



# FATS AND PROTEINS RESEARCH FOUNDATION, INC.

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## "THE DIRECTOR'S DIGEST"

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You will recall that in the August, 1965 Director's Digest a review of the Stanford Research Institute project "Modification of Animal Proteins for Structural Plastics" was presented. At that time it was indicated that additional studies would be performed in this area. Also in the same issue of the Director's Digest it was announced that a project would be activated on "Chemical Modification of Keratin Proteins" at the Harris Research Laboratories. We have now received reports covering research on both of these projects and the results are summarized below.

### MODIFICATION OF GELATIN BY GRAFT COPOLYMER FORMATION

Stanford Research Institute has evaluated a variety of vinyl ethers as grafting monomers with gelatin. A specific radical-forming material was used to produce the protein radicals, which react with the monomer and combine to form an appropriate high molecular weight substance. With one of the ethers the final polymer had a relatively low moisture regain even though it contained a relatively small amount of the ether. However, the characteristics of the material suggest that it would still not be satisfactory as a structural plastic. Stanford Research Institute recommends that further attempts be made to produce materials that could be used for structural plastics and for other applications by using both the cross linking techniques described in the original report and the graft treatment studied in the current series of tests. This proposal is now being evaluated by the Research Committee of FPRF.

### MODIFICATION OF HOG HAIR FOR ANIMAL FEED USE

The purpose of the work performed by Harris Research Laboratories was to develop, by means of chemical treatment, modified hog hair or chicken feathers which would be digestible and utilized

by animals as a feed ingredient. Three methods of chemical modification were evaluated. They were reductive alkylation, oxidation and reduction. The digestibility of the products formed by each of these methods was checked by the usual laboratory pepsin digestion procedure. In all cases the digestibility by this procedure exceeded 65% and in some cases was in excess of 90%. The materials produced were non-toxic but when fed to rats as the sole source of protein in the ration were apparently not assimilated even when the products were supplemented with amino acids known to be lacking in the modified hair.

Although these results do not appear promising, we feel that the materials produced from hair should be checked as ingredients for chick rations to supplement other proteins. Plans are under way to perform this series of experiments with modified hair.

SEMINAR ON FAT SUGAR COMPLEXES AS SURFACTANT ADJUVANTS  
FOR AGRICULTURAL SPRAY

On February 25, 1966, FPRF sponsored a seminar to discuss the results from research performed by a number of colleges and universities to determine the effectiveness of fat-derived materials in enhancing the activity of herbicides and improving the absorption and translocation of nutrient foliar sprays. This seminar was attended by the university researchers as well as by representatives of organizations concerned with the production of suitable fat-derived surfactants. In general the results presented at the seminar indicate that fat-sugar complexes or ethoxylated fat-sugar complexes were as effective as the best surfactants now commercially available. Some problems were encountered in dispersing the fat-derived materials in the spray solutions, but it was the feeling of those attending the conference that this difficulty could be overcome by the selection of appropriate fat derivatives. Best results with herbicide sprays were obtained with ethoxylated tallow fatty acid sucrose esters containing relatively high proportions of tallow but ethoxylated at a relatively low level. Sucrose esters or sucro-glycerides were effective activity enhancers but extreme difficulties were encountered with solubility, particularly at low temperatures.

The discussions held at this seminar will be very helpful for the researchers in the studies to be carried out this coming summer.