THE MEAT LOCKER

BY AMERICAN MEAT SCIENCE ASSOCIATION

Iridescence in Meat: Causes and Solutions

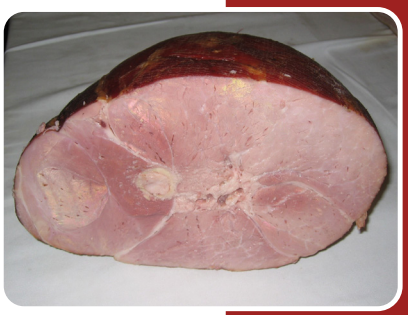
Iridescence is the multicolored appearance on the surface of meat, especially cooked and sliced beef and ham. Iridescence is often noticed by consumers who associate unusual color with spoiled meat. However, iridescence is a natural part of cooked beef and ham that is **not** due to poor handling or spoilage. A quick review of what we know about iridescence along with some possible controls will be discussed.

Details About the Cause of Iridescence

According to AskFSIS, "Meat contains iron, fat, and other compounds. When light hits a slice of meat, it splits into colors like a rainbow. There are various pigments in meat compounds that can give it an iridescent or greenish cast when exposed to heat and processing. Wrapping the meat in airtight packages and storing it away from light will help prevent this situation. Iridescence does not represent decreased quality or safety of the meat." Following is further information about iridescence and some factors that affect its presence and intensity.

What Does Research Say

Studies have determined that iridescence is the result of light diffracting off of the muscle fibers, causing an effect like that of a prism. The level of iridescence is affected by the angle of the light hitting the meat surface and the viewing angle, and is likely related to the smoothness of the meat surface, and the water-holding capacity of meat. Research of the factors associated with iridescence in eight different fresh beef muscles, found it most frequently in the semitendinosus (eye of the round; 90.6%), and the semimembranosus (inside round; SM, 34.4%) and observed least frequently in the psoas major (tenderloin; 6.3%). Higher iridescence scores in the semitendinosus were associated with younger cattle with large rib eye areas, lighter, redder color and lower ultimate pH. The good news is that surface iridescence had no effect on cooking loss or tenderness assessed by Warner-Bratzler shear force measurements.



Many of the processes that enhance the reflectance of the meat surface are common to the production of fresh and cooked beef products. Quality control checks that seek to identify and eliminate meat with iridescence is an almost impossible task as many pieces will develop iridescence during processing. There are limited solutions to the problem of iridescence. If iridescence is a major problem for a processor, some quick research may be called for to see if the problem is associated with a certain supplier, ingredient or process. It may be possible to change the supply or some part of the process to limit iridescence.

Potential Contributing Factors

Angle of cut:

Iridescence is affected by the angle of cutting with the greatest incidence occurring when the cut was made perpendicular (90°) to the muscle fibers. Muscles sliced perpendicular to the length of the muscle fiber show more iridescence than when muscle fibers run in various directions, and are sliced at an angle or parallel to the direction of the muscle fiber. In beer the higher incidence of iridescence in the semitendinosus compared with the psoas major, which was also cut perpendicular to the grain of the muscle, was due to the higher average ultimate pH of the PM muscle.

Surface Texture:

Smooth surfaced meats have more iridescence than meats with rough surfaces. Reducing the smoothness of the meat surface but intentionally leaving small cut marks decrease the reflectance of light off the meat, this

Added Ingredients and Processing:

Added Ingredients and Processing: The addition of salt or phosphates solutions enhances moisture retention, which allowing the surface of the meat to retain a smoother texture. In addition, tumbling after injection or marinating causes a smoother or shinier surface, which may also increase the amount of iridescence. There are not any fixes to limit this cause of iridescence.

Cooking:

Higher degree of doneness changes the connective tissue on the surface of meat and also, increases moisture losses and causes the muscle fibers to shrink. The changes in the meat surface can increase iridescence. Therefore, cooking to lower temperature, if feasible, can reduce incidence.

THE MEAT LOCKER

American Meat Science Association