

"Hot water for cows" is the maxim of the French dairy farmers in the department of Finistère. They claim to have proved by experiments that when cows drink hot water they yield one-third more milk than when they are refreshed with cold water only. Caution must, of course, be observed in adopting the new system. Avaricious dairymen must beware of scalding the throats of their cows in their haste to avail themselves of this discovery, which is vouched for by our consul at Brest. The proportion, we are told, are half a pail of boiling water and half a pail of cold.

A method has been recently described by which butter adulteration can be detected by means of a thermometer and some sulphuric acid. It appears that when strong sulphuric acid is mixed with pure butter the temperature of the mixture rises to about 79 deg. Fahr. If, on the other hand, margarine is mixed with sulphuric acid the temperature of the mixture rises to 88 deg. Fahr., or from that up to 104 deg. Fahr. If, then, on adding common sulphuric acid to a sample of butter the temperature rises to, say, 84 deg. Fahr., there is reason to suspect adulteration. If the thermometer marks 86 deg. Fahr., one part of margarine has been added to every 13 parts of butter; if it goes up to 90 deg. Fahr., the mixture half consists of butter and half of margarine.

Professor J. Forster, of Amsterdam, finds that to made sure of killing the tubercle bacteria in milk by means of heat (Pasteurisation) it must be exposed in one of the following ways:—131 deg. Fahr. for four hours, 140 deg. Fahr. for one hour, 149 deg. Fahr. for fifteen minutes, 158 deg. Fahr. for ten minutes, 176 deg. Fahr. for five minutes, 194 deg. Fahr. for two minutes, 203 deg. Fahr. for one minute.

A correspondent to the *Scottish Farmer* writes:—No one has as yet mentioned Schering's Formalin Solution. I claim from practical experience that it is the best article of the kind in the market. A quantity of it was procured for me from the Sorn Dairy Supply, Glasgow—the sole agents for Scotland—and I find it of the greatest value in all kinds of weather. During the recent thunderstorms I never had a drop of sour milk. That is something to boast of. Formalin solution is a clear liquid, and it neither affects the taste, character, or flavour of the milk or cream.

REPORT OF THE SUPERINTENDENT OF THE SCHOOL OF AGRICULTURE FOR 1893.

I have the honour to submit the following Report on the working of the Government Dairy during 1893:—

The dairy herd consists of 47 cows, of which 21 were imported from the Bombay Presidency, and the remaining 26 were procured locally.

Among the locally-procured animals are five pure Sinhalese cattle, the rest being natives of South India, and commonly known as "Coast cows." The Bombay animals are a well-selected lot, and they may all be said to have turned out satisfactory milkers, except one which has gone completely

off her milk owing to injuries sustained during the voyage to Ceylon. The "Coast cows" do not of course come up to the Bombay cattle as milkers, though a few of them are exceptionally good specimens. The Sinhalese animals are kept chiefly with a view to see what can be done with our indigenous breed under proper management and with good feeding and housing.

I think that the unsatisfactory cows should be sold, the amount realized by such sale, together with the balance left after completely stocking the dairy, being invested in the purchase of animals of a better type. It will be remembered that the first batch of 45 cows was estimated to cost R4,500, at R100 each. They have, however, averaged a fraction below the estimated cost. The average dairy yield of the whole herd for the first half year, during the milking periods of the cows, was eight pints nearly.

The average of the best cows (Sindh animals) during their period of milking was for the first half year $12\frac{1}{2}$ pints per day.

The ordinary charge for the milk supplied was at the rate of 18 cents a bottle. In the case of the Leper Asylum, a distance of 26 miles to and from the dairy, the cost of transport raised the price of milk supplied to that institution to 20 cents a bottle.

During the month of June the dairy stock consisted mainly of the Bombay cattle which arrived on the 30th of May. Only a few of these had calved on the journey to Ceylon, and a large number of non-milking animals had to be fed and tended for various periods at considerable expense, with no return. This could not have been avoided, as the cattle from Bombay were, as far as possible, timed to calve within a month of their arrival. The greater part of the milk produced during June was taken by a milk contractor, and the rest was disposed of in the shape of butter. The opportunity afforded of making use of the "separator" and manufacturing the cream into butter—at a time when there was no regular demand from the hospitals to meet—was after all a welcome one.

