Milk - Cost of production O.S.

Economic Report No. 14.

EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE.

(Department of Economics).

INTERIM REPORT

ON

COST OF MILK PRODUCTION, WINTER 1950 - 51.

BY

J.D. ROWBOTTOM, B.Sc.

AND

HELEN L. SMITH, B.Sc.

22 Rose Street, Edinburgh, 2.

October, 1951. R. 264

DEPARTMENT OF ECONOMICS.

STAFF.

D. WITNEY, B.Com.
J.D. NUTT, B.A., N.D.A.
D.M.R. LEASK, B.Sc.
W.B. DUTHIE, B.Sc.
J.W. DAVIS, B.Sc.
J.A. MACLENNAN, B.Sc.
J.D. ROWBOTTOM, B.Sc.
B. PEART, B.A.
HELEN L. SMITH, B.Sc.
A. TRACEY, B.Sc.

RECENT PUBLICATIONS.

FINANCIAL RESULTS OF EAST OF SCOTLAND FARMS :-

Group	1946/7	1947/8	1948/9	1949/50
	-- No. of farms --			
1. Hill sheep farms 2. Stock-rearing farms	52	48	54	52
3. Stock-rearing and feeding farms 4. Arable farms 5. Dairy Farms	153	143	184	175 (In Preparation)
	205	191	238	227

COSTS OF MILK PRODUCTION :- 1945/6, 1946/7, 1947/8, 1948/9, 1949/50.

ECONOMICS OF LIVESTOCK PRODUCTION :-

(a) Winter Fattening of Sheep, 1947/8, 1948/9, 1949/50.
(b) Winter Fattening of Cattle, 1947/8, 1948/9, 1949/50.
(c) Commercial Egg Production, 1949/50.

Inquiries regarding the above publications should be addressed to either the Secretary of the College, or the Provincial Agricultural Economist.

I. INTRODUCTION.

This interim report covers the six-monthly period from 1st October, 1950 to 31st March, 1951. The number of herds costed is 67, considerably less than for the corresponding period last year, due mainly to the protracted harvest in 1950 which caused a large number of farmers to give up the keeping of records for the purposes of the Milk Costs Investigation. Once again records were obtained on specially prepared weekly returns distributed to the farmers in book form, and active steps are now being taken to bring the number of collaborating farmers nearer to its original level.

II. GENERAL DESCRIPTION OF FARMS AND HERDS STUDIED.

Despite the changes, Midlothian and Fife still remain most strongly represented but Angus and East Lothian with eight and two herds respectively no longer figure prominently enough. Other counties showed minor changes.

TABLE I. - GEOGRAPHICAL DISTRIBUTION AND SIZE OF HERD: 67 FARMS.

County	Average No. of cows in herd.						Total Number of Herds
	Under 21	21-40	41-60	61-80	81-100	Over 100	
Angus	-	-	1	3	2	2	8
East Perth	-	3	5	1	1	-	10
Fife	-	3	7	3	1	1	15
West Lothian	3	4	-	1	-	-	8
Midlothian	1	1	5	4	2	1	14
East Lothian	-	2	-	-	-	-	2
Berwick	1	1	-	-	1	-	3
Roxburgh	-	2	-	-	-	-	2
Selkirk	-	2	-	-	-	-	2
Peebles	1	1	1	-	-	-	3
TOTAL	6	19	19	12	7	4	67

Since the beginning of the Milk Costs Investigation there has been a tendency for average herd size to increase and this is again noticeable. The average number of cows per herd is now 52 an increase of one over the 1949-50 Winter Period. The herd size as usual showed a wide variation ranging from the smallest herd of 10 cows to the largest with 123 cows. As last year there were four herds with over 100 cows, but only six herds with under 21 cows against seven for the Winter Period 1949-50.

The majority of the costed herds were situated on good arable farms from which crop sales were important. The average size of farm, excluding the town dairy, was 280 acres with a rental value of £357. 0. 0d. being equal to 25/6d. per acre which shows a slight decrease in the value per acre over last winter. The size of farms varied from a smallholding of 50 acres to an upland farm of 912 acres with a large area of mountain and heathland.

The/

The total number of cows costed was 3483, dry cows totalling 896 or 25.7 per cent, and 36 cows were temporarily suckling calves. The proportion of dry cows is less than for the previous winter six months and this, at least, in theory should have had a beneficial effect on milk yields. Individual herds showed a wide variation in the proportion of dry cows, ranging from 4 per cent for a town dairy to 46 per cent for a herd which places emphasis on summer milk production. This range in percentage of dry cows although very wide was not so wide as for the Winter Period 1949-50.

