Egg - Cost of prod.

UNIVERSITY OF MANCHESTER

FACULTY OF ECONOMIC AND SOCIAL STUDIES

DEPARTMENT OF AGRICULTURAL ECONOMICS

THE ECONOMICS OF EGG PRODUCTION

a study of production and marketing on 70 farms

DAVID A. BURTON

BULLETIN No. 162/EC68 *Price* · £2·50 APRIL 1978

AGRICULTURAL ENTERPRISE STUDIES IN ENGLAND AND WALES: No. 63

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AGRICULTURAL ECONOMICS DEPARTMENT

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FOREWORD

AGRICULTURAL ENTERPRISE STUDIES IN ENGLAND AND WALES

University departments of Agricultural Economics in England and Wales have for many years undertaken economic studies of crop and livestock enterprises, receiving financial and technical support from the Ministry of Agriculture, Fisheries and Food.

The departments in different regions of the country conduct joint studies of those enterprises in which they have a particular interest. This community of interest is recognised by issuing enterprise studies reports prepared and published by individual departments in a common series entitled "Agricultural Enterprise Studies in England and Wales".

Titles of recent publications in this series and the addresses of the University departments are given at the end of the report.

PREFACE

This report, written by David Burton, on the basis of a detailed economic survey of egg producers, is another landmark in the long history of economic studies of poultry and egg production, undertaken by the Department of Agricultural Economics over the past twenty-five years. It is one of a sequence of studies sponsored by the Ministry of Agriculture, Fisheries and Food in conjunction with University Departments. Other poultry studies are currently being undertaken by the Department under a bequest from Sir John Eastwood, this, in all, representing a large input of work by Manchester University into the Economics of Poultry Production and Marketing. Mrs. D.I. Sue Richardson, who is the Sir John Eastwood Senior Research Fellow, has kept close oversight on the progress of this study, but this is essentially David Burton's report.

It would, of course, have been impossible to produce this report without the willing, and painstaking, cooperation of the many egg producers who participated in the study. They have given of their time willingly, often in the evening, when they had already done a hard day's work. We hope that they will find the report interesting and of value to them in their management and decision making. We owe them our sincere thanks.

W. J. Thomas
Professor of Agricultural Economics
and Head of the Department.

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ACKNOWLEDGEMENTS

This report could not have been written without the willing and active co-operation of the egg producers and companies involved, who provided the information and made its collection such a pleasant task. The authors sincere thanks therefore must go to them and to individuals of the Agricultural Development and Advisory Service, the Eggs Authority and other organisations who assisted in various ways in the construction of this report.

The author also wishes to express his gratitude to Mrs. D.I. Sue Richardson, for all her invaluable help and advice during the preparation of this report.

Most of the survey analysis was facilitated through the use of the computer user package, Statistical Package for the Social Sciences (S.P.S.S.). Many thanks are due to Miss M. Irvine for setting up the egg file and for all her advice throughout the computer analysis. Thanks are also due to the other members of the Research Support Unit in the Faculty of Economics and Social Studies, and to the clerical staff of the Department of Agricultural Economics at Manchester University.

INTRODUCTION

The last major survey into the economics of egg production was carried out by Manchester University in 1969/70, shortly before the winding up of the British Egg Marketing Board in March 1971. Since that time there have been many changes within the egg industry. Producers have had to contend with entry into the E.E.C. with all the concomitant problems of metrication, decimalisation and E.E.C. marketing regulations, as well as competition within the E.E.C. free market system. Meanwhile breeding companies continued the genetic improvement of laying birds, with new and improved strains of bird coming into commercial use, eating less food and producing more eggs than ever before. However, during this period, egg consumption per head has continued to fall as Table I demonstrates.

TABLE I : AVERAGE EGG CONSUMPTION AND YIELD PER BIRD

YEAR	1970	1971	1972	1973	1974	1975	1976	1977
Eggs per head, per week	4.59	4.48	4.41	4.23	4.09	4.14	4.08	4.00
Yield per Bird (Eggs)	215.0	219.5	225.5	228.5	229.5	229.0	238.5	240.5

Sources: National Food Survey and M.A.F.F.

The industry has now become a declining one, in the sense that the total number of birds housed each year is gradually falling. The national flock reached its highest level in 1970 with a total of 42,573,000 laying birds in England and Wales. By 1976 the total had fallen to 39,301,000 laying birds, a fall of 8 per cent. With a declining human population, egg consumption per head falling, and yields per bird rising, it is likely that the national flock will continue to contract.

Since 1970, the growth of large-scale units has continued. By 1976, over 50 per cent of layers in England and Wales were housed on units of over 20,000 birds. This compares with 28 per cent in 1970 and only 9 per cent in 1965.

Also the number of flocks continued to fall, in fact by over one third from 1970 to 1976. Tables II and III show these developments.

TABLE II : DISTRIBUTION OF FLOCKS ON AGRICULTURAL HOLDINGS BY SIZE OF FLOCK (ENGLAND AND WALES)

SIZE OF FLOCK	1965	1970	1976
	Number of Flocks		
1 - 99	103,296	66,602	47,105
100 - 499	40,598	15,590	5,174
500 - 999	6,581	2,824	925
1000 - 4999	6,392	4,320	1,981
5000 - 9999	829	1,085	724
10000 - 19999	304	494	494
20000 +	103	263	372
TOTAL	158,103	91,178	56,775

Source: M.A.F.F.

TABLE III : NUMBER OF LAYERS ON AGRICULTURAL HOLDINGS BY SIZE OF FLOCK (ENGLAND AND WALES)

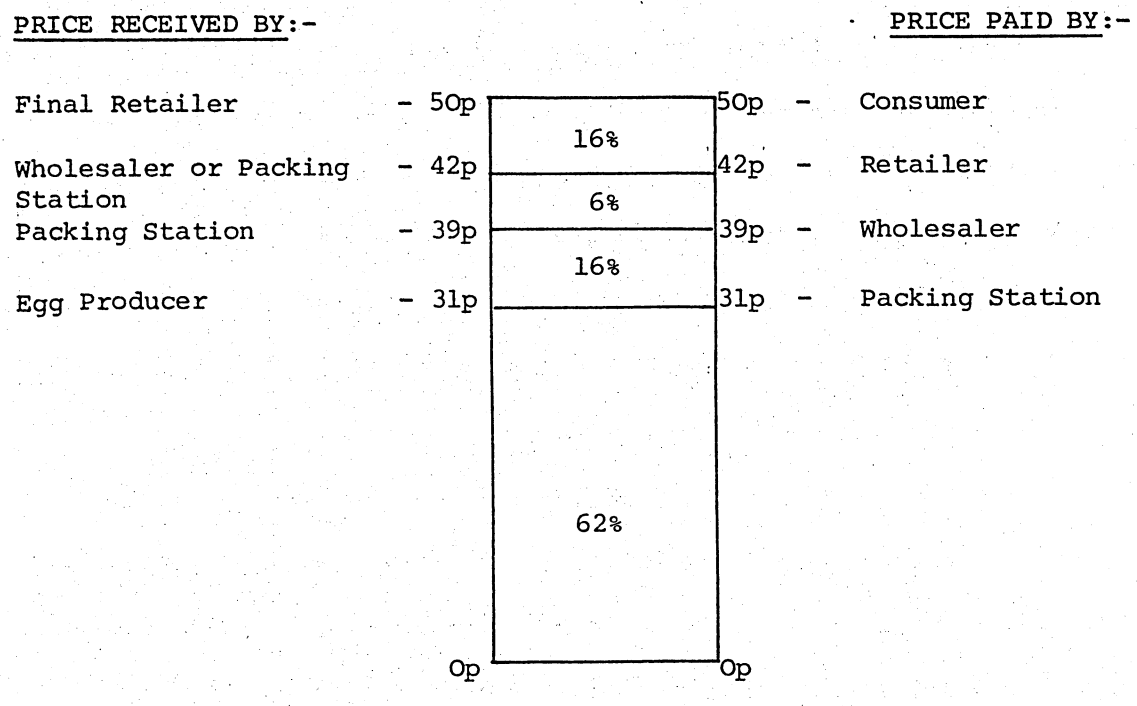
SIZE OF FLOCK	1965		1970		1976	
	'000 birds	%	'000 birds	%	'000 birds	%
1 - 99	3,252	8	1,876	4	1,096	3
100 - 499	8,054	20	3,157	7	995	2
500 - 999	4,258	10	1,901	5	618	1
1000 - 4999	12,461	31	9,657	23	4,753	12
5000 - 9999	5,319	13	7,428	18	5,016	13
10000 - 19999	3,757	9	6,548	15	6,597	17
20000 +	3,547	9	12,006	28	20,226	52
TOTAL	40,648	100	42,573	100	39,301	100

Source: M.A.F.F.

The most noticeable change which has occurred within the egg industry since 1970, has been the extensive development of vertical integration. With the advent of a free market in 1971 this is perhaps not surprising. Integration occurred both from the packing stations downwards and from production units upwards. Thus, packing stations continued to set up their own production units and some production units began to grade, pack and sell their own eggs. Some farms therefore, now cover all the operations in the marketing chain i.e., production, grading, packing, delivery and final sale to consumers. In this way the producer hopes to take at least some of the marketing share of the final egg price. This is demonstrated below by Figure I. Over one third of the final egg price paid by consumers is taken by whomsoever markets the eggs.

FIGURE I : SHARES OF FINAL EGG PRICE

AN EXAMPLE - STANDARD BROWN - Average for 1977 per dozen



Source: Eggs Authority

The potential extra profit to be gained by marketing, must obviously be tempting to producers, having a product requiring only adequate presentation and little or no processing before its final sale.

In this survey, the units have had to be divided into two broad groups for comparative purposes according to their selling method. As is the situation for the poultry industry as a whole, units no longer sell their eggs, broadly speaking, in the same way. Accordingly the units have been divided into two broad categories: those units supplying packing stations with over 70 per cent of their eggs and those units selling over 30 per cent of their output to outlets other than to packing stations. The latter group sold their eggs to wholesalers, retailers and consumers, and will be termed Producer Wholesale/Retail units. Very few of the Producer Wholesale/Retail units sold all their eggs to one buyer. Thus, farmers selling mainly to a wholesaler usually sold some proportion of their output to local shopkeepers or to consumers at the farm gate. Similarly units supplying packing stations sold differing proportions of their total output to farm gate customers. So, although the division by selling type leaves two groups of similar farms, there will still be variations within each group.

This division by selling type is necessary because the choice of selling point affects virtually all returns and costs of production. Although the basic tenets of effective production management are valid on all units, the selling policy may lead to different points of emphasis. Thus a unit supplying retailers may require a different grading pattern and a more consistent supply of eggs than a unit supplying a packing station and so on.

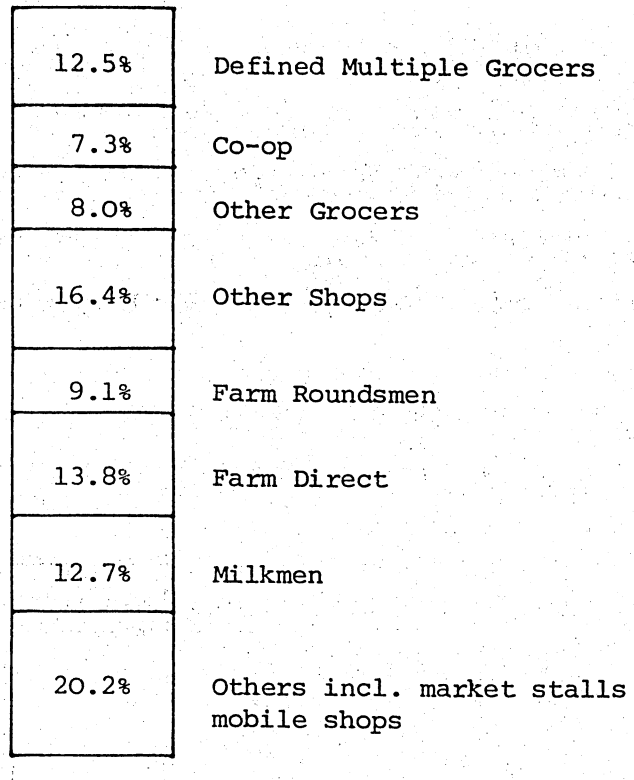
Where a production unit is owned by a packing station, but is costed as a separate financial entity, with its own profit and loss account, it has been included in the Packing Station Suppliers group. Although, a parent company may own both production unit and packing station, the production unit is treated as any external producer supplying eggs to the packing station.

The extent to which the marketing of eggs has developed on production units throughout the country, is unclear, although the Eggs Authority Packing Station Survey does indicate that over 80 per cent of all registered packing stations,

handle only their own eggs. Their actual share of the total egg market is not known at this time however.

Egg consumers buy from differing outlets and a breakdown of the market into these constituent parts, for the survey area may be helpful. The Lancashire Independent Television area used by the Eggs Authority, most nearly corresponds to the survey area. The proportion of purchases by outlet type is given in Figure II.

FIGURE II : LANCASHIRE INDEPENDENT TELEVISION AREA PURCHASES BY OUTLET TYPE FOR 1976/77 APRIL/MARCH YEAR



Source: Eggs Authority

It is noticeable that in this area, no one outlet type dominates the market and that direct sales to the public by producers either at the farm gate or by roundsmen made up over 20 per cent of all sales.

THE SURVEY

The survey was carried out on a random sample of 70 farms in the North and West of England, using farm accounts and records for the year ending April 4th, 1977.

Of the 70 farms, 33 came into the Packing Station Supplier category and the remaining 37 were Producer Wholesaler/Retail units.

Ten counties were represented, namely, Greater Manchester, Merseyside, West Midlands, West Yorkshire, South Yorkshire, Lancashire, Cheshire, Staffordshire, Shropshire and Cumbria. According to the latest available census figures, these ten counties contained some 20 per cent of all the laying birds in England and Wales.

The main emphasis of the survey was concentrated on units of over 5,000 birds, but some units below this size were included for comparative purposes. As in previous Manchester Egg Production Surveys, the average size of a unit was determined by totalling the average number of layers on the unit each 4 weekly 'month', and dividing by 13. The distribution of the sample units by size is shown in Table IV.

TABLE IV : SAMPLE FARMS BY SIZE OF FLOCK

Average No. of Birds per Unit	Number of Units
2,500 - 4,999	11
5,000 - 9,999	26
10,000 - 19,999	22
> 20,000 birds	11
TOTAL	70

The total number of birds covered in this survey, was over one million and

represented nearly 3 per cent of the national flock and nearly 4 per cent of all holdings over 2,500 birds. The sample also made up about 12 per cent of the total number of birds and holdings over 2,500 birds within the ten counties covered. The sample is thought to be representative of the region, especially of units over 5,000 birds, where over 15 per cent of all holdings over this size were included in the sample.

One half of the farms included were specialist egg farms, or farms where the egg enterprise made up over 75 per cent of gross turnover. The other half were mixed farms of various types, where the egg enterprise was of secondary importance. Of these 35 farms, 9 were intensive livestock farms, 9 were dairy farms, 7 were arable farms and the rest were mixed livestock and cropping farms.

The survey year was one of considerable price inflation. There were dramatic rises in the price of feedingstuffs and hence in pullet prices during the year. The average price per tonne paid for feedingstuffs during the first month of the survey was £85, whereas during the last month the average was £113, a rise of 33 per cent. As feed costs made up such a high proportion of the cost of pullet rearing, the cost of point-of-lay birds rose in a similar way. A brown, medium hybrid strain at 18 weeks of age, would have cost about £1.25 in April 1976, but over £1.50 in April 1977. Similarly cull values increased, from 8p per lb at the beginning of the year, to 12p per lb at the end, for brown birds, an increase of 50 per cent. These price rises did cause one or two problems of analysis and comparability in the survey.

As the costs of home pullet rearing were not included in this survey, units using their own home reared point-of-lay pullets were costed using the price they would have paid for the birds, had they bought them from a rearer, according to the strain of bird and its age. Due to the rise in pullet prices over the year, the timing of the birds introduction into the laying unit had also to be taken into account, before costing the birds in.

One major headache was the much greater stock valuation at the year end

compared to the beginning of the year. As the price of feedstuffs and of livestock were so much greater at the end of the year, part of the profit margins achieved could be attributed to stock valuation increases. Unfortunately, in order to maintain comparability amongst the farms, it was not possible to eliminate this 'paper' profit. Most of this stock valuation increase was from increased livestock valuations, as the amount of feed on hand was usually relatively insignificant, and in many cases could often be only an estimate.

The amount of the profit margin to be put down to valuation increases averaged just over 16p per bird on units supplying packing stations, and nearly 21p per bird on units supplying wholesalers, retailers and consumers. The effect is slightly greater on the latter farms due to the preponderance of solely brown bird units, where the valuation increases were highest.

The effect made on profits by valuation increases was not inconsiderable. Had there been no 'paper profits' earned during the survey year, profits would have been on average 27 per cent lower on units supplying packing stations and 18 per cent lower on Producer Wholesale/Retail Units. It is worth noting that currently the position is reversed. If the survey period had been one year later, profits would have appeared artificially low as the financial value of birds was higher in March 1977 than in the same month this year.

The units will now be examined according to the two basic selling type groups. Further divisions have been made where necessary.

SECTION I

PACKING STATION SUPPLIERS

For preliminary analysis the 33 farms in the group have been divided into three groups according to profitability per bird. The results are given in Tables V and VI.