Though it was expected that the dairy would be in a position to undertake the milk supply of all the medical institutions in Colombo from the 1st of July, the idea had eventually to be abandoned owing to the insufficiency of the output of milk to meet the large demand. And this is attributable to two causes: (1) some of the cows which were calculated to come into milk by 1st July were late in calving; (2) (and this the chief cause) only a few animals could be purchased during June, owing, to some extent, to a scarcity of milk cattle as the result of a severe drought in South India, but also and chiefly owing to a clique having been formed among the Tamil cattle-dealers, who tried their utmost to "swamp" the Government Dairy by refusing to have any dealings with it.

In this crisis the Principal Civil Medical Officer very kindly came to our assistance, requiring us to meet only the demand of the General Hospital for 126 bottles of milk a day during July. This gave us more time to look about. In the course of that month further purchases were successfully made after much manoeuvring, the prices paid being slightly higher than the ordinary rates. Thus the milk supply was gradually increased during July, the surplus milk (which was alwa

a variable quantity) being disposed of to private persons or converted into butter. But still there were some non-milking animals being fed for various periods till August 1, and the expenses under this head tended to lower the profits for the month.

I should have stated that at the end of June there was a balance on the wrong side of R148.80. At the end of July it was found that there was a small profit of R85.94.

By the end of July the output of milk had been brought up to about 230 bottles a day, and from the 1st August the dairy was able to undertake the milk supply of the various medical institutions in Colombo. At the start many difficulties were encountered, especially in the matter of delivery, but after a little time they were got over. The net profit realized at the end of August was R511.47. The success of the dairy during August was greater than was ever anticipated, but we have been fortunate, in the fact that everything has gone well with us so far. There has been hardly any sickness to speak of among the cows. Two or three animals suffered from slight ailments, but they speedily recovered under the treatment of the Veterinary Surgeon. Two deaths occurred among the calves, but there has been no diminution in the milk given by the mothers.

On the advice of the Veterinary Surgeon a "ring fence" has been constructed with the dairy as a centre, in order to prevent the possibility of diseased cattle coming in contact with our herd. Gates or bars have also been set up across the various paths leading to the dairy with the same object. No cattle or carts are permitted to enter the dairy premises, while strict regulations are enforced in the case of coolies and others.

It is to be hoped that these precautionary measures will be the means of keeping the cows free from contagion and infection.

Mr. Lye generally visits the dairy once or twice a day when he is in Colombo, and enters his remarks as to the health of the cattle in a book kept for that purpose. It is undoubtedly of the greatest advantage to the dairy that it has the benefit of Mr. Lye's services.

The statement of accounts for September shows that the income from the dairy was R1,245.06, the expenditure R751.19, and the profits R493.87.

In October the income was R1,379.80, the expenditure R798.67, and the profits R581.13. During the month the last two in calf cows of the 45 animals purchased (viz., the two cows Buttercup and Jasmine) calved on the 19th and 25th respectively.

In November the income was R1,358.64, the expenditure (including the salaries of two extra coolies) was R805.15, and the profits, R553.49. During this month there was one case of serious illness (inversion of the vagina), the cause of which was not ascertainable. Every attempt was made to treat the animal in the absence of the Government Veterinary Surgeon (who had left for India about the middle of the month with the object of bringing another batch of cows for the dairy), but inflammation and eventually ulceration of the organ set in, and the cow was in a very bad way, when a "vedarala" in the employ of Mr. J. W. C. de Soysa was called in. This native cattle doctor succeeded in completely restoring the animal to health after a fortnight's treatment.

