Glycemic Response to Raisins, Grapes and Bananas in College Aged Students


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INTRODUCTION

Raisins are a nutritious snack containing fiber, antioxidants, potassium, and carbohydrates. Raisins have a relatively high fiber content (soluble and insoluble), a viscous food matrix, with approximately 50% of sugar content being present as fructose. Raisins are also rich in phenolic compounds which affect color, taste, and human health. (Singh et al 2009; Williamson and Carughri 2010) Fiber, fructose and phenolic content can all affect the human glycemic response following consumption. Phenolics and fiber are also associated with health benefits with respect to cardiovascular disease and cancer. All foods that contain carbohydrates will produce a transient increase in blood glucose following consumption. However, foods that excessively elevate blood glucose and insulin are often perceived negatively. Raisins could provide health benefits with the additional consumer advantages of extended shelf-life and portability compared to fresh fruit. The shelf-life for bananas is approximately three days, grapes five days, and white bread fifteen days. Raisins have a shelf life of months which may make them appealing to persons seeking to increase fruit intake. This study sought to compare glycemic responses to standard serving sizes of bananas, white bread, raisins, and Thompson seedless grapes in healthy college are participants.

METHODS

This study was approved by the Winona State University Institutional Review Board. Healthy college aged students (ages 19 ± 1; male=12/female=47; BMI 24 ± 3). Participants were self described as healthy with specific exclusions including smoking, diabetes, cancer or cardiovascular disease. Participants arrived at the laboratory between 5 and 7 am following an overnight fast from all food and beverages except water. Laboratory visits were made on one of three days. Upon arrival in the laboratory participants rested quietly for 25 minutes to allow for physiological baseline. A baseline finger stick blood sample was then collected (T-0) after which, participants were assigned to single serving sizes of bananas (n=17), white bread (n=17), Raisins (n=14), and Thompson seedless grapes (n=15) (Table 1), and asked to consume 50ml water with the test snack. Additional blood samples were collected T30, T60, and T120 after completion of the snack. Accu-chek Advantage handheld blood glucose meters and Comfort wave test strips from a single manufactured lot number for uniformity were used in all experiments (Roche Diagnostics, Indianapolis, IN) were used to measure blood glucose. Area under the curve (AUC) values were obtained with the Prizm 5.0 software package (La Hoya, CA). Food composition estimates (Table 1) were based on www.nal.usda.gov/fnic/foodcomp for bananas, grapes, and raisins, and package labeling for white bread (Classic White, Sarah Lee, Downers Grove, IL).

CONCLUSIONS

This study characterized the glycemic response of college-aged participants to several common fruit snacks and bread. It was found that RA had a glycemic response that was similar in comparison to TG, BA, and WB. Because of this, RA may be an attractive choice for improving fruit consumption in college-aged persons. Raisins should also be helpful because of their extended shelf life and portability. Choosing a definition of a “serving size” in terms of grams, calories, carbohydrate load, etc., remains a problem with respect to comparing fresh fruits, dried fruits and baked goods. This is especially a problem when real life servings sizes are considered for younger school aged persons.

REFERENCES

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