

DEVELOPMENT OF A MATERIAL TESTING PROTOCOL FOR EVALUATION OF RADIO FREQUENCY TRANSPONDER EFFECTS ON BLOOM TIME OF BEEF LOIN MUSCLE

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Radio Frequency transponders are rapidly becoming a viable technology for tracking of perishable food items through the grocery supply chain. However, the effects of radio frequency transponders on package performance are not well known. This study focused on development of a radio frequency material testing protocol and effect the transponder would have on bloom of beef loin muscle.

A common transponder substrate of polyethylene terephthalate (PET) with an adhered aluminum antenna and integrated circuit was evaluated to better understand material properties. Testing was performed to identify physical and barrier properties of the substrate

Transponders were received on a stock roll and trimmed to common dimensions found in label applications. Specific testing was performed for substrate identification, surface tension, oxygen and water permeability, and tensile strength.

Beef loin muscles were used to evaluate the effect of transponders (adhered to the primary film) on bloom time of a tray packed steak. Statistical differences of ($P < 0.05$) and ($P < 0.0001$), differences interpreted as of practical significance, were seen in areas of the beef loin muscle directly beneath the transponder when compared to control areas in the absence of the transponder.