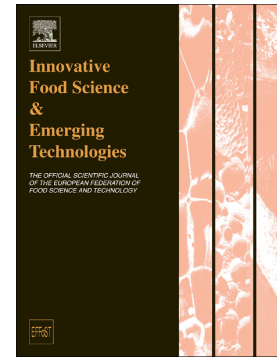


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Packaging concepts for fresh and processed meat – Recent progresses

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Review

## Packaging concepts for fresh and processed meat – Recent progresses

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**Abstract:** Modern societal, economic, nutritional and ecological changes warrant the continued evolution of packaging solutions in order to meet new requirements. This review examines current advances in the development of novel packaging related technologies, methods and materials for fresh and processed meat. The current focus of research has been found to concentrate on the development of sustainably producible packaging materials as well as increased functionality of packaging systems in general. Active & intelligent packaging solutions are showing great promise for the improvement of packaging functionality and will enable extended shelf life, higher quality and greater safety of packed meat. Novel approaches in this field are increasingly examining the use of natural functional additives and combination methods. Although often held back by legal restrictions, low retail or consumer acceptance and sometimes incomplete development, intelligent packaging systems are still being devised and show good potential for augmenting the present methods for maintaining the safety of packed meat. The overall goals of current research are to enhance the safety and quality of packed meat while reducing costs and negative environmental impacts by utilizing natural materials and synergy effects. Good efforts are being made with regard to these objectives although many promising concepts still require some additional refining for commercialization.

**Keywords:** Meat packaging; sustainable packaging; active & intelligent packaging; quality; shelf life; biodegradable

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### 1. Introduction

The global food market has always been changing and adapting according to economic and social developments. The past century has seen rapid growth in terms of both the world's population and overall economic prosperity. The consequent trend in the food sector has consistently been one towards supermarkets as the dominant retail format and increasingly packaging dependent solutions as a result of the growing prevalence of packaged foods (Popkin, Adair, & Ng, 2012). Within this category of the food market, fresh and processed packed meat is a particularly relevant and interesting segment worth examining. In order to design suitable packaging materials and processes for meat products, many different factors have to be taken into account. The technology behind meat packaging has an effect not only on the safety of the product but also on its shelf life. The latter is particularly relevant today as globally approximately one third of food produced for human consumption, equating to around 1.3 billion tons, is lost annually with close to 50% of waste in western developed countries taking place in households (FAO, 2011). Table 1 shows the waste percentages for different commodities including meat in each step of the food supply chain. The significance of the packaging process but especially the treatment of the product by the consumer is highlighted by the two highest waste percentages for meat. Inappropriate packaging is responsible for a high degree of waste, especially in developing countries where suitable technologies and materials

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