Milk - Cost of production O.S.

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(Department of Economics).

INTERIM REPORT

ON

COST OF MILK PRODUCTION, WINTER, 1946/47.

BY

D. WITNEY, J.R. PHILLIPS and J.A. MACLENNAN.

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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.R. PHILLIPS, N.D.A.
H. CHRISTINE McIVER, B.Sc., N.D.A., N.D.D.
J.A. MACLENNAN, B.Sc.
E. STEWART, B.Sc.

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I. INTRODUCTION.

This interim report on the cost of milk production covers the Winter Period for the second year of the renewed investigation, the six months from October 1st 1946 to March 31st 1947 inclusive. The summaries in this report refer to 80 herds for which full particulars of costs were available, and the majority of the herds are the same as those for which records were kept during the Winter Period 1945-46. A few dairy farmers found it impossible to continue keeping the necessary data for the second year, but others who had been unable to keep costs during the first year, started on 1st October 1946, and thus the total number of herds costed was only three less than before. The farmers' records were again kept on specially prepared weekly sheets distributed for this purpose.

II. GENERAL DESCRIPTION OF FARMS AND HERDS STUDIED.

Location and size of Herds. The new herds have made slight changes in the geographical distribution of the herds studied, and in the average size of the herds included in the sample. The present position is given in Table I; when compared with the corresponding table set out in the June 1946 Interim Report this shows that the principal difference is the increased numbers of herds costed in East Perth which have risen from 6 to 12 since the previous year. There are several minor changes, but the major milk producing counties of Fife and Midlothian are again well represented compared with some of the other counties.

The average size of herd shows an increase of two cows, from 45 cows in the Winter Period 1945-46, to 47 cows in the period under review. This year there are four herds of over 100 cows as compared with two in last year's sample: two farmers increased the size of their herds from about 90 cows to over 100. The general result shows that there are three fewer herds of 40 cows and under; there is no change in the number of herds with 41 cows and above, but the average size of these herds has increased slightly when compared with those studied in the corresponding period of last year. The reason for an increase in any individual herd could be either a desire to produce more winter milk (in which case the average size of herd in the summer might be considerably lower) or a general building-up of the herd size.

TABLE I. - GEOGRAPHICAL DISTRIBUTION AND SIZE OF HERD: 80 FARMS.

County	Average no. of cows in herd						
	Under 21	21-40	41-60	61-80	81-100	Over 100	Total
Angus	-	-	1	4	1	1	7
E. Perth	-	9	2	-	-	1	12
Fife	1	8	5	1	2	1	18
Clackmannan & Kinross	1	1	-	-	-	-	2
West Lothian	3	4	-	-	-	-	7
Midlothian	1	7	6	4	-	1	19
East Lothian	-	1	2	1	-	-	4
Berwick	1	1	1	-	1	-	4
Roxburgh	-	2	-	-	-	-	2
Selkirk	-	1	-	-	-	-	1
Peebles	1	1	2	-	-	-	4
TOTAL	8	35	19	10	4	4	80

Type/

Type and size of Farms. The classification of the farms which accommodate the herds in the investigation has been undertaken in a similar manner as in 1945-46, some difficulty being experienced again in classifying some of the farms. The number of upland stock-raising farms with dairy, and of town dairies - our two extreme types - showed practically no change, but there were a few more farms where milk was virtually the only source of income. The other two groups viz. the Dairy Farms type B and the Arable Farms were five fewer than previously. On the whole, the farms now included in our costs sample give rather more emphasis to milk production than did those studied in 1945-46.

In Table II the farms are grouped for size as well as type and apart from the slight fall in the number of herds costed there were only very minor differences compared with the 1945-46 Winter Period.

TABLE II. - CLASSIFICATION OF FARMS BY SIZE AND TYPE GROUPS.

	Adjusted Acres						
	Below 101	101-200	201-300	301-400	401-600	Over 600	Total
			----Number of farms----				
Stock-raising Farms with Dairy	-	-	2	1	4	2	9
Dairy Farms Type A#	1	14	1	1	1	-	18
Dairy Farms Type Bø	1	11	13	4	2	-	31
Arable Farms with Dairy as a subsidiary	1	1	5	4	6	-	17
Town Dairy Types	5	-	-	-	-	-	5
TOTALS	8	26	21	10	13	2	80

Predominantly DAIRY farms, with milk virtually the only source of income.
ø Primarily DAIRY farms, although crop sales may be considerable.

In the above table all the farm acreages have been "adjusted" by reducing mountain and heath lands to their equivalent of arable land, and on this basis the average "adjusted" size of farm was 250 acres, with a rental value of 27/10d. per acre. The acreage of mountain and heath land amounted to 19% of the total area of the farms surveyed.

