

Acceptability and Nutrient Composition of Multiple Blend Fruity Creams

Mustapha, R.A.¹, Amodu, S.O.², Olatunji, C.A.²

¹Department of Nutrition and Dietetics, Rufus Giwa Polytechnic, PMB 1019, Owo, Ondo State, Nigeria

²Department of Hospitality Management Technology, Rufus Giwa Polytechnic, PMB 1019, Owo, Ondo State, Nigeria

Abstract:- The acceptability and nutrient composition of multiple blend fruity creams were investigated. Pineapple, pawpaw, watermelon, apple and banana blends were formulated into four samples of varied ratio of fruit components. Proximate, Atomic Absorption Spectrophotometer(AAS) and organoleptic analysis was used to determine nutrients and acceptability of the samples. Results show that titrable acidity ranged from 0.03 to 0.16 while their P^H ranged from 4.32 to 4.59, total soluble solids ranged between 12.33 to 15.00, specific gravity from 0.79 to 0.97, Ash from 0.18% to 0.49% and vitamin C contents ranged from 50.70 to 55.70mg/100g. The samples were relatively low in protein fat and zinc but high in iron, calcium and magnesium. Samples subjected to sensory evaluation revealed that there were no significant difference(p<0.05) among the multiple blend fruity cream samples with respect to colour, taste, aroma, texture and overall acceptability. Sample with the highest pineapple was the most accepted. Multiple blend fruity cream will go a long way to prevent scurvy, constipation and overweight and also serve as a substitute to milk-based ice cream.

Keywords: Multiple blend, Fruity cream, Nutrients composition, Acceptability.

I. INTRODUCTION

Fruits are nature's wonderful gift to mankind and packed with vitamins, minerals, anti-oxidants and many phytonutrients¹. Fruits are an absolute feast to our sight, not just because of their colour or flavour but for their unique nutrients profile that help the human body free of diseases and stay healthy². They are low in calories and fat and are a source of simple sugars, fibre and vitamins¹. Also, they are rich sources of vitamin C, vitamin A, sodium, potassium, magnesium and cellulose which are essential for optimizing our health.

Fruits contain some antioxidants like polyphenolic, flavonoids and anthocyanin which help human body to be protected from oxidative stress, diseases and cancers and it also help the body to develop capacity to fight against ailments by boosting the immunity level². Ice-cream is a frozen dessert usually made from dairy products such as milk and cream and often combined with fruits or other ingredients and flavors. In some cases, artificial flavouring and colouring are used in addition to the natural ingredients³. Most ice-cream is purchased by the consumer on basis of flavour and ingredients. There are different flavours of ice-cream manufactured and to some extent limited only by imagination⁴. Many milk-based ice-cream consumers are unable to digest lactose-the primary sugar in milk because they don't produce

enough of the enzyme-lactase which is needed to break the beta bond of lactose which joined glucose and galactose⁵. Inability to digest lactose can cause intestinal gas bloating, discomfort and cramping as the unabsorbed lactose is metabolized into acids and gases by bacteria in the large intestine⁶.

Adedjiet *et al.*⁷ conducted a study on a ready-to-serve wine using pawpaw and watermelon blend in ratio(pawpaw juice: watermelon juice) 90:10,80:20,70:30,60:40 and 50:50 and they were subjected to sensory evaluation respectively. Result shows that sample with ratio 60:40 have the highest acceptability and quality. Paulo *et al.*⁸ conducted similar analysis to develop a mixed nectars of tropical fruits(cashew, apple, mango and acerola) which were subjected to sensory. Result shows that the formulation with the highest mango and cashew and lower acerola contents was the most accepted. Marta *et al.*⁹ investigated optimal proportions of three concentrate juices (passion fruit, pineapple and banana) mixed with white grape juice using preferences mapping techniques. Internal preference map for flavour and colour acceptability revealed that a commercial mix of pineapple with white grape juice mix was the most accepted. The study is design to know the acceptability and nutrient composition of multiple blend fruity creams.

II. MATERIALS AND METHOD

Fruit Collection: The pineapple, pawpaw, watermelon, apple and banana fruits used for this study were bought from 'Emure' market, Owo, Ondo State, Nigeria. The fruits were thoroughly sorted and graded to remove bad ones from the lot. The sorted fruits were washed twice, first with water containing vinegar and then in clean water to remove adhering soils, dirt and extraneous materials, the fruits were peeled thereafter sliced to remove seeds from the fruits. They were then diced and blended to a creamy texture. The fruity cream were coded and designed as follows for equal proportion of each fruity cream component.

