# REPORT OF THE CRUDE MILL OPERATIONS COMMITTEE

The Crude Mill Operations Committee has its apologies to make for not having some great accomplishment to revolutionize the oil mill industry. However, we have done quite a great deal of work.

The work done on lint determination was quite disappointing. We tried first to check mill results as to first and second cut lint production. Some members of the Committee had no seed scales, so could only approximate their tonnage. We found such differences as 2.45%-3.2% remaining lint; 7.7%-8.7% after the first cut; and from 11.7%-12.6% lint on seed. We found that after the first cut lint had been removed and the seed treated with hydrochloric acid the hull was made very brittle and the resulting lint rubbed off contained excess percentages of hull pepper. Work done in our laboratory shows that we could not check mill results. We then left checking mill production to take up determining lint on seed originally.

We find that the lint on seed protects the hull to a greater degree and the lint does not contain as much pepper; however, great difficulty was encountered in removing the lint from the ends of the seed.

Lint determinations on original seed samples show such differences as 11.0%-13.9%; 12.2%-13.3%; 12.0%-13.2%, to mention a few. In these figures moisture differences were taken into consideration and figured to a common basis. The method tried is hazardous and long and requires a great deal of trying work. One member of this Committee has devised a shaker which works very satisfactorily, and with a few proposed changes should give good results. He has a small electric motor with a 3 in. pulley attached and drives from this to an 11 in. pulley. A cam here has a 4 in. long shaft to which is attached a round wire cage, using 12 mesh wire, 3½ in. in diameter and 4 in. long, with a screw cap to facilitate loading and unloading. This machine does nice work, but in order to get all the lint the seed must be shaken until the hull breaks down badly, giving untrue results. An improvement which I think would help and which I am having made is a square cage which will be about 6 to 7 inches long with both ends padded and using a bruised screen wire. This should give more rubbing space and the padded ends should eliminate a large part of the hull breakage.

We perhaps over-stepped our limitations in doing some work on moisture; nevertheless, we are interested and ask forgiveness. From the data gathered it appears that a temperature of 101° C. for the glycerin oven is low and that 103° C. would give better results, due to the fact that there is about 2° C. difference in the temperature of top and bottom shelf. From the members of the society that I have talked with there seems to be quite a bit of dissatisfaction with the glycerin oven, and personally I would like to see it done away with. From a crude mill standpoint I hope the Moisture Committee can give us some further information and recommendations.

Crude mills over the territory are selling second cut lint and hull fibre on a cellulose basis. While the method generally in use is not so tedious, it can be improved upon.

This Crude Mill Operations Committee would like to offer the following recommendations to the incoming Committee:

(1) That the lint determination method be continued using the proposed shaker as developed by Mr. Smith, or its equivalent.

(2) That a study be made for improving cellulose determination.

ALLEN C. SMITH,
R. T. DOUGHTIE, JR.
A. G. BEDELL
R. R. HAIRE
H. L. THOMAS, Chairman

# REPORT OF SOY BEAN ANALYSIS COMMITTEE

THE work of the Soy Bean Analysis Committee this year has been confined to the further study of the method presented at the New Orleans meeting last year.

Suggestions as to changes or improvements were asked for by the chairman when the first sample was sent out, but the replies were so few and the results of the first sample so satisfactory that it seemed best to continue the work along the same line.

Three samples of beans were sent out during the year and this is one case where every member of the committee analyzed every sample and reported his results on time.

It does not seem necessary to read all of the individual figures, for a summary will show equally well the character of the results obtained by the committee.

The most important determination is, of course, the oil. On the three samples sent out there was but one case where any laboratory differed by as much as 0.3 per cent from the average of the five laboratories reporting. Furthermore, there may be a reason for that difference. That particular sample container was damaged in the mail and was received with the top loose. The moisture content had dropped about 1 per cent and where the reported figures were recalculated to the average of the other laboratories the oil was slightly out of line.

The ammonia work was not quite as good as might have been expected, but the greatest deviation from the average was 0.14 per cent in one case. All of the other results were within 0.10 per cent.

Very few check meal reports are published that do not show variations greater than these.

The moisture determinations show very good agreement on all the samples except the one case where the can was received opened, and perhaps that was a fortunate accident, for it certainly brings out the necessity of keeping the samples in air-tight containers.

One deletion is being made in the method as published, several of the committee agreeing that it is impracticable to grind the sample fine enough to do away with regrinding after partially extracting, and that portion of the procedure will be omitted when the method is submitted to the Uniform Methods Committee for their disposition.

