

*24th International Symposium on Analytical and Environmental Problems***CHEMICAL AND NUTRITIONAL ASPECTS OF SOME FRESH SMOOTHIE TYPES**

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Abstract

Vegetable and fruits are foods that can be consumed either fresh or processed into juices, smoothies, syrups, jams, fruit compotes, etc. Fruit and vegetables play the important role in the people diet. Worldwide, the consumption of fresh food (fruits, vegetables, and herbs) is steadily in increasing tendency. The good looks, nice colour or taste and aromas, but especially their nutritional value, the rich content in sugars, vitamins and minerals necessary in the diet of the human body are considered to be important. The lower incidence of degenerative diseases is associated with the diet rich in fruits and vegetables.

The purpose of our study was revealing certain physico-chemical and nutritional properties of some fresh foods and the juices or smoothies that we can obtain from them. These aspects highlight their dietary and healing properties.

Keywords: fresh food, juices, smoothie, chemical characteristics, healing properties

Introduction

A diet rich in fruits and vegetables is important for its positive effects on the prevention of chronic degenerative diseases (such as heart dysfunction, cardiovascular diseases), diabetes, high blood pressure, low density lipoprotein oxidation, and associated with a lower incidence of them [1].

Fruits contain high levels of bioactive compounds (vitamin C, total phenolic content, anthocyanin, carotenoids, tannins, flavones and flavonoids), which are important to preserve in the preparation as well as purees, beverages, juices and other varieties of food products [2]. Smoothies represent a convenient and excellent alternative to enhance the daily intake of fruit and vegetables in order to obtain their health-promoting benefits. Purees, smoothies and juice of fruit and vegetable offers similar health benefits as having whole fruits and vegetables [3, 4].

Drinking smoothies have many benefits for human health [3, 5, 6, 7] such as high nutritional and energy values, increased contents of vitamins, antioxidants, polyphenol and fibres a.o.

The aim of the study was to analyse some potential health-promoting constituents from 6 different samples (fruit, vegetable and smoothies).

Experimental*Samples preparation*

There are many possibilities to obtain the smoothie from raw material (fruits, vegetables, herbs). In our study, our smoothies were prepared without adding of water, sugar and citric acid. Smoothies were prepared from only one fruit or several fruits. Smoothies also used

frozen fruits (sea-buckthorn) and dried fruit infusions (cranberry). The samples necessary in our study are fresh fruit pineapple, apple, sea-buckthorn and dried fruit cranberry (infusion of cranberry fruit).

The samples (fruit, vegetable) were selected according to uniformity of shape and colour, then stored in polyethylene bags at 5 °C (up to 5days) until analysis. The samples are fresh (pineapple, apple, and cucumber), frozen (sea-buckthorn) and dried (cranberry) from a Romanian hypermarket, from Timisoara city (west of Romania).

The smoothie sample was obtained by mixing the fruits (fresh and frozen) with cucumber and infusion of dried cranberry fruits.

Analytical procedures

Humidity (moisture) of fresh food samples was evaluated thermo-gravimetrically by using Sartorius thermo-balance.

Total dry content (TSC,) can be determined from moisture content as below:

$$\text{Total dry content (\%)} = 100 - \text{Moisture (\%)}$$

The method for determination of **ascorbic acid content (vitamin C)** was by titration with 2,6-dichlorophenolindophenol until a pink colour appeared [1, 8].

All determinations were performed in triplicate, calculating their arithmetic mean of three separate determinations. The statistically data were acquired using the program Microsoft Excel.

Results and discussion

The obtained data regarding water content (HC, %) and dry content (TSC, %) in samples (fruits, vegetables and smoothies) represented in fig. 1.

