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EFFECT OF CARROT AND TENDER COCONUT PULPS ADDING ON CHEMICAL, RHEOLOGICAL, NUTRITIONAL AND SENSORY ORGANOLEPTIC PROPERTIES OF ICE CREAM

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Abstract: Ice cream manufactured using a substantial amount of tender coconut pulp and carrot pulp has a high organoleptic acceptability. Both were added to typical control ice cream (TC)up to10% 15% and 20% providing three variations. Through adding, tender coconut pulp andcarrot pulp natural flavour, unique colour, and health-promoting constituents were presented.The resultant ice cream was subjected to chemical, rheological, nutritional, and organoleptic properties investigation. The ice cream containing high tender coconut pulp and carrot pulp contents had higher melting resistance and lower overrun %. Health beneficial phytochemicals such as carotenoids, flavonoids (TF), flavonols (TFL), and vitamin A were commonly detected in tender coconut and carrot-ice creams, reflecting the attributes of raw ingredients. Tender coconut and carrot ice cream had the valuable content of Minerals, vitamin A and antioxidant capacity.

INTRODUCTION

From time to time, population's demands develop and healthy products consumptionis increasing. Thus, the food industry develops and marks food with added bioactive components, named "functional foods" that not only deliver basic nutrients, but also providehealth benefits. Likelihood to improve the nutritional value of ice cream using ingredients with health benefits is valuable, focusing on natural antioxidants, natural pigments, vitamins, and low fat and free from synthetic additives such as fruit and vegetables and even producing icecream which contains probiotic were investigated.

Ice cream preparation involves important processing steps being blending, pasteurization, homogenization, cooling, aging, flavoring and coloring, whipping, packaging, and hardening. It is made from milk fat and milk solids-not-fat (sniff), sugar, water, and other optional ingredients such as stabilizers, emulsifiers. The overrun and melting properties are significant variables to evaluate an ice cream product and related processing. Dietary fibersand polysaccharides are widely found in fruits and vegetables which have excellent improvement in physical properties like melting potential with minimal effect on viscosity,overrun and texture due to water-binding capacity.

Carrot is a highly nutritious vegetable, non-acidic (ph, 6.3 - 6.4), well known for its high carotenoids content mainly β-carotene as a precursor of vitamin a is growth promotingsubstance. Phenolic, flavonoids and appreciable amounts of vitamins b1, b2, and b6 in carrot have been stated.

Tender coconut is highly nutritious and packed with minerals and electrolyte. Calories 18, protein <1g, fat 0g, carbs 4g,fiber0g,manganese - 7% of the daily value (dv), magnesium-6% of the dv, phosphorus- 2% of the dv, iron - 2% of the dv, potassium-7% of the dv,sodium-4% of the dv.

Therefore, the current study aimed to examine the possibility of producing a new type of icecream product through incorporating a substantial amount of tender coconut pulp and carrotpulp in the absence of any added flavoring agent.

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COMPOSITION: (commercial ice cream)

Ingredients	Quantity%	Normal variation%
Sugar	15	13-20
Fat	12	20
SNF	11	15
Emulsifier and stabilizer	0.3	0-0.7
Total solids	38.3	36-43

Materials

The materials required for performing this work are tender coconut, Carrot, Condensed milk, Milk powder, Whipped cream, Ice cream mould were purchased from the local market.

METHODOLOGY

Preparation of carrot ice cream

Carrots were peeled and blanched in boiling water until the carrot are cooked and are fork-tender. The blanched carrots are ground into puree. Whipped cream, milk powder, condensed milk were added into a bowl. Whisked until smooth and carrot puree were added and whisked well. Cool the mixture at room temperature for a little while, then chilled in the fridge completely. After it's been chilled, the mixture is been added to a blender, and blended at high speed until completely smooth.

Preparation of tender coconut ice cream

Tender coconut were ground into puree. Whipped cream, milk powder, condensed milk were added into a bowl. Whisked until smooth and tender coconut puree were added and whisked well.

Mixing the two ice creams

To the Popsicle mould, one side tender coconut ice-cream and other side carrot ice cream were piped using a piping bag, each side without getting mixed. Deep freezed for 8-9 hours.

Variations:

Control ice cream	Variation 1 (10%)	Variation 2 (15%)	Variation 3 (20%)
1 cup	1/3 cup tender coconut pulp(tcp), 20 ml condensed milk(cm)	1/3 cup tender coconut pulp(tcp)+ 2tbsp (tcp) 20 ml condensed milk(cm)	1/3 cup+ 1/3 cup tender coconut pulp(tcp), 20 ml condensed milk(cm)
1 cup	1/3 cup carrot pulp(cp) 20 ml condensed milk(cm)	1/3 cup carrot pulp (cp) + 2 tbsp 20 ml condensed milk(cm)	1/3 cup+1/3 cup carrot pulp(cp) 20 ml condensed milk(cm)

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Variations:

Left to right, cp: 20%, 15%, 10%

Left to right, tcp: 20%, 15%, 10%

Physicochemical evaluation of prepared samples:

Determination of TSS

TSS of sample juice was determined by the method of AOAC suggested by Horwitz using a hand refractometer and the data were recorded as degree Brix. Each degree brix (°1) is equivalent to 1% sugar concentration when measured at 20°C. The Brix value of a given product can be directly obtained by using a device called refractometer or hydrometer.