TABLE V : COSTS AND RETURNS PER BIRD BY PROFITABILITY

	Average Upper Third	Average Middle Third	Average Lower Third	Average ALL FARMS	
	£	£	£	£	%
COSTS					
Feedstuffs	4.016	4.213	4.594	4.275	75
Bird Depreciation	0.794	0.758	0.862	0.805	14
Labour	0.366	0.380	0.346	0.364	6
Power	0.087	0.085	0.082	0.085	1.5
Deadstock Depreciation	0.091	0.095	0.067	0.084	1.5
Repairs and Maintenance	0.054	0.076	0.102	0.077	1
Miscellaneous	0.039	0.057	0.062	0.053	1
TOTAL	5.447	5.664	6.115	5.743	100
RETURNS					
Egg Revenue	6.603	6.156	6.165	6.308	
Other Revenue	0.031	0.019	0.024	0.025	
TOTAL	6.634	6.175	6.189	6.333	
MARGIN	+1.187	+0.511	+0.074	+0.590	
No. of Farms	11	11	11	33	

TABLE VI : COSTS AND RETURNS PER DOZEN EGGS BY PROFITABILITY

	Average Upper Third	Average Middle Third	Average Lower Third	Average ALL FARMS
	pence	pence	pence	pence
COSTS				
Feedstuffs	18.58	20.80	23.01	20.80
Bird Depreciation	3.67	3.76	4.35	3.93
Labour	1.70	1.89	1.72	1.77
Power	0.41	0.42	0.41	0.41
Deadstock Depreciation	0.42	0.46	0.33	0.40
Repairs and Maintenance	0.25	0.37	0.50	0.37
Miscellaneous	0.18	0.28	0.30	0.25
TOTAL	25.21	27.98	30.62	27.93
RETURNS				
Egg Revenue	30.55	30.42	30.84	30.60
Other Revenue	0.15	0.10	0.12	0.13
TOTAL	30.70	30.52	30.96	30.73
MARGIN	+5.49	+2.54	+0.34	+2.80
PERFORMANCE FACTORS				
Yield per bird (Eggs)	259.4	242.7	240.0	247.4
Feed Consumption p.a. (kgs)	42.123	41.678	44.669	42.823
Feed Conversion Rate	1.95	2.06	2.24	2.08
Labour per 1000 birds (Hrs.)	377	384	348	370
Feed Price Per Tonne (£)	95.17	100.3	102.64	99.38
Flock Size (Birds)	13021	17647	27311	19389

The average margin for all farms was 59p per bird, but the huge range in profitability can be seen from the difference between the averages of the upper and lower third farms. In fact results ranged from a profit of £1.60 per bird to a loss of 50p per bird. Even without deducting the "paper" profit of the valuation increase, the average margin is much lower in real terms than it was in 1970. In the 1969/70 survey the average margin for all farms was 35.4p per bird. Bearing in mind that the cost of living has risen by 128 per cent since that time, the equivalent margin in 1976 would have been 80.7p per bird. Similarly the average cost of production is now only 10p per bird greater, in real terms, than it was in 1970, whilst returns per bird are 6p lower. In other words, egg producers supplying packing stations are less well off than they were eight years ago.

Although the overall margin is fairly low, some units still manage to achieve profits of well over £1 per bird. The costs and returns therefore need to be examined to ascertain the reasons for the more successful results of their operations.

COSTS

1. Feed Costs

It is apparent that one major factor in determining profitability is the feed cost. This now makes up 75 per cent of the total cost of production, as opposed to only 61 per cent in 1970. This increase is solely due to price rises, as the average consumption per bird has actually fallen slightly. In the 1969/70 survey, consumption was 43.00 kgs per head whereas the average for these 33 farms is 42.82 kgs per head. The average price of feed in the last survey was £35 per tonne, but here the figure is £100 per tonne.

There are obviously two elements determining feed costs per bird; namely the amount fed and its price per tonne. It is noticeable that the middle third group in fact achieved a lower consumption per bird than the upper third and yet the upper third has a substantially lower feed cost per bird. This obviously

points to the fact that the upper third group paid less per tonne for its feed than the rest of the farms. Further investigation reveals that eight of the eleven farms are milling and mixing their own feedingstuffs. This indicates that a large difference in profitability may exist between the two feed types. The next section, therefore, looks into this.

Home Mixed Feed and Purchased Compounds

Of all 33 farms only 12 are home mixers, the rest buying-in proprietary compounded feed. Home mixers tended also to be on mixed farms, only one third being specialist egg producers. This was not so with purchased compound users. Here two-thirds of the group were specialist egg producers. The grouped results show that in fact there was a difference of nearly £10 per tonne between the average price paid by units buying-in compounds and those home mixing. The average price paid by purchased compound users was £102.88 per tonne, and for home mixers £93.26 per tonne. Table VII indicates the effect that home mixing has on costs and the level of profitability.

TABLE VII : COSTS AND RETURNS : HOME MIXING AND PURCHASED COMPOUNDS

Averages	Home Mixing Farms Per Bird		Farms Purchasing Compounds Per Bird		Home Mixing Per Dozen	Purchased Compounds Per Dozen
	£	%	£	%	p	p
COSTS						
Feedstuffs	3.809	72	4.540	75	18.83	21.92
Bird Depreciation	0.818	16	0.797	13	4.08	3.84
Labour	0.359	7	0.367	6	1.74	1.78
Power	0.098	1.5	0.077	1.5	0.49	0.37
Deadstock Depreciation	0.080	1.5	0.086	1.5	0.39	0.41
Repairs and Maintenance	0.050	1	0.093	1.5	0.24	0.45
Miscellaneous	0.044	1	0.058	1.5	0.22	0.28
TOTAL	5.258	100	6.018	100	25.99	29.05
RETURNS						
Egg Revenue	6.188		6.376		30.41	30.71
Other Revenue	0.034		0.020		0.17	0.10
TOTAL	6.222		6.396		30.58	30.81
MARGIN	+0.964		+0.378		+4.59	+1.76
No. of Farms	12		21		12	21

The home mixing units show an average margin nearly three times that of the purchased compound user. Virtually all of this difference in profitability is due to the much lower feed cost per bird of the home mixers. In fact the financial performance of the units purchasing compounds is especially poor, even more so when the element of profit attributable to valuation increase is deducted. This leaves a real margin of only 21p per bird, as a return to management and investment. Clearly on the basis of these results there is very little room to manoeuvre for this group of producers as far as future investment is concerned. The physical performance and other management factors are given in Table VIII with standard deviations where appropriate to indicate the range of results.

TABLE VIII : CHARACTERISTICS AND MANAGEMENT FACTORS: HOME MIXING AND PURCHASED COMPOUNDS

Averages		Home Mixers	σ*	Purchased Compounds	σ*
Yield Per Bird	(Eggs)	243.8	23.3	249.4	16.0
Feed Consumption per Bird	(Kgs)	40.892	2.28	43.927	3.45
Feed Conversion Rate		2.024	0.152	2.121	0.212
Mortality Rate	(%)	9.86	4.9	7.64	3.6
Labour Used per 1000 Birds	(Hours)	371	115	369	89
Breakeven Yield	(Eggs)	207	12	235	16
Feed Price Per Tonne	(£)	93.26	3.3	102.88	3.8
Protein Level of Ration	(%)	16.3	0.46	16.5	0.52
White Bird Units	(%)	50		38	
Brown Bird Units	(%)	17		43	
Mixed Colour Units	(%)	33		19	
Specialist Egg Farms	(%)	33		67	
Mixed Farms	(%)	67		33	
Home Pullet Rearing	(%)	63		24	
Bought-in Pullets	(%)	37		76	
Eggs Sold at Farm Gate	(%)	9.3		6.6	
Age of Unit	(Years)	18		13	
Output Per £100 Feedstuffs	(£)	163		142	
Average Size	(Birds)	20493		18672	

*Note: Standard Deviation: This is a statistical measure of the extent to which a set of numbers are dispersed about their arithmetic mean. Usually one standard deviation either side of the mean would contain over two thirds of all results. Use of this measure reduces the bias caused by extreme results.

The home mixing units showed a lower average yield per bird, but also a much lower feed consumption per bird. However the averages do not tell the whole story. The lower average yield of the home mixing group was due to the poor yields obtained by three of the 12 units which averaged only 210 eggs per bird. The other nine units averaged a yield of 255 eggs per bird. For the three poor yielding units, it is fairly clear that the rations were not seriously at fault but that a disease problem had occurred. The problem of inaccurate ration formulation and the risk of consequent poor performance and ill health must obviously be taken into account when considering home feed mixing. During the survey year one or two farms where compounds were bought-in, experienced such problems and after a feed analysis, claimed compensation successfully from the companies concerned. On home mixing farms it would be far more difficult to prove whether the fault lay in some ingredient or in the farmers ability to formulate the ration correctly and accurately.

The yields obtained by the units buying-in compounds were much more evenly distributed about the mean, and the range of results was also much smaller than that of the home-mixers. On the other hand, the range in feed consumption was far greater in the buying-in group. One of the reasons for this may have been the larger proportion of units housing brown birds in the buying-in group. Thus the proportion of brown or mainly brown units in the buying-in group was 43 per cent, compared to only 17 per cent in the home mixing group. As brown birds generally eat more than white birds the chances of some units showing very high consumption rates must be much greater in a group with a high proportion of brown units.

In fact, within the group of units purchasing compound feed, the type of bird did seem to have made a considerable difference to profitability. Table IX gives the performance of these units grouped by the colour type of birds housed. There were only three mixed colour units purchasing compounds, so they have been omitted.

TABLE IX : COMPOUND FEED PURCHASERS - BY COLOUR TYPE

Averages		Brown Bird Units	White Bird Units
Yield Per Bird	(Eggs)	242.3	256.1
Feed Intake Per Bird	(Kgs)	45.48	41.55
Feed Cost Per Tonne	(£)	102.42	103.23
Per Bird		£	£
Feed Cost		4.69	4.32
Total Costs		6.20	5.87
Total Returns		6.36	6.42
Profit Margin		0.16	0.55
Per Dozen		p	p
Feed Cost		23.21	20.26
Total Costs		30.72	27.48
Total Returns		31.49	30.08
Profit Margin		0.77	2.60
No. of Farms		10	8

As the sample sizes were small, it would be unwise to dwell overlong on the absolute averages shown in Table IX, but, as there is no reason to suppose that the samples were unrepresentative, it is quite likely that Table IX could reflect the relative performances of white and brown bird units nationally. Thus, Table IX shows that the white bird units performed much better than brown bird units, both technically and financially. The white bird units achieved an average profitability three times greater than the brown bird units. The reason for

this is almost all to do with the much lower feed consumption of the white bird units. Table IX shows that the average total return per dozen was around one penny lower on white bird units, but the average total cost per dozen was around three pence lower than the brown bird units, resulting in a difference in profitability of two pence per dozen. The difference in total costs between the two groups is nearly all accounted for by the difference in feed costs. As the average price paid for feed per tonne was actually higher on white bird units, the sole factor giving the low feed costs per dozen on white bird units was their much lower feed intakes per bird.

It is probably worth noting here, that as there are no nutritional differences between white and brown eggs, there could be a considerable saving of resources, were all brown egg eaters to be converted to white egg consumption, bearing in mind the much lower cost of production with white eggs. However, the trend appears to be the other way with the proportion of brown birds being housed getting larger every year. In 1974 the ratio of brown to white birds housed in England and Wales was 66:34 respectively, in 1977 the ratio was 78:22 respectively.

The cost of feed depends to a large extent on its protein content. Commercial feed companies now market a variety of rations, from a 15.5 per cent to over 18 per cent protein content. By far the most popular ration used in the survey, contained 16.5 per cent protein and there was very little difference in this respect between the two feed type groups. However, because of the very dry summer of 1976, it could be that home mixers' rations were more protein enriched than the normal formulations would have indicated, because the protein content of most British wheat and barley was substantially higher than usual. Commercial feed companies, with sophisticated monitoring equipment, would have been able to keep their rations consistent, whereas the home mixer would usually not have had the means to keep a check on each grain delivery. Some home mixed rations, formulated to 16.5 per cent protein, may well have been nearer to

18 per cent during the last six or seven months of the year. This may go part of the way to explaining the much lower feed consumption shown by the home mixing group. Certainly not all of the difference is accounted for by the lower proportion of brown units. One further point was that on some units, high protein rations would be fed until 40 weeks of age, with a lower protein ration being used for the rest of the laying period.

In a similar way the higher mortality rate amongst the home mixing group is by no means all on account of the slightly lower proportion of brown or mainly brown units within the group. In fact there may well be a link between high mortality and home pullet rearing, as well over half of the home mixers rear their own birds, whilst less than a quarter of the compound purchasers do so.

Another interesting point, is the relatively small mixing charge which has to be added to the ingredient cost of the feed on home mixing units. On most units this is under £2 per tonne and on some it is considerably less. The main reason for this is the relatively old equipment in use. On many units the mill and mixer is well over 10 years old and has hence been virtually written off. However, with good maintenance this plant will last for many years. Very few home mixers envisaged replacement in the short term, at least not of the main body of the plant. Thus the actual depreciation charge is very low and sometimes virtually negligible, whereas mill and mixing plant installed now, would carry a depreciation charge of around £4.00 per tonne. In fact most home mixing units had been longer established than the compound purchasing units. The average age of the home mixing units was 18 years whilst that of the compound purchasing units was 13 years. The home mixers also tend to be larger scale units. This may be a reflection of the fact that the home mixers have consistently produced better profit margins than the compound purchasers and have therefore had more capital available for expansion. Certainly in the 1969/70 survey, home mixers also made substantially higher profits, on average, than the units using purchased compounds. Over the years, as feed prices rose, the tendency would be for the difference in profitability between the two groups to widen.

The range in average feed prices was much lower in the home mixing group and what difference there was can be put down to the different protein levels fed and the occasional unit where a producer had been caught out when buying major ingredients, usually grain. The importance of buying well was stressed by home mixing producers, as was the usefulness of adequate storage space for use when prices would appear to be moving upwards.

The home mixers are split about equally into those who use straight ingredients and those who use a proprietary concentrate to mix with grains and limestone. There seems to be little difference in price between the two. Similarly there is little difference in performance between the two types, as far as yield and consumption is concerned. However the sample is rather small to be definitive.

Looking at the units buying-in compounds, an interesting point emerges. Those units buying from large national feed merchants paid an average of nearly £4 per tonne more for their feed than those units buying from smaller local compounders. The average price paid by the former was £104.52 and by the latter, £100.88. This may give some strength to the argument that the local country compounders were trying to obtain a bigger share of the feed market during 1976/77, by undercutting the large national compounders. Certainly it is apparent that some local compounders delayed price rises until quite a few weeks after the national companies had put up their charges. One point which did emerge, was the astonishingly wide variety of prices quoted to producers often in the same week, by competing firms' representatives. Obviously this competition was advantageous to producers. The above situation tended to obscure the relationship between size of unit and the price paid per tonne. Certainly, bulk and tonnage discounts were available and many of the larger units made use of this. Some of the smaller units were also able to do this, by virtue of co-operating with other producers of a similar size and jointly being able to guarantee the purchase of the minimum tonnage required.

One interesting development was that one or two producers belonged to cooperative feed companies, owned and run entirely by farmers. These were either owned solely by poultrymen or by a mixture of dairy and livestock farmers. In the latter case the egg producer can be very beneficial as the demand for cattle compounds slackens off in the spring and only the demand for pig and poultry rations can keep the plant in full operation. There may therefore be feed cost savings to be made by poultrymen joining such effectively non-profit making organisations.

One last point of note was the tightening up of merchant credit, during the survey year. At the beginning of the year £2.00 per tonne was the usual credit charge if payment was not completed within 28 days. By the end of the year, the figure was £5.00 and often payable on bills outstanding for only 14 days. The reason for this was the very steep rise in interest rates which occurred during the year; overdraft rates for instance reaching nearly 20 per cent. Interest rates have since fallen considerably.

Feed Conversion Rate

The importance of keeping feed costs down cannot be stressed too highly, but levels of feeding also affect yields and therefore returns. Restricting feed to birds is of little use when any cost savings are offset by a drop in returns through lower quality or numbers of eggs. So an important performance indicator is the Feed Conversion Rate. This is calculated simply by dividing the feed consumed per bird by the yield, in dozens per bird. The resulting figure gives the amount of food required to produce one dozen eggs. Therefore, the lower the rate, the more efficient the use of feed and the higher the margin over feed costs. Table X illustrates the importance of Feed Conversion Rates in determining profitability. Thus the group with the lower Feed Conversion Rates have an average margin over feed per bird, 90p greater than the group with the highest Feed Conversion Rates.

TABLE X : PERFORMANCE BY FEED CONVERSION RATE

Feed Conversion Rate	< 1.950	1.951-2.050	2.051-2.200	> 2.200
Yield (Eggs)	262	258	236	235
Feed Intake (Kgs)	41.0	43.1	41.3	45.7
Feed Cost Per Bird (£)	4.08	4.39	3.96	4.65
Total Returns Per Bird (£)	6.50	6.76	5.96	6.17
Margin Over Feed (£)	2.42	2.37	2.00	1.52
Profit Margin Per Bird (£)	0.84	0.88	0.58	0.12
Feed Cost Per Dozen (p)	18.73	20.41	20.12	23.77
Total Returns Per Dozen (p)	29.79	31.43	30.27	31.52
Margin Over Feed (p)	11.06	11.02	10.15	7.75
Profit Margin Per Dozen (p)	3.85	4.09	2.95	0.61
No. of Farms	9	7	8	9

The importance of keeping a check on the Feed Conversion Rate, rather than just feed consumption and yield in isolation, is well illustrated by the second and third groups in Table X. The second group has a substantially higher feed consumption figure per bird, but due to its far superior average yield, the group has an average margin over feed which is 37p per bird greater than that of the third group.

The average Feed Conversion Rate in this survey was 2.08 compared to one of 2.22 in the 1970 survey and the range of values has also become smaller since that time. This probably reflects an overall improvement in the management of flocks as well as genetic improvement in new commercial strains of bird.

