Potential Causes of Color Variations in Catfish Fillets

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   a. Ingestion of yellow pigment from diet
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         1. Yellow pigments in catfish evaluated (Li et al 2009)
         2. Yellow Fat Problem in Fish Flesh. (Lovell 1984)
         3. Effects of Various dietary carotenoid pigments on fillet appearance and pigment absorption in channel catfish. (Li et al 2007)
      ii. Natural food items
         1. Yellow pigments in catfish evaluated (Li et al 2009)
   b. Handling stress = red fillet
      i. Seine harvest, loading, hauling, unloading and immobilization

II. Processing
   a. Temperature – (salmon) red and orange sensitive. Lightness (L* value) higher at 20 °C vs. 4°C (Erikson and Misimi 2008)
   b. Freezing (carp)(high pressure = poor sensory)(Sequeira-Munoz et al 2006)
   c. Oxidation of heme proteins (methemoglobin, metmyoglobin)(tilapia) (b*yellowness) (Li et al 2008)

   note: Use of CO as euthanasia mechanism...CO bonds with heme proteins forming carboxymyoglobin preventing oxidation (Li et al 2008)

      Note: prevented with the use of CO as euthanasia
   d. Pre-Rigor mortis filleting (salmon) (incorrect color grading may result) (Erikson and Misimi 2008)

III. Post Processing
   a. Thawing process (carp) (high pressure = poor sensory)(Sequeira-Munoz et al 2006)
   b. Spoilage bacteria – Enterobacter cloacae and Pseudomonas sp (glucose to 2,5-diketogluconic acid = brown color.

IV. Catfish Processors’ Workshop 1996

V. NMFS (to become USDA) Catfish Fillet Grade Standards
   http://www.seafood.nmfs.noaa.gov/Catfish.PDF
VI. Chemical Additives

VII. Color Measurement (method and tools)

a. Methods
   i. Color Measurement Techniques for Food Products (Legegett 2008)
   ii. Communicating Food Color Effectively with Physical Color Standards (Schmehling 2008)
   iii. Computer Based Visual Sorting (Misimi et al 2007)

VIII. References


