

## POULTRY MEAT COLOUR AS AFFECTED BY POST MORTEM HANDLINGS

Rubison Olivo<sup>a,b</sup>, Paulo D. Guarnieri<sup>b,c</sup>, Adriana L. Soares<sup>d</sup>, Elza I. Ida<sup>d</sup> & Massami Shimokomaki<sup>b,c</sup>

<sup>a</sup>Globalfood Advanced Food Technology, Rua Alberto Sampaio, 45, CEP 04373-030, São Paulo-SP, Brazil. <sup>b</sup>Graduate Course in Food Science, Department of Food and Experimental Nutrition, Faculty of Pharmaceutical Sciences, São Paulo University, Av. Prof. Lineu Prestes, 580, CEP 05508-900, São Paulo-SP, Brazil, <sup>c</sup>Seara Alimentos S. A., Seara, SC, Brazil, <sup>d</sup>Graduate Programme in Food Science, Department of Food and Drugs Technology, Agricultural Research Centre, Londrina State University, P. O. Box, 6001, CEP 86051-970, Londrina-PR, Brazil. e-mail: rubison@terra.com.br

**Keywords:** *Pectoralis major*, pH, scalding, PSE.

**Background**

Brazil is the third poultry meat producer country in the world and due to the recent outbreak of mad cow and foot-and-mouth diseases in Europe there has been an increase in poultry meat production. We have recently demonstrated that PSE (pale, soft, exudative) meat also occurs in chicken breast meat (*Pectoralis major*) which affects its colour (Olivo et al., 1998, 2001). Therefore its functional properties i.e., texture, emulsifying capacity, juiciness are affected. Poultry meat industries has been adopting the colour analysis as an indicative to measure most of these qualities since it is a rapid and non destructive assay. There is possibility that PSE is not the only cause of poultry meat discoloration and other post-mortem handlings may also promote this phenomenon.

**Objectives**

The objective of this work was to investigate the breast poultry meat (*Pectoralis major*) colour changes in a commercial processing line.

**Methods**

Birds were slaughtered following the routine commercial practices with a production of chicken breast meat of app. 2 ton/h. Samples were taken from the local commercial processing line and all analyses were carried in samples 24h post mortem.

pH measurement: pH was measured by inserting electrodes into the post rigor breast muscle according to Boulianne and King (1995) using a Sentron 1001 pH meter system. Analyses were performed in triplicate.

Colour measurement: A Hunter Spectrophotometer (Hunter Lab, Model UltraScan XE) was used to evaluate the colour on the posterior surface of the intact skinless *Pectoralis* rigor muscle (Olivo et al., 2001). Both measurements were monitored during six months.

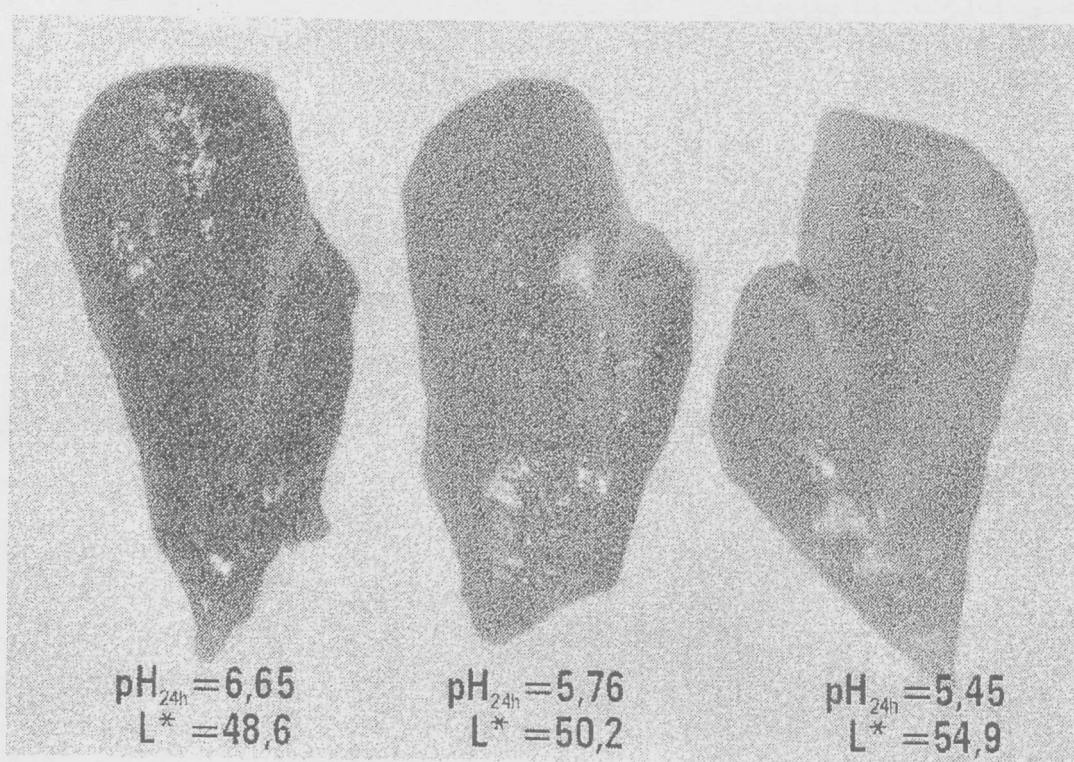


Fig. 1: Chicken breast meat showing direct relationship between final pH value and colour



Fig. 2: Chicken breast meat colour difference: Normal (A), PSE (B) and Scalded superficial burnt breast meat (C)

### Results and discussions

Fig 1 shows that there is a direct relationship between PSE and final pH value. These pH values varied from 5.45 to 6.65 and the lower final pH value paler is the breast meat ( $L^* > 50$ ) and conversely the higher final pH value, darker is the meat ( $L^* < 50$ ). The incidence of PSE is seasonal being, of course, most observable during hot months (McCurdy et al., 1996). This is the consequence of the biochemical reactions which occurs during glycolysis which parameters depends on the birds pre-slaughter handling conditions. It has been shown that the PSE meat development is due to protein denaturation whilst the carcass is warm and low pH (Olivo et al., 2001). One of the consequence of this protein denaturation is the increase of meat birefringency promoting light scattering (Swatland, 1995). On the other hand, abnormal colour can also be often observed in chicken meat as the consequence of scalding which is known as "burnt breast meat". This phenomenon can happen during the producing line at the scalding step. The normal scalding temperature ranges from 50-60°C with the velocity of 1 to 2 min. of the carcass throughout this passage. However, these parameters vary according to the bird carcass size and the equipment types. If the standard carcass size does not meet the requirement, the smaller size samplings can be excessively scalded thus causing protein denaturation at its surface regardless the presence of either skin or feather. This fact is well illustrated in Fig 2C in comparison to PSE meat (Fig 2B) and to normal meat (Fig 2A).

### Conclusions

Chicken breast meat colour depends not only on the ante mortem conditions but also on the post mortem handlings. Both conditions can be avoided by applying careful standartization procedures.

### References

- Boulianne and King (1995) Poult. Sci. 74: 1693-1698.
- McCurdy et al (1996) Food Res. Int. 29: 363-366.
- Olivo. et al. (1998 ). Proc. ICOMST 44: 500-501.
- Olivo et al. (2001) J. Food Biochem. 25:000-000.
- Swatland (1995). On line evaluation of meat. Lancaster: Technomic, 343p.

### Akcnnowledgments

ALS is under CAPES scholarship and EII and MS are CNPq Research Fellows.