Effects of sampling period and sock spacing on the chemical composition of mussel (*Mytilus galloprovincialis*)

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Aims

Chemical composition

1. Moisture
2. Protein
3. Lipids
4. Ash
5. Glycogen
6. Fatty acid profile
7. Free amino acid content

Factor A: Sampling period (~monthly)

Factor B: Sock Spacing (30, 50, 70 και 90 cm)

Sample preparation

For each sample under study, at least 100 mussels were used, in order to determine the chemical composition:

Washing → Recovery of edible part → Blending

Chemical composition

Changes in moisture content

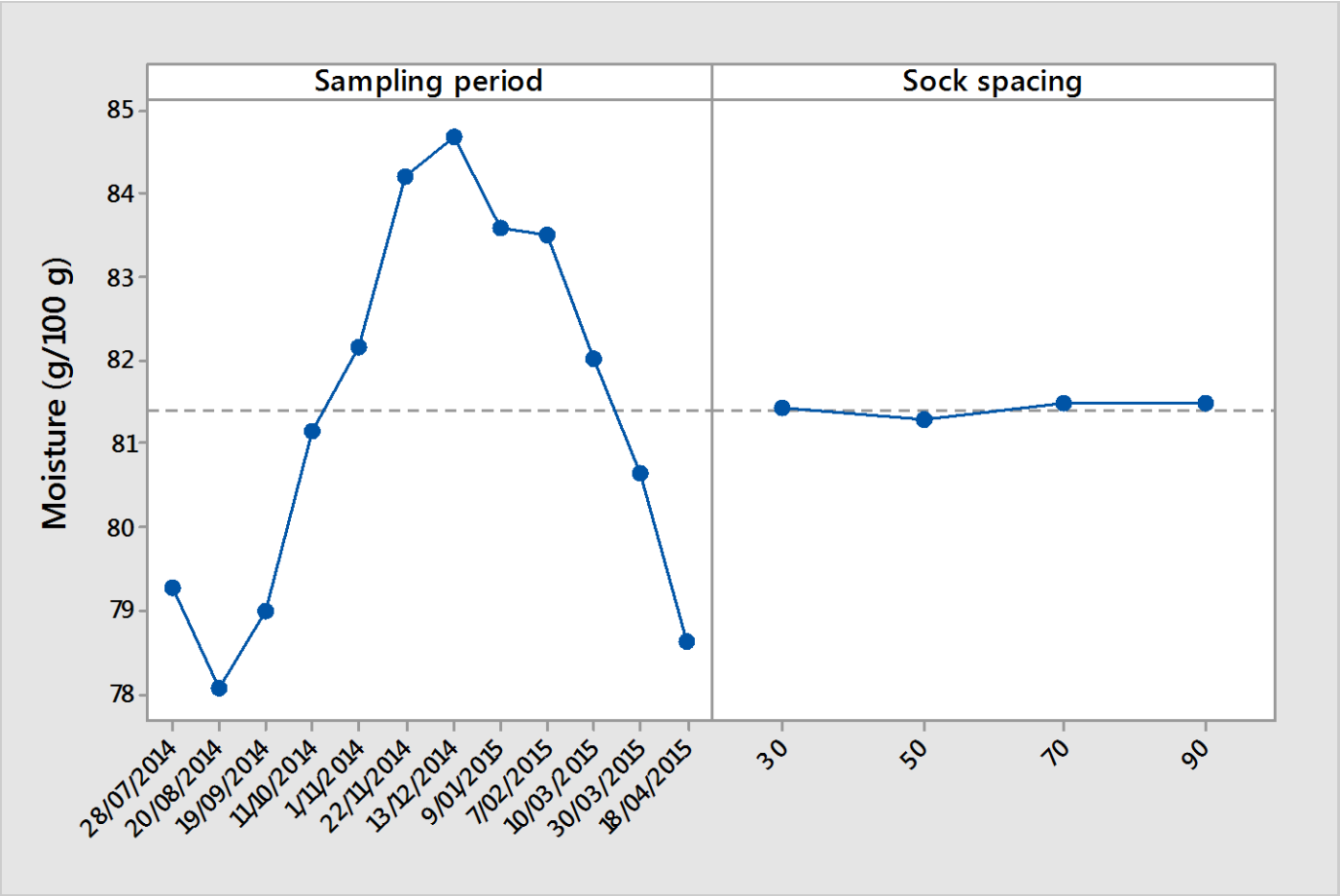


Fig.1. Changes in moisture content of mussels as related to sampling period and sock spacing

