

# GOVERNMENT REPORT

## Seal Oil

Produced by [Department of Fisheries and Aquaculture Government of Newfoundland and Labrador](#)



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Harp seal is a marine mammal found abundantly in the ice-cold waters of Newfoundland and Labrador. Because of their environments, harp seals have unique biological characteristics which make them interesting as a renewable resource to be harvested for human consumption. All components of seal carcass are currently used as shown in the Figure.

Blubber oil from harp seal is a rich source of long-chain omega-3 polyunsaturated fatty acids (PUFA) which have attracted much interest and are the focus of attention. The interest in marine oils stemmed from the observation of the diet of Greenland Eskimos in which fish as well as seal meat and blubber was important. The incidence of cardiovascular disease (CVD) in Eskimos was considerably less than that of the Danish population, despite their high fat consumption.

The beneficial health effects of omega-3 PUFA have been attributed to their ability to lower serum triglyceride and cholesterol. In addition, omega-3 fatty acids are essential for normal growth and development and may play a role in the prevention and treatment of hypertension, arthritis, inflammatory and auto immune disorders, diabetes and cancer of the breast and prostate.

Unlike saturated and monounsaturated fatty acids which can be synthesized by all mammals, including humans, the omega-3 PUFA cannot be easily synthesized in the body and must be provided through the diet. The unique feature of marine oils, such as seal oil, relates to their high content of eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), and, to a lesser extent, docosapentaenoic acid (DPA). These PUFA are formed in unicellular phytoplankton and multicellular sea algae and eventually pass through the food web and become incorporated into the body of fish and higher marine species. The high content of omega-3 fatty acids in marine lipids is suggested to be a consequence of cold temperature adaptation in which omega-3 PUFA remain liquid and oppose any tendency to crystallize.

Omega-3 PUFA not only result in a decrease in plasma lipids by reduced synthesis of fatty acids and very low density lipoproteins (VLDL), they also have a direct effect on the heart muscle itself, increase blood flow, decrease arrhythmias, improve arterial compliance, decrease the size of the infarct and reduce several cellular processes that compromise heart function. It has also been suggested that marine oils may retard

atheriosclerosis through their effects on platelet function, platelet-endothelial interactions and inflammatory response.

The long-chain omega-3 fatty acids have been found to have a marked effect on tissue development. Recent studies have demonstrated the DHA supplementation during pregnancy and lactation is necessary in order to prevent deficiency of the mother's DHA status during these periods in order to meet the high fetal requirement for DHA. It has also been shown that premature babies have lower levels of DHA in their tissues as compared to full-term babies. Thus, supplementation of infant formula with DHA/marine oils may be necessary in order to provide them with as much DHA as that available to their breast-fed counterparts. Feeding of infants with formula devoid of omega-3 fatty acids resulted in lack of deposition of DHA in their visual and neural tissues with its adverse effects on vision and nervous system.

In comparing seal blubber oil with fish oils, assimilation of seal oil into the body is more efficient than fish oils. EPA, DPA and DHA in seal oil are located primarily in the terminal positions of the triglyceride molecules while they are preferentially present in the middle position of triglycerides in fish oils. This difference in the location of the omega-3 PUFA is a major reason for superior effect of seal oils as compared to fish oils in disease prevention and potential health benefits. Seal oil may be used in the form of 500mg capsules or as a bottled product.