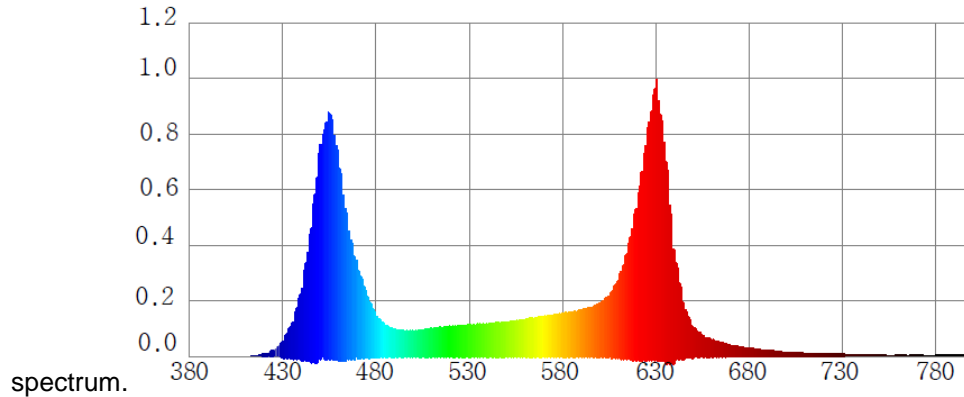


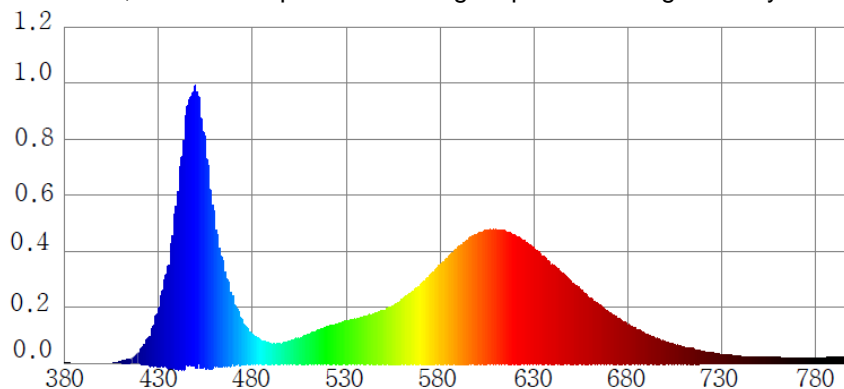
LED-Tubes METOLIGHT® MEAT-Series

3 different shades of pink for different kind of meat

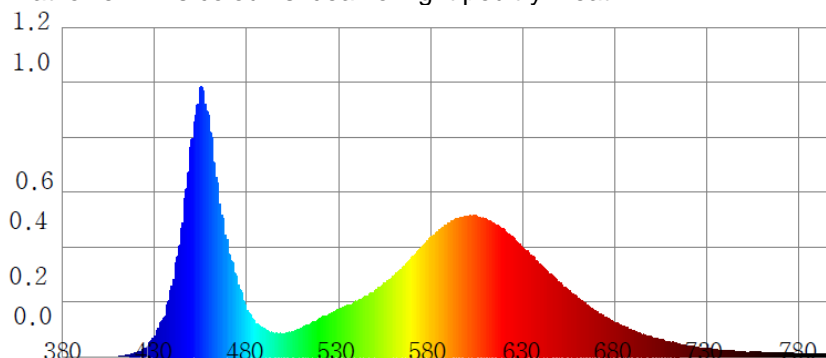
METOLIGHT® MEAT-RBW: The pink light is generated by 3 different LEDs (red, blue, white) and is optimized by the light spectrum for lighting dark meat such as beef. The highest brightness is emitted in the blue and red light



METOLIGHT® MEAT-P: Here, the pink light is generated directly from individual specially coated SMD LED diodes. The color intensity is lower than in the RBW variant and optimal for light-colored meat, e.g. Pork suitable. In comparison to the RGW variant, the red component in the light spectrum is significantly reduced and shallower.



