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Production and physico chemical analysis of mango squash from local fruits in Mogadishu Somalia

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Abstract

Mango is one of the world's most important tropical fruits, which is marketed and consumed fresh or processed. And one of the most important tropical fruits of Somalia. Over the years, increased production has been observed in combination with significant post-harvest losses, which are partly attributed to damage after harvest. This study is aimed at producing and analyzing the physical and chemical characteristics of mango squash in Somalia. The study's objective is to identify the best possible mango squash formulation. Analyses the physical and chemical properties of mango squash and determine the sensory quality of mango squash. The research will focus on the Banadir region of Somalia, where data will be collected from December 2022 to June 2023. The size of the sample analysis would be 30 samples. The results showed that PH levels increased, total soluble solid content decreased, and TDS content increased, and the quantity of samples significantly affected the mango Squash storage time. We conducted approximate analyses of three mango squash samples; results showed that samples 1 were humid (38.22), fats (0.02), fibers (0.57), proteins (0.02), ash (0.15), carbohydrates (61.03), samples 2 (42.00, 0.01, 0.99, 0.01, 0.18, 56.18), and samples 3 were very sensitive to the measurement or total acceptance rating of the ambient temperature (room temperature). This study shows the methods of forming and analyzing mango squash in Somalia, which will benefit consumers: consumers: taste different kinds of local fruit and know the health benefits of the different local fruit squash.

Keywords: Mango, production and physic-chemical, Mogadishu Somalia, squash, local fruit

1. Introduction

The mango, or *Mangifera indica* L., is a succulent fruit that is a member of the Mangifera family of flowering plants, which includes many tropical fruiting trees. Fruits and their juices are among the most essential foods that humans consume because they preserve health and replenish the nutrients that the body loses via digestion. The mango tree is a typical representative of the tropics. At temperatures below 19 degrees Celsius, growth and productivity decrease significantly. It therefore grows best in tropical lowlands 600 M. above sea level. Fruit juice provides a range of earthly micronutrients, making it nutrient-dense and essential to a balanced diet.

Citrus fruits, especially oranges and lemons, mango are some of the most popular tropical fruits grown globally. They are the second-largest fruit crop by volume after bananas. In Cameroon, people enjoy citrus fruits in many ways, including eating them fresh, adding them to food and drinks, or turning them into juice. The flavors, sugars, and acidity of citrus fruits also make them popular for use in food formulations and sweets.

The type of rainfall of the study area is Somalia receives 250 millimeters of rain on average per year, with the southwestern region receiving significantly more at 700 millimeters. The transition between the wet and dry seasons is good for production. The tree bears fruit twice a year in Somalia, during the Gu (April-May) and Deyr (October-December) wet seasons.

Majority of fruits are seasonal and the nutrients they contain cannot be assessed every time. Fruits have short shelf lives so they tend to spoil within a short period after harvest, because they contain high amount of water (more than 90%). Therefore, it is important to make many varieties of products from fruits in Somalia (therefore production of squash from mango will increase fruit products in Somalia and to reduce post-harvest spoilage) the perishability of

fruit is attributed to immense physiological changes after harvest. To reduce losses, utilize green fruits for pickles, chutneys, or sundried acidifying condiments (AMCHUR), while mature fruits are used for preserves, jams, and sauces. Squash is a concentrated syrup without alcohol, typically flavored with fruit juice and produced with water, sugar, and/or sugar replacement. Before consumption, squash needs to be blended with a specific volume of water or carbonated water. Fruit squashes are growing more and more popular when compared to artificially flavored beverages, presumably because to their flavor, taste, nutritional content, and durability in storage. Of all the drinks, squash.. Juice blending is one of the best methods to improve the nutritional quality of the fruit's beverages. It can improve the vitamin and mineral content depending on the kind and quality of fruits and vegetables used our country has no industries that produce squash beverages to develop the industry of our country To evaluate different fruit varieties, a large number of mango, citrus and other small fruit varieties were collected . The goal was to identify superior performers in the multiplication process and distribute them to farmers.

This study investigates the formula-tion, production, and quality characteristics (both physicochemical and sensory) of mango squash produced in Mogadishu, Somalia and this study aims to investigate its quality and production. Specifically, the researchers seek to develop the squash, analyze its physicochemical properties, and taste test it to determine its sensory quality in order to determine consumer acceptability.

