OCCURRENCE OF IRIDESCENCE IN FRESH PORK

Rubison OLIVO[1], Marlene Gomes PEREIRA[2] and Juliane Pavan SCHNEIDER[1, 3]

[1]Globalfood-Advanced Food Technology, Rua Alberto Sampaio, 45 - CEP 04.373-030 São Paulo (SP), Brazil. Telephone: (11) 5562-0756
E-mail: rubison@terra.com.br
[2]Food Science "Lato Sensu" Program of Contestado University, Concórdia (SC), Brazil;
[3]Graduate Course on Food Science, Faculty of Pharmaceutical Sciences, Sao Paulo University, Sao Paulo (SP), Brazil.

Background

Iridescence is a rainbow-like or multicolored appearance in meat. Consumers find it visually unappealing and may falsely associate the visual phenomenon with bacterial growth or outdated meat (LAWRENCE et al., 2002a). It is not something that can be easily created or reproduced and, as a result, has not been studied extensively (RUST, 1991). Limited research has been directed towards understanding the causes of iridescence or finding possible solutions (OBUZ & KROPF, 2002; LAWRENCE et al., 2002b). SWATLAND (1984) addressed the optical characteristics of iridescence in cooked cured beef and concluded that green iridescence is caused by micro structural diffraction by the myofibrils. Some studies of this phenomenon have been conducted in precooked beef and pork meats such as corned beef, ham, and pastrami. However, despite the fact that this phenomenon has been frequently observed in fresh meat prior to processing, it has rarely been studied.

Objective

To evaluate the presence of iridescence in fresh pork in a commercial plant.

Methods

The experiments were performed from August to September 2002 in a commercial plant that kills around 4000 pigs per day. The procedures for slaughter and deboning followed the Brazilian sanitary norms according to BRASIL (1995). The breed used was 75% Large White and 25% Landrace, and the average weight of the 180-day-old pigs were 120 kg. After the slaughter, the carcasses were chilled overnight and then deboned the following day. The following meat cuts were visually observed on the deboning line (total n= 945): Standing Rump, *Gluteos medius M.* (n=146), Outside Round, *Biceps femoris M.* (n=123), Inside Round, *Semimembranosus M.* (n=158), Knuckle, *Rectus femoris M.* (n=468) and Sirloin, *Longissimus dorsi M.* (n=50). The commercial and respective scientific names are according KAUFFMAN & CLAIR (1965) and SWATLAND (2000).

These samples were observed according to previously established experimental criteria: the muscles were cut perpendicular to the muscle fiber with a sharp knife in order to obtain a smooth surface, and observed approximately 2 hours after cutting under different angles using natural and artificial lights.

Results and Discussions

The presence of the iridescence in fresh pork is described in Table 1. The iridescence phenomenon was not observed in the cuts Standing Rump (M. Gluteos medius) and Outside Round (M. Biceps femoris).. In the cut Inside Round (M. Semimembranosus) only 1.27% of the samples were observed to have iridescence. The meat cuts that showed considerable presence of iridescence were Knuckle (M. Rectus femoris) and Sirloin (M. Longissumus dorsi), 19.02% and 38.0% respectively. Overall, the presence of iridescence was observed in 11.64% of the 945 samples. Our results point to the possibility of the relationship between the occurrence of iridescence and the function of the muscle, muscle tissue and type of meat fiber, blood irrigation and/or by the physical and chemical conditions of the fresh meat. There is a need for more studies to support this relationship.

Conclusions

The presence of iridescence is common in some fresh cuts of Brazilian pork. This phenomenon should be further studied in fresh meat to determine any methods for understanding its causes.

References

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Table 1: Sampling and general results of iridescence in pork fresh cuts

PORK FRESH CUTS	Standing Rump *M. Gluteos medius*	Outside Round *M. Biceps femoris*	Inside Round *M. Semimembranosus*	Knuckle *M. Rectus femoris*	Sirloin *M. Longissumus dorsi*	TOTAL
Samples (n)	146	123	158	468	50	**945**
Positives (n)	0	0	2	89	19	**110**
Positives (%)	**0%**	**0%**	**1.27%**	**19.02%**	**38.00%**	**11.64%**