

Educational (189⁶) Department.

ORDINARY MS.

G.O., No. 118

Dated 2nd March 1896

INDEXED.

[Despatch Abstract.]

DAIRYING

Recording Proceedings of the Board of Revenue submitting report on the analyses of milk, butter and oil-cake made by Mr. Collins, Assistant Agricultural Chemist to the Government of India, during his recent deputation to Saidapet.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

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BOARD OF REVENUE (REV. SETT., L. RDS. AND AGRI.), 28TH JAN. 1896, No. 15.

PROCEEDINGS OF THE BOARD OF REVENUE (REVENUE SETTLEMENT, LAND RECORDS AND AGRICULTURE).

READ—again Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 23rd November 1895, Mis. No. 6426.

ABSTRACT.—Requesting the Principal of the Agricultural College, Saidapet, to report what arrangements he proposes in order to carry out the instructions of Government regarding the dairying experiments.

READ—again Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 29th November 1895, Mis. No. 6559.

ABSTRACT.—Submitting, for the information of Government, Revenue Department, with remarks, the report of the Principal, College of Agriculture, regarding arrangements for carrying on dairying experiments at Saidapet during the period of Mr. Collins' stay at Madras.

READ—again Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 18th December 1895, Mis. No. 6912.

ABSTRACT.—Submitting to Government, Revenue Department, letter from the Acting Principal, Agricultural College, stating that additional dairy appliances required for carrying on the dairying experiments cannot be specified at present for reasons stated.

READ—also the following letter from the Hon'ble Mr. D. DUNCAN, M.A., D.Sc., Director of Public Instruction, Madras, to the Chief Secretary to Government, (through the Director of Agriculture), dated 18th January 1896, No. 445 :—

I have the honour to submit in original, for the information of Government, the report of the Acting Principal, College of Agriculture, Saidapet, on the analytical experiments performed by Mr. Collins, the Assistant Agricultural Chemist to the Government of India, during his recent stay at Saidapet, and to state that in the circumstances reported in paragraph 7 of the letter there seems no objection to the substitution of gingelly cake for ground-nut cake as a ration for cattle.

ENCLOSURE.

From W. KEESS, Esq., M.A., M.R.A.C., Acting Principal, Madras College of Agriculture, to the Director of Public Instruction, dated Saidapet, 8th January 1896, No. 9.

I have the honour to submit the accompanying report on the analytical work performed by Mr. Collins, Assistant Agricultural Chemist to the Government of India, during his recent deputation to Saidapet. As the results obtained by him are of agricultural interest, I request you will be so good as to forward this letter to the Director of Agriculture. I may add that I write the report at Mr. Collins' request. He seemed to think that my knowledge of the local circumstances, in connection with which he carried out the analyses, would enable me to better exhibit the practical bearing of the results obtained than if he himself essayed the task.

2. Mr. Collins performed the following analyses :—

2 samples, cow's milk.	1 sample, ground-nut cake.
2 " buffalo's milk.	1 " gingelly cake.
2 " cow's separated milk.	1 " jaggery.
2 " buffalo's separated milk.	—
1 sample, buffalo's butter.	13
1 " cow's butter.	—

3. Of the two samples of cow's milk analysed, one represented the morning's yield of the whole College herd and the other the evening's yield. The two samples of "cow's separated milk" represented the above mentioned yields after separation by means of the "Baby" separator.

The results were as follows:—

	Whole milk.	Separated milk.
Morning's yield	4.68	.13
Evening's yield	3.93	.13

per cent. of butter fat.

The above results confirm those obtained by me in 1892 to the effect that the "Baby" separator now on the Farm deals most efficiently with cow's milk, the separation being practically complete. The percentage of butter fat in the milk is distinctly high showing that the Nellores like most Indian breeds can produce rich milk. The results are especially encouraging, as the milk under analysis contained the produce of several cows which had recently calved; besides which two of the best butter-producing cows were dry at the time.

4. During Mr. Collins' deputation the College possessed only two milking buffaloes. They did not receive any special food, but were allowed to graze the whole day, and in addition they were given such fodder as the cows rejected from their daily allowances. The milk analysed was that of both animals milked together—one analysis being made of the morning's yield and another of the evening's yield. The analyses of separated milk refer to the above after separation by the College machine—

	Whole milk.	Separated milk.
Morning's yield	7.34	.12
Evening's yield	4.82	.17

per cent. of butter fat.

The first point to be noticed is the great difference in richness between the morning's and the evening's yield. The most interesting fact which the analyses bring out is that even with buffalo's milk the "Baby" separator acts exceedingly well—the separation, as in the case of cow's milk, being to all intents and purposes complete. This result differs entirely from that obtained by me in 1892 when buffalo's milk containing 6.785 per cent. of butter fat showed, after separation by the "Baby," 2.660 per cent. of butter fat—*vide* paragraph 5 of my letter, No. 439, dated 25th April 1892. The same implement worked by the same cooly was employed on both occasions and I cannot understand how such surprisingly different results have been obtained. Mr. Mollison of Poona in paragraph 2 of his note, which is embodied in Board's Proceedings, No. 521, dated 20th July 1892, made certain remarks which in the light of Mr. Collins' analyses cannot now stand.

