

## Effectiveness of a Wool Based Packaging System on the Abundance of Surface Spoilage Microorganisms on Meat Products

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### Abstract

Sheep wool can be used as an eco-friendly type of packaging that, due to its complex physical and chemical composition, can also help control humidity and reduce condensation. Given these properties, the potential of wool to be used as packaging liners for the transport of food products is of interest. The present study assessed the microbiological quality of meat packaged and stored at room temperature for 72 h in conventional expanded polystyrene boxes (EPS) and cardboard boxes lined with wool using standard approved culturing techniques. The findings suggest that the wool may have potential market value as packaging liners for transporting meat, and possibly other food products. Further research is needed to allow better characterisation to real-world conditions, and understanding of how wool used as a packaging liner could help maintain food quality on a larger scale.

**Keywords:** Contamination, microbiological quality, packaging, raw meat, spoilage .

### Introduction

Meat spoilage is mainly caused by biological deterioration of a product, which is potentially hazardous to health (Anon, 2012; Haque *et al.*, 2008) and considered unacceptable by the consumer due to defects such as off-flavours, off-odour, sour taste, discoloration and slime formation (Nychas *et al.*, 2008; Maltin *et al.*, 2003, Ouattara *et al.*, 2000). Poor operational techniques during the slaughter of animals and the subsequent stages of processing and storage of the meat may lead to elevated microbial counts and hence reduce shelf life and quality (Dave and Ghaly, 2011; FAO, 2007). Packaging

is important in maintaining the quality and safety of meat and the type of packaging can influence the microbial flora of meat (Olaoye and Ntuen, 2011). It can also affect the relative humidity of the meat environment, with lower humidity associated with lower microbial counts. Central to the above factors is the control of temperature, with meat needing to be stored at refrigeration temperatures (typically 1-4°C) to restrict microbial growth. Packaging that can maintain such temperatures during transportation aids in the delay of growth of spoilage micro-organisms (Renerre and Labadie, 1993, Dillon and Board, 1991). Wool is often used as an insu-