Out of a total of 67 herds costed 58 i.e., 88 per cent, were of one breed but not necessarily pedigreed. Very few farmers kept crossbreeds or even mixed breeds, in fact only eight. The predominant breed was Ayrshires and accounted for 75 per cent of the herds. There were 8 Friesian herds (including 3 pedigree ones) and 1 pedigree Red Poll herd. Most of the herd sires were from pedigree herds and 19 of the herds had a high proportion of pedigree stock. Official milk records were kept on 48 of the costed farms and 4 others were recorded privately.

The great majority of the herds costed 56, (equal to 83½ per cent) were producing the highest grade of milk Certified or Tuberculin Tested. The Standard Grade of milk was produced by 7 herds and only 4 herds produced Ordinary or Non-Graded milk. In most cases the milk sold off the farm went wholesale to the Scottish Milk Marketing Board or producer - wholesale to a retailer. There were however, 15 farms which sold the greater proportion of their milk direct to the consumer.

Only on 2 of the farms were the cows hand milked. Of the 65 herds milked by machine, 11 were using combine auto-recorders. In the case of these herds milked in special parlours, six were housed in byres, four in ordinary cattle courts, and one herd was kept on the pastures in which a movable bail milker was used.

As may have been expected from the general difficulties which have beset farmers in the past year, e.g., bad harvest weather in 1950 followed by a very wet and cold winter, the Winter Period 1950-51 has not been so favourable to milk production as the previous winter. This is borne out by the fact that the average yield per cow of 345 gallons shows an increase of only 6 gallons over the Winter Period 1949-50 while the average yield of 339 gallons per cow for that period showed an increase of 18 gallons compared with the previous winter six months.

TABLE II. - MILK YIELD PER COW PER FARM: WINTER 1950-51.
cf., WINTER 1949-50.

	151 to 200 Galls.	201 to 250 Galls.	251 to 300 Galls.	301 to 350 Galls.	351 to 400 Galls.	401 to 450 Galls.	Over 450 Galls.	TOTAL
No. of herds 1950-51	2	5	13	19	11	8	9	67
1950-51 percentages	3	7	20	28	17	12	13	100
1949-50 percentages	3	10	22	26	15	16	8	100

The above table shows the distribution of the herds according to their average milk yield. As before the concentration of herds is in the "average group". The general tendency has been for a slight movement of herds rightwards i.e., to the highest yielding groups. The percentage of herds in the lowest yielding groups has decreased, and that in the highest yielding groups has increased.

III. COSTS OF PRODUCTION./

III. COSTS OF PRODUCTION.

Preparation of Costs data. Every care has been taken to ensure the utmost comparability of the data not only between different farms, but also between our own and other colleges in Great Britain.

The following principles have been adhered to.

(i) Winter and Summer Periods.

The year has been divided into two six-monthly periods, viz.,

Winter .... 1st October to 31st March inclusive.
Summer .... 1st April to 30th September inclusive.

(ii) Purchased Foods.

All foods purchased whether concentrates or roughages have been charged at cost (including haulage to the dairy premises).

(iii) Home Grown Foods.

These have been charged at prices intended to cover costs of production including carting to a point within close proximity to the dairy premises. Costs were completed for most of the grain, fodder and root crops in 1950 by the Economics Department as a whole. From this and other information the following average prices were derived, which include milling charges in the case of corn crops:-

Crop	Price per ton £	s.	d.	Crop	Price per ton £	s.	d.
Oats)including	17	-	-	Swedes & Turnips	2	-	-
Beans)grinding,	24	-	-	Mangolds	2	-	-
Mashlum)etc.	18	10	-	Kale	1	16	8
Hay, Rotation	6	10	-	Cabbage	1	16	8
Straw, fed	3	10	-	Silage (Grass)	2	8	4
				Silage (Arable)	2	15	-

No charge has been made for straw used as litter.

Variations from the averages were made in the light of ascertained costs of individual farms, or because of their special circumstances.

(iv) Labour

Any labour which may be regarded as a cost of distribution as distinct from production (e.g., bottling milk, sterilising bottles, etc.) has not been charged. The milk is really costed up to the point where it is in the wholesale container at the pick up point. For milk sold retail, costings are up to and including cooling.

Unpaid family labour, viz., manual work undertaken by the farmer and/or his wife or any member of his household, has been charged at the rates locally current for equivalent hired labour; appropriate adjustments have been made for overtime work.

(v) Miscellaneous Costs.

