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85. Oxysterols and TLR-mediated intestinal inflammation: protective effect of cocoa bean shells. a smart way for waste valorisation

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Dietary oxysterols' ability to induce intestinal inflammation is widely known. Considering the important role of Toll-like receptors (TLRs) in mediating immune and inflammatory responses, we verified if a mixture of oxysterols widely present in cholesterol-rich foods could require TLR2 and TLR4 activation to promote intestinal inflammation. Furthermore, the protective effects of cocoa bean shell (CBS) extracts with high poly-phenolic content were also investigated. Differentiated CaCo-2 enterocyte-like cells were treated with a dietary oxysterol mixture and TLR2/4 gene expression and activation were analyzed. Inflammation was evaluated by quantifying IL-8, IFN β and TNF α cell release. Honduras CBS polyphenolic fractions (HFs) were characterized by HPLC-DAD-MS/MS. The HF anti-inflammatory effects were evaluated in cells under oxysterol mixture treatment. We observed that TLR2 and TLR4 activation is required to mediate oxysterol pro-inflammatory effects. HF pre-treatments fully prevented the oxysterol-dependent cytokine induction, as well as TLR2/4 over-expression. These effects may be due to the high (-)-epicatechin and tannin quantities present in specific HFs.

In conclusion, TLR2 and TLR4 can definitely contribute to mediate oxysterol pro-inflammatory action on intestinal cells. CBS fractions could be employed as anti-inflammatory food supplements, thus representing an important industrial design for recycling