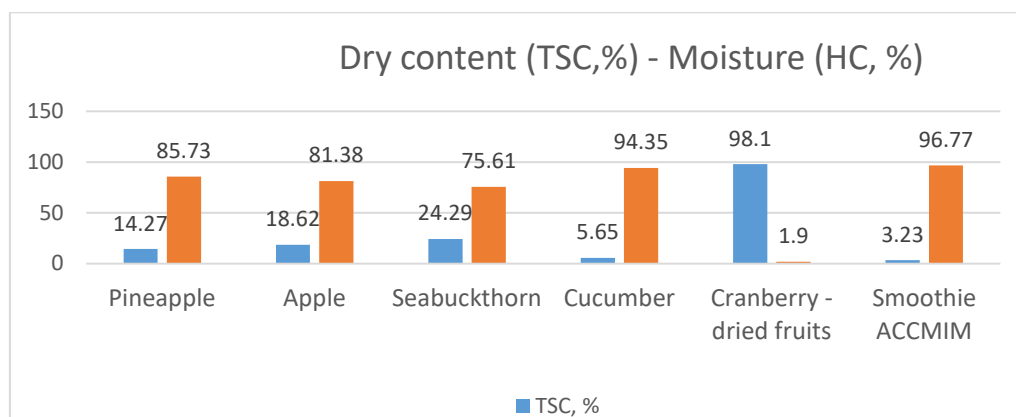


Fig. 1 Dry content (TSC, %) and humidity (HC, %) in samples

Smoothie ACCMIM is prepared from fresh pineapple, apple fruits, fresh cucumber, frozen sea-buckthorn fruit and infusion of cranberry.

Water content (humidity) is a parameter related to the maturity of fruit. In the present study water content values are between 1.9 % (in dried cranberry fruit) and 96.77 % (smoothie).

Refractive indexes of juice samples were between 1.3345 (infusion of dried cranberry fruits) and 1.3519 (pineapples juice) - see fig. 2.

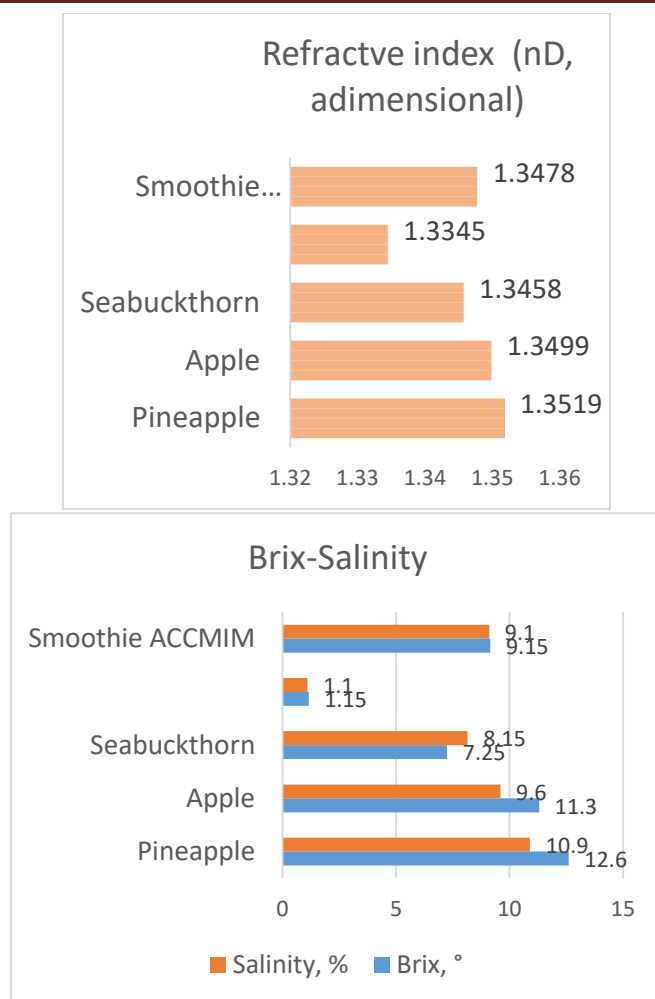


Fig. 2. a) Refractive index (nD) of sample; b) Brix and salinity of sample

The high level of brix and salinity are in pineapple, follow by apple and the low level are in infusion of dried cranberry fruit.

