



***IN VITRO* FERMENTABILITY AND ANTIOXIDANT CAPACITY OF THE INDIGESTIBLE FRACTION OF COOKED BLACK BEANS (*PHASEOLUS VULGARIS L.*), LENTILS (*LENS CULINARIS L.*) AND CHICKPEAS (*CICER ARIETINUM L.*).**

ABSTRACT

BACKGROUND: Pulses represent an important source of protein, as well as digestible and indigestible carbohydrates. Little information is available on the indigestible carbohydrates and antioxidant capacity of legume seeds. The cooked seeds of three pulses (black bean, chickpea and lentil) were evaluated for their indigestible fraction (IF), polyphenols content, antioxidant capacity and *in vitro* fermentability, including short-chain fatty acid production.

RESULTS: The insoluble indigestible fraction (IIF) was higher than the soluble counterpart (soluble indigestible fraction, SIF). The SIF value was highest in black beans, while no difference was observed between chickpeas and lentils. Black beans and lentils had higher polyphenols content than chickpeas. The IF of black beans exhibited the lowest and chickpeas the highest associated polyphenols content. Condensed tannins were retained to some extent in the IF that exhibited significant antioxidant capacity. The total IF of the three pulses produced short chain fatty acids (SCFA) after 24 h of *in vitro* fermentation by human colonic microflora. IF from black bean and lentil were best substrates for the fermentative production of butyric acid.

CONCLUSIONS: It is concluded that the IF of pulses might be an important source of bioactive compounds. Copyright © 2010 Society of Chemical Industry

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