

by Donald E. Pszczola

Future Strategies for Fat Replacement

rice starches, because they have a tiny granule size, neutral taste, and a soft and creamy mouthfeel, may be used as a milkfat replacer for low-fat ice cream products.

Keeps moisture in, fat out

A novel process utilizing proteins extracted from animal muscle tissue reduces fat content by 50–80% in deep-fried foods such as meat, poultry, seafood, and other products. The protein concentrate applied by the technique establishes a physical barrier that prevents water molecules from evaporating during the deep-frying process, resulting in products having increased moisture content with less frying oil absorbed.

The “fat-blocking” method was developed by Proteus Industries, Gloucester, Mass. (phone 978-675-9140, www.proteusindustries.com),

and was one of the emerging ingredient developments described in the July 2005 *Ingredients* section. A separation technology is used to isolate soluble proteins, which are then concentrated by an ultrafiltration membrane. The mix of proteins and liquid may be incorporated into a batter mix or applied by spraying the surface of a substrate prior to deep frying or by dipping the product after it has been breaded.

According to company founder and chief scientist Stephen D. Kelleher, independent test results showed that recent production of 90,000 lb of par-fried frozen fish portions made by the process and prepared for the U.S. military was well within the range of established low-fat standards.

Kelleher announced the findings at the School Lunch



A novel process utilizing proteins reduces fat content in deep-fried foods such as meat, poultry, and seafoods.

Photo courtesy of Proteus Industries

Fat Replacement continued...

Association’s Child Nutrition Conference. The conference focused on helping operators and industry leaders build relationships while working to boost student participation in school lunch programs and create a healthier lunch program. Proteus, in conjunction with Good Harbor Fillet Co., has used the process to successfully lower the fat in school lunch items such as fish sticks.

In addition to decreasing fat absorption, which leads to potential health benefits, the process can improve the overall quality of the deep-fried product, as discussed in the October 2005 *Ingredients* section’s update on the innovative directions that batters and breadings are taking in today’s marketplace. Because the process locks in moisture and decreases fat absorption, fried coatings stay crisper and avoid the risk of soften-

ing or sogginess after cooking. Finished products have a clean flavor, a moist substrate, and a crunchier coating with an appealing appearance. Also, the protein concentrate functions at a low pH level, which creates an environment hostile to bacteria and increases the product’s shelf life.

The process, which took about four years to develop, has been applied to seafood items, but can be extended to chicken, pork, beef, and other breaded foods. Furthermore, Kelleher noted that in laboratory conditions, some applications using the process achieved a 90% fat reduction. As such, it is possible that fried food products can be formulated with even lower fat levels. Proteus has licensed its technology to several food processors, and with the expansion of the technology to include other products, the opportunities for future licensing of the method grows.