Smalley Foundation Report 1948-1949

THIS year your chairman with the concurrence of the other members of the Smalley Committee felt that it would be desirable for the sake of brevity to consolidate and condense the sub-committee reports. Accordingly the detailed reports on the individual series are available on request, and in this we will attempt to give a brief summary of the Committee's activities. To do this it appears desirable to discuss the activities of the five sub-committees individually.

1. Oil Seed Meal
2. Oil Seeds
3. Crude Vegetable Oils
4. Drying Oils
5. Tallow and Grease

The first summary to be given will be on the Oil Seed Meal series.

Oil Seed Meal

As usual 30 samples were distributed and 87 collaborators participated. Figure I shows the extent of

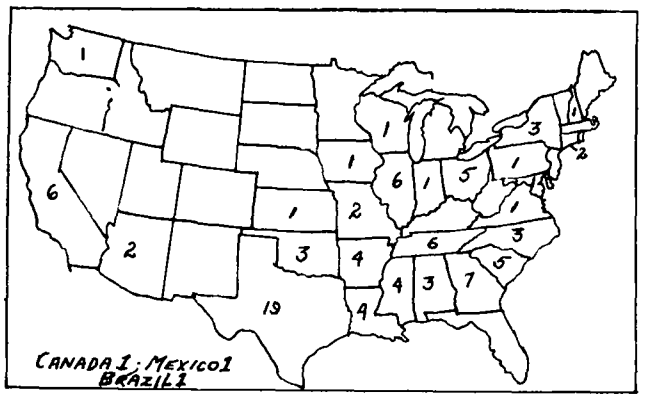

FIG. 1. Smalley Foundation Oil Seed Meal

geographical distribution of the samples in 26 states and three foreign countries.

We have shown graphically the percentage of the collaborators within the tolerance on the samples (Figure 2). It will be noted that a considerable improvement has resulted in the accuracy of the moisture results and some improvement is noted in the oil results. The nitrogen average dropped slightly. The method of reporting may have had some influence on the moisture results as this year we asked that the results be reported to only one decimal place.

A. G. Thompson of the Southern Cotton Oil Company, Columbia, S. C., wins the American Oil Chemists' cup for the highest proficiency for the determination of oil and nitrogen with a percent proficiency of 99.991. Last year this value was 99.987%.

The certificate for second place will be awarded to E. R. Hahn of the Hahn Laboratories, Columbia, S. C. His proficiency was 99.986%. Last year this value was 99.981.

On the determination of nitrogen Mr. Thompson and A. C. Summers, the state chemist of South Carolina, tied with a percent proficiency of 99.986.

On the determination of oil Mr. Thompson and Mr. Hahn tied with a percent proficiency of 99.995.

On the determination of moisture D. C. Melear, Jr.,

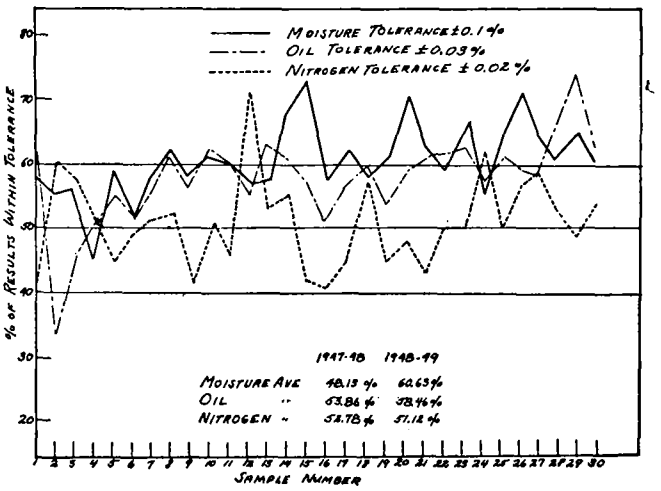

FIG. 2. Smalley Foundation Oil Seed Meal

of the Fort Worth Laboratories won first place with a perfect record of 100.0%. D. B. McIsaac of the Kershaw Oil Mill, Kershaw, S. C., and N. C. Hamner of the Southwestern Laboratories, Dallas, Tex., shared second place with a rating of 99.899%.

During the year the sub-committee voted to discontinue awarding second place certificates where two or more were tied for first place. Consequently no certificate will be awarded on the oil and nitrogen results.

A vote of the sub-committee during the season was unanimous in suggesting that only 15 samples instead of 30 be distributed next year. The samples will be distributed bi-weekly.

Oil Seed Series

In the Oil Seed Series handled by R. T. Doughtie and his sub-committee cottonseed, soyabean and peanut samples were distributed. The samples distributed and the number collaborators participating were:

Cottonseed	10 samples,	45 collaborators
Soyabean	10 samples,	23 collaborators
Peanut	7 samples,	18 collaborators

In order to elimniate ties the sub-committee adopted a method of re-evaluating tie grades on the bases of allowing no tolerance, and we believe this worked out very well.

The winners in the individual series were:

On Cottonseed:

First place, E. R. Hahn, Hohn Laboratories, Columbia, S. C., with a grade of 100.0%.
Second place, A. G. Thompson, Southern Cotton Oil Company, Columbia, S. C., with a grade of 99.40.

