



STARCH DIGESTIBILITY AND PHYSICOCHEMICAL PROPERTIES OF PROCESSED RICE

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INTRODUCTION



Traditional white rice

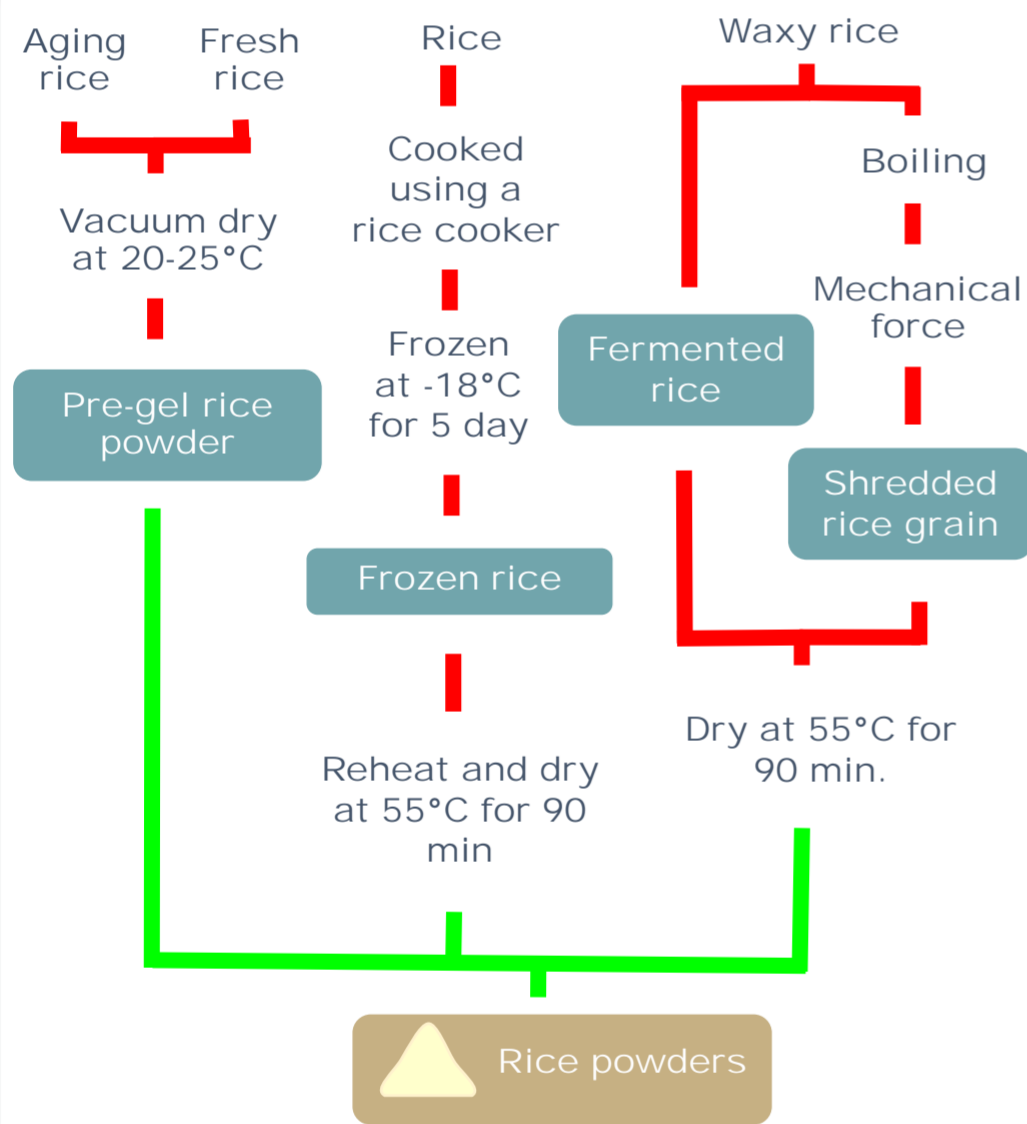
HIGH GI

Different process condition may alter GI of rices.