As would be expected, the units housing mainly white birds have much better Feed Conversion Rates than those housing mainly brown birds. This is shown in Table XI, which gives the distribution of different farm types among the feed conversion rate ranges. It is noticeable that the specialist egg producers tend to have better feed conversion rates than do the farmers with mixed farms. This reflects two things; firstly that more specialist egg producers than mixed farmers house white birds, and secondly that their management tends to be of a higher standard.

TABLE XI : DISTRIBUTION OF FARM TYPES BY FEED CONVERSION RATE

Feed Conversion Rate	< 1.950	1.951-2.050	2.051-2.200	> 2.200	Total
	Percentages				%
Specialist Egg Units	32	37	16	15	100
Mixed Farms	21	Nil	36	43	100
Family Farms	27	36	9	28	100
Non-Family Farms	27	14	32	27	100
Home Rearers	29	21	36	14	100
Bought-In Pullets	26	21	16	37	100
White Bird Units	53	7	33	7	100
Brown Bird Units	Nil	33	8	59	100
Mixed Colour Units	17	33	33	17	100
Home Mixers	33	25	33	9	100
Purchased Compounds	14	29	19	38	100

As far as efficiency of feed conversion is concerned, there seems to be very little difference between family and non-family farms, or between home rearers and units buying-in pullets. The home mixers were of course more efficient in this respect than the units buying in feed and this has already been discussed. So feed conversion rates are very important profitability indicators. However, identical feed conversion rates do not necessarily produce identical margins, even if the feed cost per tonne and the egg prices are the same in each case. This can be illustrated by looking at two hypothetical farms.

	Farm A	Farm B
Feed Conversion Rate	2.00	2.00
Feed Per Bird	40.00 kgs	44.00 kgs
Yield Per Bird	20.00 dozens	22.00 dozens
Feed Cost	£4.00 per bird	£4.40 per bird
Egg Returns	£6.00 per bird	£6.60 per bird
Margin Over Feed	£2.00 per bird	£2.20 per bird

Assumptions: Feed cost per tonne £100.00, Egg Price 30p per dozen, Quality, grading and colour of eggs identical on both farms.

Thus in the above situation both conversion rates are identical but Farm B has a 20p per bird advantage in the margin over feed. Obviously the example given is very simplistic but it does show that the feed conversion rate itself, should not be looked at in isolation. Of course a low rate should be aimed at but its constituent parts and their relative prices may be just as important in attaining maximum profitability.

2. Bird Depreciation

Since 1970 the proportion of total costs accounted for by bird depreciation has fallen from 25 per cent to only 14 per cent. However, it is still the second largest cost item. Bird depreciation cost is now considerably less, in real terms, than it was in 1970. Then it averaged 61p per bird, which, taking inflation

into account, would have been £1.39 per bird by 1976. In fact the average cost was 80.5p per bird. The main reason for this is that in real terms the price of point-of-lay pullets has fallen, whilst that of cull birds has risen.

Bird depreciation cost does not usually appear to have a great effect on the level of profitability. It will be noticed that the middle third group by profitability, has a lower bird depreciation cost than the upper third, although the lower third does have a slightly higher figure. Despite this, it is still an important cost and quite a few factors are involved in its composition.

Pullets, Age and Costs

By far the most popular age at which point-of-lay pullets were bought, was 18 weeks. Over 60 per cent of the units bought-in or transferred pullets into the laying flock at this age, with most of the others buying at 20 weeks. The age of the pullets clearly affects the price paid by the producer. Thus over the period covered, a pullet at 20 weeks of age would have cost around 15p more than one at 18 weeks of age. Of course, buying at 20 weeks the producer would have less time to wait for some return, always assuming the caging of the birds to be fairly stress-free.

The strain of bird purchased also affects the purchase price. Thus brown birds generally cost more than white birds, almost solely because brown birds have the greater appetite. The average price paid for pullets on brown bird units was £1.40, and £1.29 for those on white bird units.

Discounts on quantity were not particularly important in achieving low costs, although units under 5000 birds paid slightly more for their birds. In fact the quantity purchased does not become financially important until orders fall below 500 birds. Thus, discounts for batches over 3,000 birds were generally only one penny per bird for each 10,000 birds extra. Units home pullet rearing presumably have a potential saving to make over units buying-in pullets, but the extent to which this is achieved and the amount of the saving, are outside the scope of this survey. There are indications that any saving on costs may be

slightly offset by poorer performance. Thus on home rearing units slightly fewer eggs were produced and more food eaten than on units buying-in pullets. This poor performance is highlighted even more, as the proportion of white bird units among the home rearers was substantially higher than among units buying-in pullets. As in the previous survey the tendency is for the larger units to home rear. Thus 62 per cent of units over 20,000 birds and 55 per cent of units between 10,000 and 19,999 birds home reared pullets, whilst only 27 per cent of units between 5,000 and 9,999 birds and 20 per cent of units under 5,000 birds were home rearers.

An interesting feature was the popularity of strains which had performed well in the National Poultry Testing Trials. Thus for white birds by far the most popular strains were those well placed in the N.P.T. trials. Similarly with brown birds the top strains in the trials were by far the most popular birds being ordered on the farms surveyed. Some producers clearly were influenced by the trials as they regularly purchased copies of "Poultry Testing", the bulletins of the National Poultry Tests, Milford.

Cull Birds

As with feed and pullet costs, cull bird values rose considerably during the year of the survey. Before December 1976 the usual prices being offered by the poultry processors were 8p per lb for brown and 6p per lb for white birds. By April 1977 prices were 12p per lb and 9p per lb respectively. The main reason for this rise being the reduction in the supply of culls in the last five months of the year. Most brown birds attract a higher price due to their better fleshing. As a rule brown birds at the end of lay weigh around 5 lbs or 2.27 kgs, whilst white birds weigh only 4 lbs or 1.81 kgs, although this will vary according to the particular strain of bird. The average price received for culls on brown units was 42p and for white units 28p per bird.

All units sent the vast majority of their cull birds to commercial processors, but some units did supply the demand for live hens made by Indian and Chinese

restaurants and immigrant communities. Although the price received for cull birds sold in this manner was often higher than could be obtained elsewhere (generally about 10p per bird more), there were drawbacks. The quantity of birds required is generally small in comparison to the numbers housed in any one cabin, and the restauranteur often wishes to be fairly slective, choosing only the birds in best condition. This means a fair amount of disturbance to the remaining hens. Where more than one age of bird is kept in the same cabin, this can have a marked effect on production for at least a few days. Also, unless the restauranteur can be persuaded to arrive on the same day as the poultry processor, the producer has to be on hand for twice as long and will often have to supply his own labour to pack the birds and check that only the birds due to be culled are taken.

The advantage of dealing with the poultry processor is that all birds are taken no matter what their condition and often the processor will provide some labour to speed up the removal of the birds. The producer therefore gets his cabin emptied very quickly and can immediately begin to prepare it for the incoming flock. Thus the farmer completes his culling in a few hours and does not need to waste any time waiting for different buyers. The amount to be gained by selling to restauranteurs is usually not very great when spread over the whole flock. However it can make a noticeable difference on the smaller units and payment is nearly always made on the spot. This trade in cull birds to restauranteurs is more prevalent on Producer Wholesale/Retail units where the search for egg markets may easily lead to a secondary trade in cull hens. One or two units sold off culls plucked and dressed as boiling fowl, but the numbers involved were very small and the birds were intended to be more a way of keeping egg customers than for direct profit-making.

Mortality

The average mortality rate on all units was 8.45 per cent, but this does not show the difference between the brown and the white bird units. The average for all brown bird units was 7.4 per cent for all white bird units 10.3 per cent.

The range in mortality rates was from at best 3.6 per cent and to at worst 22.6 per cent, but in general mortality rates were low with very few units losing more than 12 per cent of their birds. The survey year was fairly free from major disease outbreaks and only one or two units had extensive problems. The causal factor on most high mortality farms, was the very hot summer of 1976. The exceptional heat meant that if the birds became short of water for any reason, they would very quickly die. The temperature could not be kept down even in environmentally controlled cabins. Often, the air outside the cabin would be as hot as the air inside. In many cases, even where a blockage in water pipes was found in time to prevent death, the laying performance of the affected birds deteriorated badly, in some cases throughout the rest of the laying period. Table XII shows the effect of differing mortality rates.

Table XII shows that high mortality rates are associated with longer laying cycles and are usually to be found on units housing white birds. Similarly units where there was little or no environmental control, tended to have higher mortality rates than units with part or full environmental control.

One interesting point was the low average yield achieved by the highest mortality group. However this low yield was accompanied by low feed consumption, resulting in a feed conversion rate which was slightly lower than the average for all farms, and considerably less than the average of the lowest mortality group.

The effect of the mortality rate on bird depreciation is not all that great for although there is a difference of nearly 10p on this cost per bird between the highest and the lowest mortality group, some of this is undoubtedly due to the preponderence of white units in the highest mortality group; white birds tending to bear a slightly higher livestock depreciation cost than brown birds. The range in mortality rates is not very great, especially if one or two problem units are discounted. The difference in the mortality rate between home reared and bought-in pullet units is insignificant, bearing in mind that the home rearing group have a higher proportion of white units.

TABLE XII : MORTALITY RATES: PERFORMANCE AND CHARACTERISTICS

Mortality Rates	< 7%	7 - 9.5%	> 9.5%
Mortality Rate (%)	5.28	8.04	13.54
Livestock Depreciation per Bird (p)	75.3	84.2	85.2
Livestock Depreciation per Dozen (p)	3.60	3.93	4.41
Yield per Bird (Eggs)	252	257	234
Feed Conversion Rate	2.123	2.027	2.077
Labour Per 1000 Birds (Hours)	386	387	331
Usual Length of Laying Cycle (Weeks)	58	60	63
Profit Margin Per Bird (p)	64.7	81.3	38.0
	---------- percentages ----------		
Proportion of Mainly Brown Units	47	38	20
Proportion of Mainly White Units	26	38	80
Proportion of Mixed Colour Units	27	24	Nil
Proportion of Home Rearing Units	27	62	50
Proportion of Units Buying @ P-O-L	73	38	50
Proportion of Home Mixing Units	20	63	40
Proportion of Purchased Compound Users	80	37	60
Proportion of Units with Full Environment Control	40	37	30
Proportion of Units with Part Environment Control	53	63	50
Proportion of Units with No Environment Control	7	Nil	20
No. of Farms	15	8	10

Length of Laying Period and Disease Break

The length of time birds are kept in lay, obviously affects the cost of livestock depreciation. Thus if the cost per bird over 52 weeks is £1.00, over 56 weeks it would be nearer 92p per bird. However there will come a point when the drop in egg numbers and egg quality becomes serious enough to outweigh any gains made by keeping birds longer. Generally speaking, if the price of eggs is relatively high at the end of the laying period; it is more profitable to sell the birds and replace with pullets. The optimum length of the laying period depends on a variety of factors; the relative price of eggs, the expected future performance of the birds in question, the price of cull hens and the cash position on the farm. Having said that, however, where units supply packing stations, there is often little scope for altering the length of the laying period. Many units have contracts with packing stations to supply a certain quantity of eggs with a regular grading pattern. This regulates the length of lay to a great extent. In any case, many orders for pullets are placed perhaps five months in advance, so determining the length of the laying period in advance.

The average length of the laying period was 60 weeks but the most popular period was 56 weeks and the range was from 52 weeks to 78 weeks. One reason for the average being so much higher than the popular choice, was the inclusion of the units where some force-moulting was regularly carried out. Here, laying periods were considerably longer than average. No flocks were regularly kept in lay for under 52 weeks and 40 per cent of the flocks were regularly kept on for over 60 weeks.

Of course, the original age of the point-of-lay pullet must be taken into account. An 18 week old bird will usually be kept two weeks longer than a 20 weeks old bird. As far as disease breaks are concerned, there were very mixed views about the length of time that cabins are left empty between flocks. Some producers favoured a month long disease break, whilst others filled cabins as soon as they had been washed, disinfected and allowed to dry. The average length of the disease break on all the units was 3 weeks, but the range was from one to

over eight weeks. The survey provides little evidence for the advocacy of either philosophy, as the top performance group had an identical average disease break time to the low performance group. Altering the disease break periods can work in two ways. If the period is one in which profits are being made, the shorter the break the better. Even when cabins are left empty there are still costs to bear in the form of deadstock depreciation. However if egg prices are so low that no profit is being earned it may be better to leave cabins empty as long as the losses which would occur outweigh the deadstock depreciation charges. The same rigidity applies to altering the disease break length as for altering the length of the laying period. Even though decisions have to be made a long time in advance, given a relatively fixed egg price pattern throughout the year; earnings may be boosted by having some flexibility in both the length of lay and in the disease break.

One noticeable feature was the tendency of many units to arrange to cull at least one cabin of birds before the Christmas break. This may have been more widespread than in previous years, as for the first time the Christmas and New Year holidays coincided with weekends, resulting in extended staff absences. Previously New Years Day had not been an official holiday.

By reducing bird numbers the workload over the holiday period is lightened and very little overtime needs to be worked, easing management problems. In the survey year this pre-Christmas culling may have helped to maintain post-Christmas egg prices. Certainly this, coinciding with the industry's efforts to export eggs in the New Year did result in a substantial reduction in the overall supply of eggs in January 1977. Prices were therefore maintained only slightly below their pre-Christmas levels, at a time when they traditionally had plummeted. This pre-Christmas culling does therefore, seem to be beneficial both at the individual and the industry level.

Force-Moulting

Of the 33 units in this section, only three units force-moulted any birds and only one did so on over 50 per cent of the total flock. Certainly the force-moulting did not have an adverse effect on profitability and in fact it may have increased it considerably. However, with so few farms and only the figures for one year, it is impossible to say whether it is the force-moulting which has led to higher than average profits on these units, or whether they would have been high profit units despite the force-moulting.

All-in/All-out Units

There were 8 all-in/all-out units among the packing station producers - an all-in/all-out unit being one where all the birds on the unit are of the same age and where they are culled together and the new birds rehoused all at once. This method of production is intended to reduce disease risks, improve performance and to make effective management easier. Table XIII gives the results of the all-in/all-out units compared with multi-age units.

TABLE XIII : CHARACTERISTICS: ALL-IN/ALL-OUT, AND MULTI-AGE UNITS

Averages		All-in/All-out Units	Multi-Age Units
Profit Margin Per Bird	(p)	54	63
Profit-Excluding Home-Mixing Units	(p)	46	34
Yield Per Bird	(Eggs)	251	246
Feed Consumption Per Bird	(Kgs)	43.68	42.55
Feed Conversion Rate		2.089	2.085
Mortality Rate	(%)	6.72	9.00
Labour Per 1000 Birds	(Hours)	347	377
Laying Cycle Length	(Weeks)	58	60
Number of Breeds Housed: One only		63%	36%
Two only		25%	28%
More than two		12%	36%
Flock Size		9808	22455
No. of Farms		8	25

Table XIII shows that the all-in/all-out units earned lower profits on average than the multi-age units, but that this was almost solely because only one of the all-in/all-out units milled and mixed its own feed, whilst nearly one half of the multi-age units did so. If only the results of farms purchasing compounds are used, it is clear that the all-in/all-out units earned on average, over one third higher profits than the multi-age units.

Although the feed conversion rates of each group were very similar, the all-in/all-out units did achieve higher yields than the multi-age units. Indeed, if the home mixing units are ignored, the seven remaining all-in/all-out units achieved a slightly better feed conversion rate than the fourteen remaining multi-age units, 2.10 compared to 2.13.

The proportion of white to brown bird units was similar for both unit types and the lower mortality rate on the all-in/all-out units probably reflects the fact that the majority of all-in/all-out units house only one strain of bird, whereas the majority of multi-age units house more than one strain. The shorter laying cycle of the all-in/all-out units would also tend to keep mortality rates at a lower level.

The all-in/all-out units tended to be more common on mixed rather than specialist egg farms, and this is only to be expected given the relative simplicity of management using this production system. It is also noticeable that the labour requirement was nearly ten per cent higher on multi-age units, indicating superior labour efficiency on all-in/all-out units.

The average size of an all-in/all-out unit was much lower than that of a multi-age unit, and indeed, all but one of the all-in/all-out units had an average flock size of under 10,000 birds. Similarly, virtually all of the all-in/all-out units were entirely dependent on family labour.

In conclusion therefore it did seem that if home mixers were discounted, all-in/all-out units did perform rather better on average than multi-age units, both financially and technically. On the basis of these results therefore, for packing station suppliers at least, the all-in/all-out system is preferable to

multi-age units, although with the former system timing is fairly important. Thus to ensure the highest profitability laying cycles should be correlated with egg price cycles, so that when the flock is producing the greatest number of eggs (peaking), the egg price is at one of the peaks in the yearly cycle rather than in one of the troughs.

3. Labour

Table XIV shows the group averages and ranges for various labour performance indicators.

TABLE XIV: LABOUR COSTS AND REQUIREMENTS

		Average	Range
Labour Cost Per Bird	(p)	36.4	14 to 65
Labour Cost Per Dozen	(p)	1.77	0.91 to 3.15
Hours Per 1000 Birds		370	166 to 520
Eggs Output Per £100 Labour	(£)	1906	970 to 3279
Percentage of Total Costs		6	3 to 12

In terms of their share of the total cost of production, labour costs have not fallen significantly since the 1970 survey, when labour costs accounted for 7 per cent of total costs. In this survey the figure is 6 per cent. However the labour requirement per bird has fallen considerably. Thus in the 1970 survey the average requirement was 560 hours per 1,000 birds, whilst the average for this survey was 370 hours per 1,000 birds.