Materials and Methods

The fresh ripe mango (84.61% of moisture) were purchased from the neighborhood market and carefully cleansed with drinkable water prior to pulp processing. Filtered water was used. We bought sugar from the nearby market. Nairobi is where Potassium Metabisulphite (KMS), citric acid, and other chemicals were purchased.

All of the reagents and chemicals utilized by the Food Chemistry Laboratory in the Department of Food Science to analyze each and every sample of mango squash, Nutrition & Technology- faculty of Agriculture University of Nairobi.

2.1 procedure for preparation of mango squash

At first, pulp was extracted from mango. Mango was washed thoroughly, peeled and cut into slices than was blended in electrical blender separately. After proper blending than the pulp was screened by using Muslim cloth. After that the squash was formulated.

The formulation of squash was coded as Pulp S0 = mango (100%); Sample (S1), sample2 (S2) and sample3 (S3) for the study.

The following procedure was used to prepare the squash. At first pulp, sugar, potassium, citric acid, guar gam was separately weighed and water also measured according to the calculation. Sugar citric acid guar gam and water were mixed and heated to prepare squash mixed thoroughly until dissolved than cooled. Potassium and sodium were added measured pulp was then mixed with the cool syrup and squash was prepared. Color and flavor were added squash finally the squash was poured in sterilized bottle and sealed carefully

Table 1: Mango squash preparation procedures

Ingredients	Sample 1	Sample 2	Sample 3
Sugar	2000g	1150g	900g
Water	500L	500L	500L
Pulp	500g	500g	500g
Potassium	2g	1.75g	1.5g
Sodium	0.5g	0.4g	0.38g
Citric acid	8g	7g	6g
Guar gam	5g	4.375g	3.75g
Color	5oz	3oz	1oz
Flavors	3oz	2oz	1oz

Key: Sample 1 = Pulp (500): sugar (2000)

Sample 2 = Pulp (500): sugar (1150)

Sample 3 = Pulp (500): sugar (900)

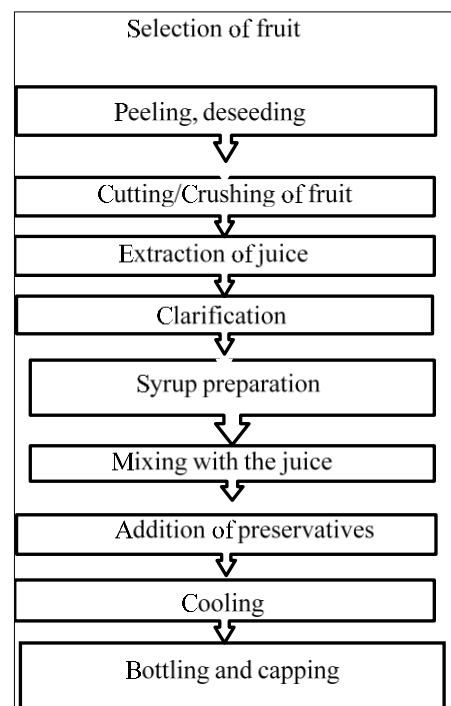


Fig 1: procedure for preparation of mango squash

2.2 Approximate methods of analysis for the mango squash

The AOAC (1995) standard was followed for the proximate analysis of the mango squash, including measurements of moisture, fat, crude fiber, crude protein, ash, and carbohydrates. The methods number 925.09 was used to find the moisture content, 920.86 was used to determine the crude fiber content, 920.87 was used to determine the crude protein content, 923.03 was used to estimate the ash content, and the % difference was used to compute the carbohydrate content.

2.3 Physic-chemical analyses of mango squash

The physicochemical analysis for the mango squash (vitamin c reducing sugar and PH) was undertaken at University of Nairobi, Faculty of Agriculture, Department of Food Science, Nutrition & Technology- the Food Chemistry Laboratory.

All the samples were collected in sterile bottle containers kept in refrigerator maintaining 4 °C and then during transportation to the laboratory analyzed.

A digital pH meter model PH 010 (ATC) was used to

measure pH, a hand refractometer (Mettler Toledo model LXC59107 Japan) was used to measure total soluble solids (Brix%), the AOAC (1995) technique was used to assess total titratable acidity (TTA), and the AOAC (2000) method was followed for vitamin C.

