

DIETARY FIBER COMPOSITION AND FERMENTABILITY CHARACTERISTICS OF ROOT CROPS AND LEGUMES

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Background: Physiological and metabolic effects of dietary fiber have significant importance in the proper control and management of chronic diseases e.g. diabetes mellitus, cardiovascular diseases, and cancer. It is now well established that dietary fiber is not metabolized in the small intestine and reaches the colon where it is fermented to produce short chain fatty acid (SCFA) such as acetate, propionate and butyrate. Acetate is a good source of energy. Propionate has been shown to inhibit the activity of the limiting enzyme for cholesterol synthesis while butyrate has some protective effect on colon cancer. **Objective:** To determine the dietary fiber composition and fermentability characteristics of local root crops and legumes. **Material and Methods:** Total, soluble and insoluble fiber were determined in six (6) root crops e.g. kamote, gabi, potato, tugi, ube, cassava and 10 legumes e.g. mungbean, soybean, peanut, pole sitao, cowpea, chick pea, green pea, lima bean, kidney bean and pigeon pea using the AOAC method. The dietary fiber from all of the test foods were isolated and fermented using human fecal inoculum. The short chain fatty acids e.g. acetate, propionate and butyrate produced after fiber fermentation was measured using HPLC. **Results:** The dietary fiber content of root crops ranged from 4.6- 13.5 g/100 g while legumes ranged from 20.9-46.9 g/100 g. The dietary fiber content of legumes was significantly greater than that of root crops. Soybean has significantly greater dietary fiber content (46.9 ± 3.4 g/ 100 g) among the legumes while gabi has significantly greater dietary fiber content (13.5 ± 0.1 g/ 100 g) among the root crops studied ($P < 0.05$). Significant amounts of short chain fatty acids were produced after fermentation of the fiber isolate from both root crops and legumes. The best source of acetate, propionate and butyrate among the root crops was tugi (2.5 ± 0.4 , 1.8 ± 0.2 , and 0.8 ± 0.0 , respectively). The best source of acetate among the legumes were pole sitao (5.6 ± 0.5) and mung bean (5.3 ± 0.1), for propionate, kidney bean (7.2 ± 1.5), and for butyrate, peanut (6.0 ± 0.2). **Conclusion:** Both root crops and legumes are good sources of dietary fiber and produced short chain fatty acids such as acetate, propionate and butyrate. The results of the study may have significant role in the proper control and management of chronic diseases e.g. cardiovascular diseases, cancer and diabetes mellitus.