



Effect of Fibersol on Physicochemical Properties of Riceberry Crackers



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ABSTRACT

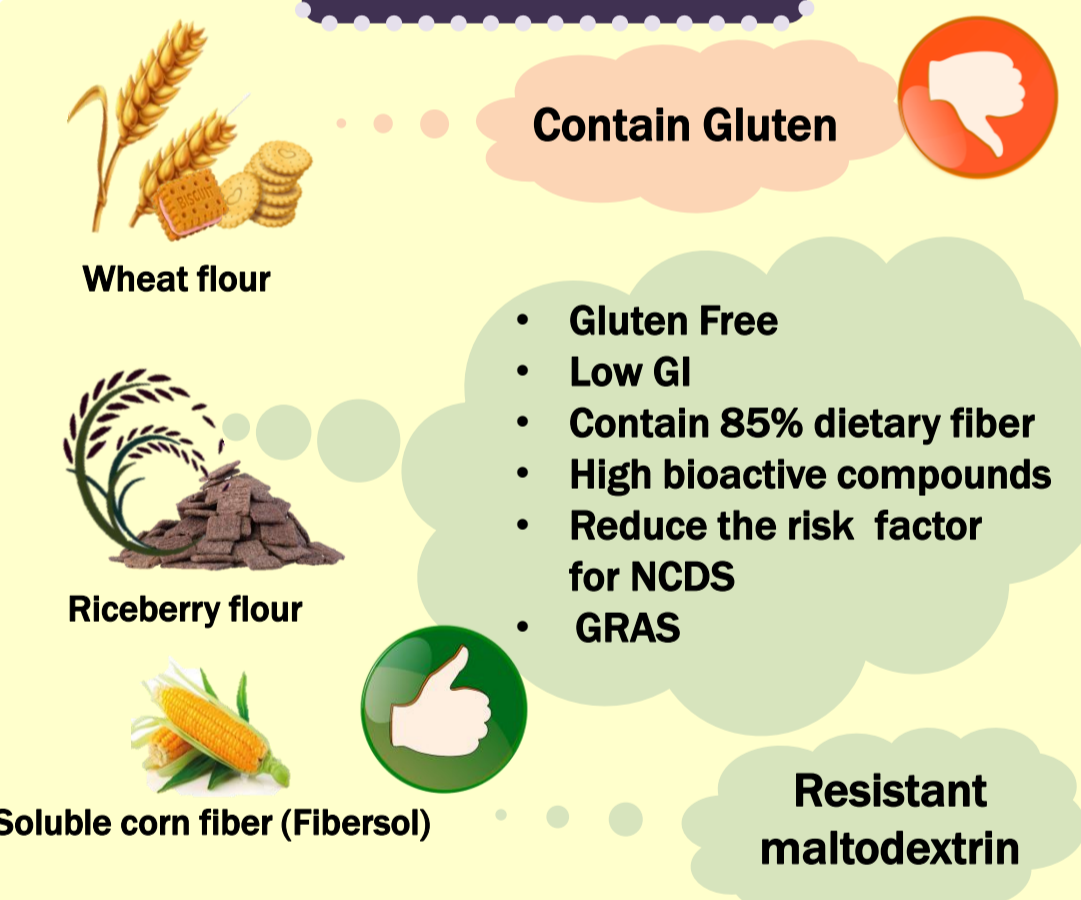
Development of gluten-free crackers enriched with fiber would create an alternative way of functional foods. Riceberry rice was used as gluten-free flour which containing high antioxidant properties. This study aimed to investigate the effect of Fibersol addition (0%, 5%, 10% and 15%) on physicochemical properties and sensory attribution of riceberry crackers. Fibersol is soluble dietary fiber ingredients. Results indicated that as the amount of Fibersol increased, water activity, hardness, fracturability, hydrolysis rate and glycemic index decreased. Color (*L) of riceberry crackers increased with increased amount of Fibersol, while a* and b* did not significant difference (p>0.05). In term of health benefits, it was found that total phenolic content, anthocyanin content, antioxidant capacity, total dietary fiber, insoluble dietary fiber and starch fraction of riceberry crackers were not significantly influenced by adding of Fibersol except in slowly digestible starch content. Slowly digestible starch content and sensory attribution significantly increased (p≤0.05) with increasing level of Fibersol.

