

## #94: Effect of different household processes on antinutritional factors and iron and zinc contents in carioca beans (*Phaseolus vulgaris L.*)

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A regular intake of beans could contribute to the prevention and reduction of anemia and other micronutrient deficiencies in vulnerable groups world-wide. The nutritional quality of beans however, is usually reduced by the presence of antinutritional factors (ANF). Their concentrations can be reduced by food processing and food preparation techniques. Though soaking and cooking of beans after discarding the soaking water seems to be unanimously recommended to improve their nutritional quality, it may result in a loss of minerals. However, the knowledge of the consequences for mineral absorption is limited. Thus, this study aimed to evaluate the influence of cooking (common pan, pressure pot) in the presence or absence of the soaking water on the content of ANF, iron and zinc in Carioca beans. Discarding the soaking water before cooking the beans resulted in a lower content of iron, but the zinc content was not reduced. Iron mean contents were determined to be  $7.48 \pm 1.05$  mg/100 g and  $6.94 \pm 1.33$  mg/100 g in raw seeds (RAW) and cooked beans after discarding the soaking water (COS), respectively. There was no statistical difference in the iron content of Carioca beans cooked in the presence of the soaking water (CWS) compared to the raw beans. The cooking procedure resulted in a statistically significant reduction in total polyphenols and condensed tannins compared to raw beans, but no statistical different ANF contents were observed for beans cooked with or without the soaking water. Total polyphenols contents decreased from  $6.73 \pm 0.04$  mg/g (RAW) to  $5.02 \pm 0.08$  mg/g (CWS) and  $4.89 \pm 0.04$  mg/g (COS), respectively. The content of condensed tannins decreased from  $1.02 \pm 0.03$  mg eq. CE/g (RAW) to  $0.87 \pm 0.04$  mg eq. CE/g (CWS) and  $0.84 \pm 0.01$  mg eq. CE/g (COS), respectively. Compared to raw beans, an increase in InsP5 content during cooking was observed, without a statistically significant change in the InsP6 contents.

The overall concentration of ANF could be reduced by applying household process. The loss in polyphenols might be due to a leaching of water-soluble polyphenols into the soaking and cooking water and a thermal breakdown during cooking. Discarding the soaking water before cooking the Carioca beans did not have any advantage in respect to ANF reduction. Furthermore, a loss in iron content was observed.

### Keywords

antinutritional factors, my-inositol phosphates, minerals, household processing

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