

Developing a New, Healthy, Value-Added Meat by Feeding Chicks with Defatted Marine Microalgae from Biofuel Production

USDA NIFA Federal Capacity Fund Impact Report



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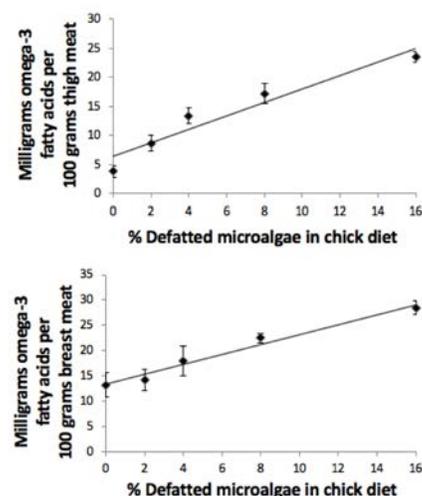
THE NEED: We've all heard about the health benefits of omega-3 fatty acids. Increasing dietary omega-3 intake may decrease risk of chronic diseases, but typical American diets are deficient in these nutrients. Because the average American consumes over 85 pounds of chicken a year, increasing the level of omega-3 fatty acids in chicken meat could increase omega-3 consumption. Marine microalgae contain large amounts of omega-3 fatty acids and are a largely untapped natural resource. The goal of this project is to supply the public with an omega-3 fatty acid-enriched chicken while taking advantage of a byproduct of biofuel production from marine algae.



THE APPROACH: We fed over 1,000 chicks with different amounts of defatted microalgae biomass, ranging up to 16% of the diet. The more algal biomass in the diet, the more omega-3 fatty acids were measured in the breast and thigh muscles of the chicks. The algal biomass additions did not affect the physical properties of the chicken meat. Mice are often used as a model for human digestion and nutrition. We tested the higher omega-3 chicken by feeding it to mice. The omega-3 fatty acids from the chicken moved into the mouse tissues and were able to decrease liver triglycerides in the mice (higher liver triglycerides in humans can cause fatty liver disease and pancreatitis).

IMPACTS: Our project takes the first steps toward creating a new source of omega-3 fatty acid-enriched meat while making productive use of a byproduct from biofuel production. Feeding chicks with algal biomass left after biofuel fermentation increased the amount of omega-3 fatty acids in the chicken. This technology will help poultry farmers produce a novel, higher value, omega-3 fatty acid-enriched chicken meat. It will also create a valuable use for a byproduct of bioenergy production and a valuable feed supplement that could replace some of the soybean protein in typical poultry diets. The public will benefit from availability of healthier chicken that can boost omega-3 fatty acid consumption without changing our dietary patterns.

Levels of Omega-3 Fatty Acids in Thigh and Breast Meat of Chicks Fed Different Levels of Microalgae in Their Diet



WEB SITE: <http://news.cornell.edu/stories/2012/01/algae-may-be-sustainable-alternative-animal-feed>