Key words: Riceberry cracker, Fibersol, Gluten free

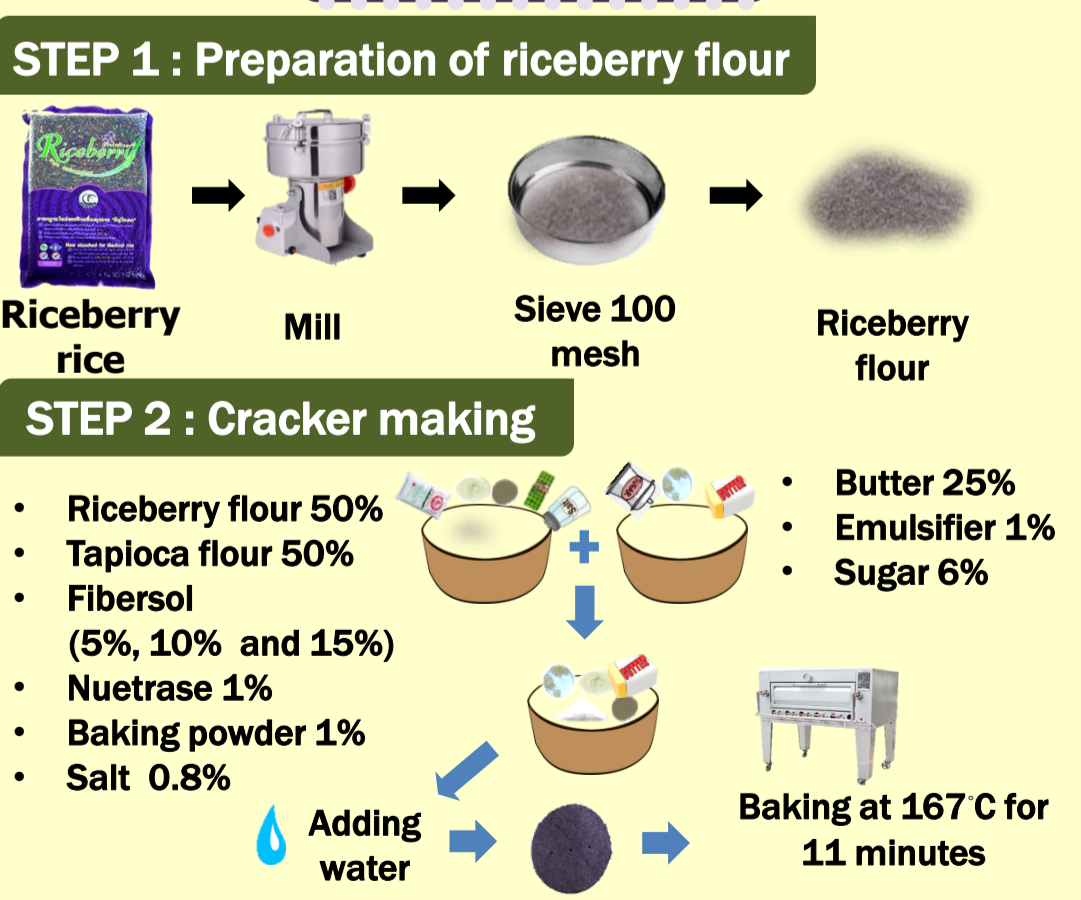
OBJECTIVE

To investigate effect of Fibersol on physicochemical properties of riceberry cracker.

INTRODUCTION



METHODS



RICEBERRY CRACKERS ANALYSIS

- Color
- Water activity
- Spread ratio
- Bulk density
- Texture
- Starch fraction
- Starch hydrolysis
- Proximate analysis
- Total anthocyanins
- Total phenolics
- Antioxidant capacity
- Sensory evaluation

RESULTS AND DISCUSSION

PHYSICAL PROPERTIES OF RICEBERRY CRACKERS

Table 1. A_w, Color, spread ratio and bulk density of riceberry crackers

Samples	A _w	Color			Spread ratio ^{ns}	Bulk density (g/cm ³) ^{ns}
		L*	a* ^{ns}	b*		
Control	0.15 ± 0.01 ^b	27.45 ± 0.27 ^{ab}	4.34 ± 0.06	1.48 ± 0.04 ^b	-0.05	2.00 ± 0.01
5% Fibersol	0.21 ± 0.01 ^a	28.17 ± 0.19 ^a	4.42 ± 0.01	1.24 ± 0.01 ^{bc}	-0.05	1.99 ± 0.01
10% Fibersol	0.20 ± 0.01 ^a	28.43 ± 0.12 ^a	4.47 ± 0.04	1.31 ± 0.01 ^b	-0.05	1.97 ± 0.02
15% Fibersol	0.15 ± 0.01 ^b	28.84 ± 0.05 ^a	4.48 ± 0.04	1.65 ± 0.02 ^a	-0.05	1.96 ± 0.03