Those comprise three elements, viz.,

(a) Expenses directly chargeable to the dairy herd or necessarily/

necessarily incurred in milk production e.g., bull upkeep, veterinary fees and medicines, consumable dairy stores, coal, milk recording fees etc.

(b) Repairs, depreciation and maintenance of dairy equipment; and

(c) Overheads i.e., an appropriate share of certain general farm expenses which has been calculated at the rate of 5/3d. per £. of the direct labour bill incurred on milk production. The basis upon which this item is calculated is in keeping with the recommendations made by the Scottish Conference of Agricultural Economists. Incidentally this is the biggest element in the composition of miscellaneous costs.

(vi) Herd Maintenance (or "Cow Replacement").

This important but fluctuating item of cost has been temporarily ignored in the preparation of our Interim Report, on the grounds that it can only properly be dealt with when we have detailed information covering a whole year. Some guidance as to the probable cost of this item may be found in the five published annual reports. The average cost over the five years was 1.88d. per gallon of milk produced or £2. 7. 2d. per cow for the winter period.

(vii) Items excluded.

The following items have not been included as items of cost:-

Managerial or supervisory work.
Milk haulage, and other costs of distribution.
Interest on capital.

(viii) Credits.

From the GROSS COSTS of milk production, credits have been deducted for the following items so as to arrive at the NET COSTS per cow and per gallon:-

Calves sold or retained.
Unexhausted manurial residues.

Both these items have been ascertained on an agreed basis.

WINTER MILK COSTS./

WINTER MILK COSTS.

The average costs for the 67 herds are shown in Table III below.

TABLE III. - WINTER MILK COSTS (PROVISIONAL). * 1950-51.

NUMBER OF HERDS COSTED	67
AVERAGE NUMBER OF COWS IN HERD	52
AVERAGE MILK YIELD PER COW (GALLONS)	345

Items	Per Cow £. s. d.		Per Gallon d.		Per Cent
FOODS - Purchased	14. 1. 9		9.78		31
- Home Grown	16.11.10		11.53		37
TOTAL		30.13. 7		21.31	68
LABOUR- Hired	6. 7. 4		4.42		14
- Family	-. 9. 8		.34		1
- Farmer & Wife	1. -. 1		.70		2
TOTAL		7.17. 1		5.46	17
MISCELLANEOUS COSTS		6.15.11		4.72	15
GROSS COSTS		45. 6. 7		31.49	100
Less: CREDITS for Calves) U.M.R.)		3. 2. -		2.15	-
NET COSTS		42. 4. 7		29.34	-

* Excluding Herd Maintenance (i.e. "Cow Replacement").

Compared with the Winter Period 1949-50 the figure shows an increase of £3. 18. 1d. per cow equal to a rise of 2.30d. per gallon of milk produced. The rise in costs is mainly accounted for by the rise in feeding costs and the proportion of the total costs attributable to foods rose by 3 per cent. The cost per cow rose by something like 10 per cent. while milk yields have shown only a very slight increase of almost 2 per cent, with the result that cost per gallon has risen by 8½ per cent.

FOODS which have always been the most important item in the production of milk formed 68 per cent of the total cost of production. The increase of £4. 2. 10d. per cow compared with the previous six months was due, partly to a rise in the price of purchased feeding stuffs and to the increased costs of production of the foods grown on the farm. The slight increase in the average milk yield was not nearly enough to offset rising costs of feeding stuffs with the result that the food cost per gallon of 21.31d. was 2.59d. greater than last year.

The quantity of concentrates fed, both Purchased and Home Grown, per gallon of milk produced was 4.64lb. - a slight increase compared with the corresponding winter period last year. Apparently if unit costs of production are to be kept down then greater output is essential, and whenever possible, a greater use must be made of Home Grown Foods, e.g., Silage and Dried Grass.

LABOUR which formed 17 per cent of the total production cost was again the second highest item of cost. The cost of hired labour per cow rose slightly/

slightly, that of family labour and farmer and wife decreased, with the overall result that labour cost per cow fell by 2/5d. compared with the Winter Period 1949-50.

MISCELLANEOUS costs rose by 6/3d. per cow equal to a rise of .15d. per gallon of milk produced. The rise in cost was due to the increased cost of practically all the small items which make up this section of the costs.

CREDITS for calves and unexhausted manurial residues were more per cow and per gallon than for last winter.

In Table IV below the distribution of herds according to cost per cow and cost per gallon is shown.

TABLE IV. - DISTRIBUTION OF HERDS ACCORDING TO COST PER GALLON OF MILK PRODUCED AND COSTS PER COW.

