Extending beef meat shelf life: an approach using active food packaging with pomegranate extract and peels

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More than 50% of the pomegranate fruit (*Punica granatum* L.) is not considered edible, being composed by peels (50%) and seeds (10%). Pomegranate peels represent an excellent source of bioactive compounds with excellent antioxidant and antimicrobial activities due to the peels' high content in phenolic compounds, specially punicalagin (A+B) and ellagic acid.

The aim of the present study was to evaluate the potential effects of a polylactic acid (PLA) based active packaging incorporated with pomegranate peels and an ethanolic extract from pomegranate peels in the shelf-life extension of fresh meat. Two PLA-based active packaging incorporating 3% (w/w) of pomegranate peels (PLA/3PP) and 3% (w/w) of pomegranate peels extract (PLA/3PPE) were used to pack beef meat. The samples were stored at 4 °C, for a maximum of 11 days. The meats' lipid oxidation and microbial contamination was evaluated at the end of 1, 4, 6, 8 and 11 storage days. Lipid oxidation was measured by the Thiobarbituric Acid Reactive Substances assay (TBARS)[1]. Meat's total microorganisms count at 30 °C was performed using the automated method TEMPO® Aerobic Count-AFNOR BIO 12/35–05/13.

Both PLA active packaging significantly delayed meat's lipid oxidation and microbial growth. The meat with PLA/3PP and PLA/3PPE presented a difference up to 3 log CFU/g on the 11th storage day. Even though both active packaging were able to inhibit meat's lipid oxidation, these results showed that PLA/3PP was more efficient, providing insights for the use of this bio-waste towards environmental sustainability.

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