ORIGINAL RESEARCH PAPER

Horticulture

KEY WORDS: calcium, fruit candy, blended juice

DEVELOPMENT OF CALCIUM RICH FRUIT CANDY AND ITS NUTRITIONAL AND ORGANOLEPTIC STUDY DURING STORAGE

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ABSTRACT

The aim of the research to develop and quality evaluation of calcium rich candy prepared from various fruits. Calcium is needed for muscle contraction, blood vessel contraction and expansion, the secretion of hormones and enzymes and sending messages through the nervous system. It also plays a major role in osteoporosis. To prepare the calcium rich fruit candy from different blend combinations. On the basis of nutritional and organoleptic evaluation of treatment 2 (B) In juice candy with pulp we includes, Blended (Pomegranate: watermelon: pineapple) with pulp was found best in which the calcium content was observed (43.09mg/100g), protein content(7.32%), iron content (7.87mg/100g) and Vitamin C (85.19mg/100g).

INTRODUCTION:

Calcium, the most abundant mineral in the human body, has several important functions. More than 99% of total body calcium is stored in the bones and teeth where it functions to support their structure. The remaining 1% is found throughout the body in blood, muscle, and the fluid between cells. Calcium is needed for muscle contraction, blood vessel contraction and expansion, the secretion of hormones and enzymes, and sending massages through the nervous system. A constant level of calcium is maintained in body fluid and tissues so that these vital body processes function efficiently.

Bone undergoes continuous remodeling, with constant resorption (breakdown of bone) and deposition of calcium into newly deposited bone (bone formation). The balance between bone resorption and deposition changes as people age. During childhood there is a higher amount of bone formation and less breakdown. In early and middle adulthood, these processes are relatively equal. In aging adults, particularly among postmenopausal woman, bone breakdown exceeds its formation, resulting in bone loss, which increases the risk for osteoporosis(a disorder characterized by porous, weak bones).

Some studies show that diets that are high in protein, especially animal protein, do cause increased losses of calcium in the urine and may even increase fracture risk. These effects of protein may be especially important in those with low calcium intakes. Other studies suggest that a higher protein intake is needed to promote calcium absorption, reduce risk of fracture and increase bone density.

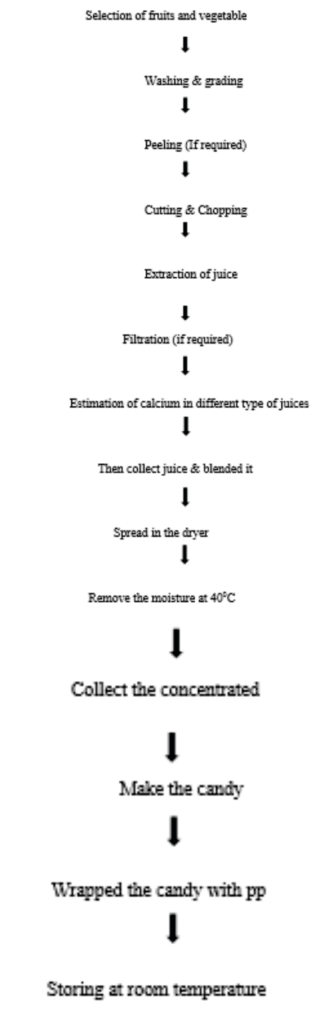
Beverages fruit juices & juices & vegetables juices, milk are good sources of vitamins, minerals, protein etc. Fruit juice beverages and juice concentrates nutritionally supplemented with significant levels of solubilized calcium are disclosed. These beverages and concentrates are substantially free of added protein, and comprise at least about 45% fruit juice. The method for preparing these beverages and concentrates involves forming a premix solution containing highly soluble calcium citrate and malate species which is then combined with concentrated fruit juice, plus other fruit juice materials. This method provides beverages and concentrates which contain substantial levels of solubilized calcium without generating cooked/browned off-flavors and without including undesirable species such as chloride ions.

OBJECTIVES AND METHODS:

Development of calcium rich fruit candy and its nutritional study during storage.

