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Eggs - Cost of production
U.S.

THE NORTH OF SCOTLAND COLLEGE OF AGRICULTURE

Agricultural Economics Department

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Egg Production in the North-East of Scotland

by

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41½ Union Street,
Aberdeen.

Price 3/-

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EGG PRODUCTION IN THE NORTH-EAST OF SCOTLAND

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Graph: Average Minimum Producer Prices (Weighted Average) U.K., 1959 - 63. 7

EGG PRODUCTION IN THE NORTH-EAST OF SCOTLAND

The poultry industry is at present undergoing great changes. The poultry unit, once the lot of the farmer's wife, is now big business involving large amounts of capital and demanding masculine attention and business efficiency. Improvements in breeding have made available prolific laying strains of birds which convert smaller quantities of food into larger quantities of eggs. Allied with this, improvements in equipment and developments in the use of controlled environment housing for the new stock are advancing rapidly.

This report is divided into two sections. The first section discusses the future of egg production along with certain factors affecting costs, prices and profitability. The second section deals with the cost of rearing birds to point-of-lay in the North of Scotland College of Agriculture area, followed by the profitability of egg production in 1962/63.

I EGG PRODUCTION AND ITS PLACE IN THE FUTURE ECONOMY

To an estimated total gross output on Scottish farms of nearly £184 million in 1962/63, egg production contributed nearly £13 million.(1) The number of fowls of six months and over in Scotland was just over $3\frac{1}{2}$ million birds in June, 1963. Table I below shows the Scottish fowl population numbers compared with those of the United Kingdom. The figures are derived from the June Agricultural Returns.

TABLE I — Number of Fowls of Six Months and Over. Scotland and United Kingdom.

	Number of Birds (000's)						
	1952	1954	1956	1958	1960	1962	1963
Scotland	4,734	4,545	4,393	4,353	4,099	3,873	3,565
United Kingdom	40,709	38,022	38,610	43,682	44,268	47,745	47,594
Scotland as a % of U.K.	% 11.6	% 12.0	% 11.4	% 10.0	% 9.3	% 8.1	% 7.5

The area covered by the North of Scotland College of Agriculture extends over the counties of Aberdeen, Banff, Caithness, Inverness, Kincardine, Moray, Nairn, Ross and Cromarty, Sutherland and the islands of Orkney and Shetland. These counties contained at June, 1963, just over 50 per cent of the Scottish laying flock. Egg production, therefore, forms an important part of the economy of the North-East of Scotland. Table II gives numbers of fowls six months and over for the counties in the College Area, figures being extracted from the June Agricultural Statistics.

(1) Scottish Agricultural Economics Vol. XIII

TABLE II — Number of Fowls of Six Months and Over.
Counties in the North of Scotland College of Agriculture Area.

	Number of Birds (000's)						
	1952	1954	1956	1958	1960	1962	1963
Aberdeen	1,390	1,226	1,177	1,188	1,085	1,035	917
Banff	277	246	245	253	237	226	203
Caithness	110	93	84	81	66	56	48
Inverness	140	127	120	107	100	101	83
Kincardine	163	148	156	161	150	140	126
Moray	84	87	84	75	68	56	58
Nairn	21	24	23	21	22	17	17
Orkney	355	359	356	364	338	325	267
Ross & Cromarty	135	115	111	95	79	69	62
Sutherland	37	31	26	22	19	16	14
Shetland	60	46	41	36	26	18	15
TOTAL IN COLLEGE AREA	2,772	2,502	2,423	2,403	2,190	2,059	1,810
COLLEGE AREA AS % of SCOTLAND	58.5	55.0	55.1	55.2	53.4	53.2	50.8

Numbers of birds of six months and over in the North of Scotland College of Agriculture area and in Scotland as a whole, have decreased gradually between 1952 and 1963. Nevertheless, despite the drop in numbers in Scotland, the United Kingdom fowl population increased quite considerably between 1952 and 1962, falling off only slightly in 1963.

Some idea of the structure of the industry in the United Kingdom is given in Table III which is based on a recent survey by the British Egg Marketing Board. This table shows the estimated proportions of producers and total laying flock in the various flock size groups at October, 1963.

TABLE III[1] Estimated Proportions of Producers and of Total Laying Flock in Various Flock Size Groups

No. of Birds in Laying Flocks	% of All Producers	% of All Laying Birds
1 - 99	46	7¾
100 - 499	43	36½
500 - 999	7	18¼
1,000 - 4,999	4	29
5,000 and over	(0.3)	8½
Total	100	100

It can be seen that 89 per cent of egg producers have laying flocks of under 500 birds and that the total number of birds in their flocks represents only 44 per cent of the total national flock. More than half the national flock, therefore, is associated with only 11 per cent of all producers - large flock owners with intensive units.

Scottish flocks follow the same pattern. In 1960/61, 97 per cent of flocks had less than 500 birds, with 50 per cent having under 100 birds.[2]

Table IV indicates the proportion of producers according to the type of system followed. In addition, the proportion of the national laying flock by type of system, together with the average size of flock in each system are also shown.

TABLE IV[3] U.K. Commercial Producers and Flocks by System of Management at October, 1963

System	% of Producers	% of National Laying Flock	Average Size of Flock (No. of Birds)
Battery	6.5	26.9	1,042
Deep Litter, etc.	51.0	56.2	277
Free Range	42.5	16.9	100
Total	100.0	100.0	251

(1) British Egg Marketing Board: Summary of October 1963 Producer Survey.
(2) Scottish Agricultural Economics Vol. XII: Scottish Egg Production & Consumption.
(3) British Egg Marketing Board - 1963 Producer Survey.

Estimates of total egg production and of output of eggs for human consumption in the United Kingdom show that some upward movement has been taking place.

