

Frequently Asked Questions

Color Change & Appearance of Meat Due to Lighting

What color light source should I use to display meat?

Color Change

Illuminance level, spectral power distribution, duration of exposure, temperature, availability of oxygen, air movement, humidity, and other factors all affect the discoloration of meats. Also, the type of meat is important, especially the distinction between fresh and frozen versus processed table-ready meats. While processed meats generally need to be sealed against oxygen to reduce discoloration, a desirable appearance for fresh and frozen meats requires available oxygen to oxidize myoglobin. Packing for fresh and frozen meat is oxygen permeable.

Much of the literature on the discoloration of meats due to light is not completely consistent. There is agreement that discoloration is proportional to light level and time of exposure, i.e., reciprocity is applicable. Some studies suggest that the small amount of ultraviolet power emitted from fluorescent lamps is not a significant factor in discoloration under normal display conditions. There is considerable disagreement on which parts of the spectrum cause the more rapid change in color appearance. UV, blue, green, yellow, and orange all caused more rapid discoloration according to some studies but not in other studies. Generally, infrared power should be minimized because it represents heat without contributing to visible light. Reports on the effect of incandescent lighting are not consistent, possibly because of variability in temperature control.

Appearance

In regard to color balance and color rendering of displayed meats, many studies report that the *Deluxe Cool White* color fluorescent lamp is as good if not the best lamp although some studies do not agree. Incandescent lamps generally are good in terms of color if not on the basis of radiant heat. Cool-Lux PAR lamps use diachronic cold mirror reflectors to direct the light beam forward while letting the infrared power pass backwards through the reflector. The TRU-AIM® and TRU-AIM TITAN® MR16 lamps perform in a similar fashion. These would be the preferred lamps when incandescent lighting is used on meat displays.

The *incandescent fluorescent* color fluorescent lamp is sometimes considered a good color but is reported to make white fatty tissue somewhat yellowish. One major study of frozen meats found the *Wide Spectrum GRO-LUX®* color fluorescent lamp a very good color but said that the standard *GRO-LUX* color was “too red and misleading.”

Incandescent lighting and the often-recommended *CWX* and the *GRO/WS* colors have an important factor in common. This is a high value for R9, the special CRI that evaluates rendering of saturated (strong) reds. It is

unknown as to whether studies on this specific issue have been done, but it suggests a useful factor to consider when choosing appropriate lamp colors. The 950 color is the only OCTRON® with a high value of R9 in the CCT range of 3000-5000K. Although that the correlated color temperature of the 950 color is higher than that of the CWX, the acceptable CWX and GRO/WS differ in correlated color temperature. It appears worthwhile for the user to look at displays under the OCTRON 950 color to decide if it is acceptable. The 841 OCTRON color also might be evaluated, but its R9 value is almost zero, and meats with a deep red color might be a problem.