Cornell CALS
College of Agriculture and Life Sciences

MQIP
Milk Quality Improvement Program

Light-Induced Flavor Defects in Milk

Background

Milk is a delicate food that is often mishandled in a manner that can result in off-flavors. Excessive exposure to light can result in a serious flavor defect known as **light-induced** or **light-oxidized**. Light-oxidized milk is characterized as having a burnt protein, medicinal or plastic-like flavor.

Light-oxidized defect develops in milk as a result of its exposure to sunlight or to fluorescent lighting common in store dairy cases. Certain vitamins are also susceptible to light-induced degradation (i.e., riboflavin and vitamin A). Exposure to sunlight for as little as 10-15 minutes (as short as 5 minutes on a very clear day with intense sunlight) is sufficient to cause the defect, while longer exposure times are generally required for fluorescent lighting. In general, the defect is more common in milk packaged in transparent plastic or glass, although it can also occur in milk in more opaque containers with very intense light and sufficient exposure time.

Prevention

Preventing light-oxidized defects simply involves protecting milk from light. Recommendations include:

- Milk receiving and handling areas, storage coolers, and display cases should be designed for minimum direct light exposure.
- Fluorescent light bulbs used should be the "warm white" variety.
- Yellow shielding may be used to reduce the intensity of light.
- Unnecessary lighting in coolers and display cases should be turned off when milk turnover rate is slow.
- Light block additives or over-wraps may be used to help protect the milk.

Want more information on light oxidation, oxidation threshold, and the MQIP? Contact Nicole Martin (nicole.martin@cornell.edu) in the Milk Quality Improvement Program or visit our website https://foodsafety.foodscience.cornell.edu/mqip/

Fluid milk quality research in the Milk Quality Improvement Program has been funded by the National Dairy Council and the New York State Dairy Promotion Advisory Board, dairy farmers dedicated to the production, manufacture and distribution of quality dairy products.