Early in the month another stud bull of the Aden breed was sent out from Poona by the Superintendent of Farms, Bombay Presidency, at a cost of R150. This animal was in poor condition on its arrival, and since the Sindh bull which came out with the Bombay cattle, as well as the Nellore bull that had been attached to the school previous to the opening of the dairy, were not very satisfactory as stud animals, under the circumstances, and as it was most important that the dairy cows should be served without delay, arrangements were made with Mr. J. W. C. de Soysa for the loan of a Cape stud bull. This animal, a proved stock setter, served 26 cows during the nine weeks it remained on the premises. Seven other cows were served by the Aden bull and one by the Nellore. All the cows served are timed to calve between the 16th of August and 19th of October, 1894.

During November two fresh animals were purchased locally with the balance available from the vote for the purchase of cows for the dairy, and the total number of cows in the dairy was raised to 47.

In December the income of the dairy was R1,387.90, the expenditure R832.61, and the profits R555.29. At the end of the month there were 44 calves in the dairy, only 2, of those which were born on the premises, having died: one cow having lost its calf before coming to us.

I may mention that the rearing of calves is a matter of great difficulty in Ceylon, and that a large percentage die when a few months old. Those belonging to the dairy were carefully reared, and grew up to be fine specimens for their ages. The calves, when a week or two old, were first given what is known as "kollu" water, or water in which kollu (*Doitchos biflorus*), a leguminous seed, had been boiled. Later, a few of the boiled seed were allowed, and then poonac or coconut cake gradually added. Eventually the calves took the ordinary diet of poonac and cotton seed.

In this way much of the milk which would have been sucked up by the calves, if they were to be nourished in the usual manner, was saved, as the calves were only permitted to suck for a short while till the secretion of milk was started in the udder, and again after milking was completed.

The cows still require—as all Indian cows do—the presence of the calf at milking; and the cows that have lost their calves have been trained to allow other calves to suck them. A distinct account of the expenditure on the feeding of calves is being kept by the Manager of the Dairy; the amount will have to be deducted from the value the animals will realize when sold. It is intended, however, to retain a number of calves for the use of the dairy.

Land attached to the School.

The new grant of land, about 40 acres, which was made to the school in 1891, originally consisted of neglected cinnamon and low scrub with about 1½ acre of cultivated grass. Since the land came to the school it has been gradually cleared and put under grass, under the superintendence first of Mr. Jayawardana, late Head Master, and then of Mr. Rodrigo, now Manager of the Dairy. This was done without any extra cost to Government, and according to the usual plan of apportioning blocks to Tamil coolies, who undertook the clearing, preparation, and planting of the land on the understanding that they would be allowed to

repay themselves by taking the crop for the usual specified period.

The result of this has been that about 15 acres are at present under grass. I beg to suggest that the grass land should now be taken in hand and systematically worked on Government account. If the necessary expenditure for labour, manure &c. be sanctioned, I anticipate that a net profit of not less than R60 per mensem will accrue.

The Alfred Model Farm was taken over for purposes of the Government Dairy from lessees in May last on the payment of R4,400 as compensation.

The income for the eight months—May to December—was R1,667.10, an average of R208.38 per mensem; the expenditure was R344.40, or an average of R43.05, and the profits amounted to R1,322.70, or an average of R165.33 per mensem.

The extent of cultivated grass land is capable of extension, and it is expected that when the farm is taken fairly in hand and proper supervision exercised by a responsible officer who should be placed in charge, the profits will, in the course of 1894, be raised to R200 per mensem.

The natural grass land on the farm will be available for pasturing the dry cows of the dairy. Parts of the farm contain cabook rock of good quality, which, if permitted to be judiciously worked, is capable of yielding at least another R150 a year.

The Dairy Manager, Mr. J. A. G. Rodrigo, has, after the unavoidable preliminary struggle, fallen into the groove of work which has been cut out for him, and it should be said to his credit that he is doing his very best for the interests of his charges. His time is fully occupied, what with superintending the milking of the cows, the weighing of the milk, refrigerating and filling it for delivery, weighing and apportioning of food, &c., and all this twice a day. He thus has to be up before 3 a.m., when the first milking begins, and up till 9 or 10 p.m. When the 30 additional cows come into the dairy next year, it will be high time to consider the advisability of giving Mr. Rodrigo an assistant. For the present I have arranged that four students in turn should take duty at the dairy from 5 a.m. to 8 a.m. to allow Mr. Rodrigo to get some rest, and at the same time to gain for themselves some experience in the management of cattle.

