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Changes in the dietary fibre content during processing of traditional breakfasts

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Dietary fibre (DF) is known to play a protective role in controlling metabolic diseases. The sources of DF in the diet are dependant on the type of foods consumed. This study reports the changes occurring in the insoluble (IDF) and soluble (SDF) dietary fibre fractions in the preparation of traditional breakfast foods and its contribution to the daily intake.

Rice and wheat flour based string hoppers (SH) and idli (ID) were formulated in the laboratory. The raw materials were subjected to dry milling, wet milling, roasting, fermentation and steaming techniques, depending on the type of breakfast preparations. The commercial preparations included two types of bread [wheat flour (100%) and wheat flour: millet (Kurakkan) in the ratio of 85:15]. The DF content in different stages of processing was determined by enzymatic-gravimetric method, expressed as dry weight basis. The presence of resistant starch was confirmed using GC techniques after 12 M and 1 M H_2SO_4 acid hydrolysis followed by derivatization into alditol acetates.

The highest contribution of dietary fibre was from breakfast preparations containing rice flour (8.7 mg/ 100 g); wheat flour bread contributed the least (1.8 mg/ 100 g), due to high extraction rate of milling. A higher SDF was observed in the 'wet milling + roasting' of rice flour, as compared to 'dry milling + roasting' (9.7 > 8.8 mg/100 g). However, this difference was not observed after steaming in the final step of the preparation of SH. The total dietary fibre (TDF) content of string hoppers made with wet milled flour and dry milled flour were 10.09 mg/ 100 g and 9.95 mg/ 100 g, respectively. Steaming of the extruded rice flour increased the TDF in the SH by ~13 mg/ 100 g. ID contributed moderately to the dietary fibre (4.25 mg/ 100 g) intake, when semolina and black gram were used in the ratio of 2:1. Removal of seed hull from the black gram after soaking reduced its TDF content. In commercial bread, substitution of wheat flour with 15% millet increased the total dietary fibre from 1.8 mg/ 100 g to 3.18 mg/ 100 g.

The study concludes that steaming and roasting increased the DF content, which could be attributed to the formation of resistant starch. The contribution of DF to the total diet from commercially available bread was less than from traditionally prepared breakfasts foods (idly, string hoppers). Rice based breakfast preparations (eg.180 g) contributed approximately 18.4% of DF to the daily diet (32 g DF/ adult diet).

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