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## Chemical-free krill oil?

A Chilean company says it has developed a revolutionary process for extracting oils from krill. The non-solvent and chemical-free extraction technique, for which an international patent is pending, produces oils that can be used in products for direct human consumption.

Tharos, a Chile-based consulting firm, has developed what it claims is a revolutionary process for extracting oils from krill, the tiny crustaceans caught in huge quantities in the seas around Antarctica. The non-solvent and chemical-free extraction technique, for which an international patent is expected to be granted in April or May, produces oils that can be used in products for direct human consumption.

"We believe this to be a revolutionary concept because, unlike oil extraction processes used by all current, as well as almost all of the soon-to-arrive, South Antarctic krill operators, this process is chemical-free," said Dimitri Sclabos, general manager of Tharos and one of the inventors of the technique. "It leaves no residue in the final product, which is aimed at the human pharmaceutical and health supplement market."

In addition, the oils extracted by the Tharos method are richer in omega-3 polyunsaturated fatty acids and contain more phospholids than oils produced using other techniques, said Sclabos. "Krill oil obtained using our extraction method also contains astaxanthin, a powerful antioxidant."

Dimitri Sclabos admitted that pharma-grade krill oils can be extracted using solvents but said some residues may remain on the final product. "Such residues might be well within market regulation," he said, "but we think that a no-residue process is a much more valuable proposition to the end user. Our method eliminates the solvent application to get a quality krill oil with no residues at all and with a pharma-quality grade, plus a lower cost structure processing concept."

A great deal of effort has been devoted to utilize the huge quantities of krill, *Euphausia superba*, found in Antarctic waters for human consumption. In fact, back in 2002, a frozen krill meat product developed by Top Ocean of Alaska won the silver medal "in recognition of innovation and new product development" at that year's International Boston Seafood Show (IBSS).

Kodiak, Alaska-based Top Ocean sent a factory trawler based in Montevideo, Uruguay, to catch and process krill in the Southern Ocean, and there were plans to equip and operate several other similar trawlers, which eventually it owned. However, even though it won an award at the Boston show, the company's owner, the church belonging to the controversial Reverend Sun Myung Moon, decided not to pursue the project.

"After IBSS, the designed sales and marketing plan was to target ESE [European Seafood Exposition] and proceed with sales in Asia and USA," said Sclabos, who was then marketing director of Top Ocean.

"The start was slow but very promising," he explained. "We endorsed chefs, made taste panels, etc., etc. But church leaders decided differently and the project was put in 'off.' We also made several mistakes in marketing the meat; we were slow on large account sales and prices were not properly set for some accounts. The story is much longer than this but very, very, interesting. Another krill end-product produced onboard the freezer trawler — also named Top Ocean — dried meal, had a great reputation and was sold at premium prices."

Top Ocean is no longer in business, although other companies from a number of countries — in fact, the fishery is host to a miniature United Nations — are processing krill caught in the Southern Ocean. According to Sclabos, Japanese vessels are landing raw krill meat, while Norwegian firms are using krill oil as a dietary supplement.

"Poles and Koreans are producing meats, both raw and boiled, but at a very low volume," said Sclabos. "The Ukrainians were the only ones left producing meat in large volumes, but they have left the fishery this year and we don't know if they will come back in 2011."

"Just arrived are very large Norwegian trawlers of a size never seen before in the south Antarctic," he said. These vessels will push up the amount of krill caught to 300,000 tons, estimated Sclabos.

And herein could be a problem. There is a very fine balance in the ecosystem in the region. Krill are at the bottom of the food chain, and a number of other marine species feed on them.

But the new oil extraction process being patented by Tharos can score here as well. Compared with other extraction methods, Tharos claims that its process requires less krill than other methods to produce the same volume of oil.

"This invention will therefore protect the resource, as the fishing effort will not be focused on a limited catch and processing period when the oil content is higher than it is at other times of the year," said Sclabos.

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Published: Monday, February 15, 2010

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