Changes in protein content

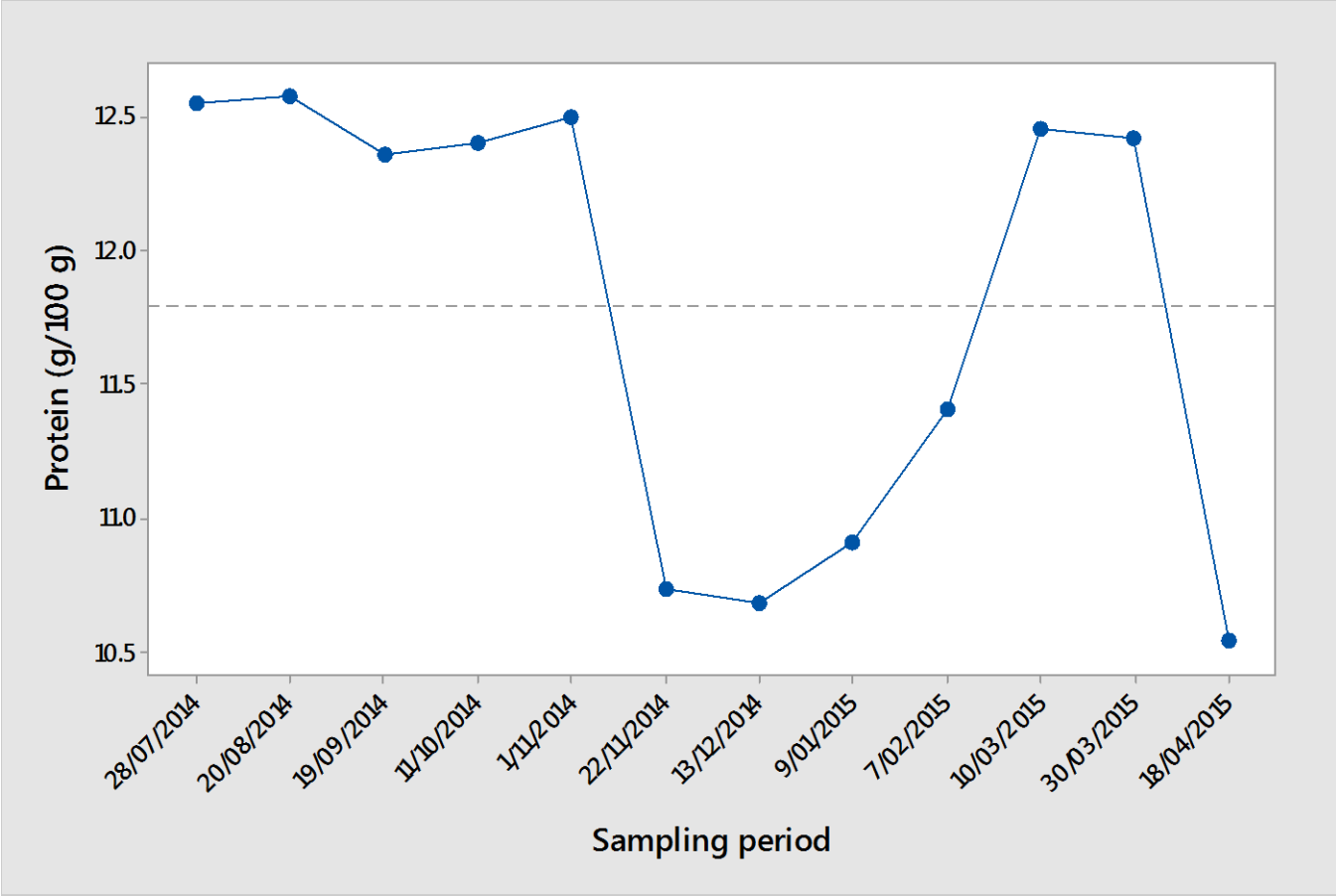


Fig. 2. Changes in protein content as related to sampling period

Changes in lipid content

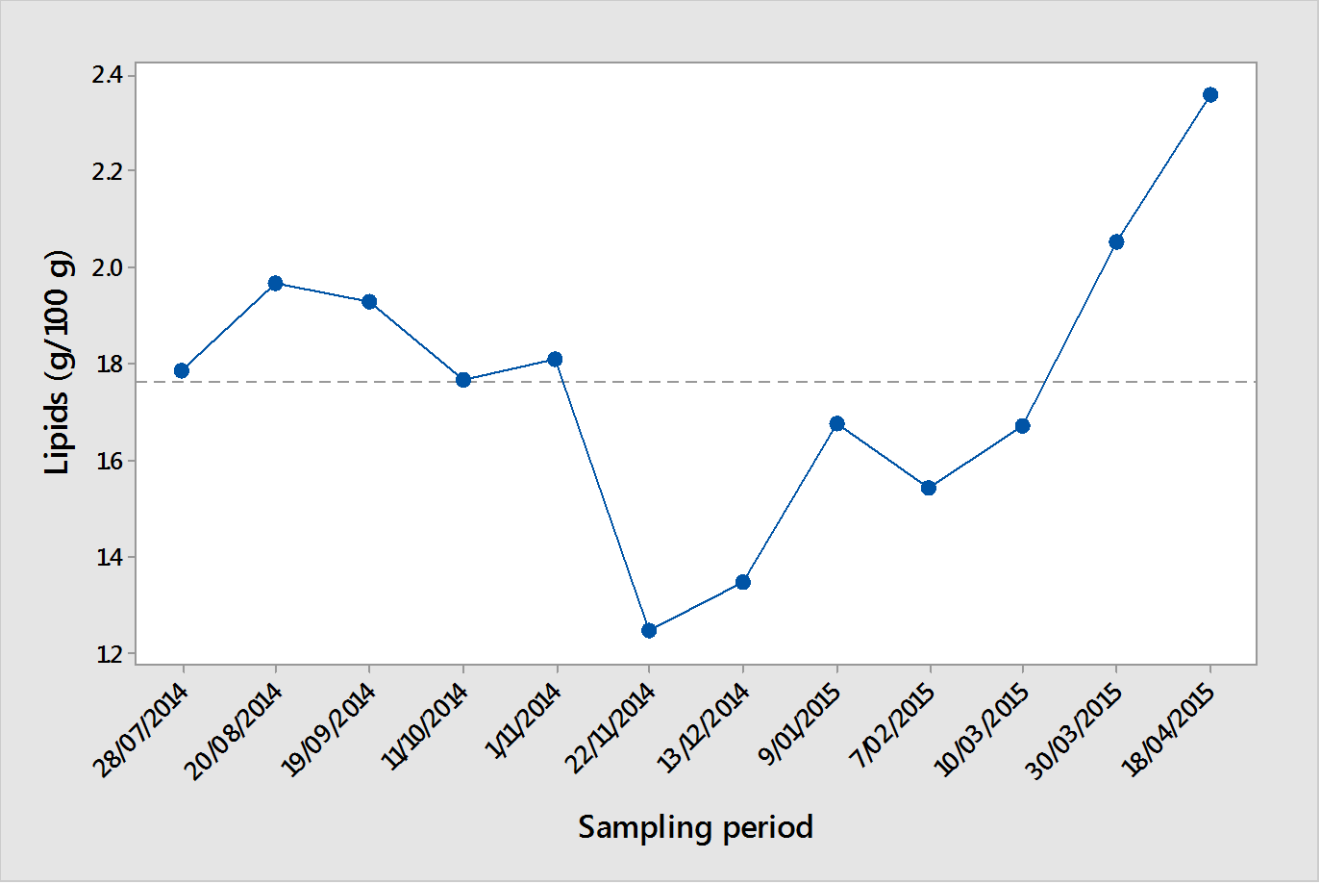


Fig. 3. Changes in lipid content as related to sampling period

Changes in ash content