TABLE V[1] Production and Utilization of Eggs, United Kingdom

	Millions of Eggs				
	Pre-War Average	1959/60	1960/61	1961/62[a]	1962/63[b]
Total Production	6,675	13,199	12,960	13,582	13,751
Eggs used for Hatching	130	374	439	463	474
Total Output for Human Consumption	6,545	12,825	12,521	13,119	13,277

(a) Provisional (b) Estimate

Egg consumption, however, has increased and higher industrial wages with the resultant higher standards of living have improved per capita consumption to-day to 4.9 shell eggs weekly. Table VI has been constructed on the basis of data contained in the Annual Abstract of Statistics. Figures are given there of lbs. of eggs in shell consumed per head per annum. These have been converted into shell egg equivalent by assuming that the average egg weighed 2 ozs.

TABLE VI Per Capita Consumption of Shell Eggs, United Kingdom

Year	Lbs. per Head[2] per Annum	Shell Egg Equivalent per Head per Annum	Shell Egg Equivalent per Head per Week
1956	27.3	218	4.2
1957	28.9	231	4.4
1958	29.7	238	4.6
1959	30.5	244	4.7
1960	31.1	249	4.8
1961	32.1	257	4.9
1962	32.1	257	4.9

Home production is almost equalling requirements and in 1962 the United Kingdom produced nearly 98 per cent of its total consumption. The British Egg Marketing Board has been conducting a vigorous advertising campaign in order to try to stimulate the consumption of eggs. However, it is doubtful whether the per capita consumption of eggs is likely to rise noticeably in the imminent future. Thus, apart from increased demand resulting from population increases, the home market for eggs appears to be saturated.

(1) Poultry and Eggs in Britain 1962-63 - Hunt & Clark. Oxford.
(2) Annual Abstract of Statistics 1962.

New arrangements between the British Egg Marketing Board and the Government will also affect producer prices. An indicator price, intended to reflect a reasonable selling price to wholesalers, was fixed at the 1963 Price Review at 3/2d. per dozen. The price guaranteed to the British Egg Marketing Board by the Government was 3/8.53d. per dozen. The basic subsidy is the difference between the indicator price and the guaranteed review price and for 1963/64 was therefore 6.53d. per dozen. Before 1963/64, the estimated market price was derived from the Board's actual realisation price in previous years and low market prices therefore increased the flat rate subsidy in subsequent years. From 1963, however, if the Board's realisation price exceeds the indicator price, the Board retains one-third of the profit and the Government two-thirds. No provision is made for a Reserve Fund. If, however, the realisation price is below the indicator price in 1963/64, the loss will be shared between the British Egg Marketing Board (40 per cent) and the Government (60 per cent). In subsequent years, the Government's liability for such loss will be reduced progressively until by 1969/70, the Board, and therefore the producers, will have to bear the entire loss. These new arrangements will result in producers themselves having to bear the consequences of over-production. Producer prices in 1963/64 were ½d. per dozen less than they would have been under the old scheme as a result of the new arrangements.

A drop in prices can itself irritate the production situation as lower prices can well act as a spur to greater production in order to keep up profit levels. Further price drops might well put the inefficient producers out of business. A large percentage of producers, smaller ones particularly, have little idea of their own inefficiencies. On these small units records may be kept of eggs laid daily, but the relationship between yield and food consumption is generally unknown. These smaller producers have their flocks on the general farm where unpaid family labour is the norm and as a result they may well be in a position to withstand considerable economic pressure. Large units, where labour is hired and wages paid, may be in a position to accept a smaller profit margin because of economies of scale. Those producers, however, whose flocks are too big to be looked after by available family labour yet lack the advantages of scale of the really large units, are the ones that will feel greatest economic pressure and these may well be the ones which decide to discontinue egg production.

Rising production and subsequent lower producer prices may lead to lower production in the following year. In the unlikely event of lower prices having

a marked effect on egg consumption, a two year cycle may well follow.

Each individual producer should attempt to assess the profitability of his egg production enterprise in order to decide whether his policy should be one of expansion or contraction. Such an assessment can only be made if the producer is willing to instal a system of recording which will allow him to measure the efficiency of his enterprise.

II EGG PRICES AND PROFITABILITY

There are various factors that can affect egg prices. These factors need to be taken into account by the producer if profits from the egg producing enterprise are to be maximised.

(i) Percentage of production sold at the farm-gate at higher prices than packing station sales.
(ii) Timing of maximum output to coincide with high price periods.
(iii) Reduction in the number of seconds and rejects with resultant increased production of quality eggs.
(iv) Group membership resulting in certain bonuses which affect the prices for eggs.

Farm-gate Sales - Although a guaranteed price for eggs exists, the price as for other agricultural products is not guaranteed to the individual producer. Table VII shows the price per dozen eggs received by producers in the North of Scotland College area from 1957/58 to 1962/63 together with the guaranteed price. The average price per dozen eggs is taken from College figures and includes farm-gate sales as well as eggs sold to the packing stations. The figures are thus higher than they would have been had all eggs been sold to packing stations. During the period producer prices have been from 6d. to 8½d. per dozen less than the ruling guaranteed prices.

TABLE VII Difference between Guaranteed and Producer Prices in North of Scotland College Area

