Characteristics of Chinese domestic freshwater fish: Postmortem changes in the muscle quality of silver carp and grass carp

M. YOKOYAMA[1] and S. S. CHEN[2]

[1]Fisheries Division, JIRCAS
[2]College of Food Science, Shanghai Fisheries University, P.R. China

Key words : freshwater fish, post-mortem changes, muscle quality

Objectives

A study on the post-mortem changes of fish muscle quality during storage was conducted focusing on the silver carp (*Hypophthalmichthys molitrix*) and grass carp (*Ctenopharyngodon idellus*), which are the most popular Chinese domestic freshwater fish (Photo 1). The fish were kept at temperatures of 5, 10, and 20℃, after death by sacrifice. Changes in muscle quality during storage were then monitored by sensory evaluation of the skin surface, gills and eyes, as well as the smell and hardness of the muscles. The concentration of ATP and its related compounds in the muscles were measured in order to calculate the K-value as a freshness index for fish meat.

Results

Fig. 1. shows deterioration in fish muscle quality as a function of time. If the score was higher than 8, the fish was considered palatable to Chinese consumers. When the fish were kept at 20℃ , scores on the sensory test decreased immediately after death, and within half a day, the scores fell below 8 in both species. At 5℃, the period that the fish was considered palatable extended to about three days. As shown in Fig. 2, the K-value increased rapidly when both silver carp and grass carp were kept at 20℃. Storage at low temperatures such as 5 and 10℃ delayed the increase of the K-value. However, there were significant differences between the two species of fish; K-values in grass carp rose faster than in silver carp, and the K-value of silver carp remained at low levels throughout five days of storage at 5℃. This finding may indicate that silver carp meat itself is stable, although rapid deterioration was evaluated through the sensory test. Poor marks on the sensory test of fish quality is usually indicative of the growth of microorganisms; if the presence of these microorganisms is well-controlled, the shelf life of fish meat may be extended.

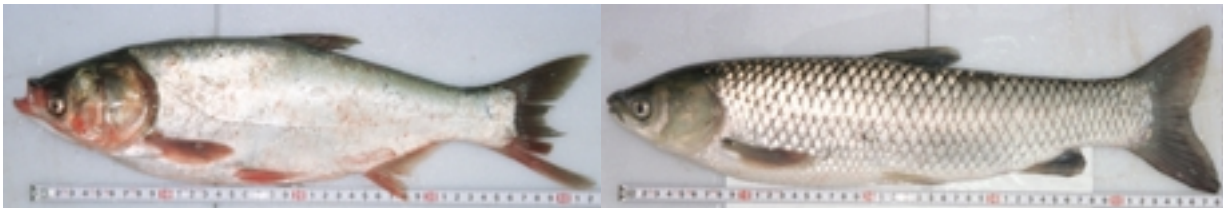

Photo. 1. Chinese domestic freshwater fish: silver carp *Hypophthalmichthys molitrix* (left) and grass carp *Ctenopharyngodon idellus* (right).

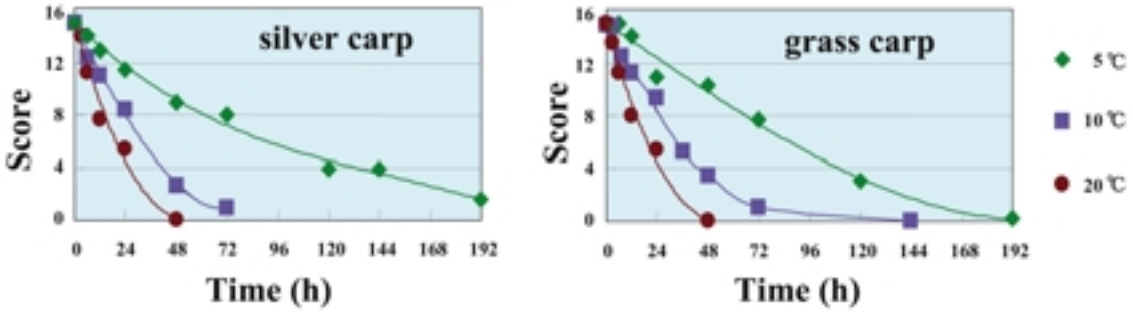

Fig. 1. Changes in sensory evaluation scores of silver carp (left) and grass carp (right) during storage under different temperatures.

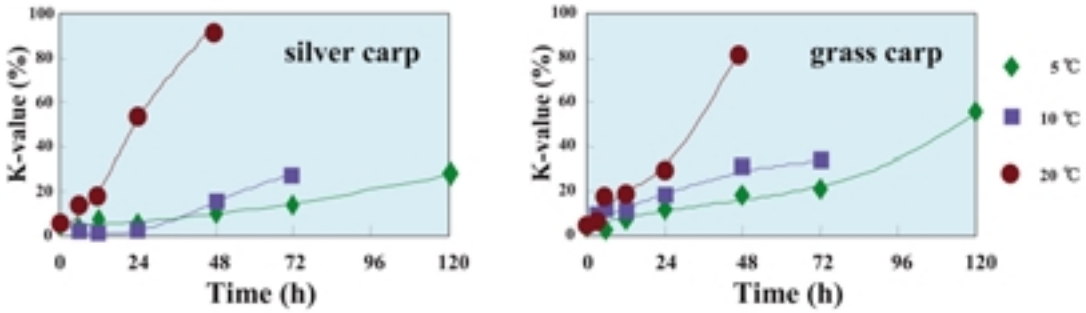

Fig. 2. Changes in K-values of silver carp (left) and grass carp (right) muscle during storage under different temperatures.

E-mail address: yokomasa@jircas.affrc.go.jp ; sschen@shfu.edu.cn