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"Arctic" tilapia (*Oreochromis niloticus*): Optimal storage and transport conditions for fillets

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"Artic" tilapia (*Oreochromis niloticus*)

Introduction

Tilapia (*Oreochromis niloticuss*) is a lean fish species of potential commercial value. The increased production of Tilapia as an aquaculture product has made it more available to consumers. It is one of the most popular fish species in USA and the consumption is increasing in Europe.

Culture of warm water species like tilapia, with high growth rate, could be economically feasible in a cold climate like Iceland given the fact that the available waste warm water used in cooling of geothermal power plants could be used in the farming. However, it is not possible to compete on markets for frozen fillets since the competition from Asia is too strong. Therefore, the focus is on the opportunities of marketing Arctic tilapia as fresh fillets overseas. For economical reasons, fillets need to be shipped by sea to Europe since air freight is too costly.

The main aim of the study was to estimate different storage methods to establish optimal conditions for fresh tilapia fillets.

Methods

Tilapia from an experimental farm in Iceland was filleted and packaged in air and MA (modified atmosphere: 50% CO_2; 50% N_2) prior to storage at 1˚C and -1˚C.

The shelf life was estimated with sensory (Quantitative Descriptive Analysis) and microbiological analysis. Raw fillets were evaluated with the Quality Index Method (QIM).

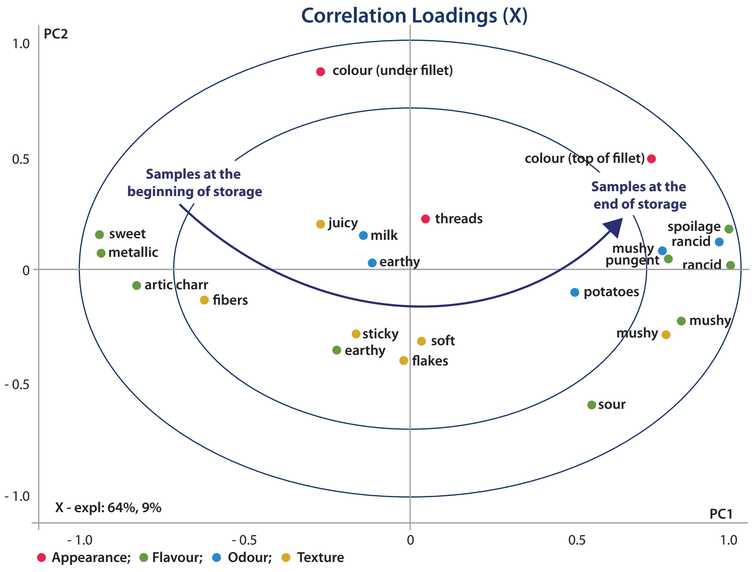

Figure 1. Correlation loadings describing sensory quality of cooked tilapia fillets as evaluated by a trained sensory panel

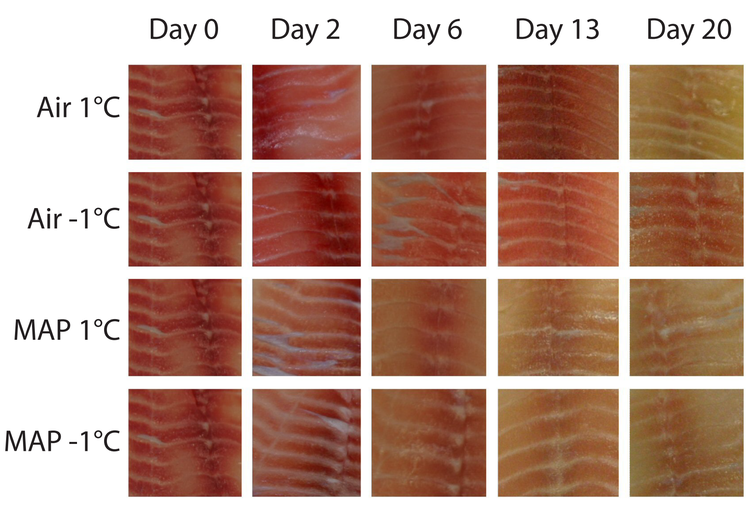

Figure 2. Changes with storage time in the appearance of the skin side of raw deskinned tilapia fillets.

Results and Discussion

At the beginning of storage, the fillets were described by sweet, metallic and artic charr flavours, but as the storage time progressed, the fillets were more described with attributes characteristic for spoilage, such as sour flavour, and rancid odour and flavour (Figure 1).

The results from sensory and microbiological analysis indicated that air packed fillets had a shelf life of 13-15 days during storage at 1˚C and 20 days during storage at -1˚C.

MA packaging negatively affected the colour characteristics of raw fillets, whereas the air packaged fillets stored at -1˚C retained superior colour characteristics during storage as well as extended shelf life (Figure 2). Therefore, MA packaging could not be considered as a desirable alternative for shelf life extension of tilapia fillets.

The long shelf life of superchilled (-1°C) tilapia fillets shows that the possibility of using warm water from geothermal power plants to produce large quantities of tilapia fillets for valuable markets is realistic.

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