Determination of titrable acidity of ice cream

Place 200 ml of boiled and cooled distilled water into a 500 ml Erlenmeyer flask and add 1ml of phenolphthalein indicator. Titrate the water with 0.1 NaOH to a definite pink end point. Add 5 ml of must/wine sample to the flask. Titrate the sample with 0.1 NaOH to the same distinct end point. Note the volume of NaOH used in the titration.

Determination of pH

The pH of the samples was estimated by the method of AOAC depicted by Horwitz by using pH meter at room temperature (28±2°C).The decision of the pH was made by setting up a buffer at pH 7.0 and the temperature was set to 28°C. pH meter is brought to neutral 7 using buffer and the tip washed with double distilled water. Again the pH is brought to 4 using buffer and the tip is washed with double distilled water. The tip is then immersed in the sample (ice cream) and the pH is noted.

Organoleptic properties

Characteristics such as appearance, texture, odour and taste are analyzed to assess product quality or derive opportunities for improvement.

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RESULT & DISCUSSION

TSS:

Brix	Tender coconut pulp	Carrot pulp
10%	°bx 45	°bx 11
15%	°bx 55	°bx 24
20%	°bx 60	°bx 30

Determination of titrable acidity of ice cream

TA as tartaric acid (g/100 ml) = (titre value of NaOH x normality of NaOH x equivalent weight of the acid x 100) sample volume x 1000

=1.3*0.1875*100/ 5*100

= 975/500

=1.95g/1000ml.

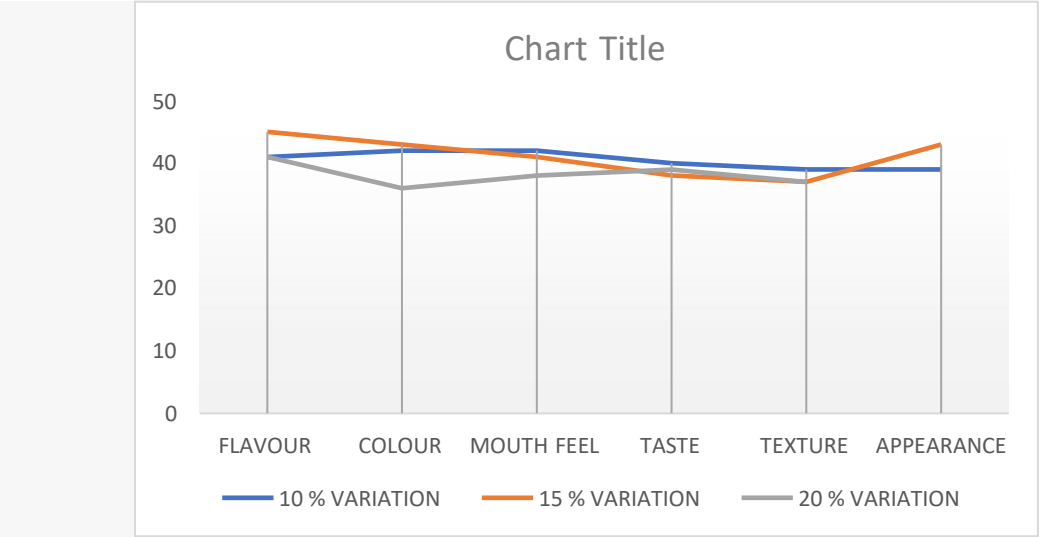
The titratable acidity of ice cream is 1.95g/1000ml.

Determination of pH test

The pH of the ice cream is found to be 6.90.

Sensory analysis:

After one day of frozen storage, organoleptic properties of the different formulas were carried out. The sample was given to 9 individuals and the texture, colour, mouth feel, appearance, flavour, taste was analysed.



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Left to right: 10%, 15%, 20%

CONCLUSION

The ice cream containing high tender coconut pulp (tcp) and carrot pulp (cp) contents had higher melting resistance and lower overrun %. Health beneficial phytochemicals such as carotenoids, flavonoids, flavonols and vitamin C were commonly detected in pp and cp-ice creams, reflecting the attributes of the tcp and cp ingredients. Only, the ice cream made with 15% of tcp and cp was highly accepted. Therefore, it is possible to use a substantial amount from tcp and cp to produce ice cream up to 15% with retained much of the natural colours as well as the unique vitamin A, carotenoids, tf and tfl as well as valuable antioxidant capacity.

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