In fig. 3 we are presenting total mineral content (ash, %) values.

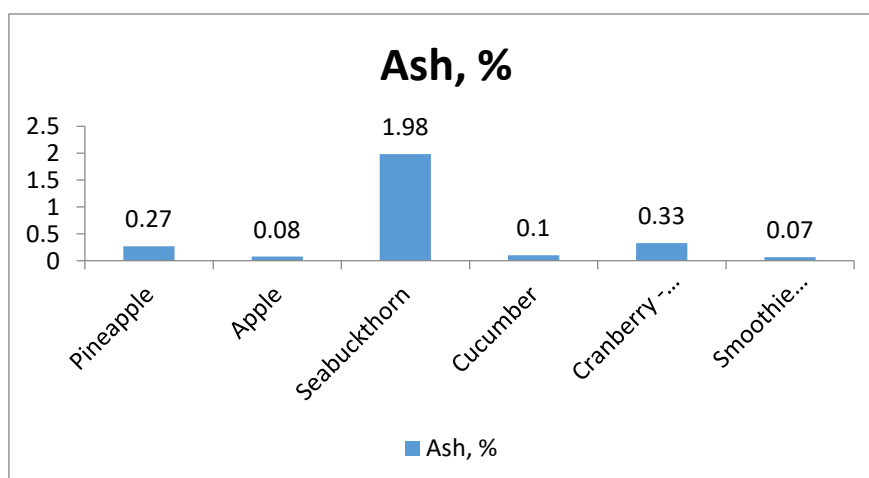


Fig. 3 Total mineral content (Ash, %) in sample

From the analysed data presented above, we can observe that the highest value (1.98 %) of the total mineral content was found in sea-buckthorn, and the lowest value were found in smoothie ACCMIM (0.07 %). The ash quantity resulting from mineralization represents the total mineral content (ash, %).

Determination of ascorbic acid content samples are presented in Fig. 4.

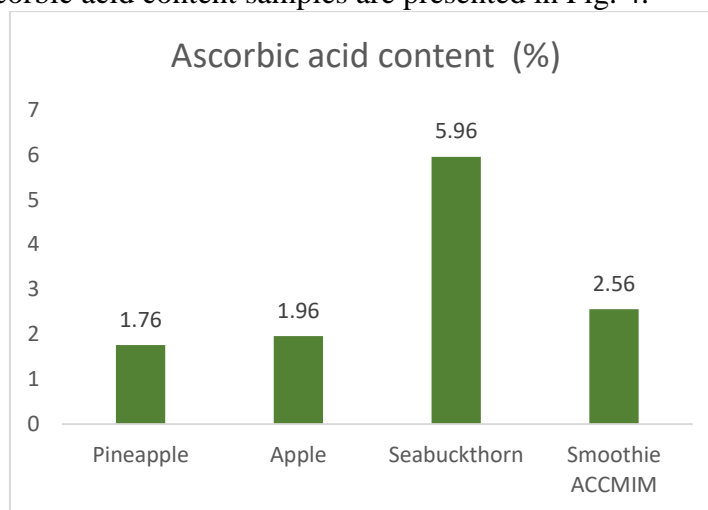


Fig. 4 Ascorbic acid content in samples

The values of ascorbic acid content were between 1.76 – 5.96 (%) (in pineapple respectively in sea-buckthorn).

Conclusions

Fresh beverages are ideal food forms to deliver bioactive compounds to consumers.

In this study, complex beverages formulas, smoothies were formulated containing green fresh food and infusion of dried fruit as medicinal tea.

The obtained results will be used for future research because this data highlighted once more the fact that minimally processed foods are important source of mineral and vitamin.

Fresh smoothies of fruits and vegetables and the tea without additives have superior quality.

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