Abstract

Near infrared in aquaculture: challenges and prospects

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Introduction

Farming of Atlantic salmon is a very successful industry in Norway. Nowadays 800 000 tons of Atlantic salmon is produced per annum and this is expected to increase. The development of this young industry has gone hand in hand with research developments; especially to find the most suitable feed. NIR technology has therefore been adapted in several different areas; from the breeding program to the slaughter quality.

Material and Methods

NIR-transmission analysis on minced samples from 850 to 1050 nm has been used to determine the proximate composition of salmon samples. Transflectance measurement has been used for analysis of whole fillets without previous mincing. These analyses have been performed on ice stored samples to avoid effect of different temperatures in the samples. To enhance the breeding program transflectance measurements have been performed on live anaesthised salmon to analyse the fat content in the muscle tissue.

Results and discussion

NIR spectroscopy of the feed has been adopted by the feed producing factories and is in regular use during at-line quality control. The analysis of the proximate composition of minced samples has been extremely useful because it makes it possible to analyse a lot of fish during the whole production period and to merge biological and chemical data for multivariate data analysis. Analysis directly on the fillet allows a truly non-destructive measurement but to the price of a higher SEP.

Conclusion

To analyse live fish, it is important to perform the calibration on fish with a body temperature similar to the variation in body temperature expected in further measurements.

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