Equation

1. % Moisture = $\frac{w_1 \times 100}{w_2}$
2. Ash (%) = $\frac{\text{weight of ash (g)}}{\text{weight of sample (g)}} \times 100$
3. Fat g /100g fresh sample = $\frac{W \times (100 - \% \text{Moisture})}{W_D}$
4. Total nitrogen (%) = $\frac{(T-B) \times N \times 1.4}{W} \times 100$
5. G nitrogen / 100g sample = $\frac{\text{mg of nitrogen} \times 100}{\text{mg sample}}$
6. Crude fiber g/100g = $\frac{(W_1 - W_2)(100 - M)}{W_3}$
7. Energy value = $(P \times 4) + (F \times 9) + (C \times 4)$ in kcl/100g
8. % Total solids = $\frac{W_3 \times 100}{W_1}$
9. Mg nitrogen = $(T - B) \times N \times 14$
10. Mg of ascorbic acid/100g ascorbic = $\frac{A(\text{sample}) - A(\text{blank})}{A(10 \mu\text{g std}) - A(\text{blank})}$

2.4 Microbiological Analysis

The microbiological analysis of different samples of Mango Squash under this investigation was carried out including the determination of total bacterial count (TBC), yeasts and molds counts according to the methods recommended in the American Public Health Association (1976).

Molds and yeasts were determined using malt extract agar Galloway and Burgess, (1952).

Total bacterial count

The total bacterial count was performed using the plate count agar medium as recommended by (APHA, 1976 and FDA, 2002).

Enumeration of molds and yeasts:-

Molds and yeasts were determined using malt extract agar Galloway and Burgess, (1952).

2.5 Sensory evaluation

Sensory evaluation was performed to judge the acceptability of different formulated product by panelists. The test testing panel was consisting 15 test panelists. They were asked to evaluate color, flavor, smell, texture, overall acceptability by scoring rate on a 5-point hedonic scale. 5 extremely like, 4= slightly like, 3 neither like nor dislike, 2 slightly dislike, 1 extremely dislike.

3. Results

This study analyzes a mango squash that has been prepared. The quality of the squash is evaluated through various tests including proximate analysis (composition), microbiological analysis (microbes), physical and chemical properties, and sensory evaluation (taste, texture, etc.).

3.1 Procedure for preparation of Mango squash

Table 2: procedure for preparation of mango squash

Ingredients	Sample 1	Sample 2	Sample 3
Sugar	2000 g	1150 g	900 g
Water	500 L	500 L	500 L
Pulp	500 g	500 g	500 g
Potassium	2 g	1.75 g	1.5 g
Sodium	0.5 g	0.4 g	0.38 g
Citric acid	8 g	7 g	6 g
Guar gam	5 g	4.375 g	3.75 g
Color	50 z	30 z	10 z
Flavors	30 z	20 z	10 z

3.2 The approximate analyses of mango squash

Table 3: The approximate analyses of mango squash

Sample name	Pulp 0	Sample 1	Sample 2	Sample 3
Moisture (%)	84.61	38.22	42.00	44.98
Fat (%)	0.02	0.02	0.01	0.01
Fiber (%)	1.05	0.57	0.99	1.41
Protein (%)	0.54	0.02	0.01	0.09
Ash (%)	0.73	0.15	0.18	0.20
Carbohydrate(%)	13.05	61.03	56.18	53.31
Energy	54.54	244.30	227.37	213.69

Data presented in Table 3 showed the approximate analyses of mango squash weight basis, it could be noticed that moisture content of mango squash of the three samples i.e., Pulp 0, Sample 1, Sample 2, and Sample 3 was 84.61, 38.22, 42.00 and 44.98, respectively while fat Content's was is

0.02, 0.02, 0.01 and 0.01 while crude fiber was 1.05, 0.57, 0.99 and 1.41, protein 0.54, 0.02, 0.01 and 0.09, total sugar and total acidity were 3.47, 3.7, 2.61, 6.68, 1.28, and 0.13 respectively