In addition to the duties detailed above, the Manager has a good deal to do in the way of keeping records and accounts. Here also some help is rendered by the students during their leisure hours.

I also forward three statements of accounts: (1) of the Alfred Model Farm from May to December, 1893; (2) capital cost of the Government Dairy; and (3) receipts, cost of maintenance, and profit of the dairy.

Statement of the Alfred Model Farm from May to December, 1893.

Receipts.		Amount.
		R. c.
May	To lease of grass lands in small blocks	210 0
June	Do do	207 0
July	do do	211 0
August	Do do	211 50
September	Do do	210 0
October	Do do	210 0
November	Do do	205 50
December	Do do	202 10
Total ...		1,667 10

	Expenditure.	Amount.		Total.
		R.	c.	
May	Pay of four watchers	37	0	
"	Cost of four mamoties and one katty	3	0	
June	Pay of four watchers and petty expenses	47	0	
July	Pay of four watchers	37	0	
August	Do	37	0	
September	Do	40	0	
"	Cost of rethatching a shed	12	0	
October	Pay of four watchers	40	0	
"	Cost of coir yarn and petty expenses	5	0	
November	Pay of four watchers	40	0	
December	Pay of four watchers and petty expenses	46	40	
				344 40
By Profit ...		1,322	70	
Total ...		1,667	10	

Capital cost of the Government Dairy Farm.

Particulars.	Amount.	
	R.	c.
Cost of erecting the dairy buildings	3,330	0
Value of two draught bulls	60	0
Value of 47 cows	4,479	21
Value of two stud bulls	300	0
Cost of utensils and materials	940	52
Cost of two return tickets to Bombay allowed to Messrs. Driberg and Lye for the selection of cows	370	28
Cost of water service with cistern, &c.	351	37
Cost of a ring fence for the cows	60	0
Cost of two telegrams sent to Mr. Lye at Bombay re the purchase of cows, &c.	5	0
Amount paid to the lessees of the Alfred Model Farm as compensation	4,400	0
Total ...	14,296	38

Statement of Dairy Accounts for the Month of December, 1893.

Receipts.	Amount.	
	R.	c.
4,618½ bottles milk supplied to General Hospital at 18 cents. per bottle	831	33
1,583 bottles and 9 ounces milk supplied to Lunatic Asylum at 18 cents per bottle	285	0
835½ bottles to Hendala Leper Asylum at 20 cents per bottle	167	10
38 bottles and 19 ounces to De Soysa Lying-in-Home at 18 cents per bottle	6	97
71 bottles 18 oz. to Police Hospital, Borella, at 18 cents per bottle	12	91
32 bottles 21 oz. to S. H. F. D. W. at Borella, at 18 cents per bottle	5	90½
25 bottles to House of Observation at 18 cents per bottle	4	50
19 bottles 20 oz. to Branch Hospital, Borella, at 18 cents per bottle	3	56
13½ bottles to Smallpox Hospital, Kanatta, at 18 cents per bottle	2	40
71½ bottles to Branch Hospital, Kanatta, at 18 cents per bottle	12	90
9½ bottles to Chickenpox Hospital, Kanatta, at 18 cents per bottle	1	72½
248 bottles to Club House at 20 cents per bottle	49	60
Manure	4	0
Total ...	1,387	90

Expenses.	Amount. R. c.	Total. R. c.
Cost of feeding 40 cows at 50 cents per day per head ...	620 0	
Cost of feeding 5 cows at 46 cents per day per head ...	71 30	
Pay of 8 coolies ...	80 0	
Cost of carriage and ferrying of milk to Hendala Leper Asylum ...	13 75	
Carriage of milk to Club House ...	7 56	
Pay of the Manager ...	40 0	
		832 61
Net profits ...	—	555 29
		<u>1,387 90</u>

Statement showing the Receipts, Cost of Maintenance, and the profit of the Government Dairy Farm during 1893.

