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cate of the sampler must show the condition of the refining kettle before the tank was unloaded. When the oil contains settlings, this sample only shall be considered official."

The committee submits drawings of several types of samplers and recommends that the Society adopt some one of these, or a modification thereof, as the official trier which only shall be used in drawing official samples.

In explanation of the recommendation which the committee has made, we desire to submit the following:

A COMPARISON OF LABORATORY RESULTS ON TANK CAR AND KETTLE SAMPLES.

Submitted by D. C. Morris, Procter & Gamble.

Car No.	Tank-car sample			Kettle sample	
	F. F. A.	Color	Loss	Color	Loss
1217	1.1	5.1	5.0	5.4	7.1
328	1.1	5.5	6.5	5.6	8.4
35	1.2	5.6	6.2	5.5	6.9
360	1.1	5.4	4.0	5.5	6.9
1202	1.4	5.6	7.5	5.7	6.3
1249	1.1	5.5	6.4	5.6	7.0
477	1.0	5.7	4.3	5.3	6.0
310	1.2	5.5	6.2	6.8	6.3
503	1.3	5.5	7.2	6.1	6.7
520	1.3	5.6	7.0	5.5	6.5
312	1.1	5.7	6.0	5.7	7.6
305	1.2	5.5	6.9	5.4	7.1
50	1.1	5.6	5.7	5.6	6.0
1711	1.2	5.0	6.2	5.6	7.0
1760	1.0	4.9	6.0	5.8	6.2
1153	2.9	8.8	11.4	9.5	11.0
1683	2.3	6.8	10.3	7.2	10.5
450	1.0	5.3	4.2	5.5	4.6
1118	2.0	6.8	8.8	6.8	8.8
1412	1.1	5.3	8.0	5.4	7.3
1537	1.0	5.2	6.6	5.6	6.7
1735	1.2	5.4	6.7	4.8	7.4
66	1.2	5.5	7.5	5.6	8.0
1762	1.1	5.4	6.0	5.3	7.2
1664	1.3	5.6	7.6	5.5	8.9
1106	1.3	5.6	7.8	5.8	8.9
1583	1.2	5.6	7.7	5.1	8.4
1264	1.1	5.0	6.0	5.5	7.1
1126	1.2	5.4	6.8	5.5	9.0
1178	1.2	5.2	7.6	5.2	7.7
1157	0.8	4.9	7.2	5.0	6.1
1319	2.6	6.8	8.8	7.0	8.8
1419	2.4	7.3	8.2	5.6	5.6
96	0.8	5.3	5.2	7.3	9.0
1537	1.6	7.0	9.0	7.5	7.8
1105	1.2	7.3	8.9	7.4	8.9
427	1.0	4.9	5.6	5.2	7.6
1568	1.3	5.8	7.7	5.6	8.0
1662	0.8	5.3	5.4	4.9	5.8
942	1.2	5.1	7.3	5.4	7.5
954	1.4	5.5	8.5	5.3	7.6
1001	1.3	5.5	7.7	5.2	7.6
1407	1.3	5.3	7.4	5.4	7.7
1823	1.3	5.2	7.4	6.1	7.4
1647	1.3	5.8	7.6	6.0	8.2
1694	1.3	5.8	6.8	5.8	7.8
328	1.5	5.2	7.2	5.4	7.8
50	1.6	5.4	7.6	5.5	8.0
709	1.2	4.9	7.0	5.6	7.5
1174	1.1	6.3	6.4	7.4	6.9
1829	1.2	5.5	7.2	5.0	8.4
1547	1.2	7.6	6.6	8.0	10.6
1811	0.7	5.3	6.0	5.1	6.0
1115	1.2	6.6	8.2	7.0	9.0
1118	1.6	3.6	7.6	3.4	7.8
996	1.3	5.5	7.7	5.4	7.9
Average	1.3	5.6	7.0	5.8	7.6

"We believe that it has been the experience of everyone that it is impossible to draw a true and representative sample of the contents of a tank car where settlings are present. This was well brought out by the work of the previous Sampling Committee, particularly the results of Mr. D. C. Morris of Procter & Gamble. It is also brought out in the article by Messrs. Tompkins and McElligott in the January, 1921, number of THE COTTON OIL PRESS. We submit below the comparative results on tank-car samples and refining-kettle samples, one set compiled by Mr. A. W. Putland

of the Portsmouth Cotton Oil Refining Corporation and the other set by Mr. D. C. Morris of Procter & Gamble. According to the nature of the settlings, the sample may be either better or worse than the true average of the tank car. It is also well understood that no sampling device can take care of the geometrical proportions of the oil in the different levels of the tank car. From the results which we have mentioned and from the conditions referred to, it seems extremely unlikely that any could be devised which could draw

COMPARISON OF TANK CAR AND KETTLE SAMPLES.
Submitted by A. W. Putland, Portsmouth Cotton Oil Refining Corporation.

