

Quality validation of mussels by flesh water content, demonstrated with *Mytilus edulis*-like

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Introduction

Mytilus edulis is a commercial important Aquaculture mussel species. To guarantee steady production, the stock was regularly monitored for condition index (CI), shell growth rate or soft body weight. This is the first study which evaluated the quality of blue mussels by measurement of the flesh water content, a simple instrument for Aquaculture producers to evaluate the quality of their stocks.

Material and Methods

Mytilus edulis-like (mean length 3.28 cm (± 0.58 cm)) were stocked in a new designed, fully controlled, artificial recirculation system (RAS) with additional biofilter, filled with artificial sea water. At stable water conditions, the animals were held over the experimental period of 218 days without feeding. At regularly samplings, 10 randomly selected blue mussels were analyzed for the total weight, total length, soft wet- and soft body dry weight. The condition index (CI) was calculated according to Walne (1976), using the formula reads as follows : dry weight/shell weight x 100.

Results

We found a decrease of blue mussels CI (loss of 74% (20.0 to 5.2)) and of their soft body weight (loss of 72% (1.95g to 0.54g)). Simultaneously, the flesh water content increased (95% to 98.4% (+3.4%)).

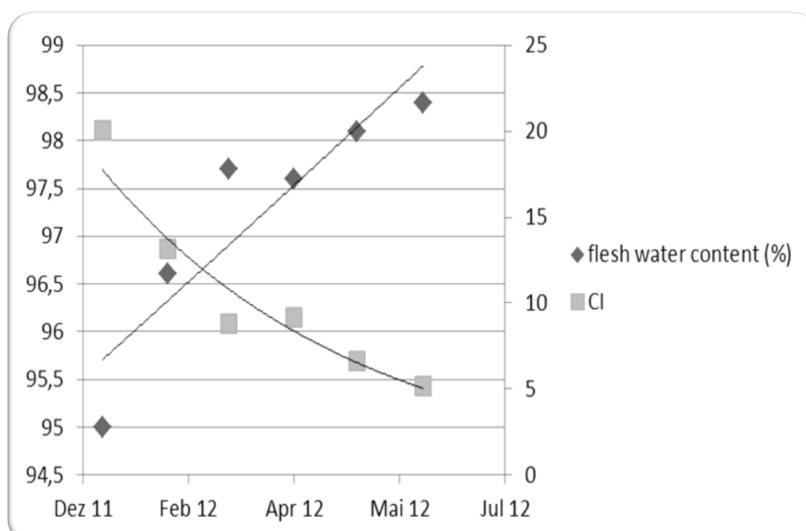


Figure 1: Condition Index (CI) and the flesh water content (%) of starving *Mytilus edulis*-like (n=100) over 218 days.

Discussion

Our results suggest, that under prolonged starvation, the mussel loose soft body weight (glycogen, protein and lipids according to Pleissner et al. 2012; Dare and Edwards 1975) while adding water to the remaining body tissue.



Figure 2: *Mytilus edulis*-like under experimental conditions

Similar effects are known for wild and farmed fish species, e.g. Atlantic salmon *Salmo salar* (Einen, Waagan and Thomassen 1998), channel catfish *Ictalurus punctatus* (Luo et al. 2008) and Atlantic cod *Gadus morhua* (Bjørnevik et al. 2017). In their studies, the body weight and condition factor decreased during feed deprivation, simultaneously body composition of fish changed: concentrations of lipid and protein decreased and the water contents increased. Starvation or restricted feed intake influenced the fish product quality negatively. For mussels in our experiment it is evident, that Baltic Sea mussels are more resilient to prolonged starvation periods, but with undesirable side effects on product quality.

Conclusion

Our results demonstrate that incorporation of water in body tissue seems a **good quality indicator** to provide information on the nutritional status of tested blue mussels. **Higher flesh water contents reduces the product quality**, which is of high interest for Aquaculture producers.

References:

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