Milk Cost of Production O.S.

Economic Report No. 20.

EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE.

(Department of Economics).

INTERIM REPORT

ON

COST OF MILK PRODUCTION, WINTER 1951-52.

BY

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RECENT PUBLICATIONS.

FINANCIAL RESULTS OF EAST OF SCOTLAND FARMS:-

Group	1946/7	1947/8	1948/9	1949/50	1950/51
	-- No. of farms --				
1. Hill sheep farms 2. Stock-rearing farms	52	48	54	52	53
3. Stock-rearing and feeding farms 4. Arable farms 5. Dairy farms	153	143	184	175	178
	205	191	238	227	231

COSTS OF MILK PRODUCTION:- 1945/6, 1946/7, 1947/8, 1948/9, 1949/50, 1950/51.

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, 1950/51.

ENTERPRISE COSTS:- Economics of Silage making in East of Scotland 1950, 1951.

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 on the cost of milk production covers the six months period from 1st October 1951 to 31st March 1952.

Herd records were again obtained from specially prepared weekly returns distributed to the farmers in book form.

Although the number of herds costed has decreased only by three as compared with the previous winter period, of the 64 herds costed 55 were costed during the year 1950-51 and nine were recruited to maintain the size of the investigation. It was felt that the average size of herd, 51 cows, in the previous period was too high to be really representative of herds in the College area. The inclusion of a number of smaller herds has reduced the average size a little.

II. GENERAL DESCRIPTION OF FARMS AND HERDS STUDIED.

The distribution of herds over the area has been altered by the changes in the herds costed. Fife and Midlothian still figure prominently and Berwick and Roxburgh have increased their representation but Angus has shown a further decrease in the number of herds costed.

TABLE I. - GEOGRAPHICAL DISTRIBUTION AND SIZE OF HERD: 64 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	1	3	1	6
East Perth	-	1	5	1	1	-	8
Fife	-	4	5	3	1	1	14
West Lothian	3	3	-	1	-	-	7
Midlothian	1	2	4	3	-	1	11
East Lothian	-	1	-	1	-	-	2
Berwick	1	3	-	1	-	-	5
Roxburgh	3	3	-	-	-	-	6
Selkirk	-	2	-	-	-	-	2
Peebles	1	1	1	-	-	-	3
TOTAL 1951-52	9	20	16	11	5	3	64
TOTAL 1950-51	6	19	19	12	7	4	67

The above table shows that there has been an increase in the number of smaller herds and a corresponding decrease in the number of larger herds due/

due partly to the influx of new herds and partly to changes in the composition and size of herds costed hitherto. The size of herds costed varied from 7 to 149 and the average size was 49 as compared with an average size of 52 during the winter of 1950-51.

As is to be expected in the area the majority of costed herds were situated on good arable farms from which crop sales were important. Excluding a town dairy, the average size of farm was 233 acres with a rental value of £334, equal to 28/9d. per acre. This shows an increase over the value per acre last winter which may be attributed to the change in the sample of herds costed. The size of farms varied from a smallholding of 36 acres to an upland farm of 832 acres only half of which was arable land.

The total number of cows costed was 3129, - a slight fall from last winter due partly to the smaller number of herds taking part in the investigation and partly to the increased number of smaller herds. Of the total 808 or 25.8 per cent. were dry cows and 15 were suckling calves. The proportion of dry cows is almost exactly the same as for last winter. The proportion of dry cows in the herds varied from one with 4 per cent. dry to one with 58 per cent. dry - this range is much wider than it was during the preceding winter period.

Very few farmers kept crossbred or even mixed herds and of the total 64 herds 55 (or 86 per cent.) were of one breed. Ayrshires were the most popular breed accounting for 46 (or 72 per cent.) of the herds, 8 were Friesians and there was one pedigree Red Poll herd. In all 20 herds had a high proportion of pedigree stock.

The importance of milk recording was recognised by most of the producers. Three quarters of the herds were recorded and of these 44 were recorded officially and 4 recorded privately.

There were 59 attested herds (92 per cent. of the total) all producing the highest grade of milk Certified or Tuberculin Tested, three produced Standard milk and two produced Non Graded or Ordinary milk. On the majority of the 64 farms the milk was disposed of on the wholesale market, only 18 farmers still maintained a retail trade.

