

INTRODUCTION

Rice, in addition to being considered a staple food, is an essential standard food for celiac patients. Usually, milled rice is consumed (Figure 1) instead of brown rice which contains the bran and germ (the most nutritional valuable fractions). Milled rice is considered a high glycemic index food due to its high starch content (~77.6%) [1]. Brown rice and treatments such as germination are being explored to increase rice's nutritional value. The glycemic index (GI) measures the glucose response when eating a fixed amount of carbohydrate food. The GI can be measured *in vivo* or through *in vitro* evaluation methods, assessing the rate of starch digestion [2]. Rice grain composition, particularly the main nutrients, starch and protein, influence the digestion rate.

RESULTS AND DISCUSSION

The results showed that, cooked milled rice has the highest RDS (68.78 %), while germinated and brown rice presents lower values of 59.37 % and 59.40 %, respectively (Table 1).

Table 1 – RDS, SDS, TDS, RS, Total starch (%) and estimated GI of cooked rice samples

Cooked samples	RDS (%) (rapidly digestible starch)	SDS (%) (slowly digestible starch)	TDS (%) (total digestible starch)	RS (%) (resistant starch)	Total Starch (g/100g)	GI
Milled rice	68.78 ^a	1.37 ^a	71.77 ^a	0.41 ^a	72.18 ^a	88.56 ^a
Brown rice	59.37 ^b	3.29 ^a	67.85 ^b	0.35 ^a	68.20 ^b	83.74 ^b
Germinated rice (48h)	59.40 ^b	2.41 ^a	64.14 ^c	0.19 ^b	64.32 ^c	82.66 ^b

Different letters in the same column represent statistically different results considering $p < 0.05$

The germinated cooked rice presented the lowest estimated GI (82.66), lowest starch content (64.32%) and the highest protein content (8.37 %) compared to cooked milled and brown rice ($p \leq 0.05$). Brown rice showed the highest starch gelatinization temperature (66.95°C) ($p \leq 0.05$).

The lower gelatinization temperature (64.75°C) and peak viscosity (Figure 2) of germinated rice (when compared to the other matrices) are in accordance with their lower starch and higher protein contents.

Milled rice presents a highest viscosity, that related directly with total starch (72.18 %).

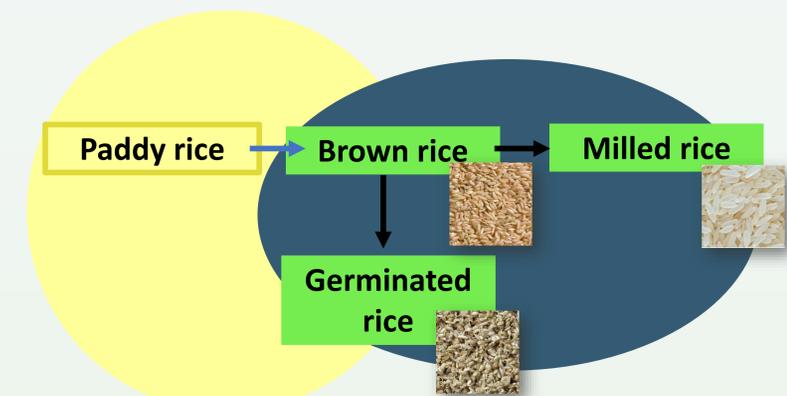


Figure 1 – Rice fractions

OBJECTIVES

The main objective of this study was to assess the glycemic response, after cooking, of different samples from Ariete rice variety subjected to milling and germination when compared to brown rice, also exploring some nutritional parameters that can predict GI, namely the starch content, protein content, and the parameters associated with starch hydrolysis, such as gelatinization temperature and viscosity profiles.

MATERIALS AND METHODS

The analysis were performed in milled, brown and germinated rice grains from Ariete variety. The rice grains were cooked and freeze-dried to obtain flours to estimated GI. The estimated GI was predicted by an *in vitro* digestion method by the determination of rapidly digestible starch (RDS), slowly digestible starch (SDS), resistant starch (RS), and total starch was acquired by using a kit Megazyme, K-DSTRS. The hydrolysed starch was determined after performing the linear regression described by Goni et al. (1997). Protein content was analysed by near-infrared spectroscopy (Bruker), and the gelatinization temperature and the viscosity profiles were evaluated by Rapid Visco Analyzer (Newport Scientific, Warriewood, Australia).

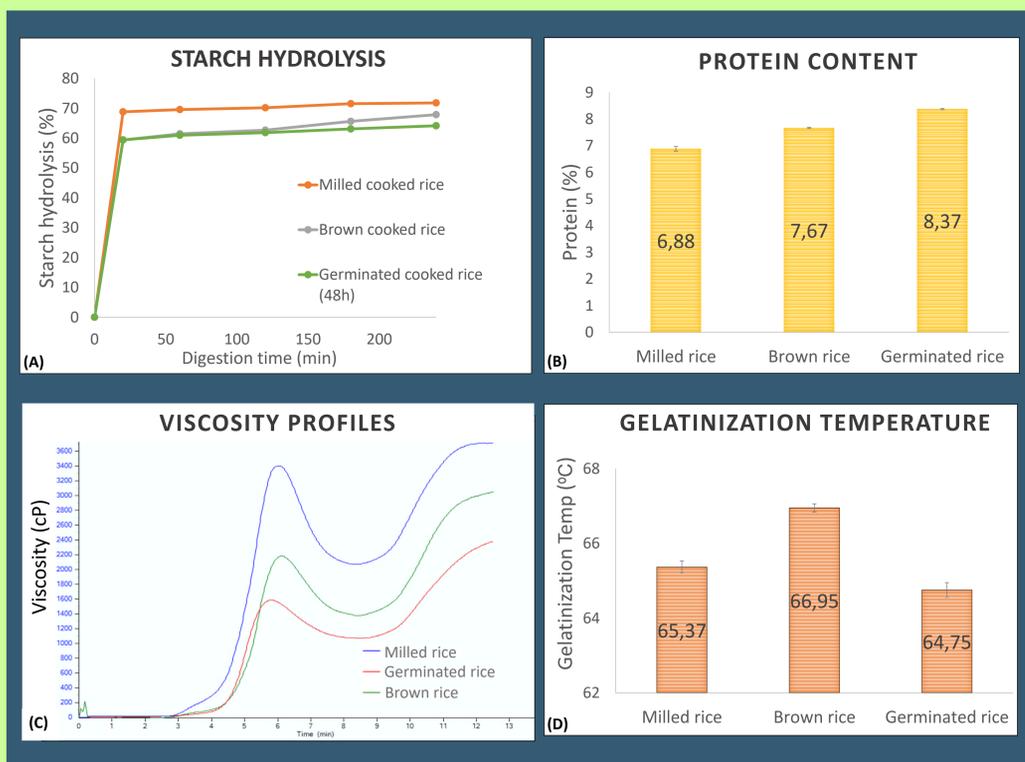


Figure 2 – (A) Starch hydrolysis (%); (B) Protein content (%); (C) Viscosity Profiles (cP); (D) Gelatinization Temperature (°C)

CONCLUSION

The results obtained shows how the milling and germination treatments can influence the cooked rice composition and consequent impact in the estimated glycemic index, reinforcing the nutritional interest in promoting brown and germinated rice consumption.

Aknowlegements

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References

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