We wish to make a further suggestion that a new committee be appointed who will carry on the work to a point where the method may be perfect enough to adopt as official for the American Oil Chemists' Society and of the National Association.

Respectfully submitted,
C. H. COX,
Chairman.

# REVISED METHOD

**Moisture:**

Weigh eight to ten grams of the whole beans and dry three hours at 130° C. in a Freas Forced Draft Oven.

**Pre-Drying:**

Dry 60 grams for two hours in a Freas Forced Draft Oven at 130° C.

**Grinding:**

Grind the 60 grams of partially dried beans as fine as possible.

**Second Moisture:**

Five grams are heated two hours in Freas Oven at 130° C.

**Oil:**

Extract two gram portions wrapped in filter paper as a seed for two hours, regrind in a mortar and re-extract three hours' additional.

**Ammonia:**

Use 1.4 or 1.7 grams and follow the method for cottonseed meal.

**Free Fatty Acid:**

If this determination is desired it can be made by following the procedure for cottonseed by partially drying and grinding through the official food chopper. It may be necessary, however, to run the beans two or three times through the food chopper to get them fine enough so that the official 7.05 grams of oil will be obtained.

**Calculation of Results:**

Recalculate oil and ammonia to the original moisture basis. Report moisture and oil to the first decimal, ammonia to the second decimal.

**Calculation of Yields:**

For uniformity I suggest the use of definite fixed moisture and oil percentages left in the cake. The average is probably about 7.5 per cent moisture and 5.0 per cent oil. The yield of cake and available oil from the beans can then be calculated from the analysis as follows:

Add together the pounds of moisture and the pounds of oil in a ton of beans. Subtract this figure from 2,000 lbs. The result is pounds of dry, oil-free cake. Assuming the above moisture and oil percentages will be left in the cake, this dry, oil-free cake is 87.5 per cent of the total cake.

The oil left in the cake is 5.0 per cent of this total cake and the oil yield the difference between the pounds of total oil and the oil in the cake. The ammonia in the cake is calculated by dividing the pounds of total ammonia by the weight of the cake and multiplying by 100. The moisture and manufacturing loss of the beans is the difference between the sum of the cake and available oil and 2,000 lbs.

**Example of Calculation of the Yields:**

Assuming beans analyze—
Moisture — 12.5
Oil — 17.3
Ammonia — 7.20
250 lbs. Moisture
346 lbs. Oil

2,000 — 596 = 1404 lbs. dry, oil-free cake = 87.5% of total cake.
1404 ÷ 87.5% × 100 = 1604 lbs. total cake.
1604 × 5.0% = 80 lbs. oil in cake.
346 total oil — 80 = 266 lbs. of Available Oil. 144 lbs. ammonia ÷ 1604 × 100 = 8.97% ammonia in cake. 2000 lbs. — (cake 1604 + oil 266) = 130 lbs. manufacturing loss.

| Sample No. 1— | Rettger | Cox | Milner | Agster | McKinney | Average |
|---|---|---|---|---|---|---|
| Moisture | 7.2 | 7.6 | 7.2 | 8.0 | 7.3 | 7.5 |
| Oil | 20.5 | 20.3 | 20.7 | 20.6 | 20.5 | 20.5 |
| Ammonia | 7.30 | 7.28 | 7.16 | 7.11 | 7.14 | 7.20 |
| Sample No. 2— | | | | | | |
| Moisture | 11.4 | 11.5 | 11.2 | 11.7 | 11.5* | 11.5 |
| Oil | 17.4 | 17.5 | 17.2 | 17.3 | 17.7 | 17.4 |
| Ammonia | 7.02 | 7.03 | 6.95 | 7.06 | 7.02 | 7.02 |
| Sample No. 3— | | | | | | |
| Moisture | 9.3 | 9.6 | 8.9 | 10.0 | 9.2 | 9.4 |
| Oil | 20.0 | 19.8 | 19.9 | 20.2 | 20.1 | 20.0 |
| Ammonia | 7.12 | 7.20 | 7.21 | 7.38 | 7.29 | 7.24 |

*Sample received with cover off and moisture reduced to 10.7%. Recalculated to average of other results.

# REPORT OF THE OLIVE OIL COMMITTEE

By a majority vote of the members of the Olive Oil Committee, of which I am chairman, this committee has decided to take up the matter of Teaseed Oil in Olive Oil and will investigate the two tests recently published for the detection of teaseed oil—the Fitelson or government test and the Siebenberg-Hubbard test.

We have no report to make other than that this committee will be engaged in the above work for some time to come.

M. F. LAURO,
Chairman.