Receipts.		Amount. R. c.
June	Amount realized by sale of milk, butter, manure, &c. ...	257 70
July	Do do ...	750 24
August	Do do ...	1,248 52
September	Do do ...	1,245 6
October	Do do ...	1,379 80
November	Do do ...	1,358 64
December	Do do ...	1,387 90
	Total ...	<u>7,627 86</u>

Expenditure.		Amount. R. c.	Total. R. c.
Amount paid to the Manager as salary from July 1 to December 31 ...	240 0		
Amount paid to six coolies as wages from June 1 to September 30 ...	240 0		
Amount paid to eight coolies as wages from October 1 to December 31 ...	240 0		
Amount expended in feeding cows from June 1 to December 31 ...	4,192 95		
Amount expended in transporting milk to Hendala Leper Asylum, &c. ...	64 93		
			4,977 88
Amount paid to the Manager being 6 per cent commission due to him on the profits realized ...	—	157 94	
	Net Profit ...	2,492 4	
	Total ...		<u>7,627 86</u>

The total cost to Government of establishing the dairy, maintaining it, and working it from June to December, 1893, including the purchase of stock, was R19,432.10.

On 31st December the estimated value of the dairy, including buildings, stock, utensils, Model Farm, &c., was R12,510.

The net profits realised from the dairy from June to December, 1893, were R2,492.04. This is exclusive of the profits realized from the working of the Alfred Model Farm, which aggregated R1,322.70.

The percentage of profit to Government for 1893 on the capital cost (R14,296.38) was 26½ for six months.

C. DRIEBERG,
Superintendent.

GENERAL ITEMS.

The drought in Colombo and its suburbs is telling severely on cultivated grass lands, with the result that the supply is short of the demand and prices are going up.

Mr. A. M. Fernando, late of the School of Agriculture, has been appointed by the Hon. the Government Agent of the Western Province to visit and report on cattle disease in the villages as soon as the occurrence of any cases is made known. Mr. Fernando has given much of his time and attention during the past two years to the subject of diseases among cattle, and should be able to do some good work among native cattle-owners.

A museum of a unique character, and the first of its kind in the Colonies, is about to be established in Brisbane. In it will be principally stored pathological specimens, by means of which information respecting the origin and nature of animal diseases could be given. This would seem to be an excellent idea and one which should be carried out wherever veterinary work is being done.

In the inaugural address of the President of the Association of Economic Entomologists of America, Mr. James Fletcher gives, among other interesting information, a fair idea as to what degree the knowledge of the habits of life of insects helps in devising means for checking them. He roughly estimates the damage done in the United States by insects at 1/5 of the value of the agricultural produce, or at the enormous sum of £76,000,000 per year.

The practice of branding is universal, and it is hardly possible to do without it, especially in the country, where the owners of cattle must use some distinguishing mark that is difficult to alter in order that their cattle can be recognised. But it is not necessary that the skin of the animal should be covered with letters or figures each about 1 foot square, or that the very best portions of the hide should be selected as the most fitting place to affix these marks. The brands used are, as a rule, far too large, particularly when young stock are being marked. A large brand applied to a young calf leaves a mark which grows with the growth of the animal, and finally spreads over a considerable portion of the side. If the calf is sold two or three times before it matures, and each successive owner affixes his own brand, the result is a series of grotesque symbols which by no means add to the appearance of the animal, and have the effect of greatly reducing the value of the hide to the leather merchant. If branding cannot be done without, the least, and not the most, valuable portions of the hide should be selected, and in the case of young stock brands of very much smaller dimensions should be used, so as not to create an immense mark when the animal is full grown. Brands would be just as readily distinguishable if placed on the neck, high up on the forearm, or low down on the thigh. Some owners have adopted the proceeding of branding the cattle on the forehead, and this has the advantage of leaving the useful portion of the skin intact. A change from the practice of indiscriminately spoiling hides should be devised and generally adopted.