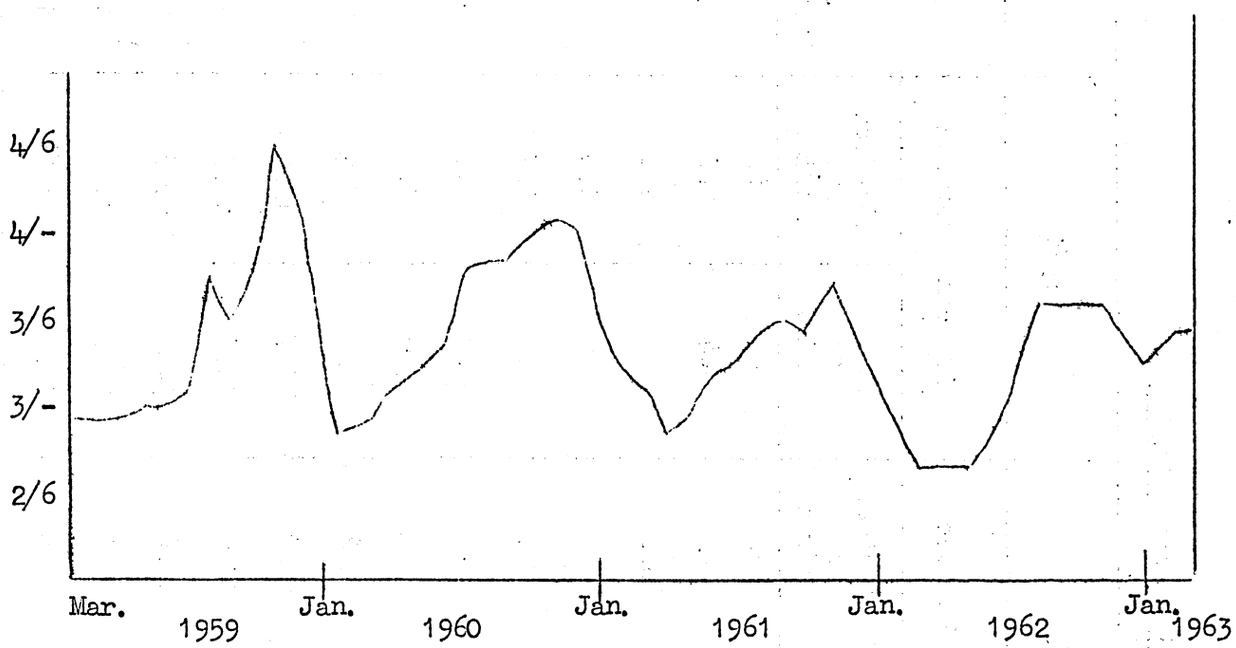
Year	Guaranteed Price	Average Price obtained per doz. in North College area including both Packing Station and Farm-gate Sales
1957/58	4/6.2d.	3/11
1958/59	4/0.95d.	3/6
1959/60	4/0.95d.	3/5
1960/61	3/11.15d.	3/4
1961/62	3/8.63d.	3/-
1962/63	3/9.79d.	3/3

Many producers manage to obtain a higher average price per dozen over the year as a result of farm-gate sales. Similarly, higher average prices are obtained by achieving the greatest output of eggs from the flocks at the time of year when egg prices are highest.

Timing of Maximum Output - From 1959 to date the highest prices for eggs have occurred from mid-August to the beginning of December, reaching peaks in October-November. These peak price periods can be seen clearly in the graph given below.

AVERAGE MINIMUM PRODUCER PRICES (WEIGHTED Av.) U.K.

1959-63 (1)



(1) Figures extracted from "Poultry & Eggs in Britain 1961/62 and 1962/63" Hunt & Clark Oxford.

At the time of peak prices, wide price differentials exist between the different grades. Disparity tends to even out from December onwards with a downward trend in prices for all grades, till prices start to rise again in April. Table VIII shows the difference in price between Large and Standard and Standard and Medium eggs each month from 1959 to 1962.

TABLE VIII (1)

Price Differentials between Grades

Month	1959		1960		1961		1962	
	Difference between		Difference between		Difference between		Difference between	
	Large and Standard	Standard and Medium	Large and Standard	Standard and Medium	Large and Standard	Standard and Medium	Large and Standard	Standard and Medium
	d.	d.	d.	d.	d.	d.	d.	d.
January	4.2	2.7	4.1	1.3	6.4	1.2	9.5	1.8
February	3.4	.9	3.0	3.0	5.2	1.0	5.7	1.0
March	3.0	1.0	3.0	3.0	4.0	1.0	3.6	1.0
April	3.8	1.8	3.8	2.7	4.2	4.7	5.8	3.5
May	5.2	5.7	6.0	6.0	7.5	6.5	6.0	4.0
June	6.0	10.1	6.8	9.4	7.0	11.9	5.0	7.5
July	7.9	13.0	4.4	10.8	8.0	13.4	7.4	10.5
August	8.8	17.5	5.5	12.7	9.7	15.8	9.0	12.8
September	13.1	14.9	8.4	17.0	14.5	17.5	15.5	15.0
October	19.8	10.5	10.6	15.6	17.6	15.5	17.4	13.1
November	16.5	2.0	10.5	9.3	17.9	10.4	17.2	8.9
December	8.9	.8	9.7	3.8	16.0	3.6	15.0	3.1

(1) Figures extracted from "Poultry & Eggs in Britain 1961/62 and 1962/63" Hunt & Clark Oxford.

Although the trend throughout the years is towards lower prices, the price pattern remains basically the same and perhaps might well be used by some producers as a guide to increase the profitability of their egg production. If production could be geared so that maximum production was obtained in the higher price months with maximum production of large eggs occurring at peak periods, higher profits could result. If we assume that maximum production occurs between 32 and 36 weeks, this would require day-old chicks to be purchased in September-October. The following table shows that only 4 per cent of producers in 1962/63 purchased chicks at this period.

TABLE IX(1) Seasonal Pattern of Chick Intake for Own Laying Flock, 1962-3

Period of Intake of D.O. Chicks			Percentage of Total Intake
			%
1962	Mid-September	to Mid-October	4
	Mid-October	to Mid-November	6
	Mid-November	to Mid-December	6
	Mid-December	to Mid-January, 1963	8
1963	Mid-January	to Mid-February	10
	Mid-February	to Mid-March	11
	Mid-March	to Mid-April	13
	Mid-April	to Mid-May	12
	Mid-May	to Mid-June	11
	Mid-June	to Mid-July	7
	Mid-July	to Mid-August	5½
	Mid-August	to Mid-September	6½
		Total	100

(1) British Egg Marketing Board - Producer Survey, 1963.

Seconds and Rejects - Careful handling of egg collections and subsequent proper storage of eggs awaiting collection can reduce the number of rejects and seconds to a minimum and thereby ensure optimum returns. This is of particular importance now as the British Egg Marketing Board is taking seconds and rejects off the retail market for breaking-out and processing in an effort to encourage the housewife to buy more and better quality eggs. However, there appears to be a market for seconds, even though it may be a limited one, and the taking of these eggs off the market by the Board may encourage a surge of cheap imported eggs to weaken market prices. It can safely be assumed that the price to the producer for seconds and rejects is likely to be lower.

