1957.

UNIVERSITY COLLEGE OF WALES
ABERYSTWYTH

A STUDY OF THE ECONOMIC ASPECTS OF CHRISTMAS-
TURKEY REARING 1955 AND 1956.

by

W. DYFRI JONES, B.Sc.

DEPARTMENT OF AGRICULTURAL ECONOMICS
CAMBRIAN CHAMBERS, CAMBRIAN PLACE
ABERYSTWYTH

Price :

2/6d.

ACKNOWLEDGEMENT.

On behalf of the Department I should like to take this opportunity of expressing my thanks to the farmers who have participated in this investigation and for the readiness with which they have supplied the information required.

CONTENTS.

SUMMARY.

Chiefly as the result of the steep fall in prices, producers of Christmas turkeys generally suffered heavy losses in 1956 - a sharp contrast to the position in 1955. Because the rate of food-conversion in turkeys declines with their increasing age, there is within each variety and strain an optimum (or most advantageous) killing-age, which depends on the relationship between the selling price of the birds and the price of the food used. Thus for certain strains of Broad Breasted Bronze, when the average price is 3/- per lb. liveweight for mixed sexes and the food used is valued at 42/- per cwt, the optimum killing-age is when the weekly food-conversion ratio is 7.3:1, i.e. at about 23 weeks. Some farmers bought their poults earlier in 1956 than in the previous year but the sale-price having unexpectedly fallen to such a low level, this change in policy, in fact, placed them in a less rather than a more favourable position.

Of the two sexes, stags are the more efficient food-converter but, since they fetch less favourable prices than hens, it does not necessarily follow that their optimum killing-age is greater. The difference in price between stags and hens is not likely to be large enough to make it worth while to rear hens alone.

The higher the death-rate the fewer are the birds remaining to bear the higher costs resulting from deaths and to contribute to total returns and the greater therefore is the fall in profit.

There is a saving in the total rearing cost if poults are bought at day-old rather than at eight weeks, provided the death-rate is not abnormally high. The purchasing of poults at day-old rather than at eight weeks, is therefore advocated unless the labour involved can be more profitably employed on some other enterprise in July and August.

The majority of the birds reared on a small sample of Pembrokeshire farms were sold plucked to wholesalers in 1955 and 1956 and the industrial towns of South Wales were the main market for them. Wax-stubbing and the use of a plucking-machine, provided the number of birds to be treated is large enough, reduces the cost of preparing birds for sale and enlarges the profit from selling plucked and dressed birds.

The largest flocks, as a whole, showed the highest average profit per bird in 1955 but they also suffered the heaviest loss in 1956. On the basis of current earnings the smallest flocks, as a whole, fared the best in both years - largely as a result of their being attended to almost entirely by family labour. Despite the fact that they suffered heavier losses through deaths, the smallest flockmasters appeared to be the most efficient feeders.

A STUDY OF THE ECONOMIC ASPECTS OF CHRISTMAS TURKEY REARING 1955 AND 1956.

INTRODUCTION.

Their numbers and the value of their output render turkeys of comparatively little importance within the poultry industry. However, the facts that they are becoming more popular as a Christmas dinner and also that the severe fall in their prices in 1956 resulted in heavy losses amongst producers, have attracted more interest and consideration to the production and marketing of turkeys. Producers, the majority of whom, until 1956, have reaped substantial profits from Christmas turkeys, are now compelled to consider seriously the future of the turkey industry, the size of their own turkey enterprise, how best to reduce their costs and how to improve the quality and the marketing of their birds so as to realise the maximum profits under less favourable market conditions.

Trends in Supplies and Consumption of Turkey-Meat.

Table I.

Numbers of Turkeys in U.K.

	Pre-war Average	1943.	1953.	1954.	1955.	1956.
Number of Turkeys – June 4th (millions)	1.258	0.896	1.506	1.453	1.561	2.344

Output of Turkey-Meat in the U.K.

	Pre-war Average	1943-44	1953-54	1954-55	1955-56	1956-57
Output of Turkey-Meat ('000 tons)	7.0	4.0	7.8	9.0	10.0	17.0
Value of Output of Turkey Meat (£m.)	1.0	1.2	3.2	4.9	5.3	5.7
Output of Turkey Meat as % of the Output of Poultry and Eggs	2.6	2.6	2.1	2.5	2.6	2.4

Source: Official Statistics – Output for 1953-54, 1955-56 and 1956-57 on request from M.A.F.F. 1955-56 provisional and 1956-57 forecast.

