ENHANCEMENT OF EPA/DHA CONTENT IN POTENTIALLY FUNCTIONAL CANNED TUNA

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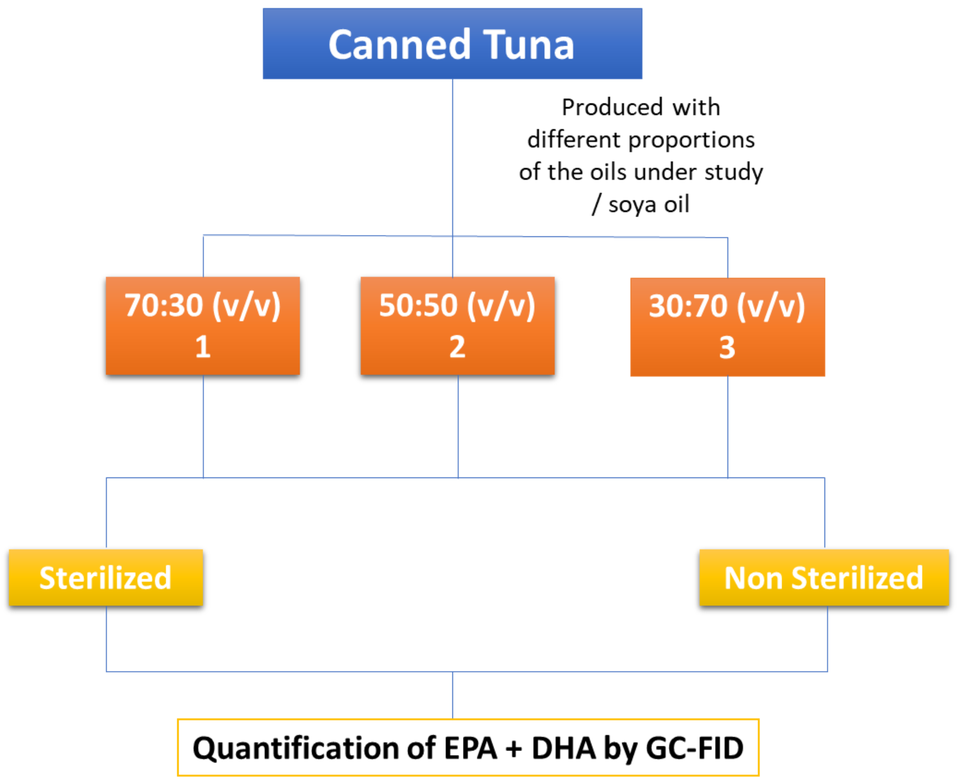
Introduction

In recent studies, the impact of polyunsaturated fatty acids (PUFA) bioactivity on human health has attracted much interest. Indeed, it has been reported that PUFA exert several functions at the cellular level [1] and docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) are essential fatty acids (FA) associated with a lowering effect of the risk of cardiovascular diseases [2]. Thus, claims from European Food Safety Authority (EFSA) state that an intake of i) 0.25-0.50 g EPA+DHA/day will maintain the normal cardiac function, ii) 2 g EPA+DHA/day is necessary for triglycerides levels reduction and iii) 3 g for maintenance of normal blood pressure values [3,4]. Canned tuna is highly appreciated by consumers and considered an attractive alternative to the perishable fresh fish due to its sensory attributes and longer shelf-life. However, a daily intake of the bioactive EPA+DHA dose cannot be achieved by a reasonable dietary portion of canned tuna.

Hence, the aim of this work was to develop a functional canned tuna in oil with enhanced EPA/DHA contents, in order to meet with EFSA's different claims. Accordingly, commercial fish (with lemon flavor), cod liver and krill oils were assayed at different proportions with soya oil.