Sample Codes and Designation

Samples	Pineapple Blend	Pawpaw Blend	Watermelon Blend	Apple Blend	Banana Blend
389	50	15	10	10	15
421	15	10	50	10	15
561	15	10	10	15	50
626	10	10	15	50	15

Physico-Chemical Qualities Determination: All the physicochemical qualities/parameters (moisture, ash, crude protein, crude fibre, crude fat, specific gravity, pH, vitamin C, total titratable acidity, refractive index and minerals) were determined according to the methods adopted by AOAC¹⁰.

Sensory Evaluation: The panelist was provided with 5 drops of lime juice mixed with water to rinse their mouth after each taste of samples in order to get the real taste of samples provided. Using multiple comparison best, Sensory evaluation of the fruity cream samples will be carried out by 10 trained panelists in a Sensory evaluation attributes evaluated laboratory. Sensory attributes evaluated were taste, aroma, colour, texture and overall acceptability using nine point hedonic scale of 1 to 9 where 1 indicates dislike extremely and 9 indicate like extremely.

Statistical Analysis : One way Analysis of Variance (ANOVA) using repeated measures was conducted on the physico-chemical qualities and mean separation was done with Duncan's Multiple Range Test (DMRT) when the level of significance at 5% were observed, means were separated using Turkey test¹¹ and descriptive statistics was done on the sensory attributes.

III. RESULTS AND DISCUSSION

Table 1. Physicochemical properties of the multiple blend fruity cream.

	Sample 389 Mean±S.D	Sample 421 Mean±S.D	Sample 561 Mean±S.D	Sample 626 Mean±S.D
Ash content (%)	0.23±0.15	0.18±0.01	0.20±0.01	0.49±0.01
Crude fibre (%)	0.46±0.10	0.37±0.10	0.54±0.09	0.50±0.05
pH	4.55±0.07	4.59±0.15	4.57±0.10	4.32±0.15
Total titratable acidity	0.03±0.004	0.03±0.005	0.04±0.01	0.16±0.22
Specific gravity (%)	0.93±0.04	0.79±0.17	0.91±0.09	0.97±0.008
Brix level (degree)	15.00±3.00	12.33±1.52	14.00±2.00	14.00±2.00
Vitamin C. (mg/100g)	50.70±0.10	54.63±0.15	53.60±0.20	55.70±0.10

Sample 389: pineapple(50), pawpaw(15), watermelon(10), apple(10), banana(15)

Sample 421: pineapple(15), pawpaw(10), watermelon(50), apple(10), banana(15)

Sample 561: pineapple(15), pawpaw(10), watermelon(10), apple(15), banana(50)

Sample 626: pineapple(10), pawpaw(10), watermelon(15), apple(50), banana(15)

Table 2. The Nutrient Composition of the Multiple Blend Fruity Cream

	Sample 389 Mean±S.D	Sample 421 Mean±S.D	Sample 561 Mean±S.D	Sample 626 Mean±S.D
Protein content (%)	1.32±0.01	1.65±0.32	2.08±0.09	2.67±0.15
Fat content (%)	1.06±0.05	1.16±0.08	1.62±0.14	0.70±1.62
Zinc (mg/l)	0.04±0.03	0.06±0.03	0.08±0.01	0.17±0.11
Iron (mg/l)	8.16±0.05	8.16±0.2	10.23±0.15	16.16±0.57
Calcium (mg/l)	11.33±1.52	10.00±1.00	13.67±1.52	17.00±1.00
Magnesium (mg/l)	11.67±1.52	12.00±1.00	13.83±0.76	14.00±1.00

Sample 389: pineapple(50), pawpaw(15), watermelon(10), apple(10), banana(15)

Sample 421: pineapple(15), pawpaw(10), watermelon(50), apple(10), banana(15)

Sample 561: pineapple(15), pawpaw(10), watermelon(10), apple(15), banana(50)

Sample 626: pineapple(10), pawpaw(10), watermelon(15), apple(50), banana(15)

Table 3: The sensory result of the multiple blend fruity cream

	Sample 389	Sample 421	Sample 561	Sample 626
Colour	7.1	6.7	5.7	6.3
Taste	6.8	5.5	5.6	6.3
Aroma	6.5	5.8	5.4	5.4
Texture	5.4	6	4.7	5.5
Overall acceptability	6.2	6	5.1	5

Sample 389: pineapple(50), pawpaw(15), watermelon(10), apple(10), banana(15)

Sample 421: pineapple(15), pawpaw(10), watermelon(50), apple(10), banana(15)

Sample 561: pineapple(15), pawpaw(10), watermelon(10), apple(15), banana(50)

Sample 626: pineapple(10), pawpaw(10), watermelon(15), apple(50), banana(15)

The result of the physicochemical analysis and nutrient composition conducted as shown in table 4 and table 5 indicated the titratable acidity of the multiple blend fruity creams ranging from 0.03 to 0.004 with sample 561 and sample 626 having the highest value. The proportion of apple and banana was high in these two products and study by Bazzano *et al.*¹⁶ have shown that. The P^H of the four samples ranges from 4.36 to 4.63 with sample 626 having the highest acidic content (P^H 4.36) and this may probably be due to the tart taste which indicate the presence of acid in the sample.

