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DETERMINATION OF PHASEOLAMIN FROM KIDNEY BEAN (PHASEOLUS VULGARIS): AN ALPHA-AMYLASE INHIBITOR IN DIETARY SUPPLEMENTS

**Maurizio Mosca^{1*}, Concetta Boniglia², Brunella Carratù³, Stefania Giammarioli⁴,
Valentina Nera⁵, Elisabetta Sanzini⁶**

^{1 2 3 4 5 6} Istituto Superiore di Sanità, Rome, Italy

* Corresponding author - E-mail: maurizio.mosca@iss.it; Phone: +390649902626 ; Fax: +390649387101

The potential dangers of obesity and its high prevalence in developed countries are well known: it has been indicated as a significant risk factor in a wide range of morbidities, from apnea, dyslipidemia, hypertension, diabetes mellitus to coronary artery disease (1). The varying remedies currently available to control excess body weight include pharmacological preparations and dietary supplements intended to restrict energy absorbance and promote weight loss. Some of dietary supplements, so-called 'starch-blockers', are based on the protein concentrate from *Phaseolus vulgaris* or kidney bean, known to contain high levels of the α -amylase inhibitor or phaseolamin, which may reduce adsorption and prevent the digestion of carbohydrates.

The aim of this study was to have a reliable analytical method to determine phaseolamin in raw materials and dietary supplements because information on the composition of the basic material and on the manufacturing processes of these products is not available.

Currently methods to determine the levels of α -amylase inhibitor are based on the measurement of α -amylase activity by the different iodine staining power in the presence or absence of inhibitor during the action of the enzyme on soluble starch (2) or by using an alkaline reactive whose brown reduction products were determined photometrically as reported by Bernfeld (3). Since these colorimetric methods cannot be applied to dietary supplements, which are complex mixtures of different ingredients that may interfere with the measurement, we propose to determine the level of phaseolamin in dietary supplements by measuring directly, by high-performance anion-exchange chromatography coupled with pulsed amperometric detection (HPAEC-PAD), the amount of maltose resulting from the enzyme action of porcine α -amylase on soluble starch in the presence and absence of the inhibitor.

The assay described proved sensitive and accurate for use with both dietary supplements and raw materials, and we verified the linearity, repeatability and applicability of the proposed method.

[1] World Health Organization (WHO) (1998) Obesity: preventing and managing the global epidemic. Report of a WHO Consultation on Obesity. Geneva, Switzerland.

[2] Bird R, Hopkins RH (1954) The action of some alpha-amylases on amylose. Biochem J 56: 86-99

[3] Bernfeld P (1955) Amylase α and β . Meth Enzymol 1: 149-153