In a market which is tending to be oversupplied, quality must eventually pay dividends. Quality eggs have no meat or blood spots and, as far as possible, have the yellow yolk popular with consumers: choice of strain and ration,

therefore, have an important part to play in quality egg production. Care should also be taken when storing eggs awaiting collection to see that temperatures are kept at recommended levels.

Group Membership - Large producers with large numbers of cases of eggs to be collected at one time make for economy to the packing stations and some stations pay higher bonuses as a result to individuals and group members. Some packing stations pay a bonus of as much as 5/- per case to producers supplying more than a certain number of cases weekly. This amounts to a differential of 2d. per dozen and is a tangible example of advantage arising from scale of production.

III COSTS AND PROFITABILITY

Factors affecting costs and therefore profitability are many, but the major ones are:

(i) Number of eggs laid per bird per annum.
(ii) Food consumed per bird per annum.
(iii) Bird Depreciation.
(iv) Labour costs.

Egg Yield - Yield is one of the most important factors affecting costs and profitability. Modern breeding has supplied the industry with birds of high laying potential, this potential being in some cases as high as from 260 to 280 eggs per bird per year depending on bird size. Such a high potential would suggest that the average flock should show a yield of 230 to 245 eggs per bird. It would seem a pity that this potential often cannot fulfil its promise because indifferent management fails to provide the stimulus necessary to achieve it. Although the very highest yields may be uneconomic, it can be seen from Table X below that the yield per bird in the national flock is below expectations.

TABLE X (1) Average Yield per Adult Bird - All Holdings, United Kingdom

June - May	Eggs per Bird per annum	Increase Over previous year
	No.	%
Pre-war (a)	149	-
1953-54	161	-
1954-55	165	2.5
1955-56	168	1.8
1956-57	171	1.8
1957-58	174	1.8
1958-59	179	2.9
1959-60	183.5	2.5
1960-61	188	2.5
1961-62 (b)	191	1.6
1962-63 (c)	194.5	1.8

(a) Average 1936-37 - 1938-39 (b) Provisional (c) Forecast

(1) Poultry and Eggs in Britain 1962/63 Hunt & Clark Oxford

Food requirements for a medium sized bird would demand a production of over 120 eggs to cover food costs alone. Allowing for an additional £1 per bird to cover other costs, a minimum of 200 eggs per bird per annum would be necessary to cover total costs. Table XI shows the number of eggs required at 3/- per dozen to cover all costs with a range of costs per bird from 40/- to 70/-.

TABLE XI Eggs required to Cover Total Costs

Total Cost per Bird	No. of eggs required at 3/- per doz. to cover total costs
40/-	160
45/-	180
50/-	200
55/-	220
60/-	240
65/-	260
70/-	280

Food constitutes nearly 60 per cent of egg production costs and is the most important factor for investigation when attempting to detect trouble spots in management. Table XII, derived from College figures, indicates a reduction in food consumption over the past 14 years of over $\frac{1}{4}$ cwt. of food per bird in the costed flocks.

TABLE XII Food per Bird and per Dozen Eggs, 1949/50 - 1962/63

Year	Food per Bird	Food per Dozen Eggs	Eggs Laid per Bird
	lbs.	lbs.	No.
1949-50	138	11.3	151
1950-51	134	10.0	174
1951-52	140	9.8	182
1952-53	145	9.6	185
1953-54	140	9.1	184
1954-55	141	9.1	185
1955-56	133	8.9	185
1956-57	133	8.5	188
1957-58	125	8.1	189
1958-59	130	8.8	179
1959-60	120	7.9	189
1960-61	112	7.3	192
1961-62	110	6.7	190
1962-63	107	6.7	193

Although these reductions may be due in part to changes in the sample of farms costed during these years, the trend towards lower consumption of feed per bird is also due to increased use of smaller type and better-bred birds. Also,

producers are undoubtedly becoming more cost-conscious and some credit must go to them for greater care in feeding as a result of improved management.

A reduction in feed costs may sometimes be achieved by mixing on the farm, but economies may only be effected if ingredients are used faithfully according to recipe and if the poultry unit itself or in combination with other enterprises on the farm is large enough to warrant the purchase of a hammer-mill and mixer. Also, supermixes now available may sometimes be used with advantage to reduce feed costs. The quality of rations mixed on the farm is sometimes variable and, generally speaking, the producer would be well-advised to use the proprietory foods of an established compounder specialised in ration-mixing and with a knowledge of the physiological requirements of the laying bird.

It should be remembered that expensive feeds are not always a guarantee of increased production and they may not warrant the extra cost. On the other hand, cheaper feeds may not provide the stimulus necessary for high production or to keep the birds in good laying condition. Laying birds cannot eat unlimited quantities of food and thus the greater the number of eggs laid per bird the lower is the quantity of food consumed per dozen eggs produced. On the other hand, a policy of reducing the quantity of food fed is not necessarily an economy.

Bird Depreciation constitutes nearly 17 per cent of egg production costs. With the increasing number of smaller-type birds appearing in the national flock, this figure may well increase in the future as a result of lower values accruing from the sale of the smaller-type birds. Factors affecting bird depreciation include:

(i) Cost of rearing to point-of-lay or purchase price of the pullet at point-of-lay.
(ii) Mortality.
(iii) Degree of culling and cull prices.

At the end of its laying life or even before, the carcase value of the laying hen to the producer at the farm is currently anything from 3/- for small hybrids to 7/6 for larger birds, depending on area, weight and price per lb. ruling at time of sale. The average cost of rearing a pullet to point-of-lay, according to figures for this area, is 14/5d. The difference between these two figures represents the cost of bird depreciation which will be increased by mortality occurring from point-of-lay onwards.