Owing to the strict rationing of poultry food during the war years, the number of turkeys in the U.K. had declined, by 1943, to about two-thirds of pre-war. However, ten years later, in 1953, the number had been increased by 70 per cent of the 1943 figure or by 20 per cent of the pre-war average. The number dropped slightly in 1954 but increased again in 1955 when it was 1.561 million. Finally in 1956 turkeys showed what is probably an all-time record increase in number of 50 per cent during a single year. The provisional figures for 1957 show a decline of 7 per cent on the number for 1956. In Wales turkeys numbered 135,000 in 1956 which was about 50 per cent more than in 1955 and 33 per cent more than the pre-war average.

The value of the output of turkey meat, at current prices, increased from £1 million in pre-war to an estimate of £5.3 million in 1955-56 (June-May year). Its value amounted to only 2.6 per cent of the value of the total output of

poultry and eggs in both pre-war and 1955-56. The quantity of turkey meat produced was estimated at about 10,000 tons in 1955-56, a figure which consists largely of the sales at Christmas 1955. The output for 1956-57 is expected to be in the region of 17,000 tons or much more than double the pre-war output and 70 per cent more than that of 1955-56.

Table II.
Home-Production, Imports and Consumption of Turkey Meat. (U.K.)

		1938.	1953.	1954.	1955.	1956.
Home-Production[1]	(tons)	7,000[4]	7,800[5]	9,000[6]	10,000[7]	17,000[8]
Imports[2]	"	10,987	8,443	5,800	6,130	4,844
Total Supplies		17,987	16,243	14,800	16,130	21,844
Population[3]	(millions)	47.49	50.61	50.78	50.97	n.a.
Consumption per head	(ozs.)	13.5	11.5	10.4	11.3	15.4

Sources:
1. Ministry of Agriculture on request.
2. Intelligence Belletin, Commonwealth Economic Committee.
3. Annual Abstract of Statistics.
4. Pre-war average.
5. 1953-54.
6. 1954-55.
7. 1955-56 (estimated.)
8. 1956-57 (forecast.)

The home-production of turkey meat has increased fairly steadily since 1945. The volume of imports fluctuated up to 1952 but since then they have declined and from 1954 onwards home-production has constituted, increasingly, the larger part of the total supplies available for consumption. In 1954 home-produced turkey meat amounted to 61 per cent of the total supplies but it is estimated to have been almost 80 per cent in 1956. The Irish Republic is our main source of imported turkeys, supplying 70 per cent of our imports in 1955 and even 81 per cent in 1956.

Total supplies have fluctuated but have broadly increased over the post-war period and especially since 1954. The consumption per head has also increased from 10.4 oz. in 1954 to an estimated 15.4 oz. in 1956. This does not compare favourably with the consumption in the United States which averages approximately 5 lb. per head of total population. The Americans eat as much turkey meat alone as we eat of all poultry meat and they consume approximately seven times as much poultry meat, per head, as we do in the United Kingdom.

Some Characteristics of Turkeys and Turkey-Rearing.

There are many varieties of turkeys. The most common in the United Kingdom are the Bronze, British — White and Norfolk Black whilst the Beltsville White is gaining in popularity. Bronze turkeys are by far the most popular, accounting for about 90 per cent of the total; White Turkeys account for 8 per cent and Norfolk Blacks for 2 per cent of the total.[1]

_____
(1) "Development of the British Turkey Industry". R. Feltwell. Report on the Proceedings of the 10th World Poultry Congress 1954".

The large majority of the Bronze turkeys are of the Standard (or American Mammoth) Bronze type which is a large turkey developed along similar lines in both the United Kingdom and America. However, the Standard Bronze does not possess the best fleshing qualities for the meat tends to be rather coarse and is not well distributed.[1] In 1950 a Broad Breasted (Bronze) strain, developed with special emphasis on the width of breast and good fleshing qualities, was introduced from America and is now gaining ground rapidly. The Broad Breasted Bronze is the heaviest of all varieties. The British White (or White Hollands as they were once known) is a fairly large turkey with a broad breast and whose fleshing qualities have been improved. The Beltsville White turkey, a comparatively new variety, is considerably smaller than the British White and was specially developed in size to satisfy the demand of the average-sized family. The Norfolk Black has been developed in the United Kingdom; it is a medium-sized bird with extremely good fleshing qualities.