The largest farm had an actual area of 1,401 acres which included an extensive area of mountain and heath grazing, whilst one town dairy had no land at all. The average actual size of farm was 292 acres and the average rent was £348, equivalent to 23/10d. per acre.

Type and Composition of Herds. Herds of pure-bred cattle were even more strongly represented in the investigation than last year, the number of Ayrshire herds increasing slightly, whilst the number of Friesian herds remained unchanged. In all, 76% of the herds were mainly pure-bred, and at the same time 28% of the total herds were pedigreed. This is an increase of about 10% of pedigree herds compared with the previous winter, but it must again be stressed that, in the main, the owners of these herds concentrate more on the production of milk than on the breeding of stock for sale.

The total number of cows costed was 3,723 which is eight more cows than in the winter period 1945-46. Dry cows amounted to 977, i.e. 26% (cf. 27% for the winter of 1945-46) and 25 cows i.e. 1% had suckling calves running with them. The herd size varied from 8 cows to 147, with an average of 47; these figures include ALL the cows in the herd whether in milk, dry, or suckling.

The proportion of dry cows showed great variations from the average of 26%;

at/

at one extreme two town dairies had no dry cows at all, and, at the other, one herd had as many as 52% cows dry. This latter herd, normally a summer producer, and, for that reason unfavourably placed even during a good winter, had a double disadvantage in the past severe winter.

Quality of milk. At the beginning of the new milk costs year (1st October 1946) some of the herds previously not tested qualified for the attested licence, whilst, in addition some of the new co-operators also had attested herds. Hence our sample of 80 herds now contains 57 attested herds, i.e. 71% of the total. Only two of these herds did not sell their milk as tuberculin tested; thus the milk from 69% of the herds was sold as tuberculin tested or certified. Of the rest, 13 herds, i.e. 16%, produced the standard grade of milk and 12 herds, i.e. 15%, produced non-graded or ordinary milk.

It is interesting to note that generally it is the larger sized herds which are attested. Our group of farms has a higher proportion of attested herds than the Scottish Milk Marketing Board Area as a whole, for recent figures show that only 58% of the total number of the Board's producers possess an attested herd.

The milk from seventeen herds was directly retailed by the producers i.e. 21% of the farmers were producer-retailers and the remainder sold most of their production wholesale.

Only five herds were handmilked, i.e. four fewer than last year. Of these four, two are no longer included in our survey, and the other two have installed milking machines.

Milk Yield per Cow. Rather unexpectedly, the average milk production per cow per farm showed a marked improvement from Winter 1945-46, rising from 280 gallons to 296 gallons for the six months' period, but this, of course, may be due as much to the change in the sample studied as to the actual increase of milk produced. The variation amongst the individual farms studied was from 163 gallons to 483 gallons per cow - a very wide range. In all these cases our "per cow" figures are based, not on the number of cows actually in milk, but on the total number of cows in the herd. In the first line of the table below the herds studied in 1946-47 are grouped according to the milk production per cow per farm; in the second line, the number of these herds falling within each group is expressed as a percentage of the 80 herds studied; and in the third line, the percentages for winter 1945-46 (83 farms) are added for comparison.

TABLE III. - MILK YIELD PER COW PER FARM: WINTER 1946-47 cf., WINTER 1945-46.

	Under 201 Galls.	201 to 250 Galls.	251 to 300 Galls.	301 to 350 Galls.	351 to 400 Galls.	401 to 450 Galls.	451 to 500 Galls.	Over 500 Galls.	Total
No. of herds 1946-47	8	14	25	18	7	5	3	-	80
1946-47 percentages	10	18	31	22	9	6	4	-	100%
1945-46 percentages	9	25	27	24	10	2	1	2	100%

The range for the 1945-46 winter period was the greater of the two, for 2% of the herds then produced over 500 gallons per cow, whereas there were none in 1946-47. Nevertheless, there were rather more "better than average" producers in/

in 1946-47 than in 1945-46.

Incidentally, it may be noted that 44 herds were recorded officially under the Scottish Milk Records Association scheme and seven others were recorded privately, giving a total of 51 or 64% of the herds, milk recorded. A few of those farmers who record privately are doing so until such time as they may enter the official scheme.

