

## **RESEARCH AND COMMERCIALIZATION FOR CONVERTING OILY BIOMASS INTO USABLE DRY PRODUCTS IN NON-OILY AND FREE-FLOWING FORM**

A major environmental problem in food, feed, and biodiesel industries is how to deal with their oily byproducts and wastes, which are in oily and viscous liquid form and easy to be rancid. There are many food, feed and biofuel processing plants in the US, which produce million tons of the oily byproducts and waste every year. The oily wastes are usually disposed onto or into land, which causes environmental pollution. Another way is to use heat and separate the wastes into low-value fat materials in paste form for feed applications. Unfortunately the process is not cost effective and does not cover the processing costs. Also the paste fat materials need to be heated into low-viscosity liquid before the applications, which need more energy to be used. Manufacturers prefer to dispose these wastes as a low cost method, which is not a long-term solution both practically and environmentally.

We have developed two novel encapsulated processes to encapsulate the non-polar materials in liquid and oily form and to convert into the dry fat products in non-oily and free-flowing form and to increase the number of applications for such as (1) fat energy products in solid form for dairy, pork, poultry and aquaculture feeds; (2) a binder for heating processes and (3) a stabilizer in plastic product production. The fat products in solid form are easily handled, delivered and applied with significantly added value. If the proposed methodology is used for the industries to convert the oily wastes into the solid fat products, this would resolve above problem and add more than hundred millions/year. Our research and scale up were done. We filed patent applications after demonstrating the feasibility of the technologies. Then commercialization was done with related manufacturer and customers. Now our facility in MO produces the value-added product in dry non-oily and free-flowing form from the oily materials in liquid form for resolving the problems and economic development.

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