Turkeys are considered to be one of the most if not the most efficient of all farm animals as converters of food into meat. It is claimed that an average conversion rate of 3 lb. of food per lb. liveweight up to 16 or 17 weeks has been achieved in a few cases. As a general rule turkey poults are purchased, at day-old, in May, June and July and the majority are killed at Christmas although an increasing number are now being killed from September onwards and kept in deep-freeze. The birds generally reach maturity between 22 and 28 weeks, according to the variety, strain, and sex. The smaller varieties mature a few weeks sooner than the larger but there are variations within each variety and much depends also on the date of hatching and their management. Furthermore hens are fit for killing about a fortnight before the stags, although at a given age, the stags weigh appreciably more than the hens especially in the case of the Beltsville White variety. Turkey stags are more efficient food converter than the hens.

Until comparatively recently turkeys were considered very 'tricky' birds to rear, a fact which has, to some extent, accounted for the relatively small numbers that have been reared. Prior to the last war turkeys were usually reared on range or fixed pens. More recently intensive methods, whereby the birds are kept completely off the ground or are confined in straw yards, have become very popular and have contributed to the reduction of the incidence of disease amongst turkeys and hence to their increasing popularity. The development of the use of drugs, particularly of the sulphonamide group, and antibiotics, and a better understanding of the nutritional requirements of the growing and breeding turkey have also contributed very substantially to the prevention, control and cure of such diseases as coccidiosis and blackhead. There is a growing confidence in turkeys, and their potentialities, either as a specialist enterprise or as a useful adjunct to other farming enterprises, are being realized.

With the increase in popularity of turkey-production, breeding and rearing have become more specialized, and it is the custom today for turkey rearers to purchase their poults (mixed sexes) at day-old or at 6 - 8 weeks from

[1] "Turkey Farming." R. Feltwell; Faber 1953, p. 47.

recognised breeders. Turkey poults are very expensive, their prices ranging
from 7/6d. to 10/- each (mixed sexes) at day-old and/18/- to 19/- at 8 weeks.
There are several reasons for the high prices for poults. In the first place
egg-production is low, averaging, in the case of the Bronze Variety, about 50
eggs during the breeding season. Secondly, fertility in turkeys is rather low the
reason being that heavy stags, especially the broad breasted varieties, have
difficulty in mating successfully. Artificial insemination is now being used
in their breeding but "although one has an increase in fertility we have found
that there is usually a reduction of about 5 per cent or more in hatchability
due to germs dying during the early stages of incubation. Coupled with this
we have a decrease in egg production of 11 per cent from birds that have been
inseminated."[1] Further unless properly balanced foods, which are expensive,
are used the hatchability also suffers and added to this is the fact that the
cost of keeping a stag must be added to the cost of keeping every 10 or 12
hens. Lastly the depreciation on breeding stock is very heavy for their value
in mid-July, at the end of the breeding season, is often less than half what
it was at Christmas, the beginning of the breeding season.

Turkeys have the advantage that they can often be reared on the general
farm with very little or no additional capital and without any or very little
additional labour. They can make use of chick brooding and rearing equipment
at a time when these are not usually required for their originally intended
purpose. In South Pembrokeshire, for instance, turkeys fit in well with the
cattle enterprise for the turkeys are frequently reared in cattle yards before
the cattle are brought under shelter at or near Christmas. Early potatoes and
turkey-rearing are commonly pursued on the same farms; the same buildings are
used for sprouting potatoes early in the year and for turkey rearing later.

FINANCIAL RESULTS FOR AN IDENTICAL SAMPLE OF FLOCKS 1955 and 1956.

The Sample.

The farms which co-operated in our Turkey Rearing Costs Investigation in
1955 and 1956 were situated in Anglesey, Caernarvonshire, and Pembrokeshire.
They numbered 21 in 1955 and 22 . in 1956; eighteen farmers kept records
relating to their turkeys for both years and the following summary and analysis
of the results for 1955 and 1956 relate only to these 18 identical farms.

Only one of the 18 farms was a specialist poultry holding. One was a
dairy farm, two were dairying and store raising farms, twelve were mixed farms;
the practice on the other two farms is not known. The approximate size of flocks
reared on these identical farms varied from 70 to 2,600 birds in 1955 and from
100 to almost 3,900 birds in 1956. The flocks were distributed according to
size (based, in this instance, on the number of poults purchased) as follows:-

---

(1) "Some Economic Aspects of Turkey Production". Paper read by Bernard
    Matthews at the British Turkey Federation Conference, February 1957.

Number of Poults Purchased.	Number of Farms.	
	1955.	1956.
50 - 200	7	6
201 - 600	6	6
Over 600	5	6

The average size of the flocks increased from 536 in 1955 to 706 in 1956 - an increase of 32 per cent. Thirteen farmers increased their purchases of poults in 1956, four kept theirs approximately the same as in 1955, whilst only one reduced his purchases. In both years, 14 farmers purchased their poults as day-olds, one purchased his at two weeks and another 3 purchased theirs at 8 weeks.

