

Physico-Chemical Analysis of *Daucus Carota* (Carrot) Juice for possible industrial applications.

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Abstract: The result of the physicochemical analysis of carrot juice was analyzed and this result showed that the moisture content is 91.000 ± 0.265 which indicates that carrot contained much water which will help in healthy hydration of the body system, in transport of nutrient, elimination of waste and body temperature regulation. protein content is $\% 1.067 \pm 0.058$ which will serve as a collagen for supportive tissue, hemoglobin for transport, antibodies for immune defense and enzymes for metabolism in the body and can serve as balanced diet in humans. ether extract (crude fat) $\% 0.367 \pm 0.089$ this shows that carrot is not rich in oil i.e. does not contain much oil, ash $\% 1.333 \pm 0.153$ this means that carrot contains essential nutrient elements, as this will normally show up in the ash content of a vegetable matter and can be used to argument minerals in food formulation. crude fibre $\% 1.167 \pm 0.153$ crude fibre is desirable in meals, as they serve as digestion aids, carbohydrate $\% 6.100 \pm 0.346$ this indicate that carrot can be used as food supplement sources of carbohydrate or energy, specific gravity 1.069 ± 0.003 , pH 6.333 ± 0.058 , ascorbic acid 16.667 ± 1.332 , Ca^{++} (mg/100g) 55.000 ± 0.000 , Fe^{++} (mg/100g) 1.667 ± 0.153 , PO_4^- (mg/100g) 44.333 ± 1.155 , thiamine (mg/100g) 0.057 ± 0.006 , niacin(mg/100g) 0.300 ± 0.000 , riboflavin 0.100 ± 0.000 , β -carotene 2730 ± 43.589 , colour (out of 10) 2.000 ± 0.000 and vitamin A 2805 ± 6.532 .

The results shown that vitamin A and β carotene has high content in carrot juice, as a result of these findings, carrot is save for consumption without passing any negative or deleting effect to its consumer, consumption of it should be encourage because of its health benefits.

I. Introduction

Daucus carota popularly known as carrot, is one of the most popular root vegetables grown throughout the world and it is one of the most important carotenoids. Carrots are credited with many medicinal properties, they are said to cleanse the intestines and to be diuretic, revitalizing, antidiarrheal, antianemic and rich in alkaline elements which purify and revitalize the blood. It also has a reputation as a vegetable that helps to maintain good eyesight.

Vegetables and fruits have improved the human diet for centuries, enriching it nutritionally and sensorially (Holland et al, 1991). As consumers become more health conscious in their food choices, they also have less time to prepare healthy meals. Although the proportion of expenditure on food outside the home may vary from country to country, trends observed in Portugal reflect the generally increasing tendency of eating out (clauson, 1999). Therefore, food service operators often have to prepare large quantities of foods, such as vegetables including potatoes, onions and carrots, in a short time frame.

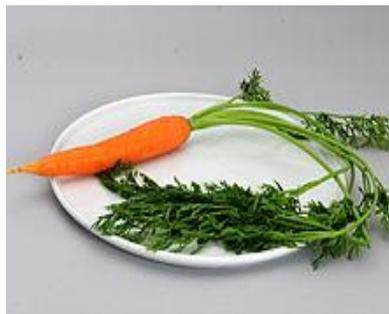
This increased consumer interest in fruits and vegetables as healthy foods with zero cholesterol, low to no fat and sodium and high levels of vitamins, minerals and fibre has accelerated and increased efforts to improve the quality of those products as they pass through the marketing system (schlimme, 1995).

Those product that are intended to be present to the food service operator conveniently peeled, cored or sliced in prepared packages, with a fresh-like quality and ready to be eaten, comprise a new category of products called minimally processed (MP). Despite the growing interest in minimally processed fruits and vegetables, little information is available on the chemical and nutritional implications of this processing, and little research has focused on minimal processing.

Several studies have already been conducted in order to extend the shelf life of minimally processed vegetables and fruits, some focusing on physiological aspects (watad et al, 1990) some on nutritional implication and others on packaging considerations (Amanatidou et al, 2000). Others have studied microbiological implications of minimal processing (lacroix, et al 2004).

Peeled carrots are available in the market processed, vacuum packed and ready to be cooked with a shelf life of 7 days at 4°C without using chemical additives. No information has been given on the chemical and nutritional implications of the processing operations, only sensory and microbiological aspects have been evaluated.

Carrot



Kingdom: [Plantae](#)
(unranked): [Angiosperms](#)
(unranked): [Eudicots](#)
(unranked): [Asterids](#)
Order: [Apiales](#)
Family: [Apiaceae](#)
Genus: [Daucus](#)
Species: **D. carota**

Trinomial name

[Daucus carota](#) subsp. [sativus](#)
([Hoffm.](#)) [Schübl.](#) & [G. Martens](#)

II. Materials And Methods

Extraction Of Juice

Carrots were purchased at Bodija market and were washed in running tap water to remove impurities. Trashes were removed with a plain stainless steel knife and then trimmed with the same knife; it was chopped into smaller pieces and blended with a blender. The juice was extracted using a sieve cloth. It was then poured into a well-rinsed bottle and kept in a refrigerator for further analysis.

