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Effect of soaking in water or in sodium carbonate on tannin content and *in vitro* protein digestibility of sorghum cultivars

EL FADIL E. BABIKIR & ABDULLAHI H. EL TINAY*
Department of Biochemistry, Faculty of Agriculture, University of Khartoum, Shambat, Sudan

Summary

Investigation of two sorghum cultivars showed that although the tannin content of untreated seeds were 3.1 and 0.6% for Karamaka and Mugud cultivars, respectively, their *in vitro* protein digestibility (IVPD) is very similar (89% and 90% respectively). Extractable tannin content was markedly reduced by steeping whole seeds in water or Na_2CO_3 solution and by incubating them for up to 24 h at 30°C or up to 20 min at 100°C. With both cultivars, the percentage tannin extracted increases with time, temperature, and Na_2CO_3 concentration, with an increase in the percentage *in vitro* protein digestibility, but the degree of change differed between the two cultivars studied.

Conditions have been observed which combine a low energy-input, short-time treatment with high protein digestibility of the treated grain.

Keywords

Sorghum, Tannin, Protein digestibility.

Introduction

In different parts of the world, vigorous efforts are directed towards coupling the beneficial effects of tannins in sorghum and faba bean as field crops with methods for overcoming the anti-nutritional effects of tannins in seeds either by direct removal of seed testa, inactivation, or by extraction. Extractable tannin content was markedly reduced when grains were soaked in water and stored under a carbon dioxide atmosphere (Reichert *et al.*, 1980). In feeding trials with rats (Reichert *et al.*, 1980; Yasaman *et al.*, 1990) and chicks (Teeter *et al.*, 1986), tannins reduced weight gain and feed conversion. Chavan *et al.*, (1979) reported that soaking sorghum seeds at high temperature for different time intervals reduced tannin content and improved IVPD. They also reported that sodium carbonate-treated high-tannin grains showed significantly lower tannin content and significantly increased IVPD than untreated grains. The study described here aimed to improve the nutritional value of high-tannin sorghum cultivars by soaking grains in water or in various sodium carbonate solutions at different temperatures and for different time intervals.

Authors' address: Department of Biochemistry, Faculty of Agriculture, University of Khartoum, Shambat, Sudan.
* Correspondent.