The present investigation was carried out keeping in mind several health benefits of calcium rich fruit juices. As the raw product is readily acceptable in nature, but present scenario every one busy ,therefore it was processed into fruits juices for taken ready to serve I was prepared calcium rich fruit candy from calcium rich fruit juices and taken for study.

Flow chart for processing of fruit juice and the preparation of calcium rich fruit candy



Storing at room temperature

To prepare the calcium rich fruit candy from fruit juices by different method. In this calcium rich fruit candy we give two treatments:

(1) Juice candy without pulp (pomegranate: watermelon: pineapple).
(2) Juice candy with pulp (pomegranate: watermelon: pineapple).

Analysis for comparing the calcium in fruit juice and calcium rich fruit candy were done as per ISI and AOAC procedure .The quality analysis parameters are- moisture, ash, fat, protein, calcium, iron, vitamin C, sugar, organoleptic evaluation etc.

RESULT AND DISCUSSION:

The present investigation study on to development of calcium rich candy from calcium rich fruits as well to analysis its calcium percentage has led to some important observations. Fruits samples i.e. peach, pineapple, carrot, watermelon and pomegranate etc from road side vendors were collected from local market of Lucknow. These fruit juices samples were further subjected for different biochemical analysis with the following parameters i.e. moisture, ash, fat, protein, vitamin C, calcium and iron.

Table1: Organoleptic Parameters

Parameters	Calcium rich fruit candy	
	T1	T2
Colour (natural)	Brown	Brown
Taste	Good	Well
Visible impurities	Nil	Nil
Texture	Little hard	Little hard

Biochemical Parameter

Parameters	Juice candy without pulp		Juice candy with pulp	
Moisture (%)	90.18	5.6	84.86	5.5
Ash (%)	1.25	12.01	0.74	7.99
Protein (%)	0.59	4.73	0.7	7.32
Fat (%)	0.78	3.9	0.98	5.4
Calcium(mg/100g)	23.77	38.41	46.88	43.09
Iron(mg/100g)	1.05	2.75	1.29	7.87
Sugar (%)	9.5	45.41	13	49.41
Vitamin C(mg/100g)	9.61	28.13	5.76	85.19
TSS	10.2	75	9.2	65
Acidity	0.07	-	0.06	-
pH	3.94	-	3.93	-

Storage study of calcium rich fruit candy

Parameters	0 Month		1Months		2Months		4Months		6Months	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
Moisture (%)	5.6	5.5	5.3	5.0	4.9	4.8	3.7	4.0	3.4	3.9
TSS (oBrix)	75.0	65.0	75.2	65.5	77.2	66.0	77.6	66.8	78.1	69.0
Sugar (%)	45.41	49.41	45.9	50.0	46.1	50.2	47.5	50.6	47.8	51.1

Several health benefits of calcium rich fruit juices. Calcium needed for strong bones, is found in dark green leafy vegetables, tofu made with calcium sulfate, calcium – fortified soy milk and orange juice, and many other foods commonly eaten by vegans. Although lower animal protein intake may reduce calcium losses, there is currently not enough evidence to suggest that vegans have lower calcium needs. Vegans should eat foods that are high in calcium and /or use a calcium supplement. In new product development candy calcium amount increased so several health benefits of calcium rich fruit juice and calcium rich fruit candy. The increase in T.S.S content was relatively slow when candies were stored at refrigerated temperature than at room temperature indicating more increase in T.S.S at higher storage temperature due to loss in moisture content. There was gradual increase in sugar content during storage. The increase in sugar content of candy may be the indirect effect of decrease in moisture content during storage.

During the comparative on biochemical composition the result lead the conclusion that calcium rich fruit candy was found to be high in Vitamin C, protein and iron. On the basis of nutritional and organoleptic evaluation treatment juice candy with pulp (T2) was found best in which the calcium content was observed (43.09mg/100g), protein content (7.32%), iron content (7.87mg/100g) and Vitamin C (85.19mg/100g).

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