international acceptability. Their extracts can be used to flavour drinks and to produce several herbal "teas" for local consumption. This is because of their characteristic flavour that people have found to be pleasant. They also gain their popularity from their stimulating properties which, unlike some other stimulants, have no obvious side effects.

The stimulating effect and the pleasant characteristic flavour of kola and cacao are due to the presence of phenolic compounds. Lee and Jarworski (1987) report that phenolic compounds are responsible for the colour and flavour of fresh fruit and processed products. They are important products in enology and contribute to the organoleptic nature of wines (flavour, astringency, and hardness). They are also important in chemotaxonomy and plant pathology (Odebode, 1995). Phenolic compounds have been implicated in host resistance to pathogens.

Cocoa is currently being used to produce thermo resistant chocolate at CRIN Ibadan. Kolanuts have also been successfully used in producing kola soft drinks (Jayeola, 1999). Nigeria exports most of its cocoa to the USA and European countries where it is processed into chocolate and other cocoa confectioneries.

Cocoa is the seed of the cocoa tree (*Theobroma cacao*) that has been fermented and properly dried. In the manufacture of chocolate and other cocoa products of commercial importance cocoa nibs are the most valuable portion. Cocoa nib is the portion of the dry seed left after the shell has been removed. The consumption of conventional chocolate and other cocoa confectioneries in Nigeria is very low compared with the total production of cocoa in Nigeria.

The need to utilize more cocoa in the producing countries cannot be overemphasized particularly with the unstable price for cocoa in the world market. Utilization of cocoa in the producing countries will offer job opportunities to many people and it will be possible to integrate cocoa and cocoa products into the local food habits (Ogutuga and Williams, 1975).

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Kola chocolate is a new brand of chocolate that is being produced by CRIN. Kolanut is substituted for all parts of the cocoa nib content in conventional chocolate production.

Kolanut is produced by the fruit of cola spp., which belongs to the family *Sterculiaceae* of this species. Two types have assumed commercial importance namely *Cola nitida* and *Cola acuminata*, the former being the more economically important. *Cola nitida* is characterised by nuts of two cotyledons and they appear in red, pink and white. While *Cola acuminata* is characterised by four to six cotyledons and mainly used to fulfil traditional roles. The greatest use to which the kolanut is put at present is to chew it as a stimulant. Kolanut is generally believed to develop a milder and more acceptable taste after being stored for about 2-12 months in Aframonium, mitrage and banana leaves. It is believed that small doses of kolanut increase mental activities, reduce the need for sleep and also dispel hunger and thirst. It is for this reason that kolanut chewing is very popular among student drivers and many people in Nigeria.

The attributes of kolanut and cocoa as beverage crops have generated the interest for this work regarding their use in beverage production.

Materials and methods

Kolanut (*Cola nitida*) powder and cocoa (*Theobroma cacao*) were used in the production of beverages. Five different beverages were produced from kolanut and cocoa in combination with milk, corn starch and sugar.

The beverages were instantised to be made with hot or cold water. The ratio of kola and cocoa powder are 100:0, 75:25, 50:50, 25:75, and 0:100.

The beverages were packed in polythene bags and sealed. Proximate analysis were carried out on the products using *Official Methods of Analysis* (Association of Official Analytical Chemists, 1990). The energy values of the beverages were determined by multiplying the percentage value obtained from fat, protein and carbohydrate by the value 9, 4, and 3.75 respectively. Sensory evaluation of the products was also carried out to analyse taste, colour, dispersability, flavour and overall acceptability using ten trained panelists.

The results of the blends are shown in Table I. The beverage becomes darker as the cocoa powder concentration increases whereas the plain kola beverage has a brick-red color. The results of the proximate analysis of the beverages are shown in Table II. The protein and fat content gives the trend of continuous increase in protein and fat as the cocoa powder increases. This could be as a result of the high protein and fat content of cocoa powder. There is no significant difference between the beverages in pH and ash content.

The caffeine content of the beverages is higher in samples with kolanut powder. This could be as a result of higher content of caffeine present in kolanut than in cocoa as reported by Egbe and Sobamiwa (1990). The sensory evaluation results are shown in Table III. All the beverage samples were acceptable to the tasters and there were no significant differences between the scores.

Conclusion

Beverage production from kola, cocoa as well as their kola chocolate and cocoa beverages have lower caffeine. This is recommended for people who prefer decaffeinated beverages. Studies are going on to determine the shelf life of these products.

Table I Formulation ratio for kola-chocolate beverages

	Formulation				
	A	B	C	D	E
Kola powder	10.0	7.5	5.0	2.5	–
Cocoa powder	–	2.5	5.0	7.5	10.0
Sugar	30.0	30.0	30.0	30.0	30.0
Milk (powder)	5.0	5.0	5.0	5.0	5.0
Corn starch	5.0	5.0	5.0	5.0	5.0

Note: All figures are g (dried material) per 50g

Table II Proximate analysis of kola-chocolate beverages

	Formulation				
Parameter	A	B	C	D	E
Moisture (%)	12.01	12.22	12.24	12.26	12.12
Protein (%)	7.44	7.88	9.63	12.06	10.74
Carbohydrate (%)	76.24	75.46	75.82	75.49	76.14
Fat (%)	0.98	1.01	1.14	1.24	1.26
Ash (%)	0.98	1.01	1.14	1.24	1.26
Caffeine (parts per 10,000)	1.70	1.02	0.84	0.56	0.23
pH	6.60	6.30	6.20	6.20	6.30
Energy (kcal/100g)	324.48	324.51	333.11	334.49	340.63

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Table III Sensory evaluation results of kola-chocolate beverages

Formula	Taste	Color	Flavor	Dispensability	Overall acceptability
A	6.40	7.00	6.50	6.20	6.20
B	6.50	7.20	6.50	6.40	6.60
C	6.90	7.20	6.60	6.60	6.60
D	6.50	7.40	6.80	6.40	6.50
E	6.60	7.40	6.86	6.30	6.60
Mean	6.58	7.24	6.64	6.38	6.50
p	NS	NS	NS	NS	NS
Coefficient of variation (%)	22.61	2.12	23.40	23.62	22.45
SE	0.211	0.234	0.242	0.287	0.230

Notes: NS = not significant. Ratings are on a nine-point scale; 9 = like extremely; 8 = like very much; 7 = like moderately; 6 = like slightly; 5 = neither like nor dislike; 4 = dislike slightly; 3 = dislike moderately; 2 = dislike very much; 1 = dislike extremely

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