Only one herd was hand milked. Of the 63 herds milked by machine 14 used autorecorders. The byre had not yet become outmoded in this area since 56 of the herds were still milked in byres, six used the court system with milking parlour and two were kept outside - one of these herds being milked in a milking parlour and one using a movable bail-milker.

The hard winter had an unfavourable effect on milk production. Even so the average yield per cow which stood at 348 gallons during the period was three gallons more than the yield during the previous winter.

TABLE II. - MILK YIELD PER COW PER FARM: WINTER 1951-52.
cf., WINTER 1950-51.

	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 1951-52	3	9	5	16	14	10	7	64
1951-52 percentages	5	14	8	25	22	15	11	100
1950-51 percentages	3	7	20	28	17	12	13	100

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The above table shows the distribution of herds according to their average milk yield. As before the concentration of herds is in the "average group". There has however been a general tendency towards the higher yield groups. The percentage of herds in the lowest yielding groups has decreased and that in the highest yielding groups has increased, yet despite this movement there has been very little change in the average yield of the whole sample.

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-months 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 obtained for most of the grain, fodder and root crops in 1951 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	5	-	Swedes & Turnips	2	5	-
Beans)grinding,	24	5	-	Mangolds	2	5	-
Mashlum)etc.	18	15	-	Kale	1	18	4
Hay, Rotation	7	-	-	Cabbage	1	18	4
Straw, fed	3	-	-	Silage (Grass)	2	8	4
				Silage (Arable)	2	15	-

No charge has been made for straw used as litter.

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

(iv) Labour

Any labour which is 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/

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 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 6/-d. 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 the Interim Report, on the grounds that it can only properly be dealt with when detailed information covering a whole year is available. Some guidance as to the probable cost of this item may be found in the six published annual reports. The average cost over the six years was 1.82d. per gallon of milk produced or £2.15.1d. 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 calculated on agreed basis

WINTER MILK COSTS.

The average costs for the 64 herds are shown in Table III below.

TABLE III. - WINTER MILK COSTS (PROVISIONAL). ≠ 1951-52.

NUMBER OF HERDS COSTED	64
AVERAGE NUMBER OF COWS IN HERD	49
AVERAGE MILK YIELD PER COW (GALLONS).....	348

Items	Per Cow		Per Gallon		Per Cent	
FOODS - Purchased	15. 1. 5		10.39		31	
- Home Grown	16.10. 9		11.40		34	
TOTAL		31.12. 2		21.79		65
LABOUR- Hired	7. -. 2		4.83		15	
- Family	-. 9. 5		.32		1	
- Farmer & Wife	1.12. 9		1.13		3	
TOTAL		9. 2. 4		6.28		19
MISCELLANEOUS COSTS		7.13.11		5.30		16
GROSS COSTS		48. 8. 5		33.37		100
Less: CREDITS for Calves) U.M.R.)		3.11.10		2.47		-
NET COSTS		£44.16. 7		30.90d.		-

≠ Excluding Herd Maintenance (or "Cow Replacement").

The table above shows that once again there has been a rise in the cost of milk production during the six winter months. Compared with the winter period 1950-51 there has been an increase of £2.12/- in the cost per cow and of 1.56d. in the cost per gallon. This is equivalent to a percen--age rise in cost per cow of 6 per cent. and this, when examined in relation to the rise of 1 per cent. in yield per cow, gives a rise in cost per gallon of 5 per cent. During the former winter period the cost per cow rose by 10 per cent and the cost per gallon by 8½ per cent. compared with the winter of 1949-50, thus it appears that there has been a slight slackening off in the rate at which costs are rising.

FOODS are still the most important item in the cost of milk production. Despite an increase of 18/7d. per cow and .48d. per gallon the proportion of costs attributable to foods has fallen by 3 per cent to 65 per cent of the total cost. This fall has taken place almost wholly in the province of home grown foods. The slight increase in the average milk yield was not enough to offset the rising cost of purchased feeding stuffs.

The quantity of concentrates fed, both purchased and home grown, per gallon of milk fell from 4.64lb. per gallon in the winter period 1950-51 to 4.12lb. per gallon during the period under review. This point will be dealt with at greater length in the next section of the report.