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, from which stage the foods are handled by the dairy staff. Where necessary, variations in our standard prices have been made to suit the circumstances of particular farms. For 'average' conditions the following average prices were used, which, in the case of corn crops, included grinding or rolling:-

Crop	Price per ton	Crop	Price per ton
	£		s.
Oats } including	14.10/-	Swedes & Turnips	31/-
Beans } grinding etc.	21	Mangolds	31/-
Mashlum }	16	Kale	20/-
Hay, Rotation	6	Cabbage	25/-
Oat Straw, fed	2. 5/-	Silage	45/-

No charge has been made for the value of oat straw used as litter.

(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 passes "over the cooler and into cans, where the farmer provides the cans".

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

(v) Miscellaneous Costs.

These comprise three elements viz:-

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

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/- per £ of 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 our final report on last year's investigation, which showed the cost to be 2.53d. per gallon of milk produced, i.e. £3.-.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

For the 80 herds studied the average costs are set out below.

TABLE IV. - COSTS PER GALLON AND PER COW (PROVISIONAL)+

	Per Gallon d.	Per Cow £ s. d.	%
FOODS - Purchased	5.95	7. 6.10	22
- Home Grown	10.85	13. 7. 7	40
Total	16.80	20.14. 5	62
LABOUR - Hired	4.17	5. 2.10	16
- Family	.61	-.15. 2	2
- Farmer & Wife	1.05	1. 5.10	4
Total	5.83	7. 3.10	22
MISCELLANEOUS COSTS	4.17	5. 2.11	16
GROSS COSTS	26.80	33. 1. 2	100
Less CREDITS for Calves, Manurial Residues	1.67	2. 1. 2	-
NET COSTS	25.13	31. -. -	-

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

Foods/

Foods are easily the biggest item, accounting for nearly two-thirds of the gross costs. Purchased foods, (including hay, roots etc., purchased mainly for town dairy herds), amounted to about half the cost of the home grown foods. The total cost of foods is seen to be £20.14.5d. per cow for the six months, which is equal to 16.80d. per gallon of milk produced. The amount of concentrates fed per gallon was 4.65 lbs. At first this may seem very excessive, but the poorer quality of foods available to-day, and the use of some concentrates for "steaming up" before calving, probably exaggerate the amounts fed during the actual production period. The cost of foods has risen by 24/- per cow compared with the winter period 1945-46, but all the increase was incurred on home grown foods, for the cost of purchased foods decreased slightly. The increase of only .06d. in cost per gallon was not so marked, due of course to the increase in milk yield per cow.

Labour, the second biggest item of cost, amounted to 22% of the total cost per cow for the six months. This item shows an increase of 16/4 per cow over the interim figures for winter 1945-46. The increase was due, in part, to the raising of the minimum wages in October 1946, and, in part, to the reduction of the length of the working week since the previous winter; which, in turn, necessitated more overtime payments.

Miscellaneous costs show an increase of over 12/- per cow compared with the winter period 1945-46. The diversity and number of items in this cost make it impossible to pin down the greater expenditure to any one separate item of expense, but, amongst the factors contributing to this rise were increases in the food and labour of the bull upkeep, more milk recording fees and higher prices of fuel for sterilizing dairy utensils.

Credits for calves sold and retained for rearing and for unexhausted manurial residues were about 2/- in excess of the previous winter's figures.

The provisional average net costs were £31 per cow for the six months ranging from £14.2.5d. to £54.-.7d.; this is equal to 25.13d. per gallon, ranging between 13.60d. to 47.30d. Comparative figures for 1945-46 were £28.9.1d. per cow and 24.39d. per gallon (provisional).

In Table V below all the herds studied in 1946-47 are grouped to show the distribution of costs per gallon and per cow.

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

	Net Cost Per Gallon							
	Under 15d.	d. 15-20	d. 20-25	d. 25-30	d. 30-35	d. 35-40	Over 40d.	Total
No. of Herds	3	10	28	16	15	6	2	80
	Net Cost per Cow (6 months)							
	Under £15	£ 15-20	£ 20-25	£ 25-30	£ 30-35	£ 35-40	Over £40	Total
No. of Herds	1	3	16	17	18	18	7	80

It will be seen that the majority of dairy farmers who furnished us with records are producing milk at from 20d. to 35d. per gallon, and it costs them from £20 to £40 to keep a cow for the winter six months. The costs vary between very wide limits.

Compared with the 1945-46 provisional winter costs, the distribution is more even in the centre and main groups, for both costs per gallon and costs per cow. The cost per cow has increased by £2.10.11d. or 9% but the milk yield per cow also increased by 16 gallons or 6%; hence the cost per gallon has increased by only .74d. or 3 per cent.

