



## Test Kit Technologies, Inc.

### Evaluation of Ingredients and New Formulations

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**Problem:** The product development group for a major industrial producer of batter and breaded products recently cost-reduced a prominent line item. Following the introduction of the "new" product into full-scale production, the production staff observed a drop in operating efficiencies and found that it was difficult to maintain certain product quality standards. What is the problem?

**Background:** One of the mandates for any product development group is to cost-reduce existing product lines. There should be no significant difference between these "new" products and the existing standard. The new products should also be able to be run on existing lines with little or no modification to those lines.

One of the least researched areas in the development of fried foods is their effect on oil quality. Most researchers monitor only one or two indices of oil quality during development of prototypes and in pilot studies. The oil quality index most commonly used is free fatty acids (FFA). A useful oil quality index rarely monitored is the formation of alkaline materials or "soaps". Why "soaps"? Most bread coatings and many other ingredients contain high levels of metal ions. This is especially true of bread coatings, which are manufactured using chemical leavening agents. When foods produced with these ingredients are fried, the metals leach into the frying oil, hastening its degradation. Metals in frying oils produce "soaps" by reacting with fatty acids, either free fatty acids, or on monoglycerides, or diglycerides. When this occurs, it is more difficult to produce consistent quality finished product. Excessive "soaps" also cause foaming and greasy, oil-soaked products.

#### **Using the VERI-FRY® Diagnostic Series to Evaluate New Ingredients:**

Product development scientists can use the VERI-FRY® Total Polar Materials (TPM), Water Emulsion Titratables (WET), and Free Fatty Acid (FFA) tests to predict the effects of new ingredients or formulations on frying oil quality and production operating efficiencies. New formulations should be fried side-by-side under identical conditions with existing formulations. Test the oil with each test at regular intervals. The only difference between the two systems is product formulation, so any differences observed may be attributed to that. Increased levels of WET and TPM indicate that a formulation or ingredient is adversely affecting the oil quality, a characteristic that can adversely affect production efficiencies. Once a "baseline" for a product in a known system has been established, new formulations can be compared to this baseline.

**Benefits of Using the VERI-FRY® Diagnostic Series in Product Development:** The main advantage of using the VERI-FRY® quick tests is the ability to gather a great deal of information very rapidly and at a low cost. The quick tests are also less expensive to run than traditional laboratory protocols. Finally, the finished tests can be saved, because the colors are stable. This allows technical staff to show others how the product or ingredient actually affected the oil. Using the tests will allow development scientists to better select ingredients for new products; ingredients that will, hopefully, enhance product performance in the plant and in the market place.