Mortality can affect the bird depreciation figure greatly and therefore

profitability because expenses incurred in taking the chick to point-of-lay and subsequent food costs to the time of her death must be made up by the remaining birds in the flock. This is particularly so if death occurs early in the hen's laying life. The extent of culling depends to a very considerable degree on the intensity of the production system employed. It was easy to cull in the battery unit when there was only one bird per cage. Nowadays when anything from 3 to 20 birds are housed together in a cage it is not so simple, nor is it easy under deep litter or free range conditions. Regular culling reduces mortality and helps to eliminate passengers in the flock and it should be remembered that it is more profitable to eat or to sell a cull than to bury a carcase. Evidence suggests that retail prices for culls are out of proportion to the prices received by producers and where possible it is usually in their interests to sell culls direct to consumers.

It is still thought by some that it is profitable to keep layers, particularly the heavier crosses, for a second laying season, thus increasing the numbers of large eggs for sale. This reasoning would appear fallacious as production is lower in the second year and there is also greater risk of mortality thereby reducing any advantage there may be in spreading the bird depreciation figure over two laying seasons.

Labour Costs account for nearly 16 per cent of egg production costs in the North-East of Scotland. On the farms covered by this report, there is no paid labour applied to the poultry flocks and family labour charges, very much an arbitrary figure, are based on the estimates of the farmer and/or his wife. The smaller flock owners, relying on unpaid family labour, tend to discount labour charges when looking at flock results. All flocks in this sample are on deep litter and this system does not have the advantage of reducing labour per bird to the extent possible with the battery system.

IV MARKETING

The function of marketing is undertaken on behalf of producers by the British Egg Marketing Board which is producer-controlled and is the vehicle through which the Government subsidy is passed to the producer. Registered producers may sell eggs direct to the public in any way they like, but they cannot give their eggs to a third party to sell for them. They can sell to a retailer by obtaining a "B" Licence from the Board, and the Board may require such eggs to be marked to identify the producer.

Producers are not compelled to sell all eggs to the Board. On the other hand, the Board must accept all eggs offered. As a result, the Board exercises only partial control over the market and estimates that only a little more than 60 per cent of total output for home consumption passes through the egg packing stations. The Board can therefore be used as a dumping ground by producers who may sell their best eggs at the farm-gate and only their surplus to the egg packing stations. Perhaps a penalty could be imposed justifiably on producers who send supplies only irregularly to the stations.

Imports of eggs were at the low level of just over 2 per cent of total consumption in 1962. There is an arrangement with the Government that the Board will be compensated for weaker market prices caused by unusually heavy imports at a time when these exceed normal market requirements. For the year April, 1963, to March, 1964, an import figure of 950,000 boxes was fixed for eggs and this quantity was apportioned over the 12 months so as to reflect seasonal import variations. The indicator price of 3/2 per dozen was apportioned on a monthly basis to give monthly indicator prices. The Board was paid compensation at the rate of 36/- per box on any imports of shell eggs in excess of the monthly import figure provided that:

(i) the Board's average selling price was below the indicator price of that month;
(ii) the Board's actual average selling price for the complete year was below the 1963/64 indicator price of 3s. 2d; and
(iii) the compensation payments did not raise the Board's total returns above the review price.(1)

Table XIII shows egg imports as a percentage of total production from 1956 to 1961:

TABLE XIII — Egg Imports as Percentage of Total Production

Year	Estimate of Total U.K. Production (Million doz.) ¤	Imports (Million doz.) ¤	Imports as % of total Production
1956	930	38.3	4.1
1957	968	11.8	1.2
1958	1048	14.2	1.4
1959	1100	11.9	1.1
1960	1080	34.6	3.2
1961	1134	38.8	3.4

¤ Commonwealth Economic Committee: Dairy Produce Review 1963.

Since its inception, the British Egg Marketing Board has conducted an intensive advertising campaign which has promoted egg sales considerably. Unfortunately, a consumer resistance to stamped eggs exists - a resistance which

(1) B.E.M.B. Quarterly Bulletin April 1963.

is sometimes justifiable because of the number of links in the chain between the purchase of eggs by the Board and the eventual purchase by the consumer. This is not the fault of the Board. Wholesalers may retain eggs if a price rise is anticipated, while retailers are not blameless as they frequently keep eggs under conditions that are not conducive to the eggs retaining their freshness. Also the eggs are not always sold in rotation.

If the British Egg Marketing Board is to aid the producer effectively as a Marketing Board, it should be granted greater control over production and marketing. With threats of overproduction great responsibility lies with the Board and a greater interest in policy matters by the producers to whom the Board belongs may help to strengthen its function in the future.

V PROFITABILITY OF EGG PRODUCTION IN THE NORTH-EAST OF SCOTLAND

From small flocks scattered throughout the North of Scotland College of Agriculture area, 40 farmers and their wives have kept financial and physical records relating to egg production during 1962/63. This report attempts to paint from these figures an economic picture of the small flocks which are so representative of Scotland's poultry farms. It is emphasised that none of these producers relied solely on the poultry unit and that in every case the poultry formed only part of the general farm plan. All the flocks were looked after by family labour and no paid labour was employed on the enterprises. In all cases, producers in the sample kept their flocks on deep litter, some having, in part, wire or slatted floors. Within the sample all types of birds made up the flocks from heavy crosses to light hybrids. Few farmers kept the same type or age group throughout the year so no direct comparison between heavy, medium or light birds is available.

In addition to data supplied relating to egg production costs, 41 flock owners supplied data relating to the cost of rearing their replacements, 37 of ~~which~~ whom purchased day old chicks and 4 bought older birds ranging in age from 6 to 12 weeks.

(A) COSTS OF REARING, 1962/63

As the cost of the replacement pullet is one of the major items affecting the bird depreciation figure in egg production, it is important to rear birds to point-of-lay at a reasonable cost. This can only be achieved if food consumption and mortality figures are kept as low as possible. Table XIV shows the average cost of rearing a pullet from day-old to point-of-lay on 37 farms where nearly 12,000 birds were reared. Average figures are also given for the three highest cost flocks and the three lowest. In the case of these 37 flocks, all birds were purchased as day-olds and labour expended on the rearing unit consisted only of family labour.