The final cost figures (including herd maintenance) may show rather a different/

different picture, but so far as can be seen at the moment the difficulties of the period seem to have been surmounted in a most admirable way. First, purchased feeding stuffs were expected to be in particularly short supply, but happily enough, the position was never quite so serious as was at first predicted. Secondly, although yields of nearly all the home-grown crops were below average this was offset by the mild open autumn which resulted in excellent grazing being available until much later in the season than usual. Finally, the unpredictable winter, which must undoubtedly have reduced milk yields very considerably, does not seem to have been as disastrous as it might well have been; for this, farmers deserve much praise for the excellence of their management in keeping up the flow of milk.

The wholesale prices received for the milk sold averaged nearly 3d. per gallon more than for the six winter months in 1945-46 and, with only a small estimated increase in cost, the profit margin will have been more in proportion to the trouble involved.

IV. THE FEEDING OF DAIRY COWS.

It has been possible to compare the quantities of feeding stuffs consumed per cow this winter period with those of the similar period last year.

TABLE VI. - FOOD CONSUMPTION PER COW - SIX MONTHS' WINTER PERIOD.

A comparison between 1945-46 and 1946-47.

	Average of 83 farms 1945-46 Cwts. per cow	Average of 80 farms 1946-47 Cwts. per cow
Concentrates		
Purchased	7.97	6.77
Home Grown	4.30	5.38
Total	12.27 cwts.	12.15 cwts.
Hay	13.61 "	14.69 "
Dried Grass	.07 "	.17 "
Draff	11.28 "	7.84 "
Oat Sheaves	.09 "	.11 "
Straw	11.01 "	11.07 "
Roots, Kale, Silage, Wet Beet Pulp etc.	73.30 "	61.17 "

Concentrates. There was little difference in the total quantity consumed, but the proportion of home-grown concentrates has increased whilst purchased concentrates have declined in importance. On account of the shortage of cattle cakes and millers' feeding stuffs, this was to be expected.

Hay. There has been an increase of 1 cwt. per cow due to the necessity on many farms of feeding hay instead of roots during the severe weather of February and March.

Draff. This item shows a drop of about 3½ cwts per cow. A shortage of distillers' grains was the reason.

Oat Sheaves. A slight increase is shown, due to the feeding of damaged grain resulting from the wet autumn.

Straw. This shows little change.

Roots, Kale, Silage, Wet Beet Pulp etc. The consumption of these feeding stuffs shows/

shows a remarkable drop of 12 cwts per cow. This was due to the inaccessible snow-covered pits and fields on many farms in February and March.

While the mild wet autumn permitted the satisfactory grazing of cattle yet the severe winter proved how small a margin of supply our dairy farmers were working upon, especially with draff, roots and kale etc. It can be expected that the balance of roots will be fed during the summer six months as the severe storm ceased about the end of the winter six months period.

V. COSTS OF PRODUCTION OF HOME GROWN FEEDING STUFFS.

On comparing the prices of home grown feeding stuffs for 1946-47, (shown on page 4) with the corresponding prices for 1945-46 it will be seen that our charges show varying increases, ranging from 12½% for oats to 25% for kale and cabbage.

These charges were obtained by collecting, (from a number of interested dairy farmers helping with this enquiry), crop costs relating to one or more of their fields, and combining these results with similar data available from other investigations conducted by the Economics Department of the College. The following results, collected from farms in the Milk Costs Investigation will give an idea of some of the yields and costs per acre obtained.

TABLE VII. - YIELDS AND COSTS - CROP YEAR 1946.

	Average Yield per acre	Average Cost per acre	Unit Cost
Oats	22.4 cwts.	£14.19. 8	11/7cwt.(Grain) 1/11cwt.(Straw)
Hay	33.4 "	£ 8. 7. 1	5/- cwt.
Swedes) Turnips)	17 tons	£26.17. 9	£1.11.7 ton

It will be noted that the unit costs for Hay and Oats# are lower than those given on Page 4 and that those for Swedes and Turnips are higher. All crops showed increased costs per acre due to the new wage rates of April and October 1946; root crops having a high labour charge were most adversely affected, for the pitting and carting costs were of course charged at the higher rates operating from October onwards.

The yields of swedes and roots, on account of the dry spring, were below average. The 24% increase in unit cost of production of these crops was to be expected.

Yields of hay were a little above average and prices show no change.

Oats had rather less than average yields due to the wet autumn and prices per cwt. increased accordingly, but only about half as much as for roots and kale i.e. 12½%.

Silage prices show an increase similar to straw, since much silage was grass, which yielded well.

ACKNOWLEDGMENT/

The charge for oats on page 4 includes 1/- per cwt. for grinding and this should be deducted to give the true cost.

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.