



FATS AND PROTEINS RESEARCH FOUNDATION, INC.

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(5 MINUTES FROM CHICAGO'S O'HARE AIRPORT)

TELEPHONE AREA CODE 312 827-0139

"THE DIRECTOR'S DIGEST"

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Technical Director

March 23, 1965

No. 9

In the Director's Digest for November, 1964, (No. 5) I reviewed the current detergent situation. Information in this area is developing so rapidly that it seems appropriate to summarize recent information relating to detergents, especially with respect to their biodegradability.

We must first of all orient our thinking with respect to the problems encountered with the petroleum-derived ABS (hard) detergents used extensively for the past several years. Although the use of these detergents resulted in difficult disposal problems, there is to my knowledge no published information showing that a definite public health hazard has occurred from their use. We don't like foam in our drinking water, but the presence of foam per se does not mean that the water is bacteriologically unsafe!

The recently developed LAS (soft) detergents likewise do not present any public health hazards. Dr. Kenneth Morgareidge, Vice President of Food and Drug Research Laboratories, Inc. recently reported the results of extensive feeding experiments with ABS and LAS compounds. On the basis of these tests he stated in a talk at the 38th Annual Meeting of the Soap and Detergent Association in January, 1965, "The public health hazard from these compounds (LAS or ABS) in our water supply is negligible or non-existent."

From other standpoints however it is essential that we change from ABS to more biogradable soft detergents. The soap and detergent industry has committed itself to a change from ABS (hard) detergents to petroleum-derived LAS (soft) detergents within the next few months.

Just how biodegradable are these LAS detergents? In the February 1 issue of Chemical and Engineering News, the following pertinent statement is made:

"Linear alkylate sulfonate (LAS) surfactants are about as degradable as are naturally occurring organic wastes in waste systems. This is one conclusion to be drawn from results of biodegradability tests that became available in New York City last week. According to the Soap and Detergent Association, in tests of LAS household detergent formulations in two sewage disposal systems last summer, LAS removals were about equal to a reduction of biochemical oxygen demand (BOD) by oxidation of the organic wastes. One study, at a small extended-aeration, activated-sludge plant at a midwestern resident boy's school, showed LAS and BOD removals of more than 95%. Alkylbenzene sulfonate "hard" surfactant was degraded only 50 to 60%. The other study at a U.S. Air Force radar station in Virginia, found LAS and BOD reductions of 85% in an activated-sludge plant with short detention time."

It is of interest that at the same meeting Dr. C. E. Renn, Professor of Sanitary Engineering, Johns Hopkins University, reported also that LAS degradation in trickling filters occurred at the same rate as BOD removal.

Will standards for biodegradability of detergents be established soon by municipal, state or federal governments? Wisconsin has legislation on the books prohibiting sale of undegradable detergents in the state (to take effect December 31, 1965). Other states are studying the matter but it appears unlikely that degradability standards will be established generally by regulatory agencies at this time, because there are no completely satisfactory test procedures for determining the degree of biodegradability. Standards without acceptable, accurate, reproducible test procedures are difficult to enforce and not very meaningful.

From the information now available, it would appear that the LAS detergents will probably meet biodegradability standards when and if they are promulgated. Fat based detergents then must compete solely on the basis of cost and performance.

There are a few bright spots on the detergent horizon for producers of tallow. Substantial quantities of tallow alcohol sulfates are now used by detergent manufacturers. Some sulfonated fatty acid esters, and sucrose esters of fatty acids have been shown to have excellent detergent characteristics. In fact, some of these materials look promising enough to justify a careful evaluation of their detergency power. Consequently FPRF is now in the process of negotiating a contract to determine the detergent quality of a number of fat-based materials including polyoxyethylenated tallow sucroglyceride, sucrose tallow fatty acid esters and tallow alcohol sulfates. The results of this study should give some indication as to whether or not some or all of these fat-based detergents can compete with LAS on a cost and performance basis.