The main reason for there being only a slight fall in the share of total costs taken by labour over this period, is the fact that wages have more than kept pace with inflation. Also a fair proportion of the labour force on egg units is made up of women and the passing of the Equal Pay Act would have added an extra increase to the wage bills of egg producing farms, which would not have been experienced to the same extent by most other sectors of the agricultural industry.

The range of the labour requirement was fairly wide, from under 200 hours per 1,000 birds on the more mechanised, automated units, to over 500 hours per 1,000 birds on units with only manually operated cabins. The level of automation affects considerably the amount of labour required. As labour costs are such a small proportion of total costs, when considering investment in labour-saving machinery, it obviously requires very careful calculations, to ascertain whether the savings are more or less than the increase in deadstock depreciation.

In fact the main problem encountered was not the quantity of labour required but its quality. Thus the savings achievable by investment in labour-saving machinery may be negligible, but as the equipment allows the producer to increase his capacity whilst maintaining his own standards of management, the investment is made. Family farms were noticeably disinclined to hire outside labour and therefore any envisaged expansion could only be done by increased automation.

Labour requirements appeared to have little effect on profitability. The average requirement was fairly similar for each profitability group. In fact the highest group had a rather higher requirement, 377 hours compared to the 348 hours per 1000 birds required by the lowest profitability group. The spread of values about the mean was fairly even for the whole group and the relative unimportance of labour costs compared to other costs can be seen when it is realised that some farms used twice as much labour as others and yet there would be no difference in profitability.

One noticeable difference in labour requirements was that between the specialist egg farms and mixed farms. The average requirement on the former was 396 hours, whilst that of the latter was 335 hours per 1,000 birds. This may help to explain the poorer performance of the units on mixed farms, where the average feed conversion rate was substantially worse than that of the specialist egg farms. It may be therefore, that on specialist farms more time is spent with the birds and any problems are discovered just that bit sooner.

The structure of the labour force is set out in Table XV.

TABLE XV : STRUCTURE OF LABOUR FORCE

	Male Family	Male Hired	Female Family	Female Hired	Totals
	percentages				
Full Time	9	41	Nil	9	59
Part Time	9	6	4	22	41
Total	18	47	4	31	100
Total	65		35		100

The largest proportion of the labour force was that of full-time, hired male workers, but at 35 per cent of the total, female labour continues to play a major role on egg units. This is almost exactly the same proportion as was found on units in the 1970 survey. Bearing in mind that the sample for the earlier survey, was orientated towards slightly larger units than this survey, and also, that the larger units tended to employ proportionally more women than smaller units; the likelihood is that more women are being employed on egg units than previously. Thus, despite the Equal Pay Act, there is very often a preference for women to do the delicate jobs involving the movement of eggs. Certainly there was no evidence at all of women being less popular as members of the work-force due to the differential increase in the cost of hiring them, which has occurred.

The part-time employment of women primarily for egg collection, is fairly important within the packing station producers group, contributing 22 per cent of all labour and more than this on the larger units. On the other hand, the contribution of female family labour was relatively insignificant overall, with only 4 per cent of all labour coming from this category. It is noticeable that there appears to be a distinct preference for female rather than male part-time workers, as most of the 6 per cent contributed by the hired men was from general farm workers employed full-time on the farm but only part-time on eggs. The

female part-timers on the other hand, were almost all employed only on the egg enterprise, being paid on a regular part-time basis. Obviously there tends to be more availability with female workers and this, coupled with a natural nimbleness, would make them preferable to men.

Family labour made up 22 per cent of all labour and most of this was on the smaller units. The maximum size of a unit run entirely by family labour was 14,000 birds, in this survey. Naturally, the maximum size for a self-sufficient unit depends to a large extent on the size of the family and the willingness of children to work on the farm.

The range in the age of the egg producing farmer, (Company farms excluded), was as wide as is realistically possible. Farmers ages ranged from the late twenties to the early seventies; the average age being 46 years.

The average hours worked by farmers and all the other staff categories are given in Table XVI.

TABLE XVI : HOURS WORKED

Average Hours Worked	Male Family	Male Hired	Female Family	Female Hired
Full Time Per Year	2414	2291	Nil	2131
Full Time Per Week	46.4	44.1	Nil	41.0
Part Time Per Year	1133	682	958	1059
Part Time Per Week	21.8	13.1	18.4	20.4

As in the previous survey the full-time men worked longer hours than the full-time women, although this position is reversed when looking at the part-time hours. It is also noticeable that the working week on egg units has shortened considerably since 1970, when the average for men was 51.6 hours and for women 46.5 hours whereas in 1977 hired male workers worked approximately 44 hours and women 41 hours.

4. Capital and Investment

In this survey deadstock depreciation has been calculated by the diminishing balance method, using 10 per cent rate for buildings and equipment and 20 per cent rate for machinery and vehicles. Deadstock depreciation made up only 1.5 per cent of the total costs of production, reflecting the fairly low level of new investment in recent years. On a unit set up with entirely new equipment, deadstock depreciation would be around 6 or 7 per cent of total costs.

Table XVII gives a breakdown of the capital tied up on egg production units and an indication of the replacement costs involved.

TABLE XVII : CAPITAL, RATE OF RETURN AND INVESTMENT TIMING

Averages	Home-Mixing Farms	Purchased Compound Users	All Farms
Historical Values			
Fixed Capital Per Bird (p)	69.3	68.0	68.5
Fixed and Working Capital Per Bird (£)	1.43	1.44	1.44
Replacement Values			
Fixed Capital Per Bird (£)	4.10	3.66	3.83
Fixed and Working Capital Per Bird (£)	5.69	5.15	5.35
Return on Fixed Capital (%)	23	10	15
Return on Fixed and Working Capital (%)	17	7	11
Range in Return on all Capital (%)	+2 to +31	-10 to +24	-10 to +31
Percentage of Units making major investments:			
Since 1972 (%)	33	24	27
Not since 1972 but after 1968 (%)	33	19	24
Before 1968 only (%)	33	57	49
Average Capacity Used (%)	88	83	85

The steep rise in the price of poultry housing and equipment over the last few years, means that rates of return on historical capital are meaningless, as they vary according to the year of investment rather than the performance of the unit. On two farms with identical margins, the return on historical capital for

one could be up to three times that of the other, if one had cabins and cages ten years old and the other equipment only one year old. So rates of return have been based on the capital needed to replace the existing unit assuming a nil scrap value.

The average rate of return on fixed and working capital was fairly low, only 11 per cent and this at a time when overdraft lending was costing over 15 per cent. As the profit margins included an element of valuation increase, the real rate of return would have been nearer 8 per cent.

The average rate of return on capital masks the great difference between the home feed mixers and units buying compounds. The average rate of return of the former was more than twice that of the latter. The evidence pointing towards home mixing units consistently achieving much higher margins than units buying compounds, is reinforced by looking at the timing of investments over recent years. Thus a far greater proportion of the home mixers had made major investments; both replacing old and erecting new cabins; in the last ten years, than had purchased compound users.

With such low rates of return on units purchasing compounds, it would have been very difficult to borrow, commercially, any money for investment. Any planned investment, therefore would have to be financed from profits. With specialist units, only the most consistently profitable ones would be able to do this. However on mixed farms there may be surplus funds available from profits gained on other enterprises. On some mixed farms it was noticeable that new investment in poultry houses had often coincided with very profitable years for other enterprises on the farm. On the other hand home feed mixing farms did seem, in general, to have generated sufficient capital from within their egg enterprise to re-invest. The performance of flocks did not seem to be affected by the age of the buildings and equipment, although units with part or full environmental control fared slightly better than those with none. However on many units, cabins over ten years old had been insulated and adapted to provide

this better environment control. In fact nearly half of the units in this section had made no reinvestment for the previous ten years and indeed 18 per cent of all units did not plan to reinvest, as the table of future intentions shows.

TABLE XVIII : FUTURE INTENTIONS WITHIN FIVE YEARS

	Units Home Feed Mixing	Units Purchasing Compounds
To increase capacity	33%	33%
To decrease capacity	17%	19%
No Change	50%	48%

What is noticeable from Table XVIII is that there was virtually no difference in future intentions between the home feed mixers and the units buying compounds. This is perhaps surprising, considering the much better margins earned by the home mixers. One of the reasons for the similarity of intentions would appear to be the intentions of the larger scale units to expand. Of the units over 20,000 birds, 75 per cent envisaged increasing their capacity before 1982. This may be one result of the increasing market share taken by Producer Wholesaler/ Retailers, forcing the packing stations to supply themselves with more home produced eggs. Thus, with outside supplies declining, the packing stations need to increase their own laying capacity to maintain throughput. High margins on the laying side seem to be less important on a packing stations own unit. What is important is the overall profitability of the companies' egg operations, with the distribution of the profit between each composite enterprise being determined to a certain extent by company accountants. But, this is not to say that the larger scale units were less efficient than the smaller units. In fact, in terms of physical performance, the larger scale units did rather better than the smaller ones on average.

One salient point was that where no major investments had been made for well over ten years, units obviously would not be able to carry on producing eggs on the same scale, without a substantial capital injection. However on many units, cages installed well over ten years ago still had some years of life left in them, given careful maintenance. This is in contrast to other units having bought new cages only five or fewer years ago, where the cages had deteriorated so badly that re-equipping was inevitable. Of the units where opinions were voiced, the older equipment was given a much higher recommendation than the newer equipment. Certainly if recently purchased cages are going to need replacing in, say, five rather than ten years, depreciation charges and therefore the total cost of egg production will rise yet again.

This problem of rapid decay does not seem to apply to laying cabins, where many were often fifteen years old, and it seemed quite likely that they would last another fifteen, again with careful maintenance. In fact on some units, other farm buildings, often of brick or stone, had been adapted to house laying birds, thus avoiding any cabin depreciation as the buildings would be an integral part of the farm, being built anything up to a century ago. This situation was not all that common however.

RETURNS

1. Egg Revenue

Two factors are involved here, the yield per bird and the price of eggs.

Yield

The yield achieved per bird has, obviously an important effect on profitability. The most profitable third farms enjoyed an average yield of over 16 eggs per bird greater than that of the lower groups. Table XIX shows the performance of units in each yield category and Table XX, the distribution by farm type.

TABLE XIX : PERFORMANCE BY YIELD

Yield	< 240 eggs	241-250 eggs	251-260 eggs	> 260 eggs
Average Yield (Eggs)	221	245	256	266
Total Cost Per Bird (£)	5.56	5.69	5.83	5.87
Total Returns Per Bird (£)	5.78	6.21	6.63	6.67
Profit Margin Per Bird (£)	0.22	0.52	0.80	0.80
Total Cost Per Dozen (p)	30.09	27.92	27.37	26.53
Total Returns Per Dozen (p)	31.28	30.47	31.12	30.11
Profit Margin Per Dozen (p)	1.19	2.55	3.75	3.58
No. of Farms	8	8	8	9

TABLE XX : DISTRIBUTION OF FARM TYPES BY YIELD

Yield	< 240 eggs	241-250 eggs	251-260 eggs	> 260 eggs	Total
	---------- Percentages ----------				%
Specialist Egg Units	11	21	31	37	100
Mixed Farms	43	29	21	7	100
Family Farms	18	9	27	46	100
Non-Family Farms	27	32	23	18	100
Home Rearers	29	25	21	25	100
Bought In Pullets	21	26	26	27	100
White Bird Units	27	20	27	26	100
Brown Bird Units	33	25	33	9	100
Mixed Colour Units	Nil	33	Nil	67	100
Home Feed Mixers	25	25	33	17	100
Purchased Compounds	24	24	19	33	100

As Table XIX shows, there was a great difference in profitability between the high and the low yielding farms. The margin of the 251-260 eggs group is equal to that of the 260+ group, only because the proportion of home mixing units amongst the former is greater than that amongst the latter.

Table XX shows, as would be expected, that most of the highest yielding farms were either mainly white or had flocks of brown and white birds in equal proportions. However, taking the two highest yield categories, 42 per cent of all brown units are included, compared to 53 per cent of all white units; so the difference is not so marked as perhaps would be expected from the results of laying trials. In fact, yields obtained from mainly brown units were much more consistent than those of white units. The range among brown units was 227-263 eggs per bird, whereas that for white units was 186-280 eggs per bird. It must be said however, that as the length of the laying cycles varied considerably, the average yields on each unit are not always strictly comparable. Thus a unit with a laying cycle of 18 months would be expected to have a much lower yield per bird over a 52 week period, than a unit with only a 13 month laying cycle. Similarly, if point-of-lay pullets are bought at 20 weeks of age, rather than at 18 weeks, the yield per bird per annum should be greater, as the birds will hopefully be coming into production two weeks earlier.

Specialist units performed much better than the mixed farms, with well over two thirds of all specialist units in the highest yield groups. Similarly, family farms had better results than non-family farms on average. The units buying-in compounds performed slightly better than the home mixers, but there was no significant difference between the home rearers and units buying point-of-lay pullets.

Egg Prices

The average egg price received on brown units was 31.78p per dozen, exactly two pence higher than that on white units, at 29.78p per dozen. The difference of two pence is slightly less when only the prices received from the packing

station are taken into account, farm gate sales being ignored. As the brown bird units sold, on average, twice as many eggs directly at the farm gate as the white bird units, (12 per cent of total production on the former and 6 per cent on the latter), the overall average price is boosted more on brown units, as farm gate sales are generally made at very favourable prices.

As units in this section could sell up to 30 per cent of their output at the farm gate, this means that the average price paid by the packing station could be increased by as much as two pence per dozen over the year as a whole. The increment in most cases was, however, under one penny per dozen when averaged over the total production. Of all 33 units only 21 (64 per cent), sold a significant proportion of their output at the farm gate, although nearly all farms sold off second quality eggs in this way. The average proportion sold at the farm gate on the 21 units was 11 per cent of total production.

It is interesting to note that over a quarter of the units in this section, planned to become Producer Wholesalers or Retailers, within five years, either trying to sell all eggs directly themselves or at least to cut down their supplies to the packing station to below half of their annual production. This desire was not restricted just to the smaller units where the low volume of eggs makes the search for a market relatively easy. A similar proportion of units among the large-scale producers also expressed their intentions of becoming egg salesmen in the near future.

Of the packing stations supplied, 55 per cent of producers used national co-operative packers, 35 per cent local company packers and the rest used their own company packing station. There appeared to be no difference in the average prices paid by the three types, although the sample, having been divided into white, brown and mixed colour units, is probably too small for effective analysis.

Most of the packing stations made bonus payments to producers, but this did vary. Usually a quantity case bonus was paid either quarterly or annually and with some stations a brown egg bonus was also paid. With some packing

stations no bonus payment was made but this was compensated for by slightly higher weekly prices, resulting in little difference to the end prices. Bonus payments usually added anything up to 1.5p per dozen on to the basic price for brown units, and up to around one penny per dozen for white units.

The price of eggs for any one unit, was obviously affected by the weight gradings achieved. The gradings depend on many factors, the most important of which is the strain of birds housed. Thus different strains give different grading profiles over time and the producer has therefore to decide which strain produces the sort of grading he requires. Also as the length of time in lay increases, so the proportion of grades 1, 2 and 3 increases but the quantity and quality of the eggs deteriorates, giving a higher proportion of second quality eggs, with their resulting low returns. Similarly, if birds have been force-moulted, the average egg weight will be higher in the second laying cycle, but again this is tempered by lower numbers of eggs, although quality should not be a problem and it may even improve on the previous cycle of performance.

The average proportion of second quality eggs produced over a yearly period is often difficult to calculate, as on many units, producers tend to pick out the cracked eggs either for home use for farm gate sales. On some units it was stated that the proportion of seconds discovered by their packing station did not alter even when this process of removing cracked eggs was for some reason discontinued. However, investigation of this allegation is outside the scope of this report. In most cases it made financial sense to remove the cracked eggs on the farm, as the price received at the farm gate was often very close to that of first quality eggs and the demand from the public was apparently insatiable.

One last notable point was that on many basically white bird units, producers were tending to house a small proportion of brown birds, almost solely to supply their farm gate demand. In fact only five units housed exclusively white birds over the survey period.

2. Other Revenue

Other revenue made up a very small part of total revenue and it consisted almost entirely of sales or valuations of hen manure. The manure was both a blessing and a problem for producers. For deep pit units on arable farms there are considerable fertilizer savings to be made, but for a manually cleaned unit in a suburban area, the problems can be enormous.

Revenue from manure was obtained by 19 of the 33 units, and averaged only 4.3p per bird. The majority of the 19 units were on mixed farms where the revenue took the form of a credit from another, land using enterprise. Where this was the case, the manure was valued at £1 per tonne over the cost of extraction and dispersal, which was anything up to £4 per tonne.

Some specialist units in mainly arable districts did manage to sell some or all of their manure to neighbouring farmers. The most common agreement was that the purchaser would cart and spread the manure himself and pay the producer up to £1 per tonne. The producer is therefore saved considerable time and expense and at the same time receives some financial benefit. The marked rise in proprietary fertilizer prices during the last few years, has certainly made poultry manure more attractive to cropping farmers. Whereas a few years ago it was difficult to find a farmer to take the manure, they now have to pay for the privilege in certain areas. Of course in industrial and suburban areas the picture is often completely different. Producers usually have to bear the cost of disposal themselves, often having to travel a fair distance to find suitable sites. There may be a small demand from gardeners but this is insignificant.

There is therefore a potential difference of up to 50p per bird, between units in an arable, country district and those in a suburban, residential areas; solely depending on manure disposal. In the former case the producer may be saved a cost of up to 20p per bird for removal, and receive 5p for the manure. In the latter case, the cost of disposal could be as high as 25p per bird, although it must be borne in mind that the figures are based on contracting rates and that the actual rates on farms will be lower. However this does illustratrate another way in which siting and farm type affect unit profitability.