Tank-car sample			Kettle sample		
Insoluble impurities	Moisture	Total moisture and insoluble impurities	Insoluble impurities	Moisture	Total moisture and insoluble impurities
Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
0.06	0.24	0.3	0.03	0.49	0.52
0.18	0.15	0.33	0.06	0.21	0.27
0.16	0.15	0.32	0.09	0.44	0.53
0.14	0.13	0.27	0.09	0.25	0.1
0.07	0.18	0.25	0.06	0.26	0.32
0.07	1.06	1.13	0.08	0.9	0.98
0.21	0.4	0.61	0.12	0.47	0.59
0.37	0.71	1.08	0.1	0.22	0.32
0.34	0.64	0.98	0.11	0.25	0.36
0.38	0.13	0.51	0.10	0.21	0.3
0.43	0.2	0.63	0.11	0.29	0.4
0.14	0.29	0.43	0.09	0.39	0.48
0.05	0.39	0.43	0.12	0.4	0.52
0.6	5.9	6.5	0.1	0.36	0.46
0.3	2.1	2.4	0.05	0.09	0.14
2.3	0.6	2.9	0.06	0.52	0.58
0.13	0.18	0.31	0.23	0.46	0.69
0.25	0.16	0.41	0.16	0.23	0.38
AVERAGE					
0.34	0.76	1.09	0.10	0.35	0.44

a sample truly representative of the contents of the tank car.

Your committee felt it advisable to standardize the type of trier to be used. The first three types shown depend upon the use of a valve which closes against the inflowing oil. They therefore expel a small portion of the charge; in the case of a tank containing settlings, the portion expelled would consist almost entirely of settlings. This criticism would seem to be a serious one. The other two types shown are not open to this criticism. A discussion of the type of trier by the Society, we think, would be of advantage.

R. W. PERRY.

Chairman Oil Sampling Committee.

DAMAGED SEED AND SEED ANALYSIS COMMITTEE REPORT.

(Abstract.)

By John Malowan, Houston Cotton Oil Co., Houston, Texas.

[Editor's Note: Due to crowded condition of the Chemists' Section this month and length of Mr. Malowan's report, only an abstract of same could be included in this issue. Full text of this report and other committee reports will be included in the convention proceedings.]

The committee intended to make seed analysis more uniform, simpler and cheaper, and a different method from the present one was looked for. Four seed samples were sent to the members and analyzed according to different methods. From the results obtained it is impossible to propose an official method, but three

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methods are proposed as provisional. The first two methods, to be used for routine work, use five grams of sample, while the third method, for referee work, uses a sample of 25 grams. The difficulty in using a small sample is of obtaining fair portions, and therefore the difficulty of good checks.

The first method is the Smalley-Copes method: Weigh approximately five grams of seeds into a canvas bag (No. 10 canvas) and dry. After a partial drying, pound the seeds thoroughly in the bag, place the bag and all in a filter paper and extract for two hours. Then remove the bag, repound and re-extract for three hours. For ammonia use 1.7032 g. whole seeds and proceed as in meal analysis.

The second method is the Lehman Johnson method: Take five grams of seed, mash each seed flat in a mortar, dry three hours at 103-105 C. and grind carefully in an iron mortar till all the meats are incorporated in the lint and hulls; wrap in two light filter papers. Extract three hours without regrinding. Drop extracted seeds with both filter papers into a 800 cc. Kjeldahl flask, and digest with 1.4 g. HgO and 15 g. Na_2SO_4 and 50 c. c. H_2SO_4 . Dilute to 800 c. c. mark and pour 400 cc. out, and distill remainder. This method has the great disadvantage of depending too much on the personal factor in grinding the seeds fine enough.