	Net Cost Per Gallon						Total Number of Herds
	Up to 20d.	d. 20-25	d. 25-30	d. 30-35	d. 35-40	Over 40d.	
No. of Herds	3	11	22	19	4	8	67
	Net Cost Per Cow						Total Number of Herds
	Up to £25	£ 25-30	£ 30-35	£ 35-40	£ 40-45	Over £45	
No. of Herds	2	3	9	15	16	22	67

As the overall increase in cost compared with last winter is in the region of 2d. per gallon it is not surprising that there has been an obvious movement upwards in the grouping of the herds. Where last year the majority of the herds were within the 20d. to 35d. per gallon groups this year the majority lie in the groups 25d. to 35d. per gallon. There has also been a widening in the gap between the lowest and highest cost producers. Last winter the range was from 1/5d. to 4/4d., this winter it has widened to 1/6d. to 5/1d. The lowest cost herd once again had a low cost per cow which combined with a high milk yield gave a low cost per gallon. On the other hand those herds with high costs owed them to high costs per cow and low yields.

The cost of keeping a cow for milk production also varied greatly being from £22. 19. 4d. to £59. 12. 3d. Incidentally the herd having the lowest cost per cow was also that which had the lowest cost per gallon. Once again the cost per cow shows an upward trend with a heavy preponderance in the grouping towards the upper end of the scale, this being demonstrated by the increase in the number of herds with a cost per cow of over £45. The individual costs however are grouped more closely around the average than they were last year.

In the result as already stated, these provisional figures show that increased costs per cow, very slightly offset by higher milk yields, show an increase of 8½ per cent. in the cost per gallon of milk produced. The average monthly wholesale price of milk rose by only 3 per cent., thus, it is obvious, that although milk production may still be profitable it is not as profitable as it has been in the past.

IV. THE FEEDING OF DAIRY COWS./

IV. THE FEEDING OF DAIRY COWS.

Table V below sets out the food consumption for the six months and compares this with the two previous winter periods.

TABLE V. - FOOD CONSUMPTION PER COW - SIX MONTH WINTER PERIODS.

A comparison between 1948-49, 1949-50 and 1950-51.

	Average of 80 farms 1948-49 Cwt. per Cow.	Average of 80 farms 1949-50 Cwt per Cow.	Average of 67 farms 1950-51 Cwt. per Cow.
Concentrates			
Purchased	7.97	8.31	8.57
Home Grown	4.61	4.76	5.73
Total	12.58	13.07	14.30
Dried Grass	.76	.63	.46
Hay	14.53	14.51	13.88
Straw	10.12	9.97	10.15
Draff	10.96	9.77	9.95
Roots	42.14	37.37	33.04
Green Fodder & Oat Sheaves	15.91	18.94	21.56
TOTAL	107.00 cwt.	104.26 cwt.	103.34 cwt.

The winter period under discussion here was wet and prolonged and was preceded by a poor summer when most crops only gave average yields, and the hay crop gave a poor yield. This low yield combined with the prolonged winter resulted in an acute scarcity of hay in the spring a fact which is reflected in the fall in the consumption of hay (equal to ¼ cwt. or 3½ lbs. per week) per cow during the winter six months.

The abolition of the food subsidies with the resultant increase in the prices of purchased concentrates did not lead to the expected cut in the overall use of those foods. Nevertheless the greater use of Home Grown Concentrates shows that some measures were being tried to use those to replace purchased concentrates. Over the period there was a substantial increase in the use of total concentrates in the area.

Silage still continues to replace roots in the feeding of dairy cows. The quantity of turnips fed during the winter period fell by 4¼ cwts. (equal to 3 lbs. per head per day) as compared with last winter while there was an increase in the use of green fodder (including silage) of approximately 3 cwts. (equal to 2 lbs. per head per day). The average quantity of silage fed over the whole group increased from 6.89 cwt. per cow last winter to 11.28 cwt. per cow this winter - a substantial increase.

The biggest changes in the feeding of dairy cows during Winter 1950-51 as compared with former years, was first the increased consumption of concentrates particularly Home Grown Concentrates, and secondly the increased use of silage to replace roots in the diet of dairy herds.

ACKNOWLEDGMENT.

Grateful acknowledgment is made of the valuable assistance of the dairy farmers who took part in this investigation, supplied the necessary records and other information, and unfailingly gave the investigators considerate attention on the occasion of their visits. Each collaborating farmer will receive along with this report a copy of his own records and costs. The investigation is continuing and again, this summer, details are required of the costs of some of the fodder crops. It is hoped that farmers will favour us with their continued help and interest.