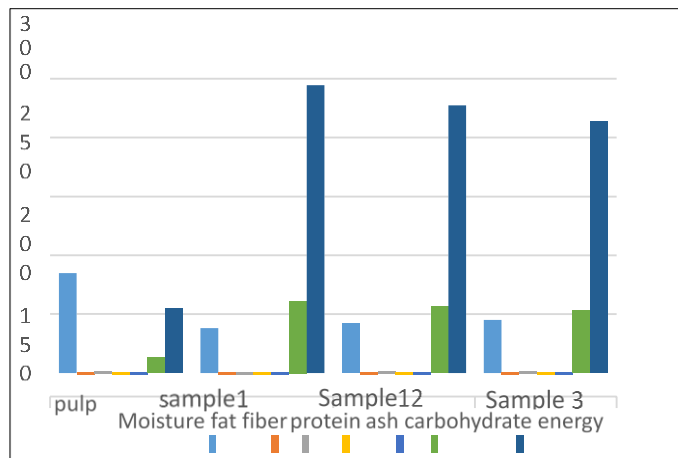


Fig 2: Approximate analyses of mango squash

3.3 Minerals composition of mango squash

Data presented in table (Table 4) showed the same of Minerals composition of mango squash Part per million, it

could be noticed that minerals content of mango squash of the four samples i.e., Pulp 0, Sample 1, Sample 2, and Sample 3.

Table 4: Minerals composition of mango squash

Sample Name	Iron (ppm)	Potassium (ppm)	Calcium(ppm)
Sample1	0.43	680.35	25.86
Sample2	0.83	801.53	28.52
Sample3	1.16	835.80	22.73

3.4 Physic-chemical analyses of mango squash

The table (Table 5) presents the results of the analysis of various physical and chemical properties of mango squash.

The data shows the values for four samples: Pulp 0, Sample 1, Sample 2, and Sample 3.

Table 5: Physic-chemical analyses of mango squash

Sample Name	Vitamin C (mg/100g)	Reducing Sugars (%)	Acidity(Grams citric acid /liter)
Pulp 0	108.59	2.30	7.17
sample1	26.19	25.54	7.49
Sample2	21.97	25.64	6.91
Sample3	23.59	8.68	6.98

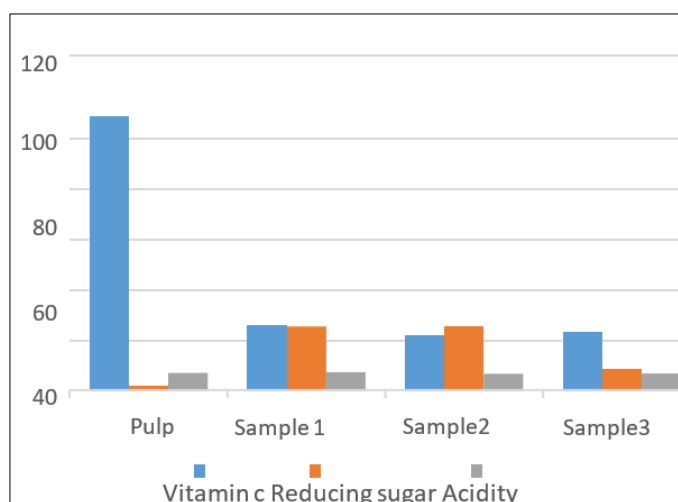


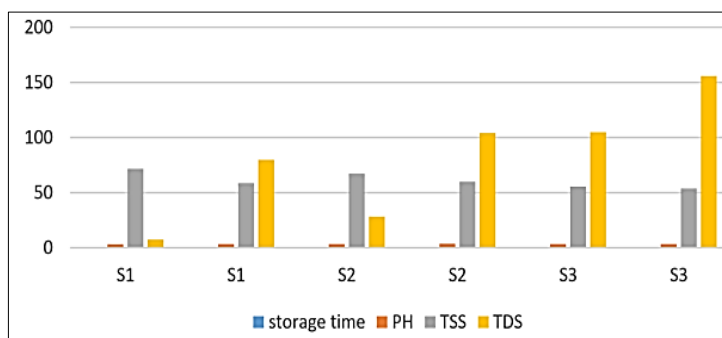
Fig 3: Physic-chemical analyses of mango squash graph

3.5 The Effects of storage stability of mango squash at room temperature: The impact of storage period on the quality of squash manufactured from three varieties of mango squash has been analyzed in terms of total TDS

content, pH level acidity, TSS content, overall acceptability score, and microbial load. At Ambient temperature (Room temperature)