TABLE XIV Average Cost of Rearing from Day-Old to Point-of-Lay

Item	Average 37 Flocks		Average 3 High Cost Flocks (All Medium Type)	Average 3 Low Cost Flocks (Two Medium, One Heavy Type)
	s. d.	%	s. d.	s. d.
Cost of Chick	3: 5	23.7	3: 3	3: 9
Food	7: 9	53.7	9: 2	5: 4
Equipment Depreciation	-: 3	1.8	-: 4	-: 4
Heating	-: 2	1.1	-: 3	-: 2
Cost excluding Labour and Overheads	11: 7	80.3	13: -	9: 7
Labour	2: -	13.9	4: 3	1: 4
Overheads	-:10	5.8	1: 6	-: 8
Cost to Point-of-Lay	14: 5	100.0	18: 9	11: 7
Food consumed per bird	26.8 lbs.		30.0 lbs.	19.5 lbs.
Purchased food as % ration	82.7%		92.4%	92.2%
Av. cost of purchased food per cwt.	34/4		34/7	31/7
Av. cost of all food per cwt.	32/3		34/3	30/9
Av. age in weeks at Point-of-Lay	20½		20	21¼
Mortality	4.6%		3.2%	6.9%
Labour per bird	0.5 hrs.		1.1 hrs.	0.4 hrs.

Cost of Chick: The price of chicks is higher during the period from September until Spring than at other times of the year. If chicks were purchased in September/October in order to gain maximum production of large eggs in the following year, this would involve an increase of £2 per 100 in their purchase cost or a difference in cost of 6d. per pullet at point-of-lay. This amount would be offset by the better prices ruling for eggs during the period of lay.

In the sample costed chicks were purchased at different times throughout the year with half of the producers in the sample buying from January to March.

The higher chick cost in the low cost group was due to two factors - one was the high mortality rate which occurred at an early stage of rearing and which therefore did not affect food costs adversely; the other was that the chicks were purchased at the time of year when chicks were relatively more expensive.

Food: This item accounted for nearly 54 per cent of total costs and on average there was a consumption of nearly 27 lbs. of feed to point-of-lay at 20½ weeks. Food consumed ranged from 17.3 to 48.9 lbs. The low cost birds, despite the fact that they were over 21 weeks at point-of-lay, had a lower feed cost and consumed under 20 lbs. of feed per bird.

Labour: All labour was family labour. Even before the addition of labour charges however, the low cost birds had an advantage because of lower food costs.

The range in total costs per bird to point-of-lay was wide and ran from 11/4 to 21/4. Table XV shows the frequency distribution of total costs to point-of-lay. As the cost of labour and overheads is estimated, the frequency distribution excluding labour and overhead charges is also shown.

TABLE XV Frequency Distribution of Flocks by Cost per Bird to Point-of-Lay

Cost to Point-of-Lay	Including Labour and Overheads		Excluding Labour and Overheads	
	No. of Flocks	%	No. of Flocks	%
11/- and under	-	-	7	19.0
11/1 - 12/-	3	8.1	9	24.3
12/1 - 13/-	9	24.4	9	24.3
13/1 - 14/-	8	21.6	5	13.5
14/1 - 15/-	5	13.5	3	8.1
15/1 - 16/-	4	10.8	2	5.4
16/1 - 17/-	5	13.5	2	5.4
17/1 and over	3	8.1	-	-
Total	37	100.0	37	100.0

Mortality: The range of mortality is shown in Table XVI. These figures probably underestimate the true picture as the purchase of 100 chicks often results in the arrival of 105.

TABLE XVI Frequency Distribution of Flocks by % Mortality

Mortality %	No. of Flocks	%
0 - 2	10	27.0
2 - 4	11	29.7
4 - 6	4	10.8
6 - 8	8	21.7
8 - 10	1	2.7
10 - 12	2	5.4
Over 12	1	2.7
Total	37	100.0

Four producers purchased their birds at ages between 6 and 12 weeks with costs as shown in Table XVII covering nearly 1,000 chicks.

TABLE XVII Cost of Rearing from 6 - 12 weeks of age to Point-of-Lay (Average 2 Heavy and 2 Medium Type Flocks)

Item	s. d.	%
Chick	7: 8	50.0
Food	6: 1	39.7
Equipment Depreciation	-: 5	2.7
Cost excluding Labour & Overheads	14: 2	92.4
Labour	-: 9	4.9
Overheads	-: 5	2.7
Cost to Point-of-Lay	15: 4	100.0

Average age in weeks at Point-of-Lay	20½
Food consumed per bird	22.6 lbs.
Mortality	1.8%

A high incidence of mortality can be an expensive factor when birds are purchased at this later stage, but fortunately the percentage mortality only amounted to 1.8 per cent for these four flocks.

The cost structure changes with the rearing of older birds and the major cost item now becomes the cost of the young birds which accounts for 50 per cent of total costs. Food accounted for only 40 per cent of total costs at this later stage.

(B) COSTS OF COMMERCIAL EGG PRODUCTION, 1962/63

The sample of 40 deep litter flocks covered over 15,000 birds with the smallest flock having an average of 91 birds over the year and the largest an average of 950. The average size of the 40 flocks was 378 birds.

It should be noted that no really large flock was included in the sample. The point has been made earlier that all of the egg production enterprises studied were non-specialist in character. Thus the poultry unit represented only one enterprise out of many on the general farm and the sample is typical of the majority of Scottish flocks. No paid labour is employed in connection with these poultry enterprises.

Table XVIII shows the frequency distribution of flocks by size.

TABLE XVIII Frequency Distribution of Flocks by Size

Average Size of Flock (No. of Birds)	No. of Flocks	%
50 - 100	1	2.5
101 - 200	8	20.0
201 - 300	7	17.5
301 - 400	10	25.0
401 - 500	6	15.0
501 - 600	3	7.5
601 - 700	2	5.0
701 - 800	-	-
Over 800	3	7.5
Total	40	100.0

Average costs and income per bird for the 40 flocks are shown in Table XIX. For comparative purposes, average figures are given for the 4 flocks showing greatest losses and for the 4 with the highest profits.

