SEASONAL AMINO ACID PROFILE AND NUTRITIONAL VALUE OF *SACCHARINA LATISSIMA* IN A COMMERCIAL IMTA SYSTEM

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ABSTRACT

Introduction
Seaweed is predicted a great future for food and feed supplement with the increasing demand for especially proteins as ingredient. However, the amino acid (AA) profile is essential for evaluation of the nutritional value of proteins. The protein concentration and AA profile were determined from sugarkelp (*Saccharina latissima*) cultivated at an integrated multitrophic aquaculture (IMTA) and a reference site, and the harvest time and nutritional potential evaluated.

Methods
Sugarkelp were sampled bimonthly near a mussel and fish IMTA facility, and at a reference site outside Horsens fjord in Denmark during 2013-2014. Biomass from one meter (2 m depth) of dropper ropes (n=2) was weighed gravimetrically, freeze dried, homogenized followed by Kjeldahl method and HPLC analyses.

Results
The protein concentration of sugarkelp increased significantly from July to November, with highest concentration at the reference site (5.3 to 18.3% of dw) compared to the IMTA site (2.9 to 14.0% of dw; $p<0.05$). Overall, there was no significant difference between the AA profiles of sugarkelp from the two sites. The aspartic acid and the glutamic acid were represented with the highest concentration among the AA's in November, and significantly higher in the IMTA biomass (2.0±0.32% of aspartic acid and 2.0±0.019% of glutamic acid of dw; $p<0.05$).

Conclusion
Winter should be preferable harvest time for sugarkelp AA utilization, however nutritional value is not necessarily based on high AA concentrations, because some (e.g. arginine and isoleucine) are scarce and therefore of high price to complete e.g. a fish feed formulation.