

Quantitative Evaluation of Carbohydrate Levels in Green Leafy Vegetables for Home Use by Uv-Visible Spectrophotometer

Kavya.Mannem*, Ch.madhu, V.S.Asha, V.Prateesh Kumar

ABSTRACT

A rapid method was developed for the quantitative estimation of carbohydrates present in the different natural green leafy vegetables by UV-VISIBLE SPECTROPHOTOMETER. The sample extract of the spinach, Chinese spinach, amaranthus, sorrel leaves, curry leaves, fenugreek leaves, drumstick leaves, mint, coriander, lettuce were subjected by using anthrone as reagent for the quantitative estimation of the carbohydrate. These samples absorbance was read in uv-visible spectrophotometer at the wavelength of 750nm. The recommendation for the general population is that carbohydrate should supply 50 to 55 percent of total calories, and 130 grams per day (520 calories per day) for male and female adults and for athletes is between 55 and 65 percent of total calories.

Keywords: green leafy vegetables, uv-visible spectrophotometer, wavelength, anthrone, absorbance.

INTRODUCTION

Carbohydrates act as the primary source of energy which is converted into glucose to generate energy essential for metabolism in every cell of the body. Though there is no absolute requirement of carbohydrates, they are essential to ensure that energy is available to the body to perform its normal functions. Carbohydrates perform numerous roles in living things. Polysaccharides serve for the storage of energy (e.g., starch and glycogen), and as structural components (e.g., cellulose in plants and chitin in arthropods) 1-5. The 5- carbon monosaccharide ribose is an important component of coenzymes (e.g., ATP, FAD, and NAD) and the backbone of the genetic molecule known as RNA. The related deoxyribose is a component of DNA. Saccharides and their derivatives include many other important biomolecules that play key roles in the immune system, fertilization, preventing pathogenesis, blood clotting, and development. In food science and in many informal contexts, the term carbohydrate often means any food that is particularly rich in the complex carbohydrate starch (such as cereals, bread, and pasta) or simple carbohydrates, such as sugar (found in candy, jams, and desserts) For most people, between 40% and 60% of total calories should come from carbohydrates, preferably from complex carbohydrates (starches) and naturally occurring sugars. Complex carbohydrates provide calories, vitamins, minerals, and fiber. Carbohydrates formula is $C_{12}H_{22}O_{11}$.

EXPERIMENTAL

Chemicals and Reagents

Anthrone, Sulphuric acid were purchased from Merck Specialities pvt.Ltd.

Instrumentation

Ultraviolet-visible spectroscopy refers to absorption spectroscopy or reflectance spectroscopy in the ultraviolet-visible spectral region. This means it uses light in the visible and adjacent (near-UV and near-infrared (NIR)) ranges. The absorption or reflectance in the visible range directly affects the perceived color of the chemicals involved. In this region of the electromagnetic spectrum, molecules undergo electronic transitions.

Sample preparation

Spinach, Chinese spinach, amaranthus, sorrel leaves, curry leaves, fenugreek leaves, drumstick leaves, mint, coriander, lettuce were taken as samples. 5 grams of each sample was extracted separately in 25ml of distilled water.

Reagent Preparation

0.2 grams of anthrone was weighed accurately and dissolved in concentrated sulphuric acid and make up the volume up to 100ml and finally transferred it in to a 100ml of reagent bottle.

Procedure

Pipette out the 1ml of each extracted sample in to a 25ml of volumetric flask and add 2ml of freshly prepared anthrone reagent in each volumetric flask and finally make up the volume up to the mark with distilled water. Reference was prepared by taking 2ml of anthrone reagent in a 25ml of volumetric flask and make up the volume up to the mark with distilled water. To the above prepared samples wavelength was check in uv-visible spectrophotometry and wavelength was set at 750nm at that wavelength the

developed colour absorbances were noted for the above mentioned samples.

RESULT AND DISCUSSION

From the experiment in spinach 0.075%, Chinese spinach 0.18%, amaranthus 0.7%, sorrel leaves 0.145%, curry leaves 0.935%, fenugreek leaves 0.3%, and drumstick leaves 0.67%, mint 0.29%, coriander 0.1835%, lettuce 0.075% of carbohydrates are evaluated. The recommendation for the general population is that carbohydrate should supply 50 to 55 percent of total calories, and 130 grams per day (520 calories per day) for male and female adults and for athletes is between 55 and 65 percent of total calories.

Table 1

Food Amount of Carbohydrate

Leafy vegetables	Carbohydrate content (%)
Spinach	0.075%
Chinese Spinach	0.18%
Amaranthus	0.7%
Sorrel leaves	0.145%
Curry leaves	0.935%
Fenugreek leaves	0.3%
Drumstick leaves	0.67%
Mint	0.29%
Coriander leaves	0.1835%
Lettuce	0.075%

CONCLUSION

From the curry leaves we gain high calories of carbohydrates of total calories to increase the activity levels in the body.

REFERENCES

1. Flitsch SL and Ulijn RV. Sugars tied to the spot. Nature. 2003; 421:219–220.
2. Maton Anthea, Jean Hopkins, Charles William McLaughlin, Susan Johnson, Maryanna Quon Warner, David LaHart and Jill D. Wright. Human Biology and Health. Englewood Cliffs, New Jersey, USA: Prentice Hall. 1993:52–59.
3. John Merle Coulter, Charler Reid Barnes and Henry Chandler Cowles. A Textbook of Botany for Colleges And Universities. 1930.

4. Carl A. Burtis, Edward R. Ashwood and Norbert W. Tietz. Tietz fundamentals of clinical chemistry. 2000.
5. Matthews C E, Van Holde KE and Ahern KG. Biochemistry. 3rd edition. Benjamin Cummings. 1999.