

6th International Workshop on Immunonutrition, 15th–17th October 2012, Palma de Mallorca

Cytokines profiles in intestinal epithelial (Caco-2) cells exposed to 7-ketostigmasterol or 7-ketocholesterol

L. Alemany¹, J. M. Laparra², R. Barberá¹ and A. Alegría¹

¹Nutrition and Food Chemistry. Faculty of Pharmacy, University of Valencia, Avda. Vicente Andrés Estellés s/n, 46100 Burjassot, Spain and ²Agrochemistry and Food Technology Institute, National Research Council, Avda. Agustín Escardino 7, 46980 Paterna, Spain

Plant sterols (PS) exert hypocholesterolemic effects and prevent cardiovascular diseases. In addition, PS have evidenced immunomodulatory properties promoting anti-inflammatory⁽¹⁾ and both innate and adaptive immune response(s)⁽²⁾. It is known that PS are susceptible to oxidation increasing their cytotoxicity; however, the influence of oxidized derivatives on inflammation and immune response(s) has been poorly evaluated and, in *in vitro* models, only in monocytic (U937) cells⁽³⁾. The objective of the present study was to compare cytokine profiles in intestinal epithelial (Caco-2) cells exposed to 7-ketostigmasterol and 7-ketocholesterol. Caco-2 cell cultures (initial density of 50.000 cells/cm²) were challenged (5 days post-seeding) to solutions (60 μM) of 7-ketostigmasterol or 7-ketocholesterol for 3h. Relative changes in the expression (mRNA) of IL-1β receptor, TNF-α and NFκB (p65) were monitored by reverse transcription-qPCR, and interleukin (IL)-8 and IL-10 production were quantified by ELISA. Cell cultures exposed to 7-ketostigmasterol exhibited a sharp up-regulated expression of IL-1β receptor, TNF-α and NFκB (Fig. 1A). This cellular response(s) was accompanied of a marked increase in IL-8, but slight IL-10, production (Fig 1B). These results indicate potential negative alterations in intestinal permeability favoring the interaction with intraepithelial lymphocytes. 7-ketocholesterol only induced a moderate up-regulation of IL-1β receptor and significant lower concentrations of IL-8 than 7-ketostigmasterol.

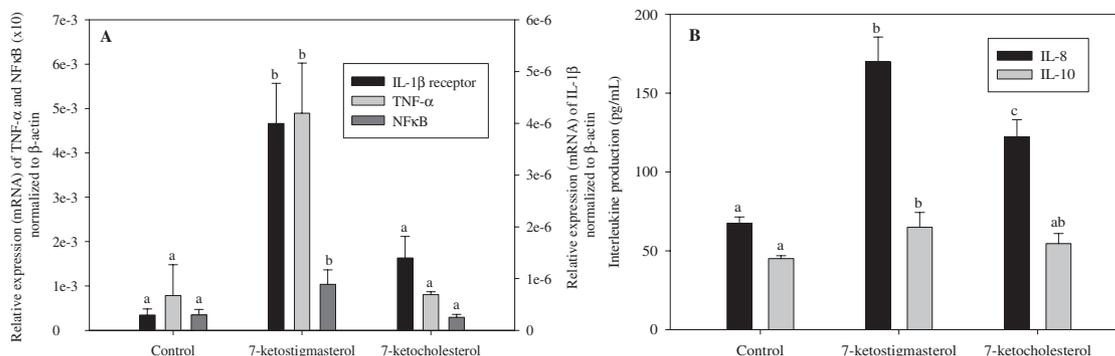


Figure 1. Changes in IL-1β, TNF-α and NFκB expression (A) and IL-8 and IL-10 production (B) (Mean ± SD, n = 4).

The results evidenced that 7-ketostigmasterol caused more severe inflammatory response(s) than 7-ketocholesterol to Caco-2 cells cultures. The potential negative impact of 7k-stigmasterol on intestinal epithelium integrity could alter its morphological functionality.

- Othman RA & Moghadasian MH (2011) *Nutr Rev* 69 (7), 371–382.
- Brüll F, Mensink RP, van den Hurk K, Duijvestijn A & Plat J (2010) *J Biol Chem* 29, 285(5): 2951–2958.
- Vejux A, Montange T, Martine L *et al.* (2012) *J Agr Food Chem* 60, 4060–4066.