*a-c Different superscript letters in column are significantly different using one-way ANOVA and Tukey HSD's test (p < 0.05). *ns refers to not statistically significant

CHEMICAL PROPERTIES OF RICEBERRY CRACKERS

Table 2. Chemical properties of riceberry crackers

Chemical properties	Control	5% Fibersol	10% Fibersol	15% Fibersol
Total phenolics content (mg GAE/100g) ^{ns}	1.74 ± 0.05	1.72 ± 0.07	1.71 ± 0.02	1.64 ± 0.02
Total Anthocyanins content (mg/100g) ^{ns}	6.85 ± 0.37	6.58 ± 0.75	6.23 ± 0.14	5.98 ± 1.72
Antioxidant capacity (mg TE/100g) ^{ns}	11.63 ± 0.84	12.44 ± 1.00	13.85 ± 0.17	13.38 ± 0.22
Soluble dietary fiber (%)	0.10 ± 0 ^c	1.96 ± 0.02 ^b	3.00 ± 0.02 ^b	7.75 ± 0.80 ^a
Insoluble dietary fiber (%)	9.84 ± 0.19 ^a	7.69 ± 0.21 ^b	7.15 ± 0.30 ^b	5.78 ± 0.23 ^c
Total dietary fiber (%)	9.94 ± 0.19 ^b	9.64 ± 0.21 ^b	10.15 ± 0.16 ^b	13.52 ± 0.58 ^a
Rapidly digestible starch (%) ^{ns}	8.60 ± 0.49	8.59 ± 0.51	8.41 ± 0.62	6.97 ± 0.78
Slowly digestible starch (%)	1.28 ± 0.01 ^b	0.98 ± 0.67 ^b	0.93 ± 0.67 ^b	3.23 ± 0.67 ^a
Resistance starch (%)	24.41 ± 0.83 ^a	20.86 ± 0.64 ^b	18.77 ± 1.17 ^c	14.36 ± 0.95 ^d
Total starch (%)	34.39 ± 1.40 ^a	30.53 ± 0.66 ^b	27.97 ± 0.27 ^c	24.70 ± 0.73 ^d
Glycemic index	57	56	55	53

*a-c different superscript letters in row are significantly different using one-way ANOVA and Tukey HSD's test (p < 0.05).

From the table above shows, antioxidant properties and rapidly digestible starch were not significantly different. Fibersol added formulations reduced total starch content and glycemic index. Furthermore, 15% Fibersol had the highest and lowest content of slowly digestible starch and glycemic index respectively.