Proximate Analysis Of The Carrot:

Determination of moisture content, protein content, crude fat, crude fibre, Ash content, Carbohydrates were carried out using standard analytical methods (Iupac, 1995)

Physicochemical Analysis Of Carrot Juice:

Determination of PH, Specific gravity, colour, were done using standard analytical methods (Iupac, 1995).

Vitamin Content Determination

Vitamins like vitamin A, Ascorbic acid, Thiamine, Niacin, Riboflavin were determined

Mineral Elements Determination

Calcium, iron and phosphorus were determined using atomic absorption spectrophotometer.

III. Results

Here are the results for the physicochemical analysis of carrot juice

PARAMETERS	VALUES
Moisture content	91.100 ± 0.265
Protein	1.067 ± 0.058
Ether extracts (crude fat)	0.367 ± 0.089
Ash	1.333 ± 0.153
Crude fibre	1.167 ± 0.153
Carbohydrates	6.100 ± 0.346
Specific gravit	1.069 ± 0.003
pH	6.233 ± 0.058
Ascorbic acid	16.667 ± 1.332
Ca ⁺⁺ (mg/100g)	55.000 ± 0.000
Fe ⁺⁺ (mg/100g)	1.667 ± 0.153
Po ₄ ⁻ (mg/100g)	44.333 ± 1.155
Thiamine(mg/100g)	0.057 ± 0.006
Niacin (mg/100mg)	0.300 ± 0.000
Riboflavin	0.100 ± 0.000
B-carotene	2730 ± 43.589
Colour (out of 10)	2.000 ± 0.000
Vitamin A	2805 ± 6.532

IV. Discussion

In the table above, the value of the moisture content was 91.100 ± 0.265 which implies that carrot has shorter life span because the higher the moisture in a sample, the higher the growth of micro-organisms on it to disrupt its constituents. Moreover, the value of protein was 1.067 ± 0.058 which means that carrot does not contain much protein but can still be used as protein food supplements in food especially for weaned babies. Likewise the fat content 0.367 ± 0.089 , as it was known to be a cholesterol-lowering food, and this will be very good for the body and be able to digest easily. The ash content was 1.333 ± 0.153 , the reason for the lesser value of ash might be because of some processes involved when making the carrot juice I.e. the juice was extracted and the chaff was discarded.

Furthermore, the value of the crude fibre present in the carrot juice was 1.167 ± 0.153 , crude fibre aids digestion and very desirable in every meal. Carbohydrate content was 6.100 ± 0.346 ; that carrot gives energy to the body and prevents biological membrane of the human body.

Carrot cannot be disputable as the percentage rates of vitamin are very high enough, the value of vitamin A was 2805 ± 6.532 meaning carrot is an excellent source of vitamin A which is very good for clear vision and also helps in making the eyes to be very healthy. Vitamin C was 16.667 ± 1.332 , indicates that carrot will be a good source of vitamin C for body normal metabolism, and can also be used in prevention of scurvy and in wound healing and tissues repair. Niacin was 0.300 ± 0.000 , a component of vitamin B, the value of niacin is very low in carrot but can still do what niacin does in the body when eating in large quantities by preventing and treating pellagra. Riboflavin was 0.100 ± 0.000 , Vitamin B₂; the implication is that when eating enough carrot it will supply the vitamin the body needs for growth, and treating facial lesions and the value of thiamine was 0.057 ± 0.006 which is very small in carrot and thiamine is one of the water soluble vitamins the body needs for proper functioning.

Also, carrot contain some essential minerals which include calcium of 55.000 ± 0.000 , which means that carrot will be very good for humans in particular cell physiology, mineralization of bone and in making the teeth and bone very strong, phosphate of 44.333 ± 1.155 and iron of 1.667 ± 0.153 , iron helps in transporting oxygen in the blood, β -carotene has the value of 2730 ± 43.589 , the high concentration of this in carrot make them to inhibit cancers, also serves as anti mutagenic, free radical scavengers and immune enhancers.

V. Conclusion

The parameters with the highest values or high concentration when undergoing this research were vitamin A and β - carotene. Vitamin A helps In improving vision and β carotene is helpful in the body for normal growth, its inhibits cancers, it's also a free radical scavengers, anti mutagenic and immune enhancer, the consumption of carrot or its juice are highly needed by our body as part of our daily meal because of these

vitamins. Chewing a carrot immediately after food kills the entire harmful organism in the mouth; it helps to alleviate most cramps.

Medicinally, the carrot was used as diuretic, stimulant in the treatment of dropsy (oedema: swelling from excessive accumulation of watery fluid in cells, tissues, or serious cuties), flatulence (a state of excessive gas in the alimentary canal, used in the treatment of chronic cough, chronic renal diseases and a host of other uses. Eating carrot is also good for allergies, anaemia, rheumatism, and also used as tonic for the nervous system.

It can now be concluded that carrot is very good for the body and need to be added to our daily meal when in season.

VI. Recommendation

Carrot is traditionally recommended to every human being especially the weak, sickly or rickety children; it's good for pregnant women, this is good news as many children and adults have poor intakes of this nutrient.

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