Table 6: Effects of storage time in physic-chemical properties

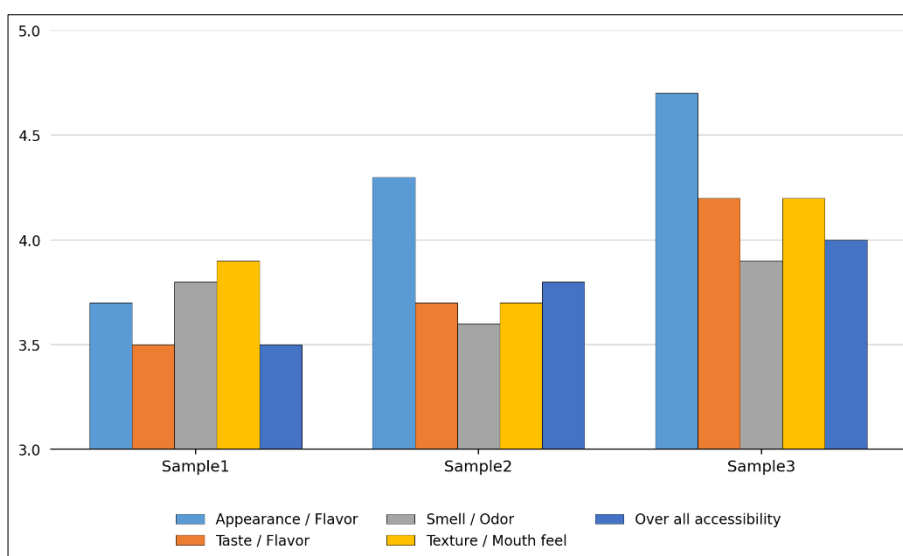
Samples	Storage period	PH	TSS	TDS
Sample1	Initial	3.2	71.6	7.4mg/l
Sample1	8 weeks	3.5	58.59	79.8mg/l
Sample2	Initial	3.4	67.3	28.1mg/l
Sample2	8 weeks	3.7	59.8	104.2mg/l
Sample3	Initial	3.4	55.5	104.9mg/l
Sample3	8 weeks	3.5	53.8	155.7mg/l

**Fig 4:** Effects of storage time in physic-chemical analyses graph

Effects of storage time in sensory evaluation after one week

Table 7: Effects of storage time in sensory evaluation after one week

Sensory attributes	Sample1	Sample 2	Sample 3
Appearance / Color	3.93	4.33	4.73
Taste / Flavor	3.80	3.93	4.33
Smell / odor	4.00	3.86	3.4
Texture / mouth feel	4.06	3.93	4.26
Overall accessibility	3.80	4.00	4.13

**Fig 5:** Effects of storage time in sensory evaluation after one week

Effects of storage time in sensory evaluation after one months

Table 8: Effects of storage time in sensory evaluation after one months

Sensory attributes	Sample1	Sample 2	Sample 3
Appearance /color	4.00	3.66	4.13
Taste/flavor	3.73	3.73	4.53
Smell/odor	4.13	3.86	4.20
Texture/Mouth feel	4.13	4.26	4.13
Overall accessibility	4.40	3.86	4.26

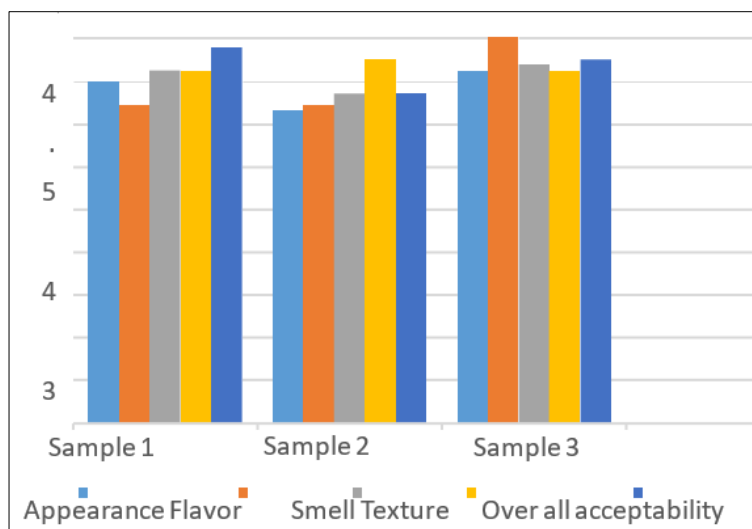


Fig 6: Effects of storage time in sensory evaluation after one Month

Effects of storage time in sensory evaluation after two months

Table 9: Effects of storage time in sensory evaluation after two months

Sensory attributes	Sample 1	Sample 2	Sample 3
Appearance /color	4.26	3.00	3.46
Taste/flavor	3.46	3.33	4.26
Smell/odor	3.60	3.60	4.20
Texture/Mouth feel	3.60	3.46	3.80
Overall accessibility	3.33	2.73	3.80

