

College of Natural Resources and the Environment

University of Massachusetts Amherst

Healthy, Well Nourished Population

Omega-3 Fatty Acids

Issue

Several dietary fats are essential for health including the fat-soluble vitamins (A, D, E and K) and the omega-3 fatty acids. There is strong evidence that the current level of healthy dietary fats is inadequate in many populations. These foods would be beneficial to the general population but in particular to populations at risk for coronary heart disease and pregnant and lactating women who must provide high levels of omega-3 fatty acids to their infants.

What has been done?

Our research is initially focusing on fats that are high in omega-3 fatty acids. Omega-3 fatty acids are beneficial because they lower blood lipid and cholesterol levels, are critical for infant brain and

eye development and they improve immune responses. We are developing antioxidant technologies in omega-3 oil emulsions that prevent rancidity development. These technologies utilize antioxidants in both the water and lipid phases of the emulsion. Once the omega-3 emulsion delivery system is developed, research will be conducted to develop methods to incorporate and stabilize the fatty acids in food products. Once these products are developed, they will then be tested in clinical trials at Harvard University to determine if the omega-3 fatty acids in the foods are absorbed into the blood where they can lower blood lipid and cholesterol levels.

Impact

It is essential that the consumption of healthy fats is

adequate in order to promote maintenance of good health, especially for pregnant and lactating women, and individuals with coronary heart disease, diabetes and immune response disorders. Consequently, there is an urgent need for inexpensive, desirable and convenient functional foods containing physiologically significant amounts of healthy fats. This research project will focus on the development of the emulsion delivery system containing nutritionally important fats and its subsequent incorporation and stabilization in foods, e.g., dairy, meat, dessert, beverage and condiment products.

This research will impact the citizens of Massachusetts in several ways. First, the development of foods containing omega-3 fatty acids could provide an easy vehicle to increase the incorporation of

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beneficial fatty acids into the diet. A second benefit will be to fishing communities. Underutilized fish species such as herring, mackerel and menhaden are naturally high in omega-3 fatty acids. If technologies can be developed to stabilize the oil from these fish, an increased market would be developed thus increasing the value of the fish stock which would provide new harvesting opportunities.

There is mounting evidence that increasing the amount of beneficial fats in our diet could improve health and the quality of life. Promising new technologies are currently being developed in the Department of Food Science at the University of Massachusetts, Amherst to accomplish this goal.

Primary impact area(s)

- Research
- Education
- Extension

Funding sources

- Hatch Act
- National Research Initiative
- Special Research Grants

Topics

- Nutrition and Diet

Contacts

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