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Research Article

QUANTITATIVE EVALUATION OF CARBOHYDRATE LEVELS IN DIFFERENT NATURAL FOODSTUFFS BY UV-VISIBLE SPECTROPHOMETER

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ABSTRACT

A rapid method was developed for the quantitative estimation of carbohydrates present in the different natural foodstuffs by UV-VISIBLE SPECTROPHOTOMETER. The sample extract of the raw rice, green gram, black gram, ground nut, guava, grape, banana, carrot, bean and milk 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: food stuffs, 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 $C_{12}H_{22}O_{11}$.

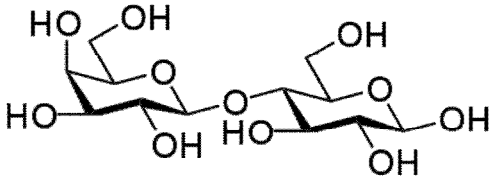

Fig.1: Chemical Structure of Carbohydrate

EXPERIMENTAL

Chemicals and Reagents

Anthrone, Sulphuric acid were purchased from Merck Specalities 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

Raw rice, green gram, black gram, corn, ground nut, guava, grape, banana, carrot, bean and milk 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 raw rice 15.8%, green gram 14.9%, black gram 14.3%, corn 12%, ground nut 10.5%, guava 10.5%, grape 7%, banana 5%, carrot 12.5%, bean 10% and in milk 11% 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
Raw Rice	15.8%
Green gram	14.9%
Black gram	14.3%
Corn	12%
Groundnut	10.5%
Guava	6.3%
Grape	7.0%
Banana	5.0%
Carrot	12.5%
Bean	10.0%
Milk	11.0%

CONCLUSION

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

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