ECONOMIES OF SCALE

One note of caution must be sounded here. As farms can only be compared fairly on a per bird or per dozen basis, it is easy to lose sight of the levels of actual enterprise profits being made on different farms. A producer achieving a profit of 50p per bird on 20,000 birds may feel, with some justification, that he is rather better off than a producer achieving £1 per bird profit on only 3000 birds. For the purposes of this survey however, the former would be said to be doing only half as well as the latter. It is also as well to remember that on many small units, allowance has been made for unpaid family labour, so that this must be added back to profits to produce the actual net farm income accruing from the egg enterprise.

Unfortunately, due to the unavoidable division by selling type of the seventy farms in the survey, the sample sizes, when looking for scale comparisons, are too low to be very definitive. However, some indications can be gleaned from the results available. Table XXI shows the distribution of units in each profitability group by size.

TABLE XXI : DISTRIBUTION OF SIZE GROUPS BY PROFITABILITY

Profitability Group	< 5,000 birds	5,-9,999 birds	10,-19,999 birds	> 20,000 birds
	percentages			
Upper Third	20	36	44	13
Mid-Third	20	18	44	50
Lower Third	60	46	12	37
Total	100	100	100	100
No. of Farms	5	11	9	6

The table shows that the larger units tend to show higher profits per bird, at least up to the 10-19,000 category. Above this size there are problems in any case as nearly as the company units are in this category and as these may

supply their own packing station and may be supplied by their own feed mill, their profits may not be strictly comparable with the rest. It is also worth noting that the 10-19,000 category has a higher proportion of home feed mixers within it than the other groups. As this is such an important determinant of profitability, it is only to be expected that the group with the highest proportion of such units should be the most profitable. It could be argued that as home feed mixing tends to occur more on the larger units, this is in itself an example of increasing economies to scale. This would be true, were all units specialists but home feed mixing tends to be a feature of mixed farms where the plant may be used to supply other livestock enterprises.

Table XXII shows the relative performance of each size group.

TABLE XXII : PERFORMANCE AVERAGES BY SIZE GROUP

Averages	20,000 + birds	10,-19,999 birds	5,-9,999 birds	< 5000 birds
Yield Per Bird (eggs)	249	241	251	247
Feed Consumption Per Bird (Kgs)	41.07	42.23	43.18	45.91
Feed Conversion Rate	1.98	2.11	2.07	2.24
Labour Per 1000 Birds (Hours)	360	362	381	376
Fixed Costs per Bird (p)	72	65	66	57
Total Costs per Bird (£)	5.77	5.40	5.78	6.29
Total Returns per Bird (£)	6.22	6.23	6.42	6.48
Fixed Costs per Dozen (p)	3.49	3.28	3.15	2.76
Total Costs per Dozen (p)	27.82	26.91	27.65	30.57
Total Returns per Dozen (p)	29.97	31.01	30.69	31.48
Margin Per Bird (p)	45	83	64	19
Margin Per Dozen (p)	2.15	4.10	3.04	0.91

The influence of the home mixing units is highlighted in the 10-19,000 group, as its feed conversion rate is, with the exception of the smallest group, the worst, yet its average profit margin is the highest.

In terms of physical efficiency, the large scale units are certainly better than the rest, achieving an average feed conversion rate under 2.00, similarly their labour requirements per bird are lower, although only slightly so. One interesting point was the higher fixed costs of production shown by the over 20,000 group, indicating perhaps an area where there are diseconomies to scale. The main reason for the high fixed costs appeared to be high repair and maintenance costs coupled with slightly higher deadstock depreciation costs.

In summary therefore, it appears that economies to scale do occur in egg production, at least up to 20,000 bird sizes and probably beyond. However in the prevailing financial climate, the advantages of home feed mixing outweigh any economies to scale and that this also obscures attempts to determine the parameters of any advantages gained by increasing bird numbers.

SECTION II

PRODUCER WHOLESALE AND RETAIL UNITS

Producer Wholesale/Retail units are defined for the purposes of this survey as those units selling over 30 per cent of their total production to outlets other than packing stations. Whilst some of the units in this category did sell some of their eggs to packing stations, the vast majority sold their eggs already graded, to wholesalers, retailers or consumers. Included in the group of units selling to wholesalers are the 'ranch packers', namely those units where eggs are graded and perhaps packed on behalf of a packing station, which then rewards the producer with higher prices.

In this section, farms supplying packing stations will be referred to as PSS units and producer wholesale/retailing units as PWR units.

The sample of PWR units is in many ways similar to that of the PSS units with a few important exceptions. Table XXIII gives the comparative composition of each section, by the different farm types.

As Table XXIII indicates, virtually all the PWR units house only brown birds, whereas the division among the PSS units is more equal between brown and white birds. The average PWR unit is smaller than the average PSS unit, but simple averages hide the fact that in this survey there were no PWR units of over 40,000 birds in size. The reason for this is presumably because over this size, competition in the market becomes very intense. Units may have to begin buying in ungraded eggs from other producers on a large scale, in order to compete successfully for the volume demand of supermarkets and chain stores. If quantities of eggs are bought in, the selling and production operations will begin to diverge and become two separate financial units.

The proportion of mixed farms is slightly higher on the PWR units, as is the proportion of family farms. This is not surprising in view of the smaller average size of the PWR units.

The importance of having a ready market is illustrated by the high

TABLE XXIII : DISTRIBUTION OF FARM TYPES BY SELLING METHOD

	Packing Station Suppliers	Producer Wholesalers/ Retailers
	percentages	
White Bird Units	45	5
Brown Bird Units	36	92
Mixed Colour Units	19	3
	100	100
Specialist Egg Farms	58	43
Mixed Farms	42	57
	100	100
Family Farms	37	53
Non-Family Farms	63	47
	100	100
Home-Feed Mixers	36	32
Purchased Compounds	64	68
	100	100
Home Pullet Rearers	42	32
Bought in Pullets	58	68
	100	100
Site: Industrial County	64	81
Site: Agricultural County	36	19
	100	100
Full Environmental Control	36	38
Part Environmental Control	55	46
Nil Environmental Control	9	16
	100	100
Average Size	19389 birds	10359 birds
No. of Farms	33	37

proportion of PWR units situated in the industrial counties rather than in the agricultural ones. The predominantly agricultural counties being: Cheshire, Staffordshire, Shropshire and Cumbria, the remainder being the industrial counties.

There was very little difference with respect to methods of purchasing feed and pulletsor to the prevalence of environmentally controlled cabins.

COSTS, RETURNS and MARGINS

The comparative results and the characteristics of the two groups are illustrated in Tables XXIV and XXV.

TABLE XXIV : COSTS AND RETURNS BY SELLING METHOD

Averages	P.S.S. Units Per Bird £	%	P.W.R. Units Per Bird £	%	P.S.S. Units Per Dozen p.	P.W.R. Units Per Dozen p.
COSTS						
Feedstuffs	4.275	75	4.322	70	20.80	21.99
Bird Depreciation	0.805	14	0.697	11	3.93	3.54
Labour	0.364	6	0.582	10	1.77	2.96
Power	0.085	1.5	0.104	2	0.41	0.53
Deadstock Depn.	0.084	1.5	0.120	2	0.40	0.61
Repairs and Maintenance	0.077	1	0.062	1	0.37	0.32
Miscellaneous	0.053	1	0.111	2	0.25	0.56
Packing Materials	0.000	0	0.136	2	0.00	0.70
TOTAL	5.743	100	6.134	100	27.93	31.21
RETURNS						
Egg Revenue	6.308		7.237		30.60	36.74
Other Revenue	0.025		0.029		0.13	0.15
TOTAL	6.333		7.266		30.73	36.89
MARGIN	0.590		1.132		2.80	5.68

TABLE XXV : PERFORMANCE FACTORS BY SELLING METHOD

Averages	P.S.S. Units	P.W.R. Units
Yield per Bird	247.4 eggs	236.5 eggs
Feed Intake per Bird	42.823 Kgs	43.231 Kgs
Feed Conversion Rate	2.08	2.20
Mortality Rate	8.45%	7.53%
Feed Price per Tonne	£99.38	£100.12
Protein Level of Ration	16.45%	16.54%
Breakeven Yield	225 eggs	201 eggs
Stock Valuation Increase	16.34 pence per bird	20.74 pence per bird
Laying Cycle Length	59.79 weeks	61.95 weeks
Labour Time per 1000 Birds	370 hours	631 hours
Age of Unit	14.84 years	13.46 years
Age of Farmer	46.62 years	42.32 years

What is immediately apparent is the much higher average margin earned by the PWR units compared to the PSS units. The average profit margin per dozen of the PWR units is twice that earned on PSS units and indeed, nearly three times as great as the average earned by PSS units where no home feed mixing was practised.

It is not very difficult to discover the reason behind this wide diversity in profitability. Although the average PWR unit had a total production cost which was over 3p per dozen higher than the average PSS unit, the total returns were over 6p per dozen higher. This is clearly the result of the much higher prices obtained on the PWR units. In fact, the range of prices received was fairly wide among the PWR units due to the diversity of selling methods. Some farms in the group would supply a packing station with half of their output and perhaps sell all the rest to a wholesaler, giving an overall average price only slightly greater than that which would have been received had all output gone to the packing station. A producer selling all of his output directly to the consumer on the other hand, would receive an average overall price only slightly below the average retail price charged by high street shops. This diversity in

selling methods resulted in a range of from 32p per dozen to 45p per dozen received by PWR units. Table XXVI reflects this diversity and shows what a difference the end price of the eggs made to profitability in the PWR group.

TABLE XXVI : PERFORMANCE BY FINAL EGG PRICE

Average Price per Dozen	Under 35p	35.01 to 37p	37.01 to 39p	Over 39p
Profit margin per Bird	82p	101p	134p	140p
Yield	243 eggs	238 eggs	239 eggs	227 eggs
Feed Conversion Rate	2.08	2.19	2.20	2.33
Labour Used per 1,000 birds	567 hours	569 hours	697 hours	698 hours
Total Costs per Bird	£5.94	£6.11	£6.24	£6.25
No. of Farms	10	9	9	9

Table XXVI shows that profitability among the PWR units increased as the end price for the eggs increased, in spite of the higher technical efficiency of units averaging the lower prices.

Table XXVI also indicates that the range in profitability within the PWR group was fairly large. In fact it varied from a profit of well over £2 per bird to a small loss per bird, although it should be said that of the 37 units in the sample, only two achieved margins over £2 per bird and only four earned margins of below 50p per bird. Apart from these extremes, the units were surprisingly evenly distributed about the mean profit figure for the group as a whole.

It would seem therefore that the selling method of a PWR unit is all important in determining profitability. Tables XXVII and XXVIII, therefore divide the PWR units into three broad groups, according to method of sale.

As might be expected, profitability increased the further the producer was along the marketing chain. However it is noticeable that the average margins of profitability in each group were not substantially different. The

TABLE XXVII : COSTS AND RETURNS BY MARKETING TYPE

	Units Selling Mainly to Wholesalers		Units Selling Mainly to Retailers		Units Selling Mainly to Consumers		Selling to Wholesalers	Selling to Retailers	Selling to Consumers
COSTS	£ per Bird	%	£ per Bird	%	£ per Bird	%	p.Per Dozen	p.Per Dozen	p.Per Dozen
Feedstuffs	4.394	73	4.253	70	4.573	67	21.72	21.94	22.89
Bird Depreciation	0.737	12	0.688	11	0.663	10	3.62	3.54	3.32
Labour	0.446	8	0.572	9	0.951	14	2.22	2.95	4.70
Power	0.091	1.5	0.108	2	0.112	1	0.45	0.56	0.56
Deadstock Depreciation	0.105	1.5	0.129	2.5	0.097	1	0.52	0.66	0.48
Repairs and Maintenance	0.051	1	0.063	1	0.074	1	0.26	0.33	0.39
Miscellaneous	0.058	1	0.116	2	0.200	3	0.29	0.59	1.03
Packing Materials	0.112	2	0.135	2.5	0.199	3	0.56	0.70	0.98
TOTAL	5.994	100	6.064	100	6.869	100	29.64	31.27	34.35
RETURNS									
Egg Revenue	7.021		7.186		8.031		34.69	36.95	40.14
Other Revenue	0.034		0.027		0.026		0.17	0.14	0.13
TOTAL	7.055		7.213		8.057		34.86	37.09	40.27
MARGIN	1.061		1.149		1.188		5.22	5.82	5.92
No. of Farms	9		24		4		9	24	4

TABLE XXVIII : PERFORMANCE LEVELS AND CHARACTERISTICS BY MARKETING TYPE

	Units Selling Mainly to Wholesalers	Units Selling Mainly to Retailers	Units Selling Mainly to Consumers
Yield per Bird	243.1 eggs	234.1 eggs	239.5 eggs
Feed Intake per Bird	43.42 Kgs	42.94 Kgs	44.57 Kgs
Feed Conversion Rate	2.150	2.216	2.231
Mortality Rate	7.06%	7.53%	8.52%
Labour Used per 1,000 birds	453 hours	633 hours	1016 hours
Breakeven Yield	206 eggs	197 eggs	205 eggs
Feed Price per Tonne	£101.54	£99.19	£102.56
Length of Laying Cycle	59 weeks	62 weeks	67 weeks
Specialist Units	44%	33%	100%
Mixed Farms	56%	67%	NIL
Home Feed Mixers	22%	37%	25%
Purchased Compounds	78%	63%	75%
Flock Size	15514 birds	9083 birds	6414 birds

units selling to consumers improved their profits over the units selling to wholesalers, by only 12 per cent on a per bird basis. The variance in profit margin between the three groups was relatively small, but within each group there were quite wide profitability variations and being at the furthest point up the marketing chain did not always guarantee the highest profit level. As with the PSS units therefore, the farms have been divided according to their profitability ranking, and Tables XXIX and XXX show their financial results and other characteristics.

The cost and returns structure of the PWR units need to be examined in order to ascertain how they differ from the PSS units, as well as the reason for differences which occur within the group.

TABLE XXIX : COSTS AND RETURNS BY PROFITABILITY

Averages	Upper Third	Middle Third	Lower Third	Upper Third	Middle Third	Lower Third
COSTS	£ per Bird	£ per Bird	£ per Bird	p. per Dozen	p. per Dozen	p. per Dozen
Feedstuffs	4.354	4.318	4.294	21.25	22.71	21.96
Bird Depreciation	0.667	0.651	0.779	3.24	3.42	3.97
Labour	0.645	0.541	0.564	3.16	2.84	2.89
Power	0.105	0.099	0.110	0.52	0.52	0.56
Deadstock Depn.	0.154	0.104	0.103	0.77	0.54	0.53
Repairs and Maintenance	0.043	0.070	0.071	0.21	0.37	0.37
Miscellaneous	0.101	0.090	0.142	0.49	0.48	0.73
Packing Materials	0.120	0.136	0.153	0.59	0.72	0.77
TOTAL	6.189	6.009	6.216	30.23	31.60	31.78
RETURNS						
Egg Revenue	7.882	7.082	6.759	38.45	37.24	34.51
Other Revenue	0.026	0.033	0.027	0.12	0.18	0.14
TOTAL	7.908	7.115	6.786	38.57	37.42	34.65
MARGIN	1.719	1.106	0.570	8.34	5.82	2.87
No. of Farms	12	13	12	12	13	12

TABLE XXX : PERFORMANCE AND CHARACTERISTICS BY PROFITABILITY

Averages	Upper Third	Middle Third	Lower Third
Yield per Bird	246.6 eggs	228.6 eggs	234.9 eggs
Feed Intake per Bird	43.90 Kgs	43.04 Kgs	42.76 Kgs
Feed Conversion Rate	2.145	2.267	2.187
Mortality Rate	6.92%	9.04%	6.48%
Labour per 1000 birds	678 hours	595 hours	623 hours
Feed Price per Tonne	£99.42	£100.46	£100.46
Protein Level in Ration	16.8%	16.4%	16.4%
Breakeven Yield	193 eggs	193 eggs	215 eggs
Average age of unit	11.75 years	13.38 years	15.25 years
Specialist Egg Farms	50%	42%	42%
Mixed Farms	50%	58%	58%
Home Feed Mixers	33%	31%	33%
Purchased Compounds	67%	69%	67%
Home Reared Pullets	25%	31%	42%
Purchased Pullets	75%	69%	58%
Family Farms	50%	23%	33%
Non Family Farms	50%	77%	67%
Flock Size	8752 birds	10815 birds	11472 birds

COSTS

1. Feed Costs

As Table XXIX shows, the PWR units show virtually the complete reversal of the results achieved by the PSS units. Thus, the lowest third PWR group in order of profitability, had the lowest feed cost per bird rather than the highest, although noticeably this is not so on a per dozen basis.

Due to the very high proportion of brown bird units in the PWR group and their longer average laying cycle compared to the PSS units, it is to be expected that feed intake per bird and feed conversion rates would be higher in the PWR group. However the PWR group does compare fairly well with the brown bird units in the PSS group. Here, the PWR farms had lower feed costs per bird due to a lower average consumption, but feed conversion rates were virtually identical because of the much better yield achieved on the PSS brown bird units. So there seems to be no evidence of poorer technical performance by the average PWR units compared to PSS units. However, as Table XXVIII shows when the performance levels of the different selling types are looked at, it can be seen, that generally, as the level of marketing increases, the standard of performance tends to deteriorate. Thus the average feed conversion rate on units selling mainly to consumers, is poorer than either of the other two unit types. This of course, does give some substance to the argument that a division of labour leads to greater efficiency. Although profitability was greatest on units selling to retailers and consumers, resource use up to the marketing stage, appeared to be that much poorer than on PSS units or units supplying wholesalers. In other words it does seem likely that the farmer marketing his own eggs, had many more day to day problems to overcome than the farmer who did not have to worry about the eggs, after they had left the farm. In consequence, the production management of the former was that much poorer.