Comparison between making squash and purchase squash

Table 10: Comparison between making squash and purchase squash

Sensory attributes	Sample 3	Purchase juice
Appearance /color	4.00	3.66
Taste/flavor	3.73	3.73
Smell/odor	4.13	3.86
Texture/Mouth feel	4.13	4.26
Overall accessibility	4.40	3.86

4. Discussion

4.1 Procedure for preparation of Mango squash

We made successfully built a process to produce mango Squash using Auxiliaries that retains biologically important physicochemical properties while providing a increased level of sensory evaluation.

We had prepared the mango squash from three samples and various amounts of sugar were added to each sample after heating for 15 minutes. Sample 2 was the standard, sample 3 was less than sample 2, and sample 1 was greater than sample 2

Auxiliaries were used in the preparation of the mango squash, which generally increased the product's sensory rating. Based on the outcomes, we add potassium to the squash to help minimize the increases of the blood pressure levels due to high sodium consumption, also we add sodium to squash to add flavor and as preservative, we add guar gum to thickening and viscosity control, and we add citric acid as a flavoring and preserving agent

4. 2 Approximate analyses of mango squash

The proximate analysis results reveal a significant difference ($p > 0.05$) between the moisture content of the mango squash the highest moisture content is the pulp and the lowest moisture content is (83.62%). Compared to the study on the physicochemical properties and antioxidant content of mango (*Mangifera indica* L.), the moisture content varied from 79.48 to 83.62%. Fruits with a high moisture content have a lower shelf life. Fruits and vegetables decay quickly because of their high moisture content. On the the contrary, edible pulp from fruit with high levels of moisture can be utilized to make juice.

4.3 Approximate analyses of mango squash

The pulp of the mango squash has the highest moisture content, and the lowest moisture level is 83.62%, according to the proximate analysis results, which show a significant difference ($p > 0.05$) between the two. Mango moisture content varied between 79.48 and 83.62%. when compared against the physicochemical characteristics and antioxidant levels in mango. Fruit that is more mostly packed has a lower shelf life. Because of their high moisture content, fruits and vegetables generally degrade quickly. Conversely, juice can be made from the edible pulp of highly moisture-contented fruit.

Fat content the findings of the proximate analysis show a substantial difference ($p < 0.05$) in the mango squash's fat content. Sample 1 has the maximum fat content, whereas Sample 2 has the lowest fat content (0.02-0.01). The study's fat content was similar to that of Kansci *et al.* (2008) who reported ranges of 0.17 to 0.33 g/100 g FW.

Fiber content the proximate analysis results show that there is a significant difference ($p > 0.05$) in the fiber content of the mango squash; the highest fiber content is sample3 and the lowest fiber content is sample1 (1.41-0.57). When compared to the compared to the Study of Physicochemical Properties and Antioxidant Content of Mango (*Mangifera indica* L.) The crude fiber content of the four mango varieties ranged from (0.37 to 0.79%) The four mango cultivars have varying levels of crude fiber (0.37 to 0.79%). Fiber offers intriguing qualities that include improving yield, changing texture and viscosity, and modifying water

and oil holding capacity (WHC and OHC, respectively; helpful in goods that require hydration)

Protein The proximate analysis results reveal a significant difference ($p > 0.05$) between the protein content of the mango squash the highest protein content is pulp and the lowest protein content is sample2 (0.54-0.01).). The study's findings regarding protein content were similar to those of Tasie, who indicated ranges of 0.14 to 0.47%.