5. With respect to the "Baby" separator which was presented to the College about eight years ago by the London Dairy Supply Company (Limited), I consider that it is an exceedingly efficient machine. It has been in constant use since its arrival at Saidapet being worked by coolies, students, &c., and it is now almost as good as new. The only part which wears is a small rubber ring (cost, one shilling). There can be no two opinions about the durability of the "Baby." Mr. Collins' analyses show that its separating powers for both cow's and buffalo's milk can hardly be improved upon.

6. In the experiments carried out by me in 1892 the butter made from ripened cream by churning with the native implement contained 2.840 per cent. of curd. This of course was excessive. The butter made by identically the same process and analysed by Mr. Collins gave the following results:—

	Buffalo's butter.	Cow's milk.
Moisture	19.66	21.65
Butter fat	80.03	78.01
Curd	.23	.24
Mineral matter	.08	.10
Total	100.00	100.00

It will be observed that curd was practically absent. The only defect from a chemical point of view is the large percentage of water. In Europe 10 per cent. of water is the usual amount in good butter; at Poona 12 per cent. to 14 per cent.; at Saidapet about 15 per cent. I attribute the high percentage of water in the samples analysed by Mr. Collins to the fact that the butter was not sufficiently worked after being churned. The milkman was apparently afraid of spoiling the texture of the butter sent for analysis. Of course a man of his education cannot be expected to know that texture is not investigated by a chemical analysis. However, the chief point to be noted is that the process described by me in paragraph 5 of my letter No. 439, dated 25th April 1892, can produce butter which is practically free from curd.

7. The analyses of ground-nut cake performed by me during several successive years showed that the percentage of oil was gradually decreasing, presumably owing to better pressing. Ground-nut cake was originally introduced on the farm by Mr. Robertson owing, I imagine, to its then extremely low price. When I took charge of the Farm nearly nine years ago, ground-nut cake was available at Rs. 7 or Rs. 7-8-0 a candy of 500 lbs. and it contained about 8 or 9 per cent. of oil. Every year has seen the price rise and during the current financial year the contract price for the Farm is Rs. 12-8-0 a candy of 500 lbs. The bazaar rate is of course higher than this and there is good reason to believe that next year the contract price will be something like Rs. 15 a candy. The percentage of oil has been steadily decreasing and the question has now arisen whether ground-nut cake should be continued or not as a special food to the College cows. I accordingly requested Mr. Collins to analyse the College cake and also a sample of gingelly cake. His results are as follows:—

	Ground-nut cake.	Gingelly cake.
Moisture	11.09	12.20
Oil	6.57	12.29
* Albuminoids	46.23	33.81
† Mineral matter	4.88	12.45

	Ground-nut cake.	Gingelly cake.
* Containing nitrogen	7.40	5.41
† Containing sand	1.09	3.95

The gingelly cake was purchased in the bazaar and did not represent the best kind (*N.B.*—Amount of sand). The price of good gingelly cake now stands very little higher than that of ground-nut cake. Under these circumstances, I fear ground-nut cake must disappear from the College rations unless in the unlikely contingency of a heavy fall in price.

8. There is nothing special to mention about the jaggery, which was purchased in the bazaar. No jaggery was made on the Farm during Mr. Collins' stay at Madras. That made previous to his arrival was tested in the College laboratory and found to be a very good sample. There was therefore no necessity to trouble Mr. Collins to confirm this result.

RESOLUTION—dated 28th January 1896, No. 15.

The report of the Principal, College of Agriculture, will be submitted for the information of Government with reference to B.P., dated 14th October 1895, No. 326.

2. The analyses now submitted throw considerable doubt on the accuracy of those dealt with in the papers read in B.P., dated 25th May and 20th July 1892, Nos. 387 and 521, respectively, and also confirm experience in other parts of India as to the efficiency of the "Baby" separator in dealing with both cows' and buffaloes' milk. They also show that the butter made at Saidapet is as free from curd as possible. Probably it would be necessary to use ice or the *delaitouse* to reduce the amount of water in the butter.

3. The analyses made of ground-nut and gingelly oil cakes are interesting and will assist the Principal in deciding what cattle-food to purchase. It is to be wished that the analyses had been extended to cotton seed, which is so commonly used as a food for milch cattle, and is, the Board understands, found in Bombay to lead to the production of a remarkably firm butter from buffaloes' milk.

(True Copies and Extract.)

[Signature]
Secretary.

To the Secretary to Government, Revenue Department.
Educational Department.

" Director of Public Instruction.

Copy to the Reporter on Economical Products.

REVENUE DEPARTMENT.

1896.

Board of Revenue

(Revenue Settlement, Land Records
and Agriculture),

MADRAS.

Printed February th.

Recd 15/2/96

Regd 17/2/96

Proceedings, 28th January 1896, No. 15.



Dairying.—Submitting report of analytical
results for milk and butter.

83: 12.2.96

H/M

Order
m/s

Recorded.

11/2/96

Note.

11/2
19/2

The Board sends a copy
of its proceedings to the Rev. Dept.
as well as to the Rev. Dept.
This has not been done before
in the correspondence about this
matter (vide G.O. 83.24
12.2.96). It is
believed that the Rev. Dept. will
deal with the question, that
the Rev. Dept. may simply record this.

11/2/96 Yes

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When signed _____

189

READ AGAIN G.O., No.
189

DATED

CURRENT No.

ENCLOSURES TO C. No.

ORDER OF GOVERNMENT A A A A A A A

LETTER OF GOVERNMENT.

STATEMENT WITH DITTO.

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