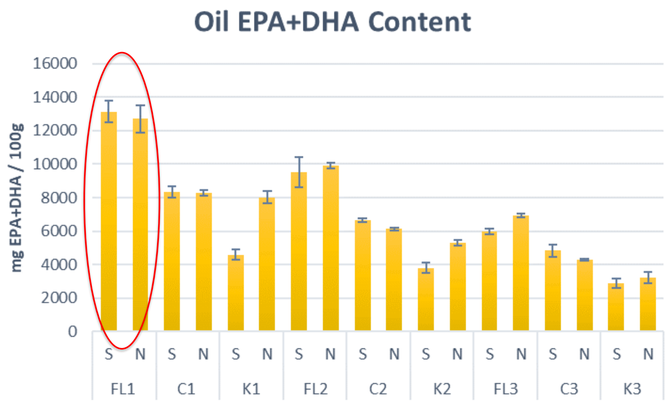
Methods

Samples: Canned Tuna; Krill oil (**K**), Fish oil (with lemon flavor; **FL**) and Cod fish oil (**C**), were kindly donated by Ramirez & Cª (Filhos) SA.

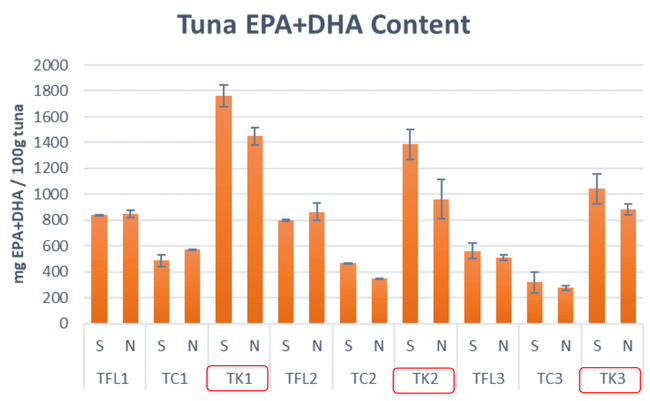


Quantification of EPA+DHA: Lipids were isolated according to the method proposed by Pimentel et. al. [5]. Analysis conditions were as follows: injector (split 25:1; injection volume 1µL), injector and detector temperatures were 250 ºC and 275 ºC, respectively; flow rate of 1 mL/min. The oven temperature was initially at 60 ºC and then increased to a final temperature of 225 ºC.

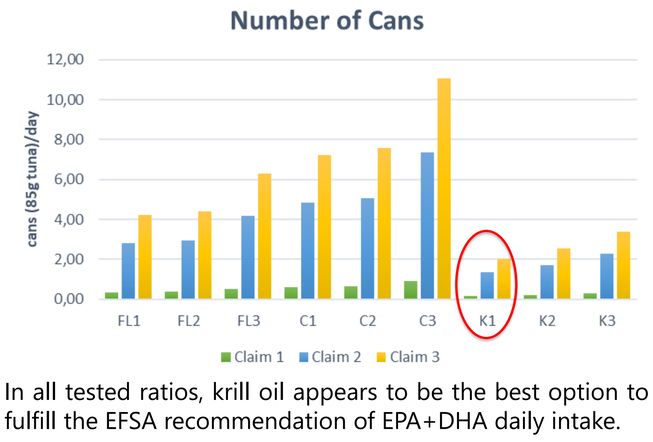
Results



The ratio 70:30 is the best assayed proportion in all cases (fish, cod fish and krill oils). Highlighted is the mixture with flavored fish oil.



The samples prepared with krill oil had higher content in EPA + DHA compared to other oils.



Claim 1- 250 mg/day – *normal cardiac function.*
Claim 2- 2 g/day – *triglycerides levels reduction.*
Claim 3 – 3 g/day – *normal blood pressure.*

In all tested ratios, krill oil appears to be the best option to fulfill the EFSA recommendation of EPA+DHA daily intake.

Conclusions

The results obtained showed that a daily intake of 2 cans containing krill oil at a proportion 70:30 would provide the benefits of the 3 claims. However, color and flavor characteristics need to be improved in further works to ensure acceptance by consumer. In addition, we verified that the industrial sterilization method does not affect the EPA+DHA content.

References

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Acknowledgements

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