Ash Content The proximate analysis results reveal a significant difference ($p > 0.05$) between the Ash content of the mango squash the highest ash content is pulp and the lowest ash content is sample1 (0.73-0.15). Food's mineral composition is reflected in the amount of ash it contains. Ash content found in this study was comparable to the results of who reported ranges of (0.14 to 0.47%)

Carbohydrates The proximate analysis results reveal a significant difference ($p > 0.05$) between the carbohydrate content of the mango squash the highest carbohydrate content is sample1 and the lowest carbohydrate content is pulp (61.03 to 13.05). The type of mango and its stage of ripening determine how many carbohydrate are in the fruit. Carbohydrate content found in this study was comparable to the results of (Chaudhary) who reported ranges of (50.70 - 4.93%)

Energy The proximate analysis results reveal a significant difference ($p > 0.05$) between the energy content of the mango squash the highest energy content is sample1 and the lowest energy content is pulp (244.30-54.54). Energy content found in this study was comparable to the results of (Tasie) who reported ranges of (62.9 Kcal/g)-80.7Kcal) When food is burned or fully oxidized in a bomb calorimeter, more energy is created than what the body produces from it.

4.4 Minerals composition in mango squash

Mangos were the most abundant source of potassium, which had a maximum value of 835.80 ppm. Sample 2 had the highest calcium level, while Sample 3 had the highest potassium and iron concentration. The ranges of iron and calcium contents were 1.16-0.43 ppm and 22.7-28.52 ppm.

4.5 Physic-chemical compositions

The physicochemical characteristics of mango squash must be measured and tracked throughout the processing and storage stages in order to promptly identify any issues and modify the process in order to make up for them. This helps to maximize the overall quality of the mango squash and minimize wastage of resources and time.

Vitamin C the physicochemical properties results reveal a significant difference ($p > 0.05$) between the vitamin content of the mango squash the highest vitamin c content is pulp and the lowest vitamin c content is sample2 (108.59-21.97mg/100g) Vitamin C is a crucial component of the human diet because it prevents scurvy and is necessary for Collagen biosynthesis

Throughout the storage time, the amount of vitamin "C" steadily declined, which may have been caused by oxygen oxidizing ascorbic acid to dehydro ascorbic acid. The results are in line with what research paper authors have reported Nidhi 2008.

Reducing sugar

The physic chemical analysis results reveal a significant difference ($p > 0.05$) between the reducing sugar content of the mango squash the highest reducing sugar content is sample2 and the lowest reducing sugar content is pulp (25.64-2.30%) When compared to the compared to the Study Effect of Blending and Storage on the Physicochemical Composition of the Papaya and Mango Squash. They found that regardless of the treatment type, the reduced sugar content increased in all samples as the storage duration lengthened. The passage suggests that a rise in the amount of simple, reactive sugars (reducing sugars) can be caused by two factors: either exposure to acidic conditions (acid hydrolysis) or natural processes happening during storage that break down more complex carbohydrates (non-reducing) into simpler ones.

4.6 Effects of storage time in physic-chemical properties

The final mango squash product has to be also analyzed and characterized of storage time to ensure that it retains its desirable properties up to the time when it is consumed, meets the appropriate high-quality requirements, and that it is safe for consumption.

The result regarding PH is given in (Table.6). The highest pH was observed in the sample2 while the minimum was observed in the sample1.

The results showed that the PH of the treatments was significantly affected during storage time of mango squash. Treatments showed increasing during storage time (fig. 5). The PH of squash normally adjusted to 3.7 with citric acid The result regarding brix is given in (Table.6). The highest brix was observed in the Sample 2 (59.8). While the minimum was observed in the sample3 (53.8).

The results showed that the Brix treatments was significantly affected during storage time of mango squash. Treatments showed decreasing during storage time (fig. 5). The result regarding TDS is given in (Table 6) the highest TDS was observed in the sample3 (155.7mg/l) while the minimum was observed in the sample1 (7.54mg/l). The results showed that the TDS of the treatments was significantly affected during storage time of mango squash. Treatments showed increasing during Storage time

4.7 Effects of storage time in sensory evaluation

The storage quality of processed mango squash was evaluated for different sensory attributes by a panel of 15 panelists for the period of eight weeks when stored at refrigerator. The storage quality evaluation was done for appearance/color, taste/flavor, smell/odor, texture/mouth feel and over all acceptability in five-point hedonic scale the means score for appearance/color, taste/flavor, smell/odor, texture/mouth feel and over all acceptability of the mango squash is presented Table 7 the color was discarded in week 8 as shown in the table 7 the color changed with in the storage period may be due to chemical relation that might occurred.