METOLIGHT® MEAT-TR: As with variant P, the pink light is produced from specially coated SMD LEDs, whereby the colouring is somewhat lower. This colour is ideal for light poultry meat.



METOLIGHT® Meat-RBW for Beef:

Early studies found that beef stored in the dark over a period of three to ten days did not change color significantly, while beef stored under fluorescent lighting for the same amount of time began to turn brown after only 5 days. In a 28 day study conducted at the University of Zaragoza in 2000, ultraviolet light was shown to have a profound effect on the rate of beef spoilage and the creation of metmyoglobin, the pigment that gives meat a brownish surface color.

The microorganisms that attach rapidly to fresh beef and are primarily responsible for beef spoilage in grocery store meat cabinets are psychrotrophic bacteria, meaning those that are able to grow in cold temperatures, and tend to be in the genus *Pseudomonas*. While these bacteria are not harmful per se, they contribute to the discoloration and spoilage of beef by accelerating the oxidation of myoglobin to metmyoglobin, the pigment that causes fresh meat to look brown, reducing the shelf life of fresh beef to 2 to 3 days.

METOLIGHT lamps and LEDs are designed for true color definition, they have a more balanced visible spectrum than other fluorescent lamps. The yellow and green wavelengths that are predominant in regular fluorescent lighting are the most damaging wavelengths in the visible spectrum. METOLIGHT lamps emit a more balanced range of wavelengths, including more of the red and blue wavelengths and more moderate levels of the yellow and green wavelengths. RBW pink mixed by Red + White + Blue Leds which has more blue and red wavelengths. It is better for Beef.

METOLIGHT® Meat-P for Pork:

Early studies of pork suggested that surface temperature is a more important factor than exposure to light for the discoloration of pork and the growth of microorganisms on pork displays in refrigerated grocery store meat cabinets. However, the surface temperature of pork has been found to increase proportionately with the intensity of the lighting, regardless of whether the lamp is an incandescent or a cool white fluorescent lamp. With all meat, even slight increases in surface temperatures accelerate oxidation and allow bacteria to grow exponentially, causing the meat to turn brown and to decompose.

Later studies have shown that even with the lower levels of myoglobin in pork as compared to beef, pork is still sensitive to the oxidizing effects of light and will become discolored, turning brown or grey, after prolonged exposure to light and UV radiation, impacting sales even though this color change is not as dramatic as it is in cuts of beef.

Pork color is the most critical deciding factor for consumers when they select pork cuts from supermarket meat display cases. Fresh pork is optimally pink. Studies have found that pork shelf life is limited more by the development of a brown or grey color, which develops long before the meat has spoiled, than by any other factor. For pork, this discoloration is accelerated by increased surface temperatures which can result from using meat display lighting that emits large quantities of UV and harmful visible spectrum radiation. These increased temperatures can also cause pork fat to become rancid. In this case, P pink which less pink than RBW type and is closer to the meat color. It makes the pork more natural, as well as reduces the meat discoloration

METOLIGHT® Meat-TR for Poultry:

Health conscious consumers have been purchasing increasing amounts of poultry in recent years, raising awareness of food safety and harmful bacteria such as Salmonella, and demanding high quality meat. Poultry display lighting that emits UV raises surface temperatures of meat packages, providing an ideal environment for bacterial growth.

METOLIGHT Safe Spectrum balanced full spectrum lamps and LEDs emit lower levels of heat and ultraviolet radiation than regular supermarket fluorescent lamps, thus reducing the rate of poultry decomposition. However, different light sources affect the perceived color of the poultry because they have different spectral components, so the same chicken part can appear to be several different colors. For example, a panel described a chicken leg as pink or red when it was under an incandescent light, brown when under a fluorescent light, and brown to purple under a metal halide light.

Since many studies have found that color is one of the fundamental factors consumers consider when purchasing chicken and turkey, it is vital that the poultry be displayed in lighting that does not hide its fresh appearance. TR type is with a little pink which can keep the real color of poultry, as well as prolong its freshness.

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