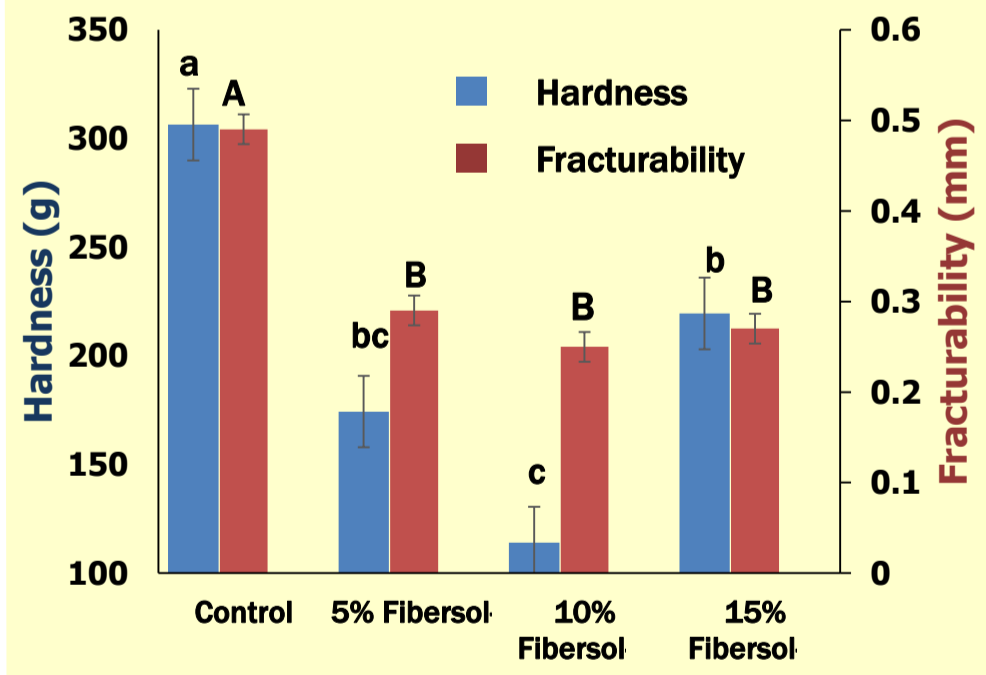


Figure 1. Hardness and fracturability of riceberry crackers

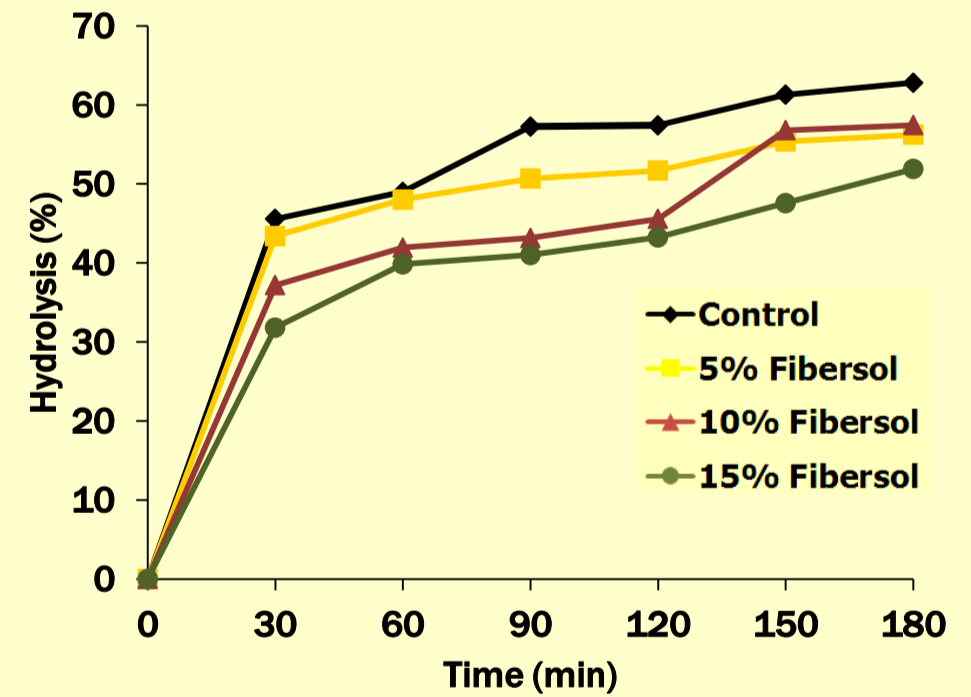


Figure 2. Starch hydrolysis of riceberry crackers

* Comparing between groups *a-c different superscript letters in the same parameter are significantly different using one-way ANOVA and Tukey HSD's test (p < 0.05).

SENSORY EVALUATION

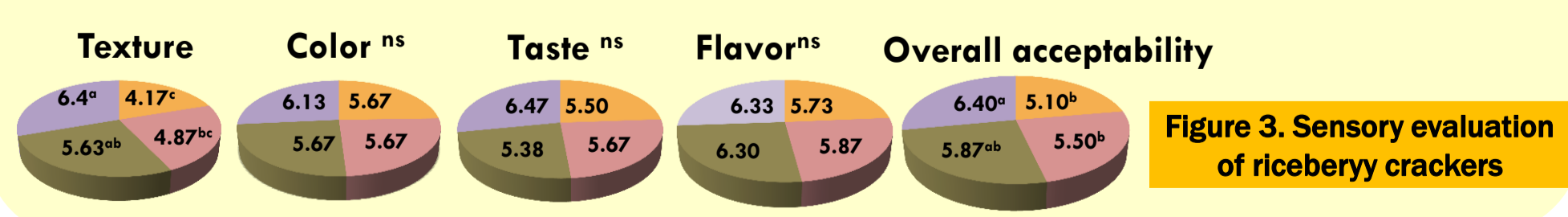


Figure 3. Sensory evaluation of riceberry crackers

CONCLUSION

- High soluble fiber content
- Low glycemic index
- Contain antioxidant properties

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