TABLE XIX Costs and Income per Bird

	Av. 40 Flocks	%	Av. 4 Flocks with Greatest Losses	Av. 4 Flocks with Highest Profits
	£ s. d.		£ s. d.	£ s. d.
Expenditure per Bird				
Food - Purchased	1: 6: 4	51.2	1: 4: 6	1: 7:10
Home-grown	-: 3:10	7.4	-: 5: 5	-: 1: 6
Total Foods	1:10: 2	58.6	1: 9:11	1: 9: 4
Bird Depreciation	-: 8: 6	16.5	-:10: 3	-: 7:11
Labour	-: 8: 1	15.7	-:13:11	-: 4: 6
Overheads	-: 3: 4	6.5	-: 5: 5	-: 2: 1
Equipment Depreciation and Repairs	-: 1: 1	2.1	-: 1:11	-: -:11
Sundry Charges	-: -: 4	0.6	-: -: 4	-: -: 3
Total Cost per Bird	2:11: 6	100.0	3: 1: 9	2: 5: -
Income per Bird (Eggs sold and consumed)	2:11: 5		2: 2: 4	2:19: 4
Profit per Bird	-: -: -		-: -: -	-:14: 4
Loss per Bird	-: -: 1		-:19: 5	-: -: -
Margin excluding Labour	(+)-: 8: -		(-)-: 5: 6	(+)-:18:10
Av. size of flock (No. of Birds)	378		230	695
Eggs laid per bird	193		168	206
Labour hours per bird	2.0		3.5	1.1
Av. price per dozen eggs sold	3/2		3/-	3/6
Av. price of culls	6/3		6/3	6/1
Av. price of purchased food per ton	£35: 6:11		£36: 6: 1	£33:15: 3
Food per bird - Purchased	80.0 lbs.		75.1 lbs.	93.0 lbs.
Home-grown	26.6 lbs.		30.4 lbs.	8.7 lbs.
Total	106.6 lbs.		105.5 lbs.	101.7 lbs.
Food per dozen eggs	6.7 lbs.		7.7 lbs.	5.8 lbs.

Food Quantities and Prices: The average food consumption of all birds in the sample was 4.7 ozs. per day with an annual consumption of nearly 107 lbs. Birds in the group showing the greatest loss were fed a higher percentage of home-grown grain which cheapened the ration, despite the fact that food consumed per bird was nearly 4 lbs. more than in the highest profit group.

Food consisted of purchased concentrates and home-produced grain. Purchased concentrates accounted for 75 per cent of total food consumed and cost on average £35: 6:11 per ton. Home-grown grain was charged at market value. The overall cost of purchased and home-grown food was £30:14:10 per ton.

Food consumed per bird per year ranged from 90 to 129 lbs. and the frequency distribution of flocks by quantity of food consumed per bird per annum is shown in the following table.

TABLE XX Frequency Distribution of Flocks by Quantity of Food consumed per Bird per Annum

Food consumed per Bird per Annum	No. of Farms	%
lbs.		
90 - 100	10	25.0
101 - 110	17	42.5
111 - 120	8	20.0
121 - 129	5	12.5
Total	40	100.0

Bird Depreciation: For comparative purposes in all the foregoing tables, figures are based on a pullet replacement charge of 15/-. Of the 40 flocks in the sample, 18 flock-owners kept rearing costs. Had replacements been charged in these 18 flocks at the cost of rearing, 13 flocks would have reduced their bird depreciation figure by an average of 1/8d. per bird, thus increasing existing profits or reducing losses as a result of good management at rearing level. The remaining 5 would have increased their bird depreciation figure by an average of 2/1d. per bird because of poor rearing ability.

Bird depreciation was higher by 2/4 per bird on average in the group showing losses and this can be attributed to the fact that there was a greater number of second year birds in the sample and mortality was greater.

The average price obtained for culls from all farms was 6/3d. and varied from 3/1d. to 10/5d. per bird, the latter price being for heavy type birds which were plucked and dressed on the farm and sold direct to customers.

The average mortality figure was 8.1 per cent. This figure was calculated by taking deaths for the year as a percentage of the opening valuation numbers plus birds added during the year. Figures ranged from 1.8 per cent to 24.9 per cent, the high figure arising in a flock which consisted mainly of second year birds. Table XXI shows the range in mortality figures.

TABLE XXI Frequency Distribution of Flocks by % Mortality

Mortality	No. of Farms
%	
0 - 5	14
5.1 - 10	13
10.1 - 15	8
15.1 - 20	4
20.1 - 25	1
Total	40

Total cost per bird showed great variation between different flocks and ranged from £1:14: 1 to £3:10: 1. The frequency distribution of total cost per bird is given in Table XXII.

TABLE XXII Frequency Distribution of Flocks by Total Cost per Bird per Year

Total Cost Per Bird	No. of Flocks	%
45/- and under	4	10.0
Over 45/- to 50/-	18	45.0
50/- to 55/-	8	20.0
55/- to 60/-	7	17.5
60/- to 65/-	-	-
Over 65/-	3	7.5
Total	40	100.0

Income per Bird relates to revenue from eggs alone and is derived from egg sales together with the value of eggs consumed in the farmhouse. The sale of culls is taken into account when calculating the figure for bird depreciation. The income per bird figures varied greatly from flock to flock and ranged from £1:14:11 to £3: 8: 7 per bird (See Table XXIII.)

TABLE XXIII Frequency Distribution of Flocks by Income per Bird and with corresponding Egg Yield per Bird

Income per Bird	No. of Farms	%	Egg Yield per Bird
45/- and under	4	10.0	142
Over 45/- - 50/-	12	30.0	183
50/- - 55/-	11	27.5	195
55/- - 60/-	10	25.0	212
60/- - 65/-	2	5.0	230
Over 65/-	1	2.5	226
Total	40	100.0	

It can be seen that increasing income per bird is associated with higher egg yields per bird. It is significant also that the flocks showing the highest profits per bird maintained higher average egg prices over the year as a result of direct sales to customers.

