New LED display lights help improve taste of milk, researchers find

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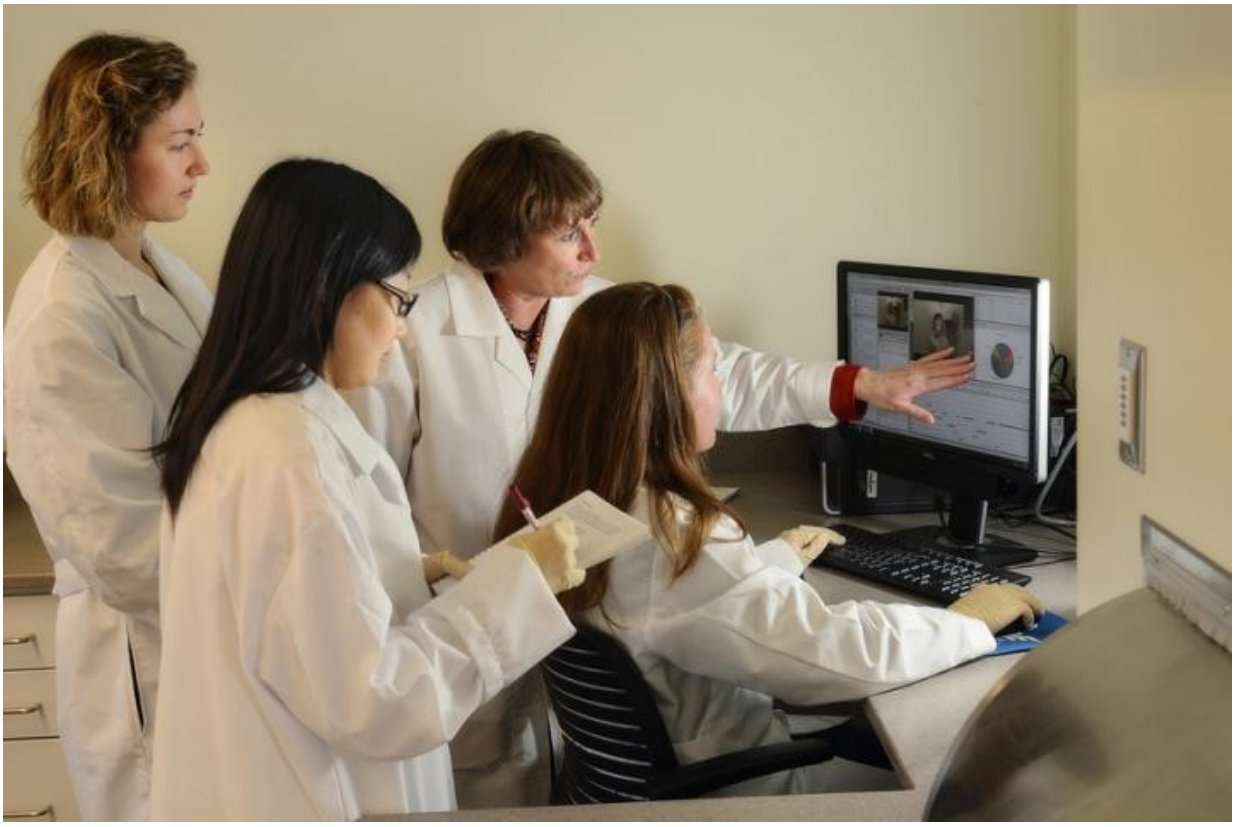

Professor Susan Duncan works in Virginia Tech's Food Sensory Lab with students. Duncan recently posted research showing that new LED lights that are being installed in milk display cases across the country do more than just reduce energy bills -- they also help milk taste better. Credit: Virginia Tech

New LED lights that are being installed in milk display cases across the

country do more than just reduce energy bills—they also help milk taste better, Virginia Tech researchers have found.

The exposure to certain light changes the flavor profile of milk. Milk fresh from the dairy should taste sweet and rich but when people describe milk that was exposed to conventional fluorescent lights, they used words like "cardboard," "stale," and "painty." Researchers found that while the new LED lights reduce those negative profiles, there is still work to be done in packaging to ensure milk tastes like it did back when a milkman delivered freshly pasteurized milk to your grandmother's doorstep.

"We want to help figure out ways to return to the fresh taste of milk that our grandparents experienced when it came straight from the dairy," said Susan Duncan, a professor of food science and technology in the Virginia Tech College of Agriculture and Life Sciences.

"Milk is delicious and nutritious and we want to find ways to protect both of those characteristics to help the industry and provide an even better product to consumers," said Duncan, who is also the associate director of the Virginia Agricultural Experiment Station and an affiliated researcher with the Fralin Life Sciences Institute.

Duncan's findings were recently published in the *Journal of Dairy Science*.

Milk consumption has been decreasing for several decades and Duncan said that the lighting used in retail display cases that change the taste of milk may be one of the factors for this decline.

One of the nutrients in milk—riboflavin—oxidizes when it is exposed to fluorescent lights. This reaction not only causes the taste to change, but can also reduce the nutritional content of milk. Duncan's tests show that

when milk is stored in the traditional translucent plastic jugs, these reactions can take place in a little as two hours. Opague milk packaging that protects riboflavin and other nutrients from lighting helps to deliver that fresh, sweet, rich taste.

Duncan conducted a series of tests at the Virginia Tech Sensory Evaluation Laboratory that showed the new LED lights leave milk with a more satisfactory taste that consumers prefer over milk that has been exposed to fluorescent lights.

"Our target is to bring a smile to your face when you drink milk," she said.

However, Duncan, said, more work still needs to be done on packaging to protect flavor profiles even further. Every milk drinking experience should deliver that positive experience.

If the traditional HDPE translucent jugs are used, milk is more likely to undergo oxidation and have its flavor changed. But her tests shows that when light-blocking pigments in HDPE or plastic PET containers were used, the flavor wasn't changed as dramatically and consumers thought the milk tasted fresh. Though improved packaging costs more than the traditional jugs, Duncan said the cost is worth it to maintain the best flavor of milk.

"The research that is being done around this new lighting gives us momentum to explore other ways that we can preserve the natural taste of milk," Duncan said.

More information: H.L. Potts et al. Retail lighting and packaging influence consumer acceptance of fluid milk, *Journal of Dairy Science* (2016). DOI: 10.3168/jds.2016-11673

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