

Phosphate vs. Non-Phosphate Detergents

Sir: James E. Weaver's letter on "Phosphate and Non-Phosphate Detergents" (JAOCs 49:203 [1972]) is another presentation of the identical arguments that have been made on this subject by Procter & Gamble many times before without, however, much effect on legislative bodies that have been exposed to both sides of the controversy. By selecting his information and referring to only one phosphate detergent, Weaver attempted to prove that phosphate detergents *as a class* are safer than their carbonate counterparts, despite published testimony from FDA, with which he surely is familiar, discrediting such class comparisons.

The argumentative device for achieving this neat categorization was to refer to one phosphate-built detergent as "typical," despite the fact that FDA found that some nationally distributed phosphate laundry detergents are more hazardous than some carbonate detergents.

Weaver also extrapolated to laundry detergents the conclusions of a report on the hazard of dishwashing detergents issued by the Cornell Aeronautical Laboratory, Inc. In that report a correlation was drawn between alkalinity and hazard. Yet, when we compared the alkalinities of 14 phosphate-built laundry detergents and a carbonate laundry detergent, we found that *damage to tissue, whether eye, skin, or gastrointestinal tract, was essentially the same for the most alkaline as for the least alkaline product tested*. Not surprisingly, the surfactants in laundry detergents themselves contribute to toxicity. The earlier letter refers to documentation Armour-Dial, Inc. has provided the Federal Trade Commission, in which this subject is discussed in detail, so the writer must be familiar with this work. Yet he chose to ignore the experimental data without taking the opportunity to attempt to refute our conclusions.

Several experimental procedures in the regulations of the Federal Hazardous Substances Act (FHSA) are becoming recognized as being unsuitable for products such as laundry detergents. Despite the fact that experimenters (R.O. Carter and J.E. Griffith, *Toxicol. Appl. Pharmacol.* 7:60 [1965]) from his company concluded that the rabbit, which is prescribed under FHSA regulations, is unsuitable for predicting detergent hazard to the human eye, Weaver, citing in-house data in justification, nevertheless relied on results obtained with that animal. At the same time he chose to ignore the FHSA test for skin irritation, according to which the "typical" phosphate detergent to which he referred is corrosive.

When the FHSA eye test is modified to simulate reasonable conditions of human accident, the carbonate detergent is found to be relatively innocuous, whether rabbit or monkey is used as test animal.

Unlike the Procter & Gamble work, in which 40% detergent slurries were introduced directly into the stomach, we fed powdered detergent to rabbits or dogs, relying on the animal to produce its own saliva for swallowing. Under these circumstances, and contrary to Procter & Gamble's results, emesis in dogs was instantaneous in the case of the carbonate detergent, whereas emesis was delayed for ca. 1 hr with several phosphate detergents and did not occur at all with two of those we tested. While the carbonate detergent was extremely irritating when administered to fasted dogs, it was only moderately so when animals were fed 2 hr before dosing, certainly a more realistic procedure if one is concerned with hazard to children.

We have submitted for publication experimental details on these as well as other investigations. Suffice it to say that nothing we have seen is inconsistent with the view that there are non-phosphate detergents available the safety of which is comparable to that of phosphate detergents sold for years without cautionary labeling. As everyone knows, several such phosphate products are now being labeled, providing the consumer with the same kind of essential information found on the labels of carbonate detergents.

It is interesting that when both sides of the phosphate-non-phosphate controversy have been aired, legislation banning phosphate has often been passed. The situation has been summarized in the Ninth Report (on phosphate and phosphate substitutes in detergents) by the Committee on Government Operations (House Report No. 92-918, March 15, 1972): "General statements by government and industry officials that high phosphate detergents are 'safe' while those low in phosphate or containing phosphate substitutes are 'hazardous,' are substantially unfounded and misleading." The section of the report in which this is discussed is titled, "The Safety Myth."

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