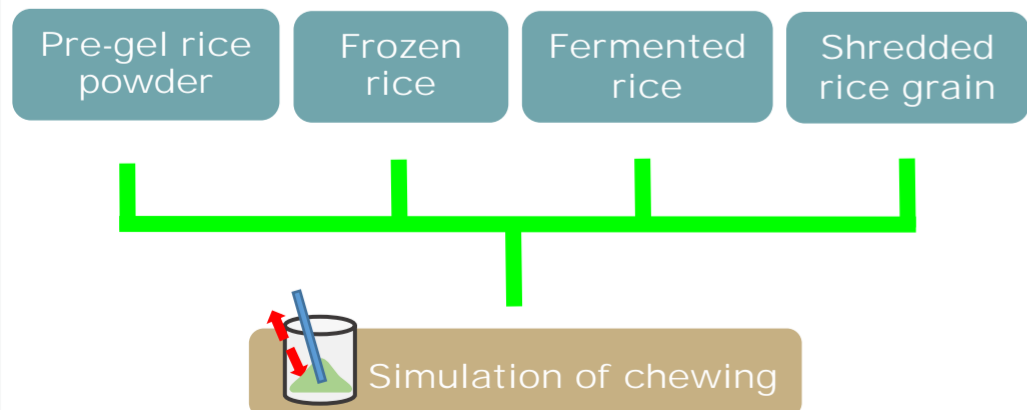
METHOD

Preparation of different processed rice



- Rapid visco analyser (RVA)
- Scanning electron microscopy (SEM)
- Amylose content

Preparation for analysis



- Rapidly digested starch (RDS)
- Slowly digestible starch (SDS)
- Resistant starch (RS)
- Glucose release

Englyst et al. (2000)

ABSTRACT

The digestibility and physicochemical properties of different rice products was investigated in this work. Rice products including pregelatinization rices (pre-gel rice powder no.1 and pre-gel rice powder no. 2), freezing frozen cooked rice, fermented rice and shredded rice grain were used. Results showed that fermented rice had the highest RDS (13.37 %) which contributed to the highest of glucose release rate. This product is suitable for people who need a lot of energy. Shredded rice had the lowest of glucose release rate which is suitable for those who want to control weight or control the glucose release in the blood. Pre-gel rice powder no.1 and pre-gel rice powder no. 2 had high levels of SDS, RS and slow glucose release rate. Pregel rices are better choice than other types of processed rices which provide benefits in controlling blood sugar levels and weight control.

Keywords : Processed rice, slowly digestible starch, resistant starch, glucose release

RESULTS & DISCUSSION

Amylose content and starch fraction

Table. 1 Amylose content and starch fraction

Sample	Amylose content (%)	RDS (%)	SDS (%)	RS (%)
Pre-gel rice powder No.1	20.83 ± 0.10 ^a	5.51 ± 1.98 ^c	14.89 ± 0.59 ^b	43.99 ± 0.04 ^c
Pre-gel rice powder No.2	21.04 ± 0.49 ^a	4.45 ± 0.21 ^b	13.19 ± 1.75 ^b	47.65 ± 0.14 ^d
Frozen rice	17.22 ± 0.29 ^b	3.33 ± 0.28 ^a	20.49 ± 0.93 ^c	48.41 ± 1.07 ^d
Fermented rice	1.42 ± 0.64 ^c	13.34 ± 0.42 ^d	23.76 ± 0.30 ^c	15.52 ± 0.42 ^a
Shredded rice grain	2.64 ± 0.20 ^c	3.74 ± 0.09 ^{a,b}	5.11 ± 0.42 ^a	20.78 ± 0.45 ^b

Values bearing the same letters within the same column are not significantly (p > 0.05) different from each other

Glucose release rate

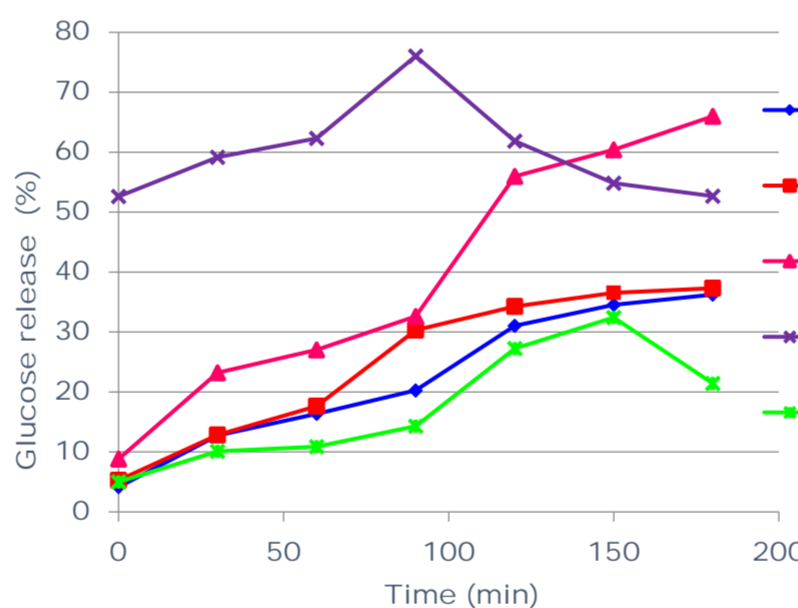


Fig. 1 Glucose release rate of processed rice

Fermented rice has the highest glucose release and shredded rice grain have the lowest glucose release.

