



# Process for algae-based health promoting food product, with documented effect on immune system

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## Summary

This report describes the process of fermenting rapeseed and seaweed food grade. In addition we investigated the potential of such fermented food product to reduce the inflammation response in human cells. Our hypothesis is that by fermenting seaweed and rapeseed meal with selected lactic acid bacteria, the composite of naturally present anti-inflammatory compounds will be enhanced and be able to reduce the inflammatory response in human cells significantly. For this purpose, we used markers for antigenic immune stimulation after addition of lipopolysaccharide (LPS) mature dendritic cells. Different solvent were tested to extract the bioactive compounds from the food grade fermented seaweed-rapeseed. The extracts were investigated using the ratio of interleukin secretion IL-12p40/IL-10. In parallel, bioactive composition was screened with GC-MS. This analysis found a vast array of phenolic compounds associated with beneficial metabolic activity in abundance (total phenolic compounds of interest  $600 \pm 85$  mg/kg product). Furthermore, several long chain omega-3 poly unsaturated fatty acids (PUFA) were found in abundance. The inflammation study revealed a positive effect on the anti-inflammatory response as judged by the cytokine IL-12p40/IL-10 ratio. Extracts with 80% methanol and methanol:dichlormethane shown an statistically significant effect ( $p < 0.05$ ) Furthermore, the positive effect significantly increased with increasing dose of fermented rapeseed-seaweed. This effect was repeatedly consistent ( $n = 8$ ) in the two batches tested, extracted with 80% methanol. We conclude that lacto-fermentation of rapeseed-seaweed has the potential to be used as a food supplement to aid reduction of inflammation. However, a clinical study with patients with a chronic inflammation disease should be evaluated as a second step.

## 4 ACKNOWLEDGEMENT

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