The total soluble solid was between 11.00⁰ to 15.00⁰ brix which indicate the presence of sugar in the fruity cream and it may be use as an indication of energy (carbohydrate) in the fruity cream. Sample 389 has the highest sugar content which may be due to the degree of ripeness of the highest proportion of pineapple used and also the brix contents of the samples are moderate, safe for consumption and will be easy to digest by humans¹². The highest brix content of the multiple blend fruity cream also agrees with Food and Agricultural Organisation that as fruit matures, the sugar and colour increases and any fruit product above 18.00 brix is too ripe for consumption. The specific gravity ranges from 0.968 to 0.971 with sample 389 and 421 having the highest specific gravity which was similar to Nidhi *et al.*¹³ products.

The multiple blend fruity cream provides a considerable amount of vitamin C has been reported to provide more than one third of the daily requirements¹⁴. However, vitamin C. contents of the fruity cream ranges from 50.6 to 55.6mg/100g with sample 626 having the highest content (55.6mg/100g) probably due to its high content of apple, the fruity blend may provide more than two-third of the daily requirement, vitamin C. content of the fruity cream was high probably because they does not pass through any heat treatment, ascorbic acid is vital for iron absorption as well as the formation of intracellular protein collagen and it helps to prevent molecular changes caused by oxidation¹⁵.

The crude fibre ranges from 0.46% to 0.64% with sample 561 having the highest fibre content and this may probably be due to the highest proportion of banana used because banana is known for its high fibre content¹⁶. The Ash content of the fruity creams ranges from 0.18% to 0.49% with sample 626 having the highest ash content probably due to its highest proportion of apple because apple has been known for its mineral-rich content¹⁷. Protein content of the fruity cream ranges from 1.32% to 2.67% with sample 626 having the highest protein content. The fruity cream samples are relatively low in protein and fat, therefore, they are poor sources of these nutrients and this correlate with the study of Ogbona *et al.*¹⁸ and that of Nnam *et al.*¹⁹.

The fruity cream was relatively low in Zinc ranging from 0.04mg/l to 0.17mg/l with sample 626 having the highest zinc content, the iron, calcium and magnesium contents ranges from 8.2 to 17.5mg/l, 10 to 17mg/l and 12 to 14.5mg/l respectively. Divalent mineral elements (Fe²⁺, Ca²⁺ and Mg²⁺) function as enzyme stabilizers and transport co-factors in metabolic pathways in addition to other critical and various physiological functions²⁰. Sample 626, 626 and 561 have the highest amount of iron, calcium and magnesium in them probably due to the high proportion of apple and banana in 626 and 561 respectively.

The result of statistical analysis (ANOVA) for the sensory characteristics shows that there was no significant difference in their organoleptic attributes evaluated. However, sample 389 was scored best in term of colour, taste and aroma, this may be due to the aroma, cream colour, taste

and flavour of pineapple which is the most commonly used as flavourants in juice and most fruits drink; the much familiarity of the consumers to pineapple taste at the expense of other fruits gave it the same edge; this agrees with the study of Ogbona *et al.*¹⁸ on a comparative study of the nutritive factors and sensory acceptance of juices from selected Nigerian fruits (Orange, pineapple and pawpaw) of which pineapple juice has the highest acceptability.

Sample 421 was scored best in texture, this is partly as a result of the watermelon which was present in highest quantity. Overall general acceptability was given to sample 389. The level of other attributes which was scored best was responsible for its overall acceptability amongst the samples. Generally, the samples compared favourably well with one another and can be used or consumed alternatively to one another based on individual's preferred taste and colour.

IV. CONCLUSION

The aim of this study was to comparatively evaluate the nutritional composition and sensory acceptance of multiple blend fruity cream of different proportions of pineapple, pawpaw, watermelon, banana and apple blends. The multiple blend fruity cream is rich in vitamin C, crude fibre, sugar, and minerals although low in zinc. They contain relatively low protein and fat, which make it to be a poor source of protein and fat. The dietary fibre content is beneficial to individuals who intend to shed some weight as well as persons suffering from heart diseases. On the Other hand, its minerals, Vitamin C and sugars will offer good nutritional benefits. The organoleptic analysis showed that the multiple blend fruity cream is good and recommended for commercial production and consumption.

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