LABOUR. The rise in wage rates in November 1951 has had its effect in the rise in the cost of labour in milk production. The result was an increase in the cost of labour amounting to £1.5.3d. per cow or .82d. per/

per gallon which raised the proportion of gross cost attributable to labour from 17 per cent. to 19 per cent. of the total. Labour still maintains its place as the second highest item of cost in milk production and accounts for almost one-fifth of total gross cost.

MISCELLANEOUS COSTS rose by 18/- per cow or .58d. per gallon as compared with the last period. This rise in costs was due to increases in the costs of practically all the small items which make up this section of costs.

CREDITS for calves and unexhausted manurial residues also rose slightly in comparison with 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	2	7	26	14	7	8	64
	Net Cost Per Cow						Total Number of Herds
	Up to £25	£ 25-30	£ 30-35	£ 35-40	£ 40-45	Over £45	
No. of Herds	1	8	7	6	16	26	64

The rise in cost of milk production is reflected in the distribution of the herds according to cost per gallon and cost per cow as shown in the above table. In the first part of the table there is a general movement of herds into the higher cost groups and the majority of herds are within the 25d. - 35d. per gallon groups with a distinct lessening of the numbers in the under 25d. group as compared with the previous winter when 14 herds had costs under 25d. Again there has been a widening in the range between the lowest and highest cost producers. Last winter the lowest cost per gallon was 1/6d., this winter it had risen to 1/8d., similarly the highest cost per gallon in the two periods were 5/1d. and 7/2d. respectively, the range having widened from 3/7d. to 5/6d. The lowest cost herd once again had a low cost per cow which combined with a high milk yield to give a low cost per gallon. On the other hand the highest cost herd owed it to a very low yield and this serves to emphasize once again the importance of high yields in profitable milk production.

The same trend towards higher costs shows in the second part of the table where the majority of the herds are in the over £40. per cow groups. The cost of keeping a cow varied from £23.8.5d. to £82. 1. 1d. this winter as compared with a variation from £22.19.4d. to £59.12.3d. during the last winter period, showing that in individual cases the cost per cow has very greatly increased although when averaged out the per cow figure has only shown a rise of £2.12/-.

The provisional figures given in this report show that increased costs per cow with a very slight rise in yield per cow result in an increase amounting to 5 per cent. in the cost of production of one gallon of milk. The average monthly wholesale price of milk rose 7 per cent. over last winter's prices. The percentage rise in price thus more than offsets the percentage rise in cost over the sample, and possibly augurs a return to more profitable milk production.

IV. THE FEEDING OF DAIRY COWS./

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

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

A comparison between 1948-49, 1949-50, 1950-51 and 1951-52.

	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	Average of 64 farms 1951-52 Cwt. per Cow
Concentrates				
Purchased	7.97	8.31	8.57	7.44
Home Grown	4.61	4.76	5.73	5.09
Total	12.58	13.07	14.30	12.53
Dried Grass	.76	.63	.46	.68
Hay	14.53	14.51	13.88	14.18
Straw	10.12	9.97	10.15	7.68
Draff	10.96	9.77	9.95	8.95
Roots	42.14	37.37	33.04	34.43
Green Fodder & Oat Sheaves	9.96	12.05	10.28	12.19
Silage	5.95	6.89	11.28	10.36
TOTAL	107.00	104.26	103.34	101.00

From the above table it can be seen that the total ration fed per cow has decreased slightly over the last few years.

There has been a cut in the use of concentrates both purchased and home grown - probably in the case of the former because of the steadily mounting price. There may well be some connection between this decreased use of concentrates and the very slight rise in the yield per cow when compared with the rise in yield in previous years.

This winter more hay has been included in the dairy ration and there has been quite a substantial cut in the feeding of straw and draff. Both roots and green fodder have been slightly increased.

The table however does bring out quite clearly one significant factor in winter feeding and that is the increased use of silage in this area. Four years ago the average amount fed was equal to only half the quantity of silage which is fed now. To some extent silage has been used to replace roots but also in many cases it was fed to replace purchased concentrates and thus helped to maintain the yield per cow.

Four years ago the total ration fed to each cow amounted to 107 cwt. during the winter six months, during the period under discussion this had fallen to 101 cwt. The changes in the rations fed are that straw, draff and roots have declined in use while they have been to some extent replaced by green fodder and a greatly increased use of silage.

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The changes in rations may have been affected by changes in the composition of the sample of herds, yet despite that one trend is clear, namely, that towards an increased utilisation of silage in the feeding 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.