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Novel approach to intensify the formation of the bioactive sulforaphane in cooked *Brassica* vegetables

Sameer Khalil Ghawi

University of Reading, UK

Sulforaphane, a naturally occurring cancer chemo preventive, is the hydrolysis product of glucoraphanin, the main glucosinolate in broccoli. The hydrolysis requires myrosinase isoenzyme to be present in an active state; however, cooking leads to its denaturation. In order to ensure glucoraphanin hydrolysis, broccoli must either be mildly cooked or active sources of myrosinase can be added post-cooking.

In this study, mustard seeds as exogenous source of myrosinase were added to cooked broccoli as a condiment with a view to intensify the formation of sulforaphane. Thermal inactivation of myrosinases from broccoli and mustard seeds was studied. Thermal degradation of broccoli glucoraphanin was also investigated. In addition, the effect of mustard seeds addition on sensory profiling and consumer acceptability was assessed.

Mustard seed myrosinase showed higher thermal stability than broccoli myrosinase. Limited thermal degradation of glucoraphanin (about 10%) was observed when broccoli was sous vide cooked in a water bath at 100°C for either 8 or 12 min. Addition of mustard seed powder to cooked broccoli reinitiated the formation of sulforaphane.

Broccoli that had been mildly cooked was not acceptable to consumers. Addition of mustard seed powder significantly changed sensory attributes of broccoli samples and affected consumer liking. Despite the significant increase in pungency and burning sensation in samples with added mustard seeds, a considerable number of consumers (32%) liked it. This suggests that optimized addition of *Brassica* condiments (e.g. mustard seeds, rocket, horseradish, watercress) to cooked broccoli may be a route to enhance bioactivity of cooked broccoli without compromising consumer acceptability.

Biography

Sameer Khalil Ghawi is a Post-Doctoral Researcher at the Department of Food and Nutritional Sciences, University of Reading, White knights, UK.

s.khalilghawi@reading.ac.uk