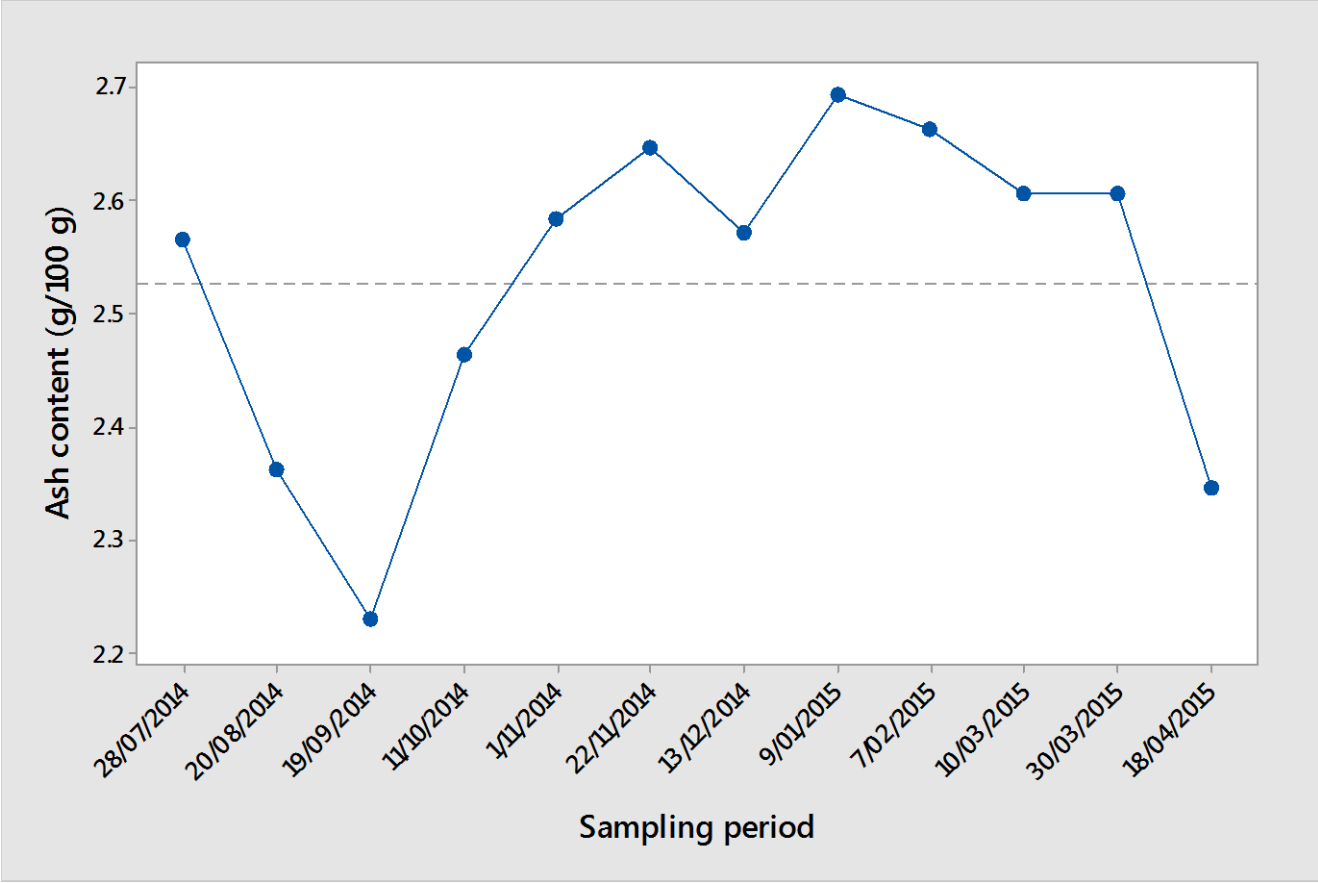


Fig. 4. Changes in ash content as related to sampling period

Changes in glycogen content

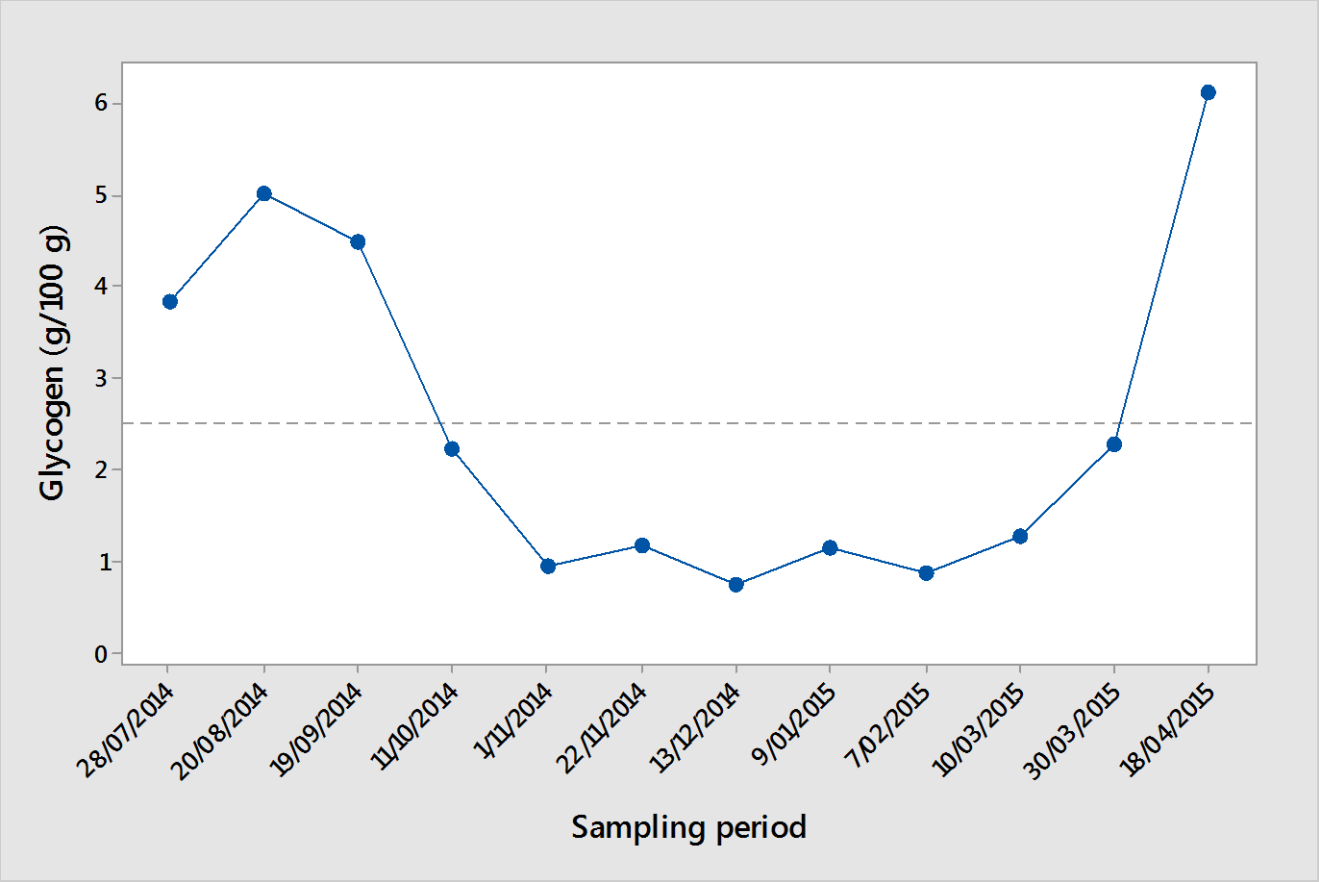


Fig. 5. Changes in glycogen content as related to sampling period

Fatty acid profile of mussel

Table 1. Typical fatty acid profile of mussel

Fatty acid	g/100 g lipids
C14:0	3.93±0.11
C15:0	1.47±0.03
C16:0	24.50±0.35
C16:1n7	8.51±0.03
C17:0	1.13±0.01
C16:4n3	0.08±0.02
C18:0	4.20±0.02
C18:1n9	1.13±0.01
C18:1n7	1.93±0.01
C18:2n6	1.23±0.01
C18:3n6	0.09±0.02
C18:3n3	0.11±0.02
CLA (9c.11t)	1.09±0.03
C20:0	1.27±0.29
C20:1n9	1.67±0.12
C20:4n6	6.37±0.05
C20:5n3	11.88±0.10
C22:1n9	0.32±0.01
C22:4n6	0.75±0.03
C22:4n3	0.72±0.01
C22:5n3	1.14±0.03
C22:6n3	13.16±0.19
SFA	***36.50±0.27***
MUFA	***13.55±0.12***
PUFA	***36.61±0.36***
ω-3	***27.09±0.28***
ω-6	***9.52±0.08***