Profits and Losses: The range of profits and losses was wide with 21 flocks showing profits of from 6d. to 17/10d. per bird; the remaining 19 flocks showed losses per bird ranging from 3d. to 25/11d. It is again emphasised that labour on these farms consisted entirely of family labour and this amounted to 2 hrs. per bird. If unpaid family labour is discounted, there is an average margin per bird of 8/-, the highest margin being 25/8d. per bird. Table XXIV shows the frequency distribution of flocks according to profits and losses per bird, both including and excluding labour charges.

TABLE XXIV Frequency Distribution of Flocks by Profits and Losses per Bird

Loss or Profit	Including Labour Charges		Excluding Labour Charges	
	No. of Farms	%	No. of Farms	%
Loss - over 10/-	4	10.0	1	2.5
10/- - 5/1	5	12.5	1	2.5
5/- - 0/-	10	25.0	2	5.0
Profit 0/- - 5/-	11	27.5	12	30.0
5/1 - 10/-	7	17.5	7	17.5
over 10/-	3	7.5	17	42.5
Total	40	100.0	40	100.0

Costs and Returns per Dozen Eggs.

Table XXV gives the expenditure and income per dozen eggs.

TABLE XXV Expenditure and Income per Dozen Eggs

	Average 40 Flocks	%	Average 4 Flocks with Greatest Losses	Average 4 Flocks with Highest Profits
	s. d.		s. d.	s. d.
Expenditure per Dozen Eggs				
Food - Purchased	1: 8	51.3	1:10	1: 7
Home-grown	-: 3	7.7	-: 5	-: 1
Total Foods	1:11	59.0	2: 3	1: 8
Bird Depreciation	-: 7	17.9	-: 9	-: 6
Labour	-: 6	15.4	-:11	-: 3
Other Charges	-: 3	7.7	-: 6	-: 3
Total Cost per Dozen Eggs	3: 3	100.0	4: 5	2: 8
Income per Dozen Eggs (Eggs sold and consumed)	3: 3		3: -	3: 6
Profit per Dozen Eggs	-: -		-: -	-:10
Loss per Dozen Eggs	-: -		1: 5	-: -
Margin excluding Labour	(+) -: 6		(-) -: 6	(+) 1: 1
Eggs laid per bird	193		168	206
Food consumed per dozen eggs	6.7 lbs.		7.7 lbs.	5.8 lbs.

Eggs laid per bird ranged from 131 to 233 with an average number of 193. The frequency distribution of flocks by egg yield per bird is shown in Table XXVI. Also included in the table are figures showing the quantity of food consumed per dozen eggs to illustrate how this figure decreases as production rises.

TABLE XXVI Frequency Distribution of Flocks by Egg Yield per Bird and Food Consumed per Dozen Eggs

Number of Eggs Laid	No. of Farms	Food per dozen eggs
150 and under	3	9.0 lbs.
151 - 175	7	7.9 "
176 - 200	16	6.6 "
201 - 225	10	6.0 "
Over 225	4	5.3 "
Total	40	

Capital Invested in Deadstock per bird. The majority of farms in the sample were using deep litter houses which had been in existence for some time. Some flocks were housed in converted farm buildings while one flock-owner had a brand new house. The capital investment per bird in houses and equipment (for the laying unit only and excluding all rearing equipment) is based on written-down values. Figures ranged widely from 3d. to 22/10d. per bird with an average figure of 10/3d.

VI CONCLUSIONS. A combination of low egg prices resulting from overproduction and the threat of giant producers entering the industry have tended to cast a gloom over egg producers. The mammoth units are causing some concern to the smaller producers and to the British Egg Marketing Board. The Chairman of the Egg Marketing Board warns: "It is being suggested that many egg producers have already taken fright and that instead of a vast surplus we face a shortage of eggs in a year's time. If that is so, the situation could be as dangerous as too many eggs, for it would be a golden opportunity for larger quantities of imports to become firmly re-established. If producers are afraid of the egg giants and just pack up, it leaves the field clear: if, on the other hand, they are not prepared to accept some responsibility beyond the packing station door for their contribution to the national production, they might as well pack up."(1)

For the future, the smaller producer can take comfort from the fact that his overheads are small; in the vast majority of cases, he is not paying hired labour for the job. If, by careful recording of the performance of his flock, he can be certain that all possible sources of wastage are eliminated, and that he can say with assurance that he is efficient, he is then in a position, along with other small farmers to stay in egg production. He should not expand at the present time to keep up his own profit levels in face of declining egg prices; to do so would only worsen the national situation, which would eventually affect him.

Figures given in the latter portion of this report have shown that profits can still be made in the small deep litter flock, but the returns from eggs are likely to be lower this coming year. The downward trend in egg prices emphasises the need for the keeping of adequate records for measuring the efficiency of the enterprise. By making use of these records, costs may be reduced and, as a result, the profitability of the existing unit may be maintained.

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(1) From speech by Mr. C.J. Harrison, Chairman of British Egg Marketing Board Inverurie. May 1964.

APPENDIX

Methods of Costing and Standards Used

Valuations

Birds reared on the farm and added to the laying flock were included at 15/- while for opening and closing valuations, adjustments were made to this figure according to age of the birds.

Bird Depreciation

This was calculated by taking the difference between opening valuation plus purchases and closing valuation plus sales. Birds bought and sold during the year were charged at actual prices paid and received.

Average Number of Birds per Flock

Where birds were added and culled at different periods throughout the year, this figure was obtained by calculating the total number of bird months and dividing by 12.

Food

Purchased food was charged at purchase price delivered on the farm, whilst home-grown food was estimated at market value.

Labour

Labour of the farmer was charged at 5/-., wife and family at corresponding rates, per hour.

Overheads

These were calculated according to the method recommended by the Conference of Scottish Agricultural Economists being 7/-d. per £1 of man labour employed on poultry work and 30/3d. per livestock unit.

Receipts

Eggs consumed in the farmhouse were added as a receipt at 1/6d. per dozen.

Management and Interest

No charge was made either for a managerial salary to the farmer or for interest on capital.