Feed costs on the PWR units, contributed a smaller proportion of total costs than on PSS units, 70 per cent rather than 75 per cent. The reason for

this was that the costs of marketing were included in the accounts of PWR units, whereas there was little or no marketing cost on PSS units. This therefore increases total costs per bird on PWR units, but it will not affect feed costs. Hence the contribution of feed towards total costs will be a smaller proportion on PWR units. Obviously the level of feed costs on PWR units was important but it appeared not to be as crucial in profit determination as with PSS units. The highest profitability group did have the lowest feed cost per dozen and the lowest feed conversion rate, although the latter was only achieved by much better yields than on other units, their feed consumption being higher than the others. However the differences in the average feed costs were nowhere near as marked as that between the PSS profitability groups.

One surprising factor was that home feed milling and mixing had no influence on group profitability, there being virtually an equal proportion of home mixers in each PWR profitability group. As Table XXXI shows, the average margin over feed per bird, was actually greater on the units using purchased compounds. The main reason for this lack of advantage to home mixers was almost solely because of their lower technical performance, with consequent poor feed conversion rates. The average price of eggs received was notably almost identical in both cases.

TABLE XXXI : HOME MIXED AND PURCHASED COMPOUNDS: COSTS, RETURNS AND PERFORMANCE

		Home-Feed Mixing	Purchased Compounds
Yield		228	241
Feed Per Bird		43.5	43.1
Feed Conversion Rate		2.29	2.15
Feed Cost Per Bird	£	4.10	4.43
Total Return Per Bird	£	7.01	7.39
Margin over Feed Per Bird	£	2.91	2.96
Profit Margin Per Bird	£	1.08	1.16
Feed Cost Per Dozen	p	21.66	22.16
Total Return Per Dozen	p	36.88	36.90
Margin over Feed Per Dozen	p	15.22	14.74
Profit Margin Per Dozen	p	5.63	5.71
No. of Farms		12	25

As in the PSS group, the home mixing units tended to be on mixed farms and were of higher than average size. Similarly a high proportion of home mixers also reared their own point-of-lay pullets.

By dividing the PWR units according to their feed conversion rate, the relative importance of high technical efficiency in explaining levels of profitability among PWR units is demonstrated. Table XXII shows the farms with the best feed conversion rates actually obtained the lowest average margin over feed per dozen. This was not due to feed costs but to low egg returns.

TABLE XXXII : PERFORMANCE BY FEED CONVERSION RATE

Feed Conversion Rate	< 2.050	2.051 to 2.200	2.201 to 2.350	> 2.350
Yield per Bird eggs	256	234	236	225
Feed per Bird kgs	41.2	41.8	44.0	45.7
Feed Cost per Bird £	4.29	4.08	4.48	4.44
Total Returns per Bird £	7.38	7.18	7.33	7.19
Margin over Feed per Bird £	3.09	3.10	2.85	2.75
Feed Cost per Dozen p	20.19	20.88	22.83	23.73
Total Returns per Dozen p	34.57	36.77	37.31	38.30
Margin over Feed per Dozen p	14.38	15.89	14.48	14.57
No. of Farms	6	11	13	7

The average feed cost per tonne on PWR units, was about £1 higher than for the PSS units, but this was of little significance bearing in mind the slightly higher proportion of PSS units with home mixed feedingstuffs, and the higher average level of the protein content in the PWR rations. Also as the PWR units were, on average, of smaller capacity, very few would be able to qualify for quantity discounts on feed. In fact one or two of the PWR units bought some or all of their feed in bags rather than in bulk whereas all the PSS units bought

in bulk.

One last point to note was that the highest profitability group did feed on average a higher protein enriched ration than the other two groups and although the average intake was higher, the yield achieved more than compensated for this.

2. Bird Depreciation

The average bird depreciation cost on PWR units, was over ten pence per bird less than that of the PSS units and there were quite a few contributory factors.

The first reason is that brown birds generally have a lower depreciation cost than white birds. However, as the difference between the brown and white bird livestock depreciation cost within the PSS group, was only three pence per bird, this was not such a decisive factor. Linked with this however, was the problem of bird valuation increases at the year end. With the valuation increase being smaller for white birds, the average margin increase, accountable to valuation change was 20.74p per bird for PWR units, but only 16.34p per bird for the PSS units.

The average price of pullets purchased was no different from that paid by brown bird PSS units, but the average cull value received was slightly higher, as a higher proportion of PWR units sold culled birds to "foreign" restaurants and outlets other than the usual poultry processors.

Other reasons helping to lower bird depreciation costs on PWR units were their longer laying cycles and lower mortality rates compared to the PSS units. The average length of the laying cycle was nearly 62 weeks, two weeks longer than the PSS average, and the average mortality rate was lower by nearly 1 per cent on PWR units. A slightly higher proportion of PWR units force-moulted part of their flock, which would tend to increase the overall average laying cycle length, but the main reason for longer cycles appeared to be a definite

policy decision by some units to keep to an extended cycle in order to produce a high proportion of large sized eggs, for which they had a lucrative market. The very small grades, on the other hand, were often difficult for PWR units to dispose of, and would probably require severe price cutting before they were purchased.

There was only one all-in/all-out unit amongst the PWR units, which is not surprising considering the need for direct sellers to maintain a more or less stable grading pattern and a steady supply throughout the year.

As far as mortality is concerned, the PWR units did have an average mortality rate, somewhat higher than that of the twelve brown bird PSS units, 7.5 per cent compared to only 6 per cent. This is only to be expected with the incidence of long laying cycles and force-moulting being much greater amongst the PWR units.

The coincidence of long laying cycles and high mortality rates is again borne out when the selling types within the PWR group are looked at in this context. Thus the average mortality rates for units selling mainly to wholesalers, mainly to retailers, and mainly to consumers, are respectively 7.06 per cent, 7.53 per cent and 8.52 per cent, with the corresponding average lengths of laying cycle being 59 weeks, 62 weeks and 67 weeks.

A final word of warning must, however, be made about comparisons between units, of bird depreciation costs. The actual capacity used does affect per bird and per dozen figures. Thus the actual bird depreciation cost may be identical on any two farms but because one has a higher average number of birds on the farm during the year, his livestock depreciation cost per bird will be lower. A hypothetical example will illustrate this point:-

A and B are two units of identical capacity, assume both fill units to capacity when rehousing, and both have the same number of deaths. All prices are identical. The only difference is that Farm A has a 1 week disease break and Farm B, a 4 week disease break. Bird depreciation costs would be worked out as follows

for a 52 week period.

Farm A		Farm B
10,000 birds	Capacity	10,000 birds
10,000 birds	Birds in	10,000 birds
£14,000	Cost	£14,000
9,400 birds	Culls out	9,400 birds
£4,700	REVENUE	£4,700
£9,300	NET COST	£9,300

Average Numbers = 51 wks @ 9700 birds
1 wk @ NIL
= 52 wks average 9513 birds

Average Numbers = 48 wks @ 9700 birds
4 wks @ NIL
= 52 wks average 8954 birds

. . Livestock Depreciation Per Bird

= £0.98 — Capacity Used = 95 per cent

= £1.04 — Capacity Used = 90 per cent

Of course, on a hen housed basis, livestock depreciation costs per bird would be identical in the above case, but unfortunately basic information on yields and feed usage would have become quite meaningless over the fixed time period of the survey.

Under-utilization of capacity generally, was far less marked than in the 1969/70 survey, but this is in part due to the very high mortality rates experienced in 1969/70. However the importance of making full use of capacity must be stressed, as this not only reduces per bird costs but also increases per bird returns and hence per bird profit margins.

As the average unit capacity used was greater on PWR units, 88 per cent compared to 85 per cent on PSS units, the total bird depreciation cost would have been spread over more birds, giving a lower per bird cost. Also it is noticeable that the lower third profitability group of PWR units had a much

higher livestock depreciation than the other two groups, and that the use made of the unit capacity made in this group was relatively low. The high bird depreciation cost on the lowest profitability group is also partly explained by the groups short average laying cycle, 58 weeks compared to the total group average of 62 weeks.

3. Labour

Table XXXIII shows the averages and ranges of labour performance factors for the PWR units and each selling type.

As the table shows, labour costs made up an average of 10 per cent of all production costs on PWR units as a whole, compared to only 6 per cent on PSS units. The most noticeable point however, is that it required nearly three times the amount of labour to produce and sell eggs directly to consumers, than to solely produce the eggs prior to sale to a packing station. If the marketing chain is divided into four stages, it required 22 per cent extra labour time, over that needed for basic production, to pack and grade eggs, an extra 71 per cent if the eggs were supplied to retail outlets, and an extra 175 per cent to supply final consumers.

The labour cost added per dozen at each marketing phase, was 0.45p from PSS unit to wholesale supplier, 0.73p from wholesale to retail supplier and 1.75p from retail to consumer supplier.

Marketing Tasks

The actual operations required in reaching each phase, did vary from farm to farm, but there was a general pattern.

The units supplying wholesalers graded and candled their eggs, but did not generally pack the eggs any further than on to keyes trays and into cases, holding, usually, thirty dozens. The cases of graded eggs would then usually be collected by the wholesaler. On some units, some eggs were packed into pre-packs (cartons holding six eggs), but this would generally only be done if

TABLE XXXIII : LABOUR COSTS AND REQUIREMENTS

	Average	Range	Units Selling to Wholesalers	Units Selling to Retailers	Units Selling to Consumers
Labour Cost per Bird	58.2p	34.8p to 134.1p	44.6p	57.2p	95.1p
Labour Cost per Dozen	2.96p	1.54p to 6.34p	2.22p	2.95p	4.70p
Hours per 1,000 Birds	631 hours	338 hours to 1464 hours	453 hours	663 hours	1016 hours
Egg Output per £100 Labour	£1340	£714 to £2267	£1637	£1301	£909
Percentage of Total Costs	10%	6% to 17%	8%	9%	14%

requested by the wholesaler, and the terms of payment would then be altered to take the extra work into account. Also there would occasionally be some delivery of eggs by the producer, but this was generally only a small proportion of total output.

The units supplying retailers followed much the same procedure but most of the eggs would be delivered by the producer and sales of pre-packed eggs would be much more common. In many instances, units supplying delivered cases of eggs to shops and sold pre-packs separately to the retailer, so that his customers would actually see their eggs being transferred from the keyes trays to the pre-packs. There appear to be a number of reasons for this practice. Firstly, of course, the eggs are cheaper to buy on keyes trays and although the pre-packs have to be bought, not all the eggs sold have to be pre-packed. Some customers are content with eggs in paper bags whilst others bring their own containers. Some shops encouraged customers to return the pre-packs, thereby getting several "trips" from the same pack. Also, breakages should be less if the shop staff pack eggs for the customer, who at the same time can see that each egg is whole. Lastly the sight of the eggs on trays may help to promote a fresher image of the eggs to the customer. The producers generally made no profit on the sale of pre-packs.

The increased labour time required by the retail suppliers was therefore virtually all due to extra delivery time needed although where shops were supplied with pre-packed eggs extra packing time would have been required.

As the sample of units selling eggs direct to consumers was so small, it would be unwise to be too definitive, and it is not known how representative the sample was. However, within the group, several outlets were used, the most popular being the market stall. In this case all eggs would be on keyes trays and usually they would only be put into pre-packs at the specific request of a customer. Often paper bags or the keyes trays themselves were used for the larger orders. The extra labour needed here was obviously for selling as well

as delivery to the market. Other outlets included farm shops and door-to-door selling. With the former, eggs usually made up only a relatively small proportion of the total shop sales, and therefore their corresponding share of the overhead costs was small. The farm shops were of necessity in suburbs of towns with easy access for customers. In fact, the extra labour required to sell eggs through a farm shop was generally less than that required on market stalls, as the delivery time was obviated unless the unit was on another site.

For door to door selling, the labour time required was very great. There are physical limitations to the number of eggs which can be sold in any one hour by this method, which obviously boosts the labour requirement. As well as the need to deliver eggs in small quantities, virtually all had to be in pre-packs for easy disposal and to minimise breakages. Thus on this type of unit the eggs were fully packed and required hand delivery, making this the most labour intensive method of selling eggs.

The incidence of delivery and the proximity of the different unit types to population centres, is given below in Table XXXIV.

TABLE XXXIV : SITING AND DELIVERY BY MARKETING TYPE

	Units Selling to Wholesalers	Units Selling to Retailers	Units Selling to Consumers
	percentages		
Sited Within 10 miles of conurbation	44	46	75
Sited Within 10 miles of Major Town	22	54	25
More than 10 miles from Major Town	34	NIL	NIL
Delivery of All Eggs	NIL	58	75
Delivery of Some Eggs	33	30	NIL
No Delivery	67	12	25

Thus the further up the marketing chain, the greater the incidence of egg delivery and the closer the unit was to a major population centre.

To complete this look at labour requirements, the table below gives an indication of the average number of birds and the unit capacity that one full time worker could adequately manage in one standard man year, based on the survey findings.

TABLE XXXV : FLOCK SIZE REQUIRING ONE STANDARD MAN YEAR ONLY

Unit Type	Average Nos. approx.	Capacity of Unit
Units supplying Packing Station	6,000 birds	7,100 birds
Units supplying Wholesalers	4,900 birds	5,600 birds
Units supplying Retailers	3,500 birds	4,000 birds
Units supplying Consumers	2,200 birds	2,500 birds

It must be remembered that the above figures are averages only, and that there will be considerable variation from farm to farm.

Structure of Labour Force

The structure of the labour force on the PWR units, is given in Table XXXVI.

TABLE XXXVI : STRUCTURE OF LABOUR FORCE

	Male Family	Male Hired	Female Family	Female Hired	Totals
	percentages				
Full-Time	20	26	2	7	55
Part-Time	9	14	7	15	45
Total	29	40	9	22	100
Total	69		31		100

The main difference between the PWR and the PSS units was that the proportion of family labour contributed, was much greater on the former, 38 per cent

compared to 22 per cent. This is only to be expected, bearing in mind the smaller average size of the PWR units. Farmers and their sons made up over one quarter of the labour force on PWR units, compared to less than one fifth in the PSS group. The farmers also tended to be slightly younger in the PWR units.

What is perhaps surprising is that the proportion of hired female labour was lower on the PWR units, indeed, the overall proportion contributed by women was lower, although by only 4 per cent. It may have been assumed that packing and grading would have required the feminine touch, and therefore that women would have played a greater role on PWR units. However, the relative size of the PWR units again affects this, with smaller producers being able to use their own labour to pack and grade. On the larger units, where the volume of eggs was correspondingly high, where hired packing staff were required, women were preferred to men. Most delivery drivers were men however. This last point may account for the higher proportion of part-time male workers in the PWR labour force, although as with the PSS workers, the majority were general farm workers, employed only part-time on the egg enterprise.

Working Hours

The average number of hours worked by each type of worker is given in Table XXXVII.

TABLE XXXVII : HOURS WORKED

Average Hours Worked	Male Family	Male Hired	Female Family	Female Hired
Full-Time per year	2073	2470	2139	2026
Full-Time per week	39.9	47.5	41.1	39.0
Part-Time per year	975	846	1097	810
Part-Time per week	18.8	16.3	21.1	15.6

There were some differences in the number of hours worked compared to PSS units. Full-time farmers tended to work fewer hours on the PWR units, although

it should be remembered that a full-time egg producer may rear his own pullets, in which case the total hours worked on the farm will be greater than as shown.

The greatest difference was in the hired part-time female category. On the PWR units nearly 25 per cent fewer hours were worked. This may have been due to the smaller size of the PWR units. Thus, rather than employing one full-time woman, on what is possibly a monotonous task, better results may be obtained by employing three or four women part-time. This may then fit in nicely with any family or household business and provides, hopefully, a more convivial working atmosphere. Certainly it was very easy for units within suburbs of towns and cities to recruit part-time women workers.

4. Capital and Investment

Table XXXVIII shows the levels of capital and investment on PWR units.

The average PWR unit was more heavily capitalised than the average PSS unit, with historical fixed and working capital valuations being nearly 50p per bird greater on the PWR units. Obviously PWR units would be expected to have a greater capital outlay, needing such things as grading machines, packing sheds and delivery vehicles. But, some of the difference must be put down to the relative youth of the average PWR unit. Thus, the investment pattern over the last ten years or so, on PWR units, is almost exactly the reverse of the PSS group. Nearly one half of the PWR units had made major investments since 1972, whilst nearly one half of the PSS units had made no major investments since 1968, as a comparison of Tables XXXVIII and XVII reveals. This is surely an indication that PWR units have consistently been making higher profits than PSS units following the winding up of the B.E.M.B., and in consequence have had sufficient funds to generate new investment.

