

Comparison of two *in vitro* analysis of resistant starch of some carbohydrate containing foods

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Resistant starch (RS) is defined, as the sum of starch and products of starch degradation not absorbed in the small intestine (1). Determination of the amounts of RS in foods will help explain physiological benefits of RS. An ideal *in vitro* method should simulate conditions *in vivo* as much as possible to comply with the existing definition of RS. It is hard to mimic the degree of gastrointestinal transit time *in vitro*. At present, there is no simple, rapid method which estimates RS in food samples both *in vivo* and *in vitro*. This study compared the amounts of resistant starch in four starch rich foods using the methods of RS analysis by Muir and O'Dea (2) and Goni et al., (3) and determined the effects of processing on the amount of RS. Boiled long grain white rice, cornflakes, boiled, sprouted and boiled, and pressure cooked mungbean, boiled potato and boiled and cooled potato were studied.

Table 1 shows the comparison of resistant starch of the processed and unprocessed foods using two methods of RS analysis. Among the samples, RS was significantly ($p \leq 0.05$) higher in all except for boiled potato using the method of Muir and O'Dea compared to Goni *et al.* Different processing techniques yielded different RS between the two methods. Resistant starch in boiled mungbean was significantly higher than pressure-cooked and sprouted boiled mungbean. Cooling boiled potato overnight at 4°C produced significantly more RS.

Food Samples	Amount of Resistant Starch	
	Muir and O'Dea (1992) ¹ (g/100 g dry wt)	Goni <i>et al.</i> (1996) ¹ (g/100 g dry wt)
Long grain white rice	13.3 ± 1.8 ^a	5.5 ± 0.41 ^b
Cornflakes	5.4 ± 0.31 ^a	3.4 ± 0.62 ^b
Mungbean, boiled	15.1 ± 2.1 ^a	5.3 ± 0.74 ^b
Mungbean, pressure cooked	13.4 ± 1.4 ^a	2.6 ± 0.76 ^b
Mungbean, sprout, boiled	4.7 ± 0.38 ^a	2.5 ± 0.46 ^b
Potato, boiled	4.6 ± 0.48 ^a	4.6 ± 0.45 ^a
Potato, boiled, cooled	10.1 ± 1.8 ^a	8.1 ± 1.3 ^b

¹Values are means ± standard deviation. Values between columns not sharing the same superscript are significantly ($p \leq 0.05$) different.

Differences in RS between two methods and food samples could be due to differences in incubation time, enzymes used, retrograded starch, starch structure and form.

1. EURESTA GROUP. Physiological Implication of the Consumption of Resistant Starch in Man. Presented at Agro-Industrial and Forest Research Technology Days. FLAIR. Concerted action. European Communities Brussel, March, 1992:10-12.
2. Muir, JG and O'Dea, K. Measurement of Resistant Starch: Factors Affecting the Amount of Starch Escaping Digestion *in vitro*. *Am J Clin Nutr*, 1992; 56:123-7
3. Goni, *et al.* Analysis of resistant starch: a method for foods and food products. *Food Chem.* 1996;56(4) 445-49.