FATS AND PROTEINS
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"THE DIRECTOR'S DIGEST"
D. M. DOTY
Technical Director

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BEEF CATTLE FEEDING TRIALS AT NORTH CAROLINA STATE UNIVERSITY

You will recall that preliminary results indicated that beef cattle fed rations containing 5% animal fat or rations with sucroglycerides replacing part of the fat showed excellent gains and feed efficiencies (Director's Digest No. 22, April 21, 1966). We have received from Professor Wise the final results on these trials and they confirm the preliminary findings. The basal ration for these studies contained ground shelled corn 55%, animal fat 5%, ground corn cobs 23%, soybean oil meal 10%, alfalfa meal 5% and adequate supplements of minerals and vitamins. The results (Table 1) show that performance was excellent on all treatments. According to Professor Wise, this supports previous experiments at North Carolina in which outstanding performance and feed conversion have been obtained from rations containing animal fats.

The data do not indicate any additional response to sucroglyceride (GHT) in the ration. This does not agree with previous beef cattle feeding trials at North Carolina State University in which both gain and feed efficiency were improved by adding 0.5% GHT to rations containing 5% animal fat (see Director's Digest No. 8, February 26, 1965).

Table 1. Performance of Steers Fed Rations Containing Animal Fat and Animal Fat plus GHT

	Basal[a]	Basal +0.25% GHT	Basal + 0.5% GHT	Basal + 1.0% GHT
No. of Animals[b]	10	10	10	10
Days on Test	170	170	170	170
Av. Initial Wt.-lbs.	540	540	543	540
Av. Gain - lbs.	485	472	494	477
Av. Daily Gain - lbs.	2.85	2.78	2.91	2.81
Feed/Gain	6.90	7.29	7.30	7.27
Shrink Wt. - lbs.	1002	992	1012	998
% Shrink	2.3	2.0	2.5	1.9

[a] Contained 5% animal fat
[b] Two lots of 5 steers per lot

There are two possible explanations for this difference in response. (1) The steers in the last experiment exhibited such excellent gains and feed efficiency on the basal ration containing animal fat that no improvement could be expected from any ration modification. (2) Unfortunately the GHT used in the last experiment was somewhat different in composition than the material used in the first test. It is hoped that at some future date a basic study can be performed that will demonstrate the fundamental physiological influence of sugar-fat complexes in beef cattle rations. Such a study would indicate the exact nature of the materials that might improve feed efficiency and would establish the conditions necessary for maximum response.

FPRF RESEARCH GETS PUBLICIZED

As the FPRF fiscal year ends, it is well to review our program and to summarize the accomplishments of the past year. It is always difficult to evaluate a research program because any monetary return always lags several years behind the actual research findings. The first step in the utilization of research results comes with the publication of research findings in technical journals and trade magazines and in patent applications to protect any novel discoveries. This "first step" has been taken in many areas of the FPRF program as indicated by the following:

Technical Articles Published

"Sucrose Derivatives of Tallow: New, Effective Surfactants for Herbicide Sprays". Edwin B. Kurtz, Jr., Keith C. Hamilton, Stephen B. Bingham, John R. McCarthy, Nathan Hartwig. Arizona Agricultural Experiment Station Technical Bulletin 176, July(1966).

"Laundering Performance of Tallow Derived Surfactants". C. A. Rader, A. M. Schwartz. Detergent Age, May(1966).

"Chemical Intermediates and Derivatives from Oleyl Alcohol". William Rosenblatt, Lloyd I. Osipow and Foster Dee Snell, Foster D. Snell, Inc. Journal of American Oil Chemists' Society 43, 245-248(1966)

"Studies on Improved Recovery of Protein from Rendering-Plant Raw Materials and Products. III. Pilot-Plant Studies on an Enzyme Hydrolysis Process". J. J. Connelly, V. G. Vely, W. H. Mink, G. F. Sachsel and J. H. Litchfield. Food Technology 20, 829-834 (1966).

"Seeking New Chemical Uses for Inedible Animal Fats. Waterproofing Concrete". Dr. Joseph E. Burch. Meat Processing, 85-88(June,1966)

"Tallow Derived Surfactants: Superior Adjuvants for Agricultural Sprays". Dr. Allan Berne-Allen. Fette·Siefen·Anstrichmittel·Die Ernahrungsindustrie 67, 509-511(1965).

Manuscripts in preparation for publication

"Fat and Fat Derivatives in Rations for Dairy Cattle". Wisconsin Alumni Research Foundation. Journal of Dairy Science.

"Trichlorosilanated Fatty Materials as Concrete Waterproofing Agents". William J. Sheppard, M. Jack Snyder and Roger L. Folz. Paper and manuscript in preparation for presentation at American Oil Chemists' Society meeting this fall and publication in Journal of American Oil Chemists' Society.

"Fat-Sugar Complexes as Surfactant Adjuvants for Herbicide Sprays". Fred W. Slife. Paper and manuscript in preparation for presentation and publication this fall or winter.

Articles in Trade Magazines

"Open Road for Concrete Additives". Chemical Week, January 15, 1966.

"Hogs' Hair Into Feed? It Looks Promising". The National Provisioner,, December 11, 1965.

"Fats-Proteins Research Group Sets Sights on Six Projects". The National Provisioner, August 6, 1966.

Patent Applications in Process

1. "Novel Compositions and Their Use" based on work of Foster D. Snell, Inc. for FPRF on fat-derived compounds for high temperature lubricants.

2. "Inorganic-Fat Mixtures for Portland Cement Compositions" based on research of R. L. Johnson for FPRF.

3. "A Fat-Derived Compound for Water-Proof Coating for Concrete and a Novel Method for its Preparation" based on studies by Battelle Memorial Institute for FPRF.

A reprint of the article on the enzyme hydrolysis process is enclosed for your information. Reprints of the other technical articles can be furnished on request from the FPRF office.

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Enclosure