Changes in SFA, MUFA, PUFA

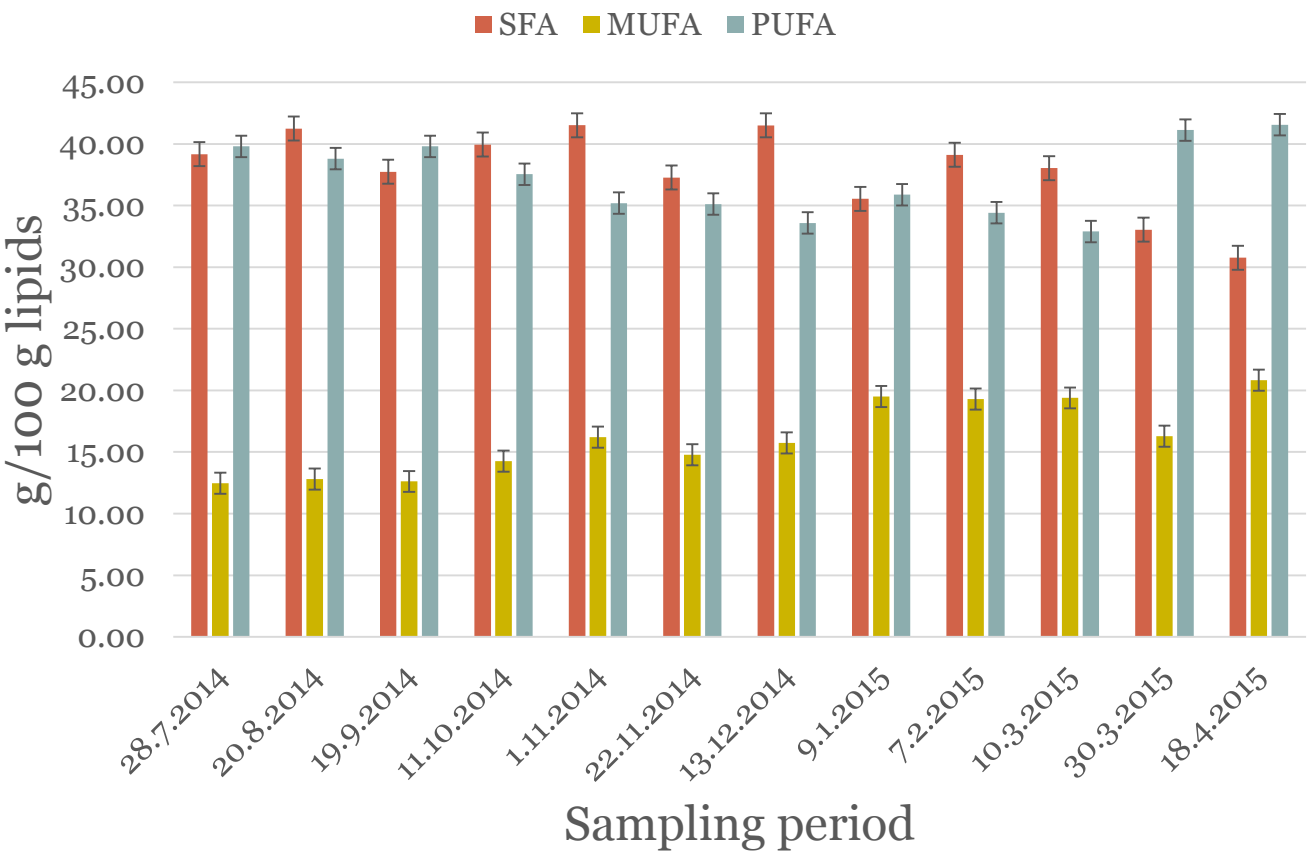
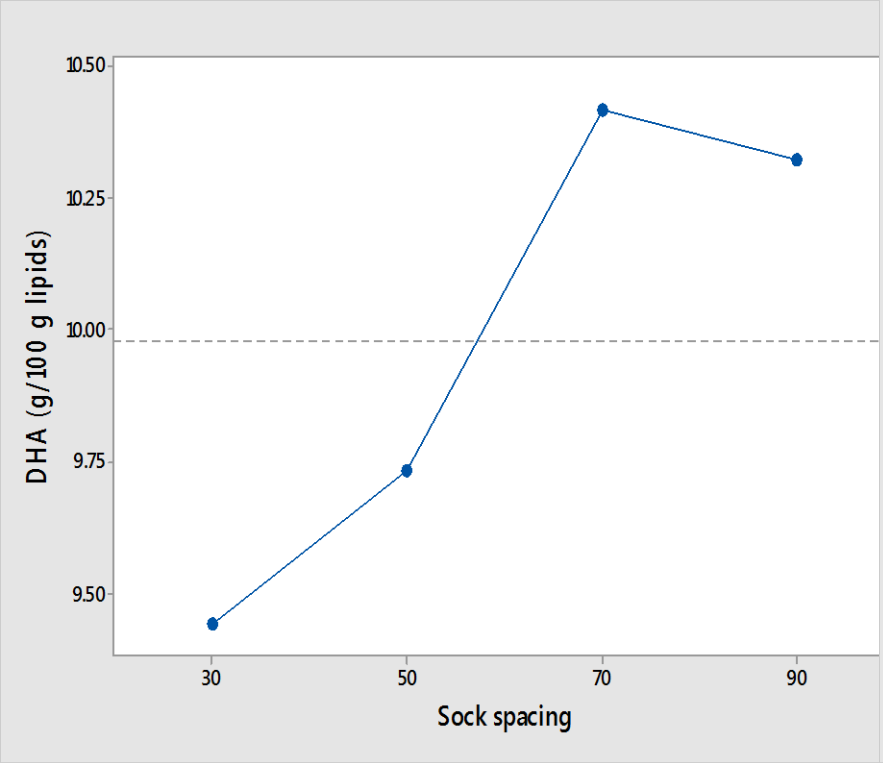