Looking within the PWR group, the units supplying consumers tended to have much older buildings and equipment and therefore their historical capital valuation was lower than that of the other groups. The need for delivery vehicles as the producer progressed along the marketing chain, is clearly shown by the

TABLE XXXVIII : CAPITAL, RATES OF RETURN AND INVESTMENT TIMING

Averages	Units Supplying Wholesalers	Units Supplying Retailers	Units Supplying Consumers	All Farms
HISTORICAL VALUES				
Buildings & Equipment per Bird	85p	85p	61p	83p
Machinery & Vehicles per Bird	5p	16p	12p	13p
Total Fixed Capital per Bird	90p	101p	73p	96p
Fixed & Working Capital per Bird	£1.77	£1.99	£1.61	£1.91
REPLACEMENT VALUES				
Buildings & Equipment per Bird	£3.88	£3.90	£3.68	£3.87
Machinery & Vehicles per Bird	£0.06	£0.26	£0.34	£0.22
Total Fixed Capital per Bird	£3.94	£4.16	£4.02	£4.09
Fixed & Working Capital per Bird	£5.44	£5.80	£5.62	£5.69
Return on Fixed Capital	27%	28%	30%	28%
Return on Fixed & Working Capital	20%	20%	21%	20%
Range in Return on All Capital	+9% to +39%	-3% to +47%	14% to 28%	-3% to +47%
Average Capacity Used	87%	89%	86%	88%
Percentage of Units making major investments				
Since 1972	78%	42%	25%	49%
Not Since 1972 but after 1968	NIL	29%	25%	22%
Before 1968 only	22%	29%	50%	29%

rising machinery and vehicle valuations.

The rates of return on fixed and working capital were substantially higher on the PWR units, nearly twice as high as on the PSS units, but this is in part the result of differences in historical valuations. If the element of valuation increase is deducted from profits, the average real rate of return on all replacement capital, falls to 16 per cent on the PWR units. Although this is still far

better than the average for the PSS group, it is not so remunerative when it is realised that the rate of inflation was also around the same level during the survey period.

Within the PWR group, the three selling types had similar rates of return, but it is interesting to note the difference in investment patterns between them. Virtually all the wholesale suppliers had made major investments since 1972, whilst less than half the retail suppliers and only one quarter of the consumer suppliers had done so.

A point worth noting is that the extra fixed capital needed to become a PWR unit, was not usually as high as might be expected. Many producers had bought second-hand graders and converted existing buildings into packing and grading sheds, using their own labour. If delivery was necessary or desired, the vehicle would probably be the costliest item, if the farm car or van was unsuitable. Delivery vans had to be reliable and therefore were replaced at fairly regular intervals. On the larger farms there were often additional capital expenses involved in maintaining pleasant working conditions for the staff in the packing shed.

As far as future investment intentions are concerned, fewer PWR units intended to expand over the next five years than PSS units, which is slightly surprising considering their relative profitabilities. Table XXXIX provides details of producers intentions.

TABLE XXXIX : FUTURE INTENTIONS WITHIN FIVE YEARS

	Units Supplying Wholesalers	Units Supplying Retailers	Units Supplying Consumers	All PWR	All PSS
To Increase Capacity	33%	29%	NIL	27%	33%
To Decrease Capacity	NIL	4%	NIL	3%	18%
No Change	67%	67%	100%	70%	49%

An interesting point is that unlike the PSS units, the large scale PWR units

were not intending to expand, and in fact expansion was generally only contemplated, where the producer was relatively sure of his market. The size of unit had no bearing on intentions within the PWR group. The expansion procedure appeared to be in general to find a market first, buy in eggs from other producers to supply and consolidate it, then put up your own cabin to satisfy the new demand, gradually phasing out the need for buying in. All the farmers in this group were very conscious of the keen competition existing for egg outlets and were therefore aware of the dangers of over-expansion with its resulting embarrassment of surplus eggs.

5. Other Costs

There were differences in the other costs of production between the PWR and the PSS units. Electricity costs were higher on the PWR units, which may be a result of the more modern cabins and equipment on these units, giving perhaps a tighter control of the cabins heating and lighting. As most of the electricity cost was caused by non-stop extractor fans during the drought of 1976, units with more fans obviously would pay more. Also of course, PWR units need electricity to power the grading machines and some would be needed to heat and light the packing sheds. In some cases, freezers for liquid egg also boosted the final bills.

Repairs and maintenance costs were lower on the PWR units and this can again be put down to the more modern buildings and equipment, requiring much less attention than the older PSS units.

Miscellaneous costs on the PWR units were more than double those of the PSS units, this being mainly due to the inclusion of delivery vehicle fuel, tax and insurance costs in the PWR accounts.

Packing Material Costs

The major difference between the groups was in packing material costs. Obviously the packing cost on a PSS unit was usually nil. There was, however,

a distinct difference between the different selling types within the PWR group. Packing material costs on units selling to consumers, averaged nearly twice those on units selling to wholesalers. In fact even this is not the whole story. Packing costs varied enormously from farm to farm, from less than 5p per bird to over 30p per bird, and generally the larger the unit, the higher the packing cost.

The main reasons for the wide variety, were the differing standards and situations of each individual farmer. Some smaller farmers were able to buy all their materials second-hand, and therefore cheaply, from various sources. If they still supplied a packing station with some eggs, they were able to use some of the trays supplied.

The cost of materials over the year also depended on the number of times they could be used. When outlets were regularly supplied, a certain proportion of trays and boxes would be returned to the producer, most of which could be re-used. If a cardboard egg case together with the trays, managed to complete two 'trips' before having to be scrapped, the initial cost of, say 2p per dozen, would have been halved. Unfortunately not all producers did have packing materials returned to them, and indeed some units used only new materials as a matter of policy, hence the great difference in material costs.

On the larger units, packing materials were often ordered ready-printed with the farm's trading name on the boxes and pre-packs. This precluded using any second hand material and helped to promote customer loyalty. On other farms returnable outer containers were used, made of wood or plastic, and these resulted in some savings. Thus after the initial cost, the only payments needing to be made were to replace the few badly damaged ones each year. In this case of course, the level of retrieval had to be virtually 100 per cent to ensure noticeable savings. Virtually all the PWR units using pre-packs used the moulded pulp variety rather than the clear plastic or polystyrene types.

RETURNS

1. Egg Revenue

Yield

The average yield achieved by the PWR units was nearly one dozen eggs per bird lower, than that achieved by the PSS units, 236.5 eggs compared to 247.4 eggs per bird. But, once the brown to white bird ratio and the respective length of laying cycles are taken into account, there appeared to be very little difference in the average performances. Within the PWR group, however, there did seem to be a drop in production management standards between wholesale suppliers and retail suppliers. Thus, the wholesale suppliers were presumably able to spend more time on production itself, achieving a yield of 243.1 eggs per bird compared to the retail suppliers average of 234.1 eggs.

As a result of the greater profitability on PWR units compared to PSS units, the average yield needed for a unit to break even was much lower, 201 eggs or 16.75 dozens, compared to 225 eggs or 18.75 dozens per bird on the PSS units. In fact, on units supplying retailers the break even yield fell below 200 eggs per bird with the average being 197 eggs or 16.42 dozens per bird.

Yield was much less important in deciding profitability on PWR units as Table XL shows, although the most profitable third PWR units did achieve higher average yields than the others.

TABLE XL : PERFORMANCE BY YIELD

	< 230 eggs	231-240 eggs	241-250 eggs	250 +
Total Cost per Bird £	5.90	6.21	6.24	6.54
Total Revenue per Bird £	6.82	7.61	7.23	8.20
Margin per Bird £	0.92	1.40	0.99	1.66
Total Cost per Dozen p	31.97	31.23	30.76	29.81
Total Revenue per Dozen p	36.95	38.29	35.66	37.23
Margin per Dozen p	4.98	7.06	4.90	7.42
No. of Farms	15	7	10	5

Although the five highest yielding farms showed the highest average profit both per bird and per dozen, the second highest yielding farm group actually had the lowest profit per dozen, although not per bird. This merely emphasises the importance of final egg prices to the level of profitability achieved on the units in the PWR group.

Prices

As Table XXVI has already shown, the price of eggs had a great deal to do with eventual profitability in the PWR group. However Table XXVII has also shown that the difference in profitability between each selling type group is not that great. Thus all units selling to consumers were not necessarily in the upper third profitability group and all units selling to wholesalers were not in the lower third group. Therefore, the most crucial factor in determining profitability within the PWR group was the actual marketing of the eggs, thereby obtaining the best possible price within the limits of the selling type. In other words, as long as PWR units achieve reasonable production performance levels, the producer stands or falls by his ability as an egg salesman.

On the PSS units, the range in costs per dozen was very wide whilst the range in returns per dozen was fairly small. Profitability was therefore usually associated with a low cost of production. With PWR units on the other hand, the range in costs and the range in returns per dozen were about the same and in fact, the standard deviation for total returns per dozen was greater than that of total costs.

So, it would appear that the most successful farms in the PWR section were those achieving the highest egg prices within their particular selling group. Progressing up the marketing chain did not automatically signify higher profits, as the cost of production would rise due to the extra work required. Thus although the most profitable third of the PWR units did produce at the lowest cost per dozen, they also achieved the highest price per dozen. The difference between the average total costs per dozen of the highest and lowest third farms

was only 1.55p but the difference in returns was 3.92p. Taking the middle and lower third farms, the difference in costs per dozen was only 0.18p but that in returns was 2.77p.

Type of Outlets

As the average egg prices were so important, it would be as well to look at the type of outlets used by the PWR units.

The units selling mainly to wholesalers, obviously relied very much on their contacts within the egg trade, although most units did sell some eggs to retailers, usually at the farm gate. In consequence, the range in price amongst the units, (32p to 36p), was not as great as for the other two selling types, although siting could be important. Some units could take advantage of their position and offset low summer prices by supplying the extra demand created by holiday-makers. This therefore boosted their yearly average price. One or two units did send up to half their output to a packing station, but the eggs sent were usually the smaller grades, or those eggs remaining after all their retail and wholesale outlets had been supplied. The packing station was therefore acting as the floor of the market for such units.

Among the units selling mainly to retailers there was a wide range in total returns per dozen from 33p to 40p. The type of outlet supplied varied enormously. By far the most common outlet was the small shop, usually a butchers or a grocery store. Another popular customer was the milk roundsman, usually on the small local dairy rounds rather than those of the national dairies. Some units were on dairy farms with their own retail milk rounds and these were made use of to sell eggs. Other units supplied hotels, restaurants, canteens, factories and market stallholders. Hardly any of the units supplied supermarkets.

As has already been pointed out, units supplying consumers either had farm shops, market stalls or made door-to-door sales.

As far as the weekly pricing of eggs was concerned, most producers did

take some notice of published weekly average prices usually from the Eggs Authority or NEPRA, although these were ignored if local conditions differed from the national picture.

The scope for improving prices was least in the wholesale supplying group. In general the wholesale prices offered for the different grades varied very little during any one week, although there would be some regional variation. In most cases producers would deal only with one or two wholesalers and there would be very little 'shopping' around to find higher prices.

For the retail suppliers however, pricing was not always so one-sided. Most producers were aware of impending price changes and would alter their own selling prices in the same direction although not necessarily by the same amount as published. Most units practised some form of differential pricing, usually giving large order customers discounts and perhaps increasing prices for very small orders. During the survey year there were instances of nationally published price changes not being necessary on some units. In January 1977 for instance, the nationally published prices fell, but many producers were able to maintain their pre-Christmas prices without being undercut by producers with excess supplies.

The problem of price competition from other producers trying to increase their market share, was experienced by nearly all producers. Most producers were not so perturbed at the thought of other PWR units increasing their customers on a regular basis, but reserved their most scathing comments for producers who off-loaded occasional surpluses very cheaply on their own customers, who would later wish to resume trading with their original supplier after a few weeks. Hopefully the newly formed Central Egg Agency will reduce the frequency of these occurrences.

Units supplying consumers also have some scope in deciding their egg prices. Obviously they are competing with other retail outlets and so must be aware of the prices being charged in the high street. With farm shops, the

eggs may be used to attract custom to buy other goods, with resulting egg prices which are considerably below those charged in competing shops. Prices charged on market stalls were generally at the lower end of the retailing price range but often all grades of egg were available rather than the one or two sold in most shops. Similarly cheap cracked eggs sold on market stalls, were often used as a draw to the consumer who would then buy some whole eggs at the same time. In fact the trade in cracked eggs was often so good that it made financial sense to crack whole eggs deliberately. This occurred usually when a grade was in surplus and the price paid by consumers for cracked eggs was often higher than that paid by a wholesaler for the whole eggs of that grade. Where eggs were sold door-to-door on milk rounds, or special egg rounds, the prices charged were very similar, and sometimes higher, than the average high street shop price. Consumers were obviously prepared to pay a higher price for the convenience of home delivery, which is not surprising considering that eggs are not always the easiest item to carry on shopping expeditions.

One important non-price factor involved in keeping their customers loyalty was the maintenance of first class egg quality. This was particularly important where consumers were supplied at the farm gate. Some producers stated that they would rather spend money on improving their egg quality than on advertising their eggs, as a good yolk and shell quality tended to make their own eggs popular in any case. Where advertising was carried out, this usually took the form of brightly painted delivery vans, and eye-catching packaging, although one or two units had used local newspapers and commercial radio to promote their own eggs, with apparent success.

One other factor in generating customer loyalty was the relationship between the customer and the delivery driver. Some of the larger units relied on their drivers to give an efficient, cheerful service and producers were very much aware of the importance of their choice of deliveryman. With so much competition for egg outlets, any mishandling of situations could result in the loss

of a customer and a resulting surplus of eggs which could only be sold at low prices. The same problem did occur on the smaller units where the delivery man or woman was usually a family member, but any differences of opinion could usually be instantly dealt with, without having to refer the customer back to the farmer. Some delivery drivers also did assist the retailer with his own marketing by ensuring that the freshest eggs were placed at the back of a display to ensure that any eggs unsold after the previous weeks delivery, did not stay on the display for more than two weeks.

In cases where producers were or had expanded, this would usually have been achieved by taking over an existing delivery round which had been relinquished by another producer, for whatever reason.

2. Other Revenue

As with the PSS units, virtually all the other revenue was composed of manurial credits. As the proportion of mixed farms was slightly higher in the PWR group, the average other revenue per bird and per dozen was higher than in the PSS group. On the farms where there was revenue from manure however, it averaged less than 5p per bird as with the PSS units.

Manure disposal tended to be a greater problem on specialist PWR units than on any others, because they were often sited either in or very close to residential areas.

Economies of Scale

As the units over 20,000 birds, in the PWR group, numbered only three, no comment can safely be made on their mean performance. Also, as the profitability of a PWR unit depended so much on its owners or managers ability to market his eggs successfully, the size of the unit was to some extent irrelevant. As long as the unit was geared to its particular market requirement, its absolute size had little effect on performance. Table XLI shows that the distribution of the differing size groups amongst the profitability groups, was about even.

TABLE XLI : DISTRIBUTION OF SIZE GROUPS BY PROFITABILITY

Profitability Group	10,000 + birds	9,999-5,000 birds	< 5,000 birds
	percentages		
Upper Third	31	33	33
Middle Third	38	34	34
Lower Third	31	33	33
Total	100	100	100
No. of Farms	16	15	6

The size of the unit was also linked to its method of selling, with the units supplying consumers tending to be smaller than average and units supplying wholesalers tending to be larger than average. This is emphasised in Table XLII which shows that as size became smaller, labour requirements, total costs and total returns per bird and per dozen, all rose.

TABLE XLII : PERFORMANCE BY SIZE GROUP

	10,000 + birds	9,999-5,000 birds	< 5,000 birds
Yield per Bird	238 eggs	237 eggs	233 eggs
Feed Intake per Bird	43.78 kgs	42.41 kgs	43.79 kgs
Food Conversion Rate	2.22	2.16	2.27
Labour per 1000 Birds	548 hours	637 hours	836 hours
Total Costs per Bird	£6.09	£6.09	£6.32
Total Returns per Bird	£7.18	£7.30	£7.37
Margin per Bird	£1.09	£1.21	£1.05
Total Costs per Dozen	30.7p	30.8p	32.5p
Total Returns per Dozen	36.1p	37.0p	38.0p
Margin per Dozen	5.4p	6.2p	5.5p

It is noticeable that margins do not differ greatly among the size groups.

So, amongst the PWR units there was no evidence to show that size had any effect on profitability.

SECTION III

PERFORMANCE STANDARDS

If the sample of 70 farms can be taken as being reasonably representative of the national situation, the overall production standards should reflect those of the national flock. Obviously due to the different selling methods used, an average of the costs and returns for all 70 farms, would not represent any farm type and would be out of date. The usefulness of the cost and return averages is in the comparisons which can be made from them, rather than for any statements of absolute values. An amalgam of all 70 farms' cost and return averages would therefore be meaningless, unless other costings were made over exactly the same period and on exactly the same farm types. However, the standards of technical performance may be helpful as these tend to alter much more slowly over time than do the financial considerations. By far the most important standards are those of yield and feed intake per bird and the resulting feed conversion rate. Table XLIII gives these standards for the differing farm types.

One important point arises here. The average, grouped, performance figures throughout this report, are weighted such that the size of a unit has no influence on the final group average. The average yield for all farms of 241.6 eggs per bird is arrived at by taking the sum of the average yields on each farm and dividing by 70. If the survey is to be used as a window on to the national scene, the simple average must also be used. As the larger units tended to be more efficient in the technical sense, the three standards become that much better. Thus if the total number of eggs produced on all farms is divided by the total average number of birds on all farms, the resulting average yield per bird is 245.2 eggs. This figure is only slightly higher than that arrived at in the M.A.F.F. yield survey for 1977. By again using the same method,the overall average feed consumption per bird is 42.828 kgs per year or 117 gms per day. This means that on average for the farms surveyed, it required 2.096 kgs of feed to produce one dozen eggs.

