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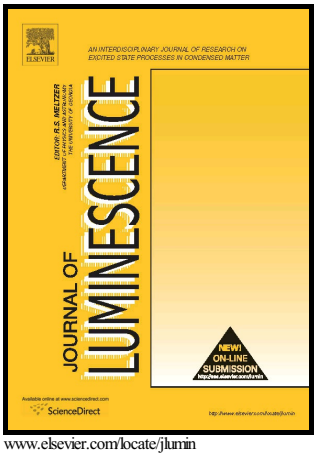

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Determination of chicken meat contamination by porphyrin fluorescence

Lilia Coronato Courrol[1,*], Ricardo Elgul Samad[2]

[1]*Universidade Federal de São Paulo, Laboratório de Lasers e Óptica Biomédica Aplicada, Departamento de Física, Diadema, SP – Brazil;*
[2]*Centro de Lasers e Aplicações, IPEN-CNEN/SP, São Paulo, SP, Brazil*
**Corresponding author: lccourrol@gmail.com*

Meat quality is normally defined by a combination of factors such as visual appearance, smell, firmness, succulence, tenderness, and flavor. Contamination of poultry meat with pathogens remains an important public health issue since it can cause illnesses due to negligence in handling, cooking or post-cooking storage. Conventionally, meat quality tests are based on visual evaluation or chemical analysis, which have the disadvantages of being subjective and time-consuming. To improve the biological contamination detection accuracy and productivity, the evaluation of porphyrin contents in meat by fluorescence spectroscopy is proposed, considering that most microorganisms and animal cells excrete porphyrins. For this purpose, chicken meat was cut into small pieces and separated in three groups: a control group where the meat was conserved under refrigeration, and two experimental groups in which the pieces were kept for 24 and 30 h at room temperature. Porphyrin was extracted from the meat samples and the fluorescence was measured in the range 550–750 nm, under excitation around 400 nm. The fluorescence lifetime was also studied. To ensure porphyrin synthesis, a concentration of 9.3 mM of δ-Aminolevulinic acid (ALA) was added to each sample, 2 h before porphyrin extraction. The results show that, in meat kept at room temperature and incubated with ALA, the porphyrin fluorescence increased, and a short-lived component was enhanced due to the action of microorganisms, indicating a potential new method to test meat quality.

Keywords: Meat, contamination, porphyrin, fluorescence.