Lipids and Composition of Fatty Acids of Saccharina latissima Cultivated Year-round in Integrated Multi-trophic Aquaculture - DTU Orbit (31/10/2017)

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This study is evaluating the seasonal lipid and fatty acid composition of the brown seaweed Saccharina latissima. Biomass was sampled throughout the year (bi-monthly) at the commercial cultivation site near a fish farm in an integrated multi-trophic aquaculture (IMTA) and at a reference site in Denmark (2013-2014). Generally, there was no difference in the biomass composition between sites; however, significant seasonal changes were found. The lipid concentration varied from 0.62%-0.88% dry weight (DW) in July to 3.33%-3.35% DW in November (p < 0.05) in both sites. The fatty acid composition in January was significantly different from all the other sampling months. The dissimilarities were mainly explained by changes in the relative abundance of 20:5n-3 (13.12%-33.35%), 14:0 (11.07%-29.37%) and 18:1n-9 (10.15%-16.94%). Polyunsaturated fatty acids (PUFA's) made up more than half of the fatty acids with a maximum in July (52.3%-54.0% fatty acid methyl esters; FAME). This including the most appreciated health beneficial PUFA's, eicosapentaenoic (EPA; 20:5n-3) and docosahexaenoic acid (DHA; 22:6n-3), but also arachidonic (ARA) and stearidonic acid (SDA), which are not found in land vegetables such as cabbage and lettuce. Compared to fat (salmon) and lean fish (cod) this seaweed species contains higher proportions of ARA and SDA, but lower EPA (only cod) and DHA. Conclusively, the season of harvest is important for the choice of lipid quantity and quality, but the marine vegetables provide better sources of EPA, DHA and long-chain (LC)-PUFA's in general compared to traditional vegetables.

General information
State: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering, National Food Institute, Research Group for Bioactives – Analysis and Application
Authors: Silva Marinho, G. (Intern), Holdt, S. L. (Intern), Jacobsen, C. (Intern), Angelidaki, I. (Intern)
Pages: 4357-4374
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information
Journal: Marine Drugs
Volume: 13
Issue number: 7
ISSN (Print): 1660-3397
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.83 SJR 0.87 SNIP 1.304
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.777 SNIP 1.205 CiteScore 3.66
Web of Science (2015): Indexed yes
Scopus rating (2014): SJR 0.781 SNIP 1.356 CiteScore 3.59
Web of Science (2014): Indexed yes
Scopus rating (2013): SJR 0.934 SNIP 1.766 CiteScore 4.77
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Scopus rating (2012): SJR 0.888 SNIP 1.605 CiteScore 4.16
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Scopus rating (2011): SJR 0.975 SNIP 1.448 CiteScore 4.06
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
Scopus rating (2010): SJR 0.745 SNIP 1.277
Web of Science (2010): Indexed yes
Scopus rating (2009): SJR 0.439 SNIP 0.836
Scopus rating (2008): SJR 0.433 SNIP 0.329
Scopus rating (2007): SJR 0.501 SNIP 0.448
Scopus rating (2006): SJR 0.586 SNIP 0.931