Flavor is a combination of various sensation derived from foods flavor was agreeable sedimentation was noticed s1 after eight weeks. The process mixed fruit squash was organoleptic all acceptable

A. COLOR / appearance: The score for color was found highest in squash sample3 with square (4.73) as compared other samples

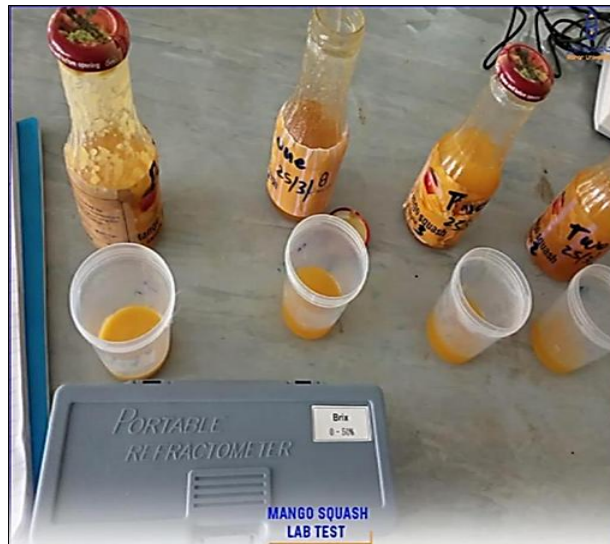
B. test /flavor: The score for test /flavor was found highest in squash sample3 with square (4.33) as compared other samples

C. Smell/odor: The score for smell/odor was found highest

in squash sample1 with square (4.00) as compared other samples

D. texture /mouth feel: The score for texture /mouth feel was found highest in squash sample3 with square (4.26) as compared other samples

E. overall accessibility: The score for color was found highest in squash sample3 with square (4.13) as compared other samples (Table7).





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COLLEGE OF AGRICULTURE AND VETERINARY SCIENCES
Faculty of Agriculture
DEPARTMENT OF FOOD SCIENCE NUTRITION AND TECHNOLOGY

Our Ref: UoN/FSNT/2023/001

April 13, 2023

ATTN: ABDI ISSE

RE: LAB ANALYSIS RESULTS OF YOUR JUICE SAMPLES

Sample name	Moisture (%)	Fat (%)	Fibre (%)	Protein (%)	Ash (%)	Carbohydrates (%)	Energy (Kcal/100g)
Pulp 0	84.61	0.02	1.05	0.54	0.73	13.05	54.54
Juice 1	38.22	0.02	0.57	0.02	0.15	61.03	244.30
Juice 2	42.00	0.01	0.99	0.01	0.18	56.18	227.37
Juice 3	44.98	0.01	1.41	0.09	0.20	53.31	213.69

Sample name	Vitamin C (mg/100g)	Reducing sugars (%)	pH	Brix	Acidity (grams citric acid/litre)
Pulp 0	108.59	2.30	4.19	15	7.17
Juice 1	26.19	25.45	3.31	58	7.49
Juice 2	21.97	25.64	3.28	53.5	6.91
Juice 3	23.59	8.68	3.36	51	6.98

MINERALS

Sample name	Iron (ppm)	Potassium (ppm)	Calcium (ppm)
Juice 1	0.43	680.35	25.86
Juice 2	0.83	801.53	28.52
Juice 3	1.16	835.80	22.73

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5. Conclusion

Mango one of the most important tropical fruits commercialized and consumed worldwide fresh or processed and one of the most important tropical fruits in Somalia. Increased production has been observed over years paralleled by large postharvest losses which are partly attributed to spoiling after harvesting. The overall acceptability sensor evaluation was highest in squash prepared with 500g mango pulp 900g of sugar sample3. Negligible change was observed in all the samples. The product stored without any deterioration in physic chemical, sensory quality and microbial count and are consumer acceptable up to two months of storage per the study.

According to the microbial test, there were no bacterial colonies found in the products. Therefore, it is safe for human consumption.

6. Abbreviations

	Abbreviations
TSS	Total soluble solids
TDS	Total dissolved solids
PH	Potential hydrogen
AOAC	Association of official analytical chemists
TTA	Tetra decyl thioacetal acid
ATC	Air traffic control
TBC	To be continued
UBC	United bottling company

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