

RADIO FREQUENCY IDENTIFICATION TRANSPONDER PERFORMANCE ON REFRIGERATED AND FROZEN BEEF LOIN MUSCLE PACKAGES

By

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Radio Frequency Identification (RFID) is a technology that is quickly becoming an integrated tool in the field of Supply Chain Management. This research investigated the potential use of RFID as a cold-chain management tool for fresh meat packaging. Current RFID technology can penetrate many materials, but the retail food supply chain presents many challenges. Beef muscle presents a challenge due to the storage environment and moisture content of the product.

The objective of this research was to evaluate the effects of different storage temperatures of beef muscle on the data communication performance of an RFID system. Two RFID systems were utilized to evaluate performance differences between frequencies. Beef packages were tested individually and in stacked configurations to simulate item and shelf level tracking. Packages were frozen and refrigerated to simulate different storage conditions.

This research found that RFID systems operating in the 13.56 MHz frequency range should experience no loss of data when transmitting through a package of refrigerated or frozen beef. RFID systems operating in the 915 MHz frequency range should communicate through frozen packages, but may experience a loss of data when communicating through a refrigerated package.