

マサバにおける致死前の筋肉中グリコーゲン量と乳酸量が致死後の肉質に及ぼす影響

(2018年6月26日受付)

(2018年9月11日受理)

宮崎里帆^{a)}、王 曜^{b)}、宮崎貴美子^{b)}、平坂勝也^{b)}、竹下哲史^{b)}、橘 勝康^{b)}、谷山茂人^{b)}

a) 東筑紫短期大学食物栄養学科

b) 長崎大学大学院水産・環境科学総合研究科

Glycogen and lactic acid contents in muscle of Pacific mackerel *Scomber japonicus* immediately prior to killing and their relationship to its meat quality during storage

(Received June 26, 2018)

(Accepted September 11, 2018)

Riho Miyazaki^{a)}, Yao Wang^{b)}, Kimiko Miyazaki^{b)}, Katsuya Hirasaka^{b)}, Satoshi Takeshita^{b)},
Katsuyasu Tachibana^{b)}, Shigeto Taniyama^{b)}

a) Department of Food Dietetics, Higashi Chikushi Junior College

b) Laboratory of Food Nutritional Science, Graduate School of Fisheries and Environmental Sciences,
Nagasaki University

Abstract

In this study, we examined the effects of muscle glycogen and lactic acid contents on the meat quality of the Pacific mackerel *Scomber japonicus*. The fish samples were subjected to 30 min of forced exercise with a weight (40% of body weight) placed on the tail. The fish were then killed at 0, 6 and 24 hours after removing the weight (exercise-recovery groups). The glycogen content in the dorsal ordinary muscle markedly decreased after exercise, whereas it increased during rest. Conversely, increased lactic acid content in the dorsal ordinary muscle was observed after exercise, while its contents decreased to the same level as the control (without exercise) after 6 hours of rest. The decreasing rate of muscle pH in the meat of exercise-recovery groups which rested for 6 or 24 hours were smaller than those in the meat of the group without exercise during storage at 30°C. The color L* value was used as an indicator of whiteness of the dorsal ordinary muscle, and although it increased when meat of the control and the exercise-recovery groups rested for 0 hour were stored at 30°C, that of the meat of the exercise-recovery group rested for 6 or 24 hours did not change during storage. Furthermore, increasing rate of K value of the meat of the exercise-recovery group which rested for 0 hour was significantly higher than those of the other groups. However, there was no significant difference in the K value of meat between the control and exercise-recovery groups which rested for 6 or 24 hours. These results suggest that low glycogen and lactic acid in the muscle prior to killing prevented the decrease in pH during storage, consequently suppressing the deterioration of the meat quality of the Pacific mackerel.

Keywords : マサバ、グリコーゲン、乳酸、筋肉 pH、肉質劣化

Pacific mackerel, glycogen, lactic acid, muscle pH, deterioration of meat quality

I 緒言

魚類を含む多くの動物は生存時に筋肉の pH を 7.2 ~ 7.4 に維持し、体内の恒常性を保っている。しかしながら、致死後には筋肉中のグリコーゲンの分解に伴う乳酸の生成や、ATP の分解に伴うプロトンの生成により筋肉 pH は低下するた

め、それが原因となり肉質が劣化してしまう。特に、赤身魚は致死後の筋肉 pH の低下が極めて迅速であることが特徴のひとつであり、マグロ類やカツオ類では保存時間の経過とともに pH は 5.2 ~ 5.6 付近まで低下することもある^{1,2)}。魚筋肉の低 pH が肉質に与える影響については、これまでに様々な観点から検討が行われている。例えば、魚筋肉の内在性