On Soyabeans:

First place, E. H. Tenent, Woodson-Tenent Laboratories, Memphis, Tenn., with a grade of 99.99%.
Second place, N. C. Hamner, Southwestern Laboratories, Dallas, Texas, with a grade of 99.96.

On Peanuts:

First place, Thomas B. Caldwell, Law and Company, Wilmington, N. C., with a grade of 99.60%.

Second place, G. K. Witmer, Battle Laboratories, Montgomery, Ala., with a grade of 99.44.

Again this year certificates will be awarded on the cottonseed and soyabeans series. The results are still too erratic on the peanut series to make the awarding of certificates feasible.

Crude Vegetable Oils

Six samples of crude vegetable oil were distributed by Dr. Richardson and his sub-committee: three each of cottonseed oil and soybean oil. A total of 73 chemists participated in the work, being graded in the case of cottonseed oil on free fatty acid, refining loss and refined color; however the bleached color was reported also. The collaborators were graded on free fatty acid, refining loss, and bleached color on the soybean oils. The results in general were very good, and the following men were awarded certificates this year for proficiency on this work:

First place, Analyst No. 19, C. A. Lathrop of Curtis and Tompkins Ltd., San Francisco, Calif., with a grade of 100.0.

Second place, Analyst No. 20, Edward G. Williams, The Edward G. Williams Laboratory, New Orleans, La., with a grade of 99.367.

In order to eliminate ties in this series a similar method was used to that described in the Oil Seed Series to recalculate the results without tolerances.

Drying Oils

The drying oil series handled by Francis Scofield has been handled on a somewhat more informal basis. There has been no charge to date for the samples, and the organizations participating have taken turns in mailing the samples. Further the analytical determinations made have been varied somewhat.

In all four sets of samples were sent out, and each set consisted of four samples each. Twenty-seven organizations participated, and reports were made on the determination of color, refractive index, specific gravity, acid value, and iodine value. On set No. 4 the Gardner Viscosity and saponification value were added and the specific gravity was deleted.

Tallow and Grease

A new sub-committee was set up in December 1948 to distribute and tabulate the results on check samples of tallow and grease. Due to significant price differentials in the price of these materials a poll of the membership indicated that there would be considerable interest in such a program. W. C. Ault of the Eastern Regional Laboratory acted as chairman of this sub-committee.

Two samples were sent out early in 1949, and the results have been tabulated and mailed to the collaboratories. Thirty-six laboratories participated in the work. Several additional samples were sent outside the country, but on account of custom difficulties the samples evidently were not received. Determinations were made on these samples for free fatty acid, FAC color, titer moisture, insoluble materials, and unsaponifiable. While the results were not too bad, certainly improvement is needed, especially in the reading of color. On sample No. 1, 10 chemists reported FAC 9; 14 chemists reported 7, and 10 reported 5. On sample No. 2, 11 reported FAC 17; 15 reported FAC 11B; 2 reported 19; 3 reported 15; and 1 reported 11A. While it is recognized that few analysts agree too well on FAC colors, these results were extremely varied.

Dr. Ault's report together with the tabulation of results on these two samples are available upon request. It is planned to continue this work next season.

I would like at this time to thank the other members of the Smalley Committee, Mr. Doughtie, Dr. Richardson, Dr. Ault, and Mr. Scofield for their fine cooperation and painstaking effort in handling their phase of the work as well as all of the sub-committee members for their assistance and guidance. T. C. Law and Law and Company in particular have contributed immensely to the success of the oil seed meal and oil seed work through their thorough and careful preparation of samples.

R. T. DOUGHTIE, JR. — W. C. AULT
FRANCIS SCOFIELD — R. W. BATES, chairman
A. S. RICHARDSON

Soap Versus Synthetic Detergents*

FOSTER DEE SNELL, Foster D. Snell, Inc., New York, N. Y.

ON the retailers' shelves synthetic detergents stand side by side with soap in appealing for the consumer's dollar. They similarly compete in the advertising pages. Both appear in flake and bead form. Soap as yet has the bar field in the United States, but one synthetic bar is being test-marketed, another is nearly to that stage, and who can predict how many others are in the laboratory? In England synthetic bars have been sold for some time.

A Thumb-Nail History

The initial step in the development of synthetics was simple; replacement of the sodium carboxylate group of soap, -COONa, with one not so sensitive to hard water, typified by $-OSO_2ONa$. Appreciation of the fact that a polar-non-polar compound of sufficient chain length was needed with a proper degree of polarity on one end led to development of many sources of the polar groups. The difference between sodium stearate, $C_{17}H_{37}COONa$, and octadecane, $C_{18}H_{38}$, is only a carboxyl group. The end carbon of octadecane cannot be commercially oxidized to a carboxyl group. But there are many substitutions which can be made at the end of a hydrocarbon chain, either directly or by roundabout means. Typical of the commercial method is attachment of the aliphatic chain to a benzene ring, itself equivalent to a 4-carbon straight chain, followed by sulfonation. While the aliphatic radical will not sulfonate readily, the aromatic will. From that grew the replacement

* Presented at the 22nd annual fall meeting, American Oil Chemists' Society, New York City, Nov. 15-17, 1948.