The third method is the Malowan method: Take 25 or 50 grams, stir in a beaker with diluted HCl , drain, dry partly, weigh and grind in a mortar or mill. Take five grams of the ground seeds for oil determination, regrinding after two hours, 1.7032 g. for NH_3 determination, and 5 grams for the moisture determination as is meal, figuring back the results to original weight. Impurities are determined by shaking on a screen and picking out trash. Grading should be done by cutting 100 seeds with a sharp knife. Report also the acidity of the oil in damaged seeds. In case the percentage of hulls and meats are required, the above portion may be used after weighing.

Questionnaires were sent to the commercial chemists of the South for standardizing reports, and the following rules are proposed: The results should be reported as yield of 1900 lbs. available seeds. The damaged seeds should be reported by count, and not by weight. The percentage of damaged seeds should not be taken into consideration when figuring the yield.

The following formulas should be used in figuring the yield:

$$\frac{(2000 \times \% \text{ oil in seeds}) - 60 \text{ lbs.}}{7.5} \times 95 = \text{gallons available oil}$$

$$\frac{(2000 \times \% \text{ NH}_3 \text{ in seeds}) - 5 \text{ lbs.}}{\text{Desired NH}_3 \text{ in cake}} \times 95 = \text{available pounds cake.}$$

JOHN MALOWAN,

Chairman Damaged Seed and Seed Analysis Committee.

AMMONIA COMMITTEE REPORT.

(Abstract.)

By H. C. Moore, Armour Fertilizer Works
Chicago, Ill.

[Editor's Note: Full text of Mr. Moore's report, chairman of the Ammonia Committee, will be published with the convention proceedings. Due to crowded condition of the Chemists' Section this month and length of the committee's report, only an abstract of same can be included in this issue.]

Activities of the Ammonia Committee for the past year has included consideration of the following:

(1) Shall the Gunning copper method be recommended for adoption by the Society as official?

(2) Is a trap bulb between the distillation flask and the condensing coil necessary?

(3) Request the members of the Society who are contestants in the check-meal work to reply to a questionnaire describing in detail their method for determining ammonia.

(4) That some co-operative work be undertaken with the help of members of the Society to determine results by the two methods, and in case of the copper method, with and without the addition of sulphide before distilling.

(5) That the committee's recommendation that a supply of standard samples of pure ammonium sulphate and sodium carbonate of known purity be secured for distribution through sale to members be submitted to the members for approval.

The committee received 86 replies to its questionnaire, which replies have been summarized and discussed in connection with the contestants' standing to date, including the first 33 of the check-meal samples.

Forty contestants also made special determinations for ammonia on six of the meal samples by three methods, viz., the Gunning-mercury, Gunning-copper and the latter method with the addition of sulphide before distilling.

The results of these analyses are tabulated showing comparison with the accepted averages for each of the six samples by each method.

A brief discussion follows these results, including a comparison of results by various methods and the various analysts.

Following the committee presents the following recommendations:

(1) That the Gunning-copper method should not be adopted as official until its various details of analysis can be further perfected.

(2) That suitable trap connecting bulbs be employed as a safeguard at least against the entrainment of alkali.

(3) That a better grade of reagents, those practically free from nitrogen, be secured in order to reduce blank corrections to a minimum. The blank should not amount to more than from 0.05 to 0.10 cc. $\text{N}/4$ alkali, and can be kept within these limits by the careful selection of reagents and without unreasonably increasing their cost.

(4) That the Society secure for standard samples suitable quantities each of ammonium sulphate and sodium carbonate of known purity packed in small sealed containers for sale to members.

(5) That the members aim for more uniformity in their method for determining ammonia, especially for important samples when accurate results are desired in order to bring about a better agreement between the various laboratories. A higher order of the accuracy, resulting in a much closer agreement between chemists, will surely command greater respect from those who now believe there is no excuse for some of the discrepancies so often found.

The committee desires to thank all who have co-operated with it in its activities for the past year.

H. C. MOORE, Chairman Ammonia Committee.

ADDITIONAL MEMBERS OF A. O. C. S.

Secretary Caldwell reports that four new members have joined the Society. They are Bernard C. Hauck, Chemical & Engineering Co., Chicago; Clarence C. Graves, Chemical & Engineering Co., Chicago; William P. Dunne, Mutual Refining Co., Sherman, Tex., and Floyd E. Joyce, Haskins Brothers & Co., Sioux City, Iowa.