Rapid visco amylograph (RVA)

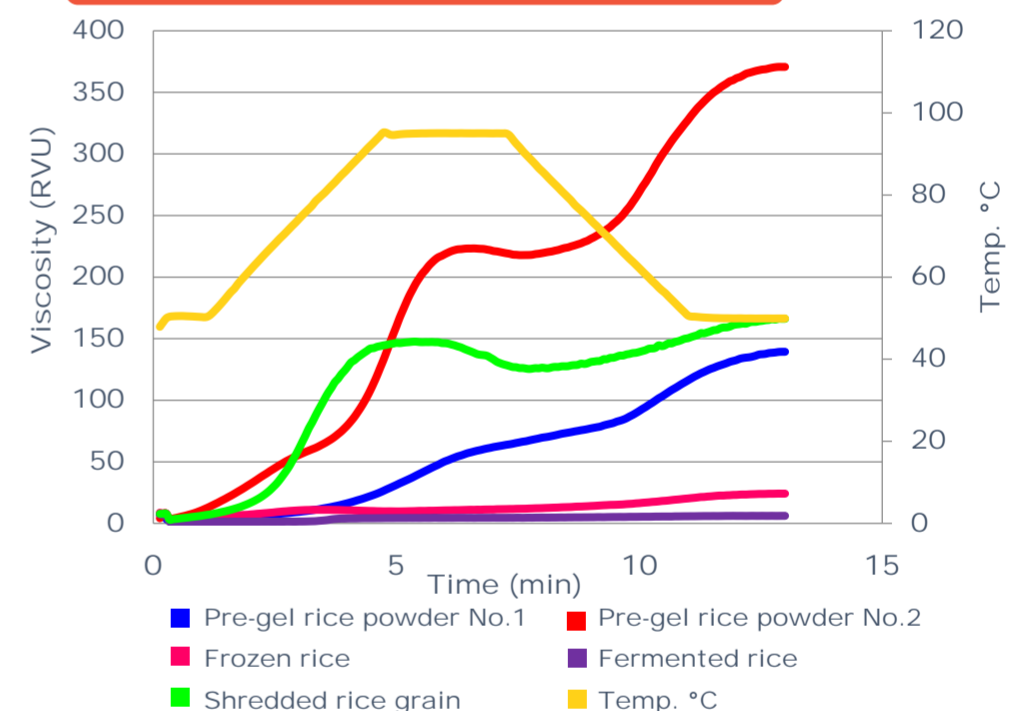


Fig. 2 Rapid visco amylograph (RVA) profile of processed rice

Pre-gel rice powder No.2 has the highest viscosity and fermented rice have the lowest viscosity

Scanning electron micrograph (SEM)

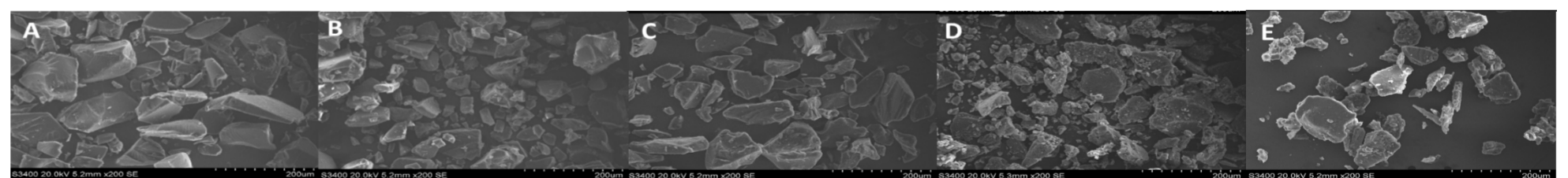


Fig. 3 Scanning electron micrograph (SEM)

A) New rice powder B) Aging rice powder C) Frozen rice D) Fermented waxy rice E) Shredded rice grain

CONCLUSIONS

Pre-gel rice powder

- RS ↑
- Amylose content ↑

Frozen rice

- SDS ↑

Fermented rice

- RDS & SDS ↑
- Glucose release rate ↑

Shredded rice grain

- RS ↑

REFERENCES

- Englyst, K. N., Hudson, G. J., and Englyst, H. N. 2000. Starch analysis in food. Encyclopedia of Analytical Chemistry. 4246–4262.
- Juliano, B. O. 1971. A simplified assay for milled-rice amylose. ResearchGate. 334-340.