TABLE XLIII : PERFORMANCE STANDARDS BY ENTERPRISE TYPE

Unit Type	Yield per Bird Eggs	Feed Intake per Bird Kgs	Feed Conversion Rate	Number of Farms
All or mainly brown birds	237.3	43.711	2.217	46
All or mainly white birds	246.1	40.659	1.993	16
Equal Numbers White or Brown	257.5	43.933	2.052	8
Specialist Egg Farms	246.0	43.105	2.109	35
Mixed Farms	237.3	42.972	2.185	35
Home Feed Mixing	236.0	42.180	2.159	24
Purchased Compounds	244.6	43.486	2.141	46
Home Pullet Rearing	239.0	43.34	2.189	26
Purchased Pullets	243.2	42.86	2.122	44
Family Farms	243.0	43.25	2.145	24
Non Family Farms	241.0	42.92	2.148	46
Protein Levels of 16.5% +	243.8	42.652	2.108	44
Protein Levels under 16.5%	237.9	43.693	2.212	26
Usual laying cycle under 58 wks	249.0	43.560	2.112	31
Usual laying cycle over 58 wks	236.0	42.624	2.175	39
Full Environmental Control	243.5	42.49	2.101	26
Part or Nil Control	240.5	43.36	2.173	44
All Farms	241.6	43.039	2.147	70

The influence of the larger units can be seen in Table XLIV, where the largest units show the lowest feed conversion rate. Thus the units of over 20,000 birds achieved higher yields and lower feed intakes per bird than any

other size group, indicating that levels of stockmanship may indeed be rather better on the large scale units than on the smaller farms. Feed costs have been included to demonstrate how this technical efficiency translated into financial terms with the largest units producing eggs with the lowest feed cost per dozen.

TABLE XLIV : ALL FARMS: PERFORMANCE BY SIZE GROUP

Averages	Units < 5,000 birds	5,000-9,999 birds	10,000-19,999 birds	Units > 20,000 birds
Yield per Bird	239.2 eggs	242.6 eggs	239.5 eggs	246.0 eggs
Feed per Bird	44.757 kgs	42.737 Kgs	42.826 kgs	42.457 kgs
Feed Conversion Rate	2.254	2.124	2.156	2.076
Feed Cost per Bird	£4.62	£4.30	£4.20	£4.18
Feed Cost per Dozen	23.20p	21.42p	21.07p	20.41p
No. of Farms	11	26	22	11
Average Size	4054	7430	12910	45576

Finally, Tables XLV and XLVI show the different contributions made and hours worked by the labour force over the whole 70 farms.

TABLE XLV : ALL FARMS: STRUCTURE OF LABOUR FORCE

	Male Family	Male Hired	Female Family	Female Hired	Totals
	percentages				
Full-Time	14	31	1	9	55
Part-Time	8	10	6	21	45
Total	22	41	7	30	100
Total	63%		37%		100

TABLE XLVI: ALL FARMS: HOURS WORKED

Average Hours Worked	Male Family	Male Hired	Female Family	Female Hired
Full-Time per Year	2165	2362	2139	2085
Full-Time per Week	41.6	45.4	41.1	40.1
Part-Time per Year	1042	791	1025	943
Part-Time per Week	20.0	15.2	19.7	18.2

SECTION IV

ESTIMATED RESULTS FOR 1977/78

Tables XLVII and XLVIII give estimated costs, returns and margins, per bird and per dozen, based on the findings of this report. The actual survey figures for 1976/77 are included in brackets to allow comparisons to be made.

It must be stressed that the 1977/78 figures are only estimates, and are not based on actual profit and loss accounts for that year. Similarly it must be noted that both the estimates for 1977/78 and the actual figures for 1976/77, have been presented with no element of valuation increase or decrease included. The 1976/77 figures have been rounded and an approximate "paper profit" deducted in each case. The 1977/78 figures have been calculated using the technical performance standards revealed in this survey report, but allowance has been made for some improvement in efficiency. Pricing was carried out using the best available data.

The tables do not show costs and returns as at April 3rd 1978, but are rather estimates of the profitability of the different farm types over the last financial year. For individual farm comparisons to be made, the farm's enterprise profit and loss account for the year 1977/78 need only be put on a per bird and per dozen basis.

Of the 1977/78 figures themselves, it seems likely that virtually all types of unit earned marginally lower profits than in the previous year, although packing station suppliers suffered more than producer wholesalers or retailers. Although egg prices did rise slightly over the previous years averages, feed prices and fixed costs also rose, thereby nullifying any positive effect.

In fact, from the beginning of the year, compound feed prices rose to a peak in the early summer of 1977, but then began to fall until mid-November. Prices then remained stable for over three months, but by the end of the accounting year they had once again taken an upturn.

The fall in the cost of point-of-lay pullets due to the lower feed costs

TABLE XLVII : ESTIMATED COSTS AND RETURNS 1977/78 FOR PSS UNITS

(1976/77 figures in brackets)

	Home Mixing Farms				Purchased Compound Farms			
COSTS	£ per Bird		Pence per Dozen		£ per Bird		Pence per Dozen	
Feedstuffs	4.18	(3.81)	20.6	(18.8)	4.87	(4.54)	23.4	(21.9)
Bird Depreciation	0.94	(0.98)	4.6	(4.8)	0.91	(0.96)	4.3	(4.6)
Labour	0.39	(0.36)	1.9	(1.7)	0.39	(0.37)	1.9	(1.8)
Other Fixed Costs	0.33	(0.27)	1.6	(1.3)	0.38	(0.31)	1.8	(1.5)
Total Costs	5.84	(5.42)	28.7	(26.6)	6.55	(6.18)	31.4	(29.8)
Total Returns	6.49	(6.22)	31.9	(30.6)	6.71	(6.40)	32.2	(30.8)
Margin	0.65	(0.80)	3.2	(4.0)	0.16	(0.22)	0.8	(1.0)

TABLE XLVIII : ESTIMATED COSTS AND RETURNS 1977/78 FOR PWR UNITS

(1976/77 figures in brackets)

COSTS	Wholesale Suppliers				Retail Suppliers				Consumer Suppliers			
	£ per Bird		Pence per Dozen		£ per Bird		Pence per Dozen		£ per Bird		Pence per Dozen	
Feedstuffs	4.69	(4.39)	23.1	(21.7)	4.63	(4.25)	23.6	(21.9)	4.80	(4.57)	24.0	(22.9)
Bird Depreciation	0.90	(0.94)	4.4	(4.6)	0.86	(0.89)	4.4	(4.6)	0.80	(0.86)	4.0	(4.3)
Labour	0.49	(0.45)	2.4	(2.2)	0.63	(0.57)	3.2	(3.0)	1.05	(0.95)	5.3	(4.7)
Other Fixed Costs	0.37	(0.31)	1.8	(1.5)	0.50	(0.42)	2.6	(2.1)	0.58	(0.48)	2.9	(2.5)
Packing Costs	0.14	(0.11)	0.7	(0.6)	0.16	(0.13)	0.8	(0.7)	0.24	(0.20)	1.2	(1.0)
Total Costs	6.59	(6.20)	32.4	(30.6)	6.78	(6.26)	34.6	(32.3)	7.47	(7.06)	37.4	(35.4)
Total Returns	7.40	(7.06)	36.4	(34.9)	7.60	(7.21)	38.8	(37.1)	8.44	(8.05)	42.2	(40.3)
Margin	0.81	(0.86)	4.0	(4.3)	0.82	(0.95)	4.2	(4.8)	0.97	(0.99)	4.8	(4.9)

in the latter half of the year, coupled with the increased prices being paid for cull birds over most of the year, resulted in the cost of bird depreciation being lower than in 1976/77. However by early 1978, cull prices had begun to fall drastically due to the severe reduction in the capacity of the old hen processing industry. Many of the smaller processing plants have and are being faced with closure as they will not be able to meet the E.E.C. regulations on poultry hygiene. This has resulted in very much a buyers market and indeed, small scale, white egg producers who do not book in their culls in advance, may be hard pressed to find a buyer at all.

The better fleshing of most brown birds has kept up the demand for them to some extent, but the difficulties of disposing of white birds and their consequent high livestock depreciation, must surely lead to a further swing towards brown egg production. As the production of white eggs has been shown to be cheaper and more efficient than brown egg production, a further swing towards a solely brown bird national flock, must surely not be in the national interest.

It is worth noting that if birds are written down at market values, most actual farm accounts for the 1977/78 year would show a "paper loss" due to the much lower financial value of birds on hand at the end of the year. This would be especially so on units housing mainly white birds.

Most fixed costs of production and marketing have risen steadily over 1977/78, with one possible exception being fuels, and this is reflected in the tables.

As far as egg prices are concerned, the price cycle followed very much the same pattern as in the previous year, and for the second time, the post-Christmas price fall was averted, again by a combination of exporting and pre-Christmas culling. The marketing share of the final egg price continued to increase slightly over the 1977/78 year.

In summary therefore, once accounts have been worked out, it is likely

that profits for 1977/78 will on average be found to be slightly lower than for 1976/77, and that the relative profitability of egg marketeers over packing station suppliers will have increased.

CONCLUSIONS

The 1976/77 survey into the economics of egg production was carried out against a background of declining egg consumption, a diminishing national flock and severe cost inflation. Feedstuffs prices increased by one third over the survey year and producers were saved from making losses only by a marked improvement in egg prices during the latter half of the year.

The tendency for producers to venture into marketing over the previous five years, meant that units were now selling eggs in a wide variety of ways, and all units could no longer be compared together. So the sample farms were initially divided into two broad groups, Producer Wholesale/Retail (PWR) units and Packing Station Supplying (PSS) units.

Of the two main groups, by far the most profitable were the PWR units. Their average profits per bird and per dozen were virtually twice that of the PSS units. The range in profits per bird was greater within the PWR group with just over £2.50 difference between the best and the worst. The equivalent range with the PSS group was just over £2.00 per bird. In fact the PWR units appeared to be generally on a higher profitability scale altogether, than the PSS units. The former had less than 10 per cent of all units falling below 50p per bird whilst 45 per cent of the latter group fell into this category. At the other end of the scale, over 20 per cent of all PWR units earned profit margins of more than £1.50 per bird, whilst less than 5 per cent of PSS units managed to achieve results of this order.

The simple reason for the far superior profitability of the PWR units was that although their extra costs of marketing added over three pence per dozen to total costs, the extra returns from marketing, added over six pence per dozen to total returns. This resulted in the profit margin per dozen on PWR units being virtually double that achieved on PSS units, this being entirely due to the marketing of eggs on PWR units.

On balance, there was little evidence to suggest that the average PWR unit was any less efficient technically than the average PSS unit, once the strain of bird used had been taken into account. Virtually all PWR units housed only brown birds, whilst the proportion of white or tinted to brown birds was much more even on the PSS units. However, within the PWR group there were indications that as the level of marketing increased, physical production efficiency began to fall. Thus units selling to wholesalers achieved much better feed conversion rates and lower mortality rates than units selling to retailers or consumers. This suggests that if production standards are to be maintained or improved, any envisaged marketing operation should be kept fairly simple.

Average profits on PSS units were generally at a very low level, especially considering that around 27 per cent of profit was due to valuation increases. Rates of return on capital were therefore generally poor, and most units would have found it very difficult if not impossible, to generate sufficient capital for reinvestment purposes from within the business.

Within the PSS group, the most crucial factor in deciding profitability was the method of feed purchase used with the proviso that reasonable production standards were attained. Units purchasing ingredients and then milling and mixing their own rations, achieved profit margins of well over twice those earned on units using purchased compounds. Thus, with average production figures most home mixers achieved high profits, whilst these were only earned on compound purchasing units with very high production standards.

Feed costs per bird on home mixing units were on average 15 per cent lower than on units purchasing compounds. Similarly the average cost of feed per tonne paid on home mixing farms was over £9 less than that paid by purchased compound users. Feed costs constituted nearly 75 per cent of all costs of production on PSS farms, and therefore the major savings made by home mixing units resulted in a very favourable level of financial performance.

Profit margins on units using purchased feed were extremely low on average, although units housing white or tinted birds performed much better financially than units housing brown birds. This was due to the far superior physical efficiency in production of the white bird units. Also, all-in/all-out units performed significantly better than multi-age units, if the home mixing units were excluded.

Apart from the method of feed purchase, high profits were generally earned on those PSS units achieving the best feed conversion ratios. High yielding farms also showed far better results than low yielding farms. In fact, producers achieving yields per bird of over 250 eggs per year, earned well over three times the profit margin per bird on average than producers obtaining results of under 240 eggs per bird per year.

Profits earned on PWR units generally provided a fair return to management and investment. Within the group, profits did increase marginally as the level of marketing increased. The key area for achieving high profits within the PWR group, was in salesmanship however. The type of market used to sell the eggs, was far less important in determining profits, than the ability of the producer to achieve the best position within his chosen market.

Technical efficiency in production was still important on PWR units, but only adequate rather than high standards were needed to give good financial results. A careful marketing strategy and good salesmanship could produce excellent results from only moderate production levels. On the other hand, a high level of technical efficiency could easily be wasted by poor marketing.

The average PWR unit required nearly twice as much labour per 1000 birds as the average PSS unit. Within the PWR group however labour requirements rose dramatically the further up the marketing chain a unit became. Thus units selling to retailers required nearly 50 per cent more labour per 1000 birds than units selling to wholesalers, and units selling to consumers required over 100 per cent more.

Within the limitations of the size groups in the survey, there was some evidence of economies of scale existing within the PSS group, at least up to 20,000 birds. It does seem likely however, that economies of scale do occur above the 20,000 bird mark, as a much higher proportion of this size group were planning to expand before 1982, than in the other size groups. As levels of investment appeared to be fairly closely correlated with levels of profitability, this would indicate good financial performances by the large-scale units over previous years, despite the disappointing results in this survey. It is noticeable that of all 70 farms in the survey, the large-scale units achieved the lowest feed cost per dozen eggs produced, by virtue of a very good feed conversion rate.

On the other hand, there was little evidence of economies of scale within the PWR group. Unit size was fairly closely related to the type of marketing pursued however. Thus, the problems of selling vast quantities of eggs to consumers and small shopkeepers, generally meant that most of the larger scale producers supplied wholesalers. As profitability was governed more or less by the relative success of the individual producer as a marketeer, the scale of production was to some extent immaterial. The decision process therefore, ought to be the producer deciding where he will be most effective in the marketing chain, and then regulating the size of his unit accordingly.

On technical standards generally, the most successful units in terms of feed conversion rates appeared to be large scale, specialist units, housing mainly white birds. It was noticeable that units feeding high protein rations performed better than those feeding a lower protein ration and that units having cabins over which they had full environmental control, performed better on average, than those with only part or no control. Similarly units buying in point-of-lay pullets performed better than those home rearing. There was virtually no difference between the performances of family and non-family farms.

On the basis of these findings therefore it seems likely that if the egg

industry does continue to contract, both in terms of numbers of units and national flock size, the contraction will be greatest amongst the smaller scale, purchased compound using, PSS units, and in particular the poorer specialist units where egg enterprise results do not become submerged in overall farm accounts. The increasing size of production units looks likely to continue, where eggs can be marketed through a parent company or organisation, inevitably at the expense of the less efficient, purchased compound using PSS units. It is also likely that the process of vertical integration will continue slowly although the potential markets for PWR units must already be saturated. Indeed increasing pressure on the markets used by PWR units may force margins down in the long term, although generally producers now seem much more aware than previously of the perils of over supplying the market for eggs.

TERMS AND DEFINITIONS

1. Average Size of Unit: The total of the average number of birds on the unit each four weekly period, divided by 13.

2. Average Feed Consumption per bird: Total quantity of feedingstuffs used during the year divided by the average size of unit.

3. Average Yield per bird: Total number of eggs laid divided by the average size of the unit.

4. Feed Conversion Rate: Average Feed Consumption per bird divided by average yield per bird in dozens.

5. Feedingstuffs: Purchased feed is charged at the net cost delivered to the farm. Where feed was home mixed, costs of milling and mixing are added.

6. Home-Reared Pullets: Costed for an equivalent bird bought in, on a sliding scale depending on time of introduction into the laying unit.

7. Labour: Paid labour is charged gross of all national insurance contributions. Overtime is included where worked. Holiday pay is also included. Standard rates were charged for unpaid family labour.

8. Deadstock Depreciation: Charged at 10 per cent for buildings and equipment, 20 per cent for machinery and vehicles, by diminishing balance method.

9. Working Capital: The closing feed, livestock and stores valuation was used as an estimate of working capital.

10. Miscellaneous Costs: Includes direct costs involved in egg production, such as vet. and medicines, water, advertising, flock insurance etc. General farm overheads such as rent and rates, are not included.

11. Interest Payments: No interest or bank charges are included.

12. Specialist Egg Farms - Farms where the egg enterprise generates at least 75 per cent of total turnover.

13. Family Farms - Farms where over two thirds of all labour used on the egg enterprise is contributed by family members.

14. Brown Bird Units - Units where brown birds make up over two thirds of the total flock.

15. White Bird Units - Units where white or tinted birds make up over two thirds of the total flock.

16. Mixed Colour Units - Units having broadly equal numbers of brown and white birds.

17. Standard Man Year - 275 standard man days, a standard man day representing 8 hours work by an adult male worker under average conditions.

APPENDIX

Enterprise Studies Recently Published or Soon to appear

No.		Price (£)
42	The U.K. Broiler Industry 1960-1975 (Manchester)	£1.50
43	Sheep Production and Management in Wales (Aberystwyth)	£1.00
44	Early Potato Production in England and Wales (Aberystwyth)	£1.00
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46	Ewe Flocks in England - Breeds, Lamb Production and other aspects of Husbandry 1973-74 (Exeter)	£1.00
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50	Fodder Crops (Reading)	£0.70
51	Pig Management Scheme - Results for 1976 (Cambridge)	£0.70
52	Pig Production in S.W. England 1975/76 (Exeter)	£0.75
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54	Hill and Upland Farming in the North of England (Newcastle)	£1.50
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61	Pig Management Scheme - Results for 1977 (Cambridge)	£1.00
62	Beef from Older Animals (Newcastle)	

Where no price is quoted, the report was still to be published when this report went to press.

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