Fig. 6. Changes in saturated (SFA), monounsaturated (MUFA) and polyunsaturated (PUFA) fatty acids as related to sampling period

Changes in EPA and DHA



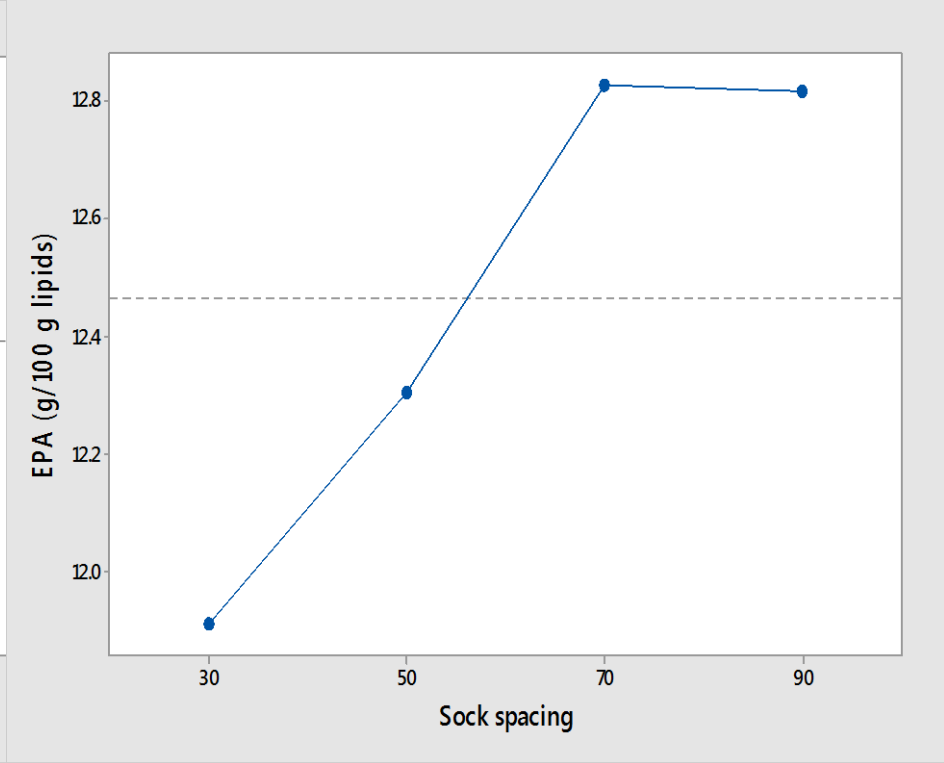


Fig. 7. Changes in DHA and EPA content in relation to sock spacing

Changes in free amino acid content

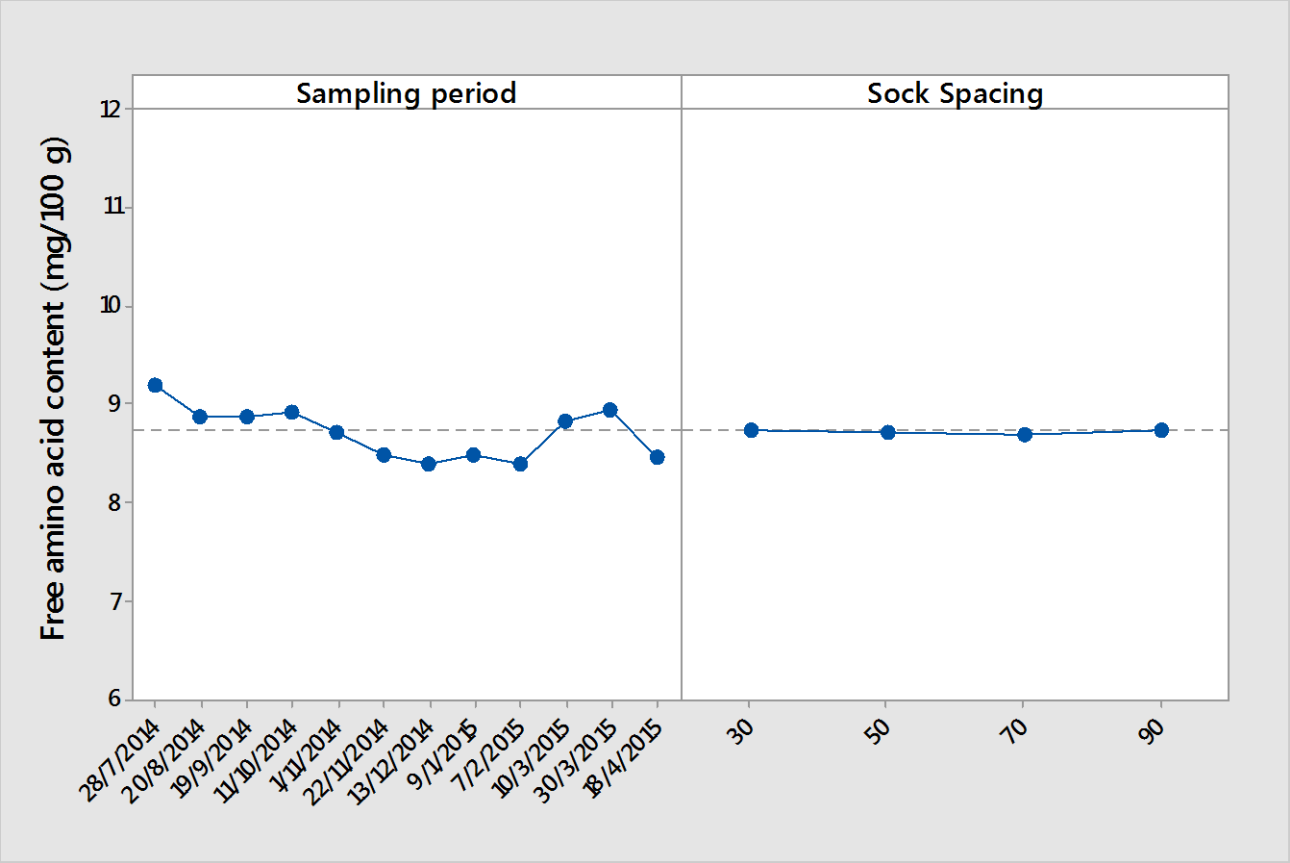


Fig. 8. Changes in free amino acid content as related to sampling period and sock spacing

Amino acid profile

Table 2. Typical total amino acid profile of mussel

Amino acid	g/100 g protein
Ala	2.02±0.28
Gly	3.66±0.37
Val*	4.54±0.45
Leu*	14.88±1.31
Ile*	4.58±0.35
Thr*	2.75±0.14
Ser	1.03±0.06
Pro	3.60±0.51
Asn/Asp	5.49±0.27
Met*	9.27±0.33
Gln/Glu	22.70±0.56
Phe*	3.06±0.14
Cys	0.07±0.01
Arg	1.08±0.05
Lys*	7.41±1.71
His*	1.19±0.48
Tyr	10.68±2.17
$(Cys)_2$	0.19±0.08
Essential amino acids	***47.68***

Conclusions

- The results of the present study confirm the high nutritional value of mussels cultivated in the gulf of Thermaikos. Therefore, mussels can be considered as a food with interesting dietetic properties.
- The chemical composition of mussels is subject to seasonal changes with significant decrements in protein, lipid and glycogen content during November and December.
- Sock spacing did not affect the chemical composition of mussels (moisture, protein, lipids, ash and glycogen), however, it did affect food availability, as evidenced by the fatty acid analysis.
- From a commercial point of view, the best period for processing and consuming mussels is the period of April to October, where mussels exhibit the highest commercial and nutritional value.

Thank you for your attention!

Questions?

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