

P-037 - A SIMPLIFIED STRATEGY TO MEASURE GLUCOSE RELEASE IN COOKED RICE SAMPLES

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Background

Many varieties of rice are considered a high glycemic index food. High glycemic index (GI) foods are characterized by fast-release of carbohydrates and higher blood glucose levels (Augustin et al., 2002). *In vitro* estimation of the amounts of glucose released during gastrointestinal digestion can be useful to identify or develop low GI foods for incorporation in a healthier diet. The aim of this work is to assess the possibility of using a simple and low cost method (dinitrosalicylic acid (DNS) assay) to estimate starch hydrolysis, and consequent glucose release, during the digestion of cooked rice along the gastrointestinal tract.

Method

Cooked white and integral rice samples were submitted to simulated gastrointestinal digestion using a standardized *in vitro* digestion protocol according to Minekus et al. (2014). Samples were taken in duplicate after oral, gastric and intestinal phases and were analyzed using the glucose oxidase/peroxidase method and the DNS method to determine glucose release/hydrolyzed starch. Total starch was determined using Megazyme's "Total Starch" (amylglucosidase/ α -amylase method - AOAC method 996.11). Pearson's correlation coefficient was used to assess correlations between D-Glucose kit and DNS method on glucose release from rice samples.

Results & Conclusions

A positive correlation was observed between results from D-Glucose kit and the DNS method for glucose release throughout simulated gastrointestinal digestion for white rice ($r=0.96$) and integral rice ($r=0.99$). Percentage glucose release increased steadily over time for both rice varieties, in both tests used. As expected, the results obtained with the D-glucose kit are lower than the results obtained with the DNS method, due to its specificity for free D-Glucose. Overall, results showed a 6-fold increase in glucose release between oral and intestinal phases in white rice compared to a 3-fold increase in brown rice. Furthermore, glucose values were 30-fold higher in order of magnitude in white rice versus brown rice. These differences are associated with the different biochemical and nutritional characteristics of the two rice varieties.

References & Acknowledgments

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Keywords: glucose release, DNS method, starch hydrolysis, glycemic index, rice