

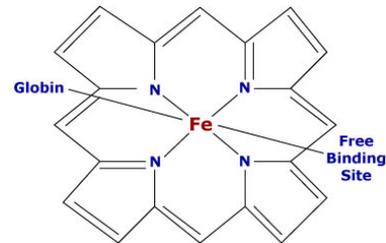


BROILER PROCESSING TIMELY INFORMATION – APRIL 2010

Worthwhile Operational Guidelines & Suggestions

Meat Color – Part I

Characteristic red color of meat is due to the oxygen carrying pigment called myoglobin (Mb). Pigments are molecules that absorb some of the energy from the light (invisible to eye) and reflect the rest (seen as color). In addition to Mb, hemoglobin (Hb) and cytochrome c are also involved in meat color. Both Hb and Mb pigments contain an iron (Fe) atom in the center of the molecule that can bond with six other atoms. Fe is always bonded to one globin molecule and four nitrogen (N) atoms. The remaining free binding site can bind oxygen, water or various other compounds to alter meat color. Most of the time Fe atom exist in ferrous (Fe^{++}) or reduced state, where it can bind and readily give up an atom, serving as a carrier for oxygen from blood to the muscle tissue. Deoxymyoglobin is a purple-red Mb pigment with an available bonding site on the iron. Upon dissection of the muscle, it will pick up oxygen, giving meat the bright red color (oxymyoglobin). More Mb in the muscle results in greater the intensity of red color.



Because muscles differ greatly in their activity level (i.e., contraction), their demand for oxygen also differ. Domesticated poultry seldom use their muscles for extensive flight and therefore the breast (i.e., white meat) muscles need less oxygen and have lower level of Mb as compared to the leg (i.e., dark meat) muscles which are constantly used for standing and walking. Of course, wild and migratory birds have dark muscles throughout the body. Mb concentration in the muscle also differs with age and sex of the animal, where older birds and males contain more Mb. Color is an important quality characteristic consumers typically observe of a meat product. The biological-basis of color changes will be discussed in future issues to help processors control defects in raw and cooked meat products.

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