In both years 87 per cent of the poults purchased were stated to be of the Broad Breasted Bronze variety and about 5 per cent were American Mammoth Bronze. In 1955, another 3 per cent were B.B.B. x A.M.B. Thus in both years over 90 per cent were of Bronze varieties. The remainder consisted of Beltsville Small White and British Whites.

Twelve of the flocks were reared on deep-litter, one intensively on wire or slats, one semi-intensively, two on free-range whilst another two were reared partly on free-range and partly on deep-litter.

Financial Results.

Table III presents the average financial results for the turkey enterprises of the 18 identical co-operators in 1955 and 1956. When comparing the results for the two years it must be borne in mind that in 1956 the birds were, on average, sold at 27 weeks and were about 3 weeks older than in 1955. The average costs[1] of rearing turkeys on these farms increased from 40/- per bird reared in 1955 to almost 45/- in 1956 or from 2/7½d. to 2/9d. per lb. liveweight. On adding the average labour costs of preparing the birds for sale (i.e. killing, plucking, drawing and trussing), transport and marketing costs and miscellaneous costs (i.e. commission, wax, coal etc.),[2] the average total costs were 48/1d. per bird reared or 2/11½d. per lb. liveweight in 1956 compared with 41/8d. per bird and 2/9d. per lb. in the previous year. Not all these costs, of course, were actually incurred in cash during these two years. The labour of the farmer and wife and the depreciation of buildings and equipment, for instance, are not actually paid for in cash during any one particular year. It was not possible to distinguish between the labour of the farmer and wife and that of sons and daughters on all records. Therefore in arriving at the current costs i.e. the costs incurred in cash, the value of all

(1) The charges for labour and home-grown foods are given in the Appendix.

(2) The majority of the birds were sold in the plucked state in both years.

Table III.

Average Costs and Returns per Bird Reared and per lb. Liveweight for 18 Identical Flocks 1955 and 1956.

	Per bird reared.		Per lb. liveweight.[1]		Per cent.	
	1955.	1956.	1955.	1956.	1955.	1956.
	s. d	s. d	s. d	s. d	%	%
Costs:						
Cost of Poults	10. 4	10. 8	0. 8	0. 8	25.8	23.8
Food – home-grown	4. 5	2.11	0. 3½	0. 2½	11.0	6.5
– purchased	20. 5	26. 9	1. 4½	1. 8	51.0	59.7
Labour – family	0. 9	0. 9	0. 0½	0. 0½	1.9	1.7
– hired	1. 6	1. 7	0. 1	0. 1	3.8	3.5
Rent and/or Depreciation on						
Buildings and Equipment	1. 4	1. 3	0. 1	0. 1	3.3	2.8
Veterinary and Medicines	0. 5	0. 4	0. 0½	neg.	1.1	0.7
Fuel and Electricity	0. 4	0. 2	neg.	neg.	0.8	0.4
Other Rearing Costs	0. 6	0. 5	0. 0½	neg.	1.3	0.9
Total Rearing Costs	40. 0	44.10	2. 7½	2. 9	100.0	100.0
Credit for Manurial Residues	0. 3	0. 3	neg.	neg.	–	–
Total Net Rearing Costs	39. 9	44. 7	2. 7½	2. 9		
Preparation for Sale:						
Labour – family	0. 1	0. 2	neg.	neg.		
– hired	1. 9	2. 4	0. 1½	0. 1½		
Transport and Marketing	0. 1	0. 6	neg.	0. 0½		
Miscellaneous	neg.	0. 6	neg.	0. 0½		
Total All Costs	41. 8	48. 1	2. 9	2.11½		
Total Current Costs[2]	39. 6	45.11	2. 7½	2.10		
Returns:						
Birds Sold and in Closing Valn.	70. 6	42. 7	4. 7½	2. 7½		
Profit or Loss[3]	28.10	–5. 6	1.10½	–0. 4		
Current-Earnings[4] or – Loss	31. 0	–3. 4	2. 0	–0. 2½		

(1) i.e. Costs and Returns divided by the liveweight-equivalent of the birds.

(2) Current Costs = Total Costs excluding charge for family labour and depreciation on buildings and equipment.

(3) Profit or Loss = Difference between Returns and Total All Costs.

(4) Current Earnings = Difference between Returns and Total Current Costs.

family labour, rather than only that of the farmer and wife, together with