

'Meating' a solution: Research finds that LED lights extend meat shelf life, save retailers money

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A switch to LED lights in refrigeration units could save the retail meat industry millions of dollars each year, according to research from Kansas State University.

Kyle Steele, recent master's graduate in [animal sciences](#) and industry, Silver Lake, Kan., found that using light-emitting diode, or LED, lights in refrigeration units both saves energy for [meat](#) retailers and extends the shelf life of some beef products.

"By using LED lighting in meat retail display cases, Kansas retailers can save money by lowering the operational costs of refrigerated cases and extending the color shelf life of fresh [meat products](#)," Steele said.

"Additionally, by extending the color shelf life, retailers have a greater opportunity to sell the product at full price, and the state of Kansas can gain tax revenue from the full retail price rather than a discounted price."

Steele compared the use of LED lights and fluorescent lights in meat refrigeration units because many meat retailers currently use fluorescent lights. He worked with Elizabeth Boyle and Melvin Hunt, both professors of animal sciences and industry, as well as with Melissa Weber, recent doctoral graduate in animal sciences and industry, Collinwood, Tenn.

During refrigerated display, the color of fresh meat changes because of its natural chemistry and exposure to oxygen. Because color is a large factor that influences customers in purchasing meat, some consumers discriminate against discolored meat. These discolored meat products must either be discounted or discarded, which has been estimated to cost the meat industry up to a billion dollars each year, Steele said.

For his research, Steele looked at five different meat products: pork loin chops, beef loin steaks, ground beef, [ground turkey](#) and beef inside round steaks. Steele looked at several aspects of these meat products and their refrigeration units:

- * **Discoloration:** The researchers brought in trained color panelists to score meat color changes over time while displayed under both lighting types.

- * **Rancidity:** The researchers measured the rancidity of the meat products stored under both types of light. Light affects the oxidation of fat in meat, which can cause rancidity and a change in taste.

- * **Operating efficiency:** The researchers studied operating efficiency of the two types of lights by measuring how many times a refrigeration unit had to cycle to keep the meat cool and how many running hours that cycle lasted.

The researchers found that LED lights scored positively in nearly all areas. Most significantly, LED lights helped reduce operating costs and prolonged the shelf life for most of the meat products.

"Most meat products displayed under LED lighting had colder internal product temperatures, which helps extend product shelf life," Steele said. "Beef loin steaks and inside round steaks that were stored under LED lights can have up to one day longer shelf life."

Among operational costs, LED lights had fewer cycles per running hour, meaning they were a more efficient and cost-saving light source than fluorescent lights.

Steele will give a research presentation titled "[Shelf life](#) of five meat products displayed under light emitting diode or fluorescent lighting" at the Capitol Graduate Research Summit in Topeka in February.

Provided by Kansas State University

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