



FATS AND PROTEINS RESEARCH FOUNDATION, INC.

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THE DIRECTOR'S DIGEST

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Recently there has been a great deal of published information relating to detergents. Articles in newspapers, trade magazines and scientific journals have all called attention to the disposal problems created by the petroleum-derived detergents now in almost universal use. Several renderers have asked for my opinion of these articles and have suggested that an issue of "The Director's Digest" be devoted to this subject. Here it is.

Until a few years ago, the largest single outlet for inedible animal fats was the soap industry. With the development of so-called synthetic detergents, derived largely from materials produced by the petroleum industry, this market has gradually declined in importance although very substantial amounts of fats are still used by the soap and detergent industry.

Naturally several groups of scientists interested in industrial utilization of agricultural products have continued to investigate the possibility and desirability of using fat and other agricultural products for the preparation of detergents. Three types of compounds with good detergent characteristics have been produced from fat:

(1) Sugar esters of fatty acids, (2) alcohol sulfates prepared from fatty acids, and (3) esters of sulfonated fatty acids.

The sugar esters have been produced largely under license from the Sugar Research Foundation or by Ledoga SpA, an Italian pharmaceutical and chemical company. Ledoga also produces a series of detergent mixtures containing both sugar esters and mono-, di- and triglycerides. The alcohol sulfates and esters of sulfonated fatty acids have been produced and tested experimentally by scientists at the Eastern Utilization Research Laboratory of the United States Department of Agriculture, and undoubtedly also by scientists in the soap and detergent industry. These detergents have not been produced and distributed extensively by the detergent industry because they cost more to produce and are not generally superior in detergency power to the petroleum-based ABS detergents (alkylbenzenesulfonates).

Within the past few years it has been shown that the "hard" ABS detergents are not completely degraded in the normal sewage disposal systems and may be found in rivers and streams, or even in our potable water supplies. This led to the development of LAS detergents (linear alkylbenzenesulfonates) that are much more biodegradable than the ABS branched chain detergents. Although the LAS ("soft") detergents are almost completely removed in a good aerobic sewage disposal system, under conditions where aeration is not good, a significant amount of even the LAS detergents are not broken down by the microorganisms present. Furthermore, recent studies by the researchers at the Eastern Utilization Research Laboratory indicate that both the LAS and ABS petroleum-based detergents are somewhat toxic to the very microorganisms that are expected to digest or degrade the sewage—including detergents.

Similar tests on fat-based detergents by the same scientists showed that the alcohol sulfates were completely biodegradable, even under conditions with limited oxygen supply. Although the sulfonated fatty acid esters were not digested under these conditions, they were not toxic to the microorganisms present.

What does this all mean with respect to the probable utilization of fats for the preparation of these biodegradable or "soft" detergents? If the LAS petroleum-derived detergents prove satisfactory to the sewage disposal authorities, these will undoubtedly be the detergent of choice by the manufacturers because of lower cost. Fat-based detergents will be more expensive to produce even with considerably lower tallow prices than those currently in effect.

If LAS detergents are not completely acceptable from the biodegradability standpoint, then there will undoubtedly be a rapid shift to fat-based detergents. In any case, it now appears likely that detergent manufacturers will gradually increase the amount of fat-based detergents in their formulations for specific uses. It will be several years however before this will become a major outlet for tallow.

REPRINT ENCLOSED

Some of you may have neglected to request copies of the reprint covering the Battelle studies on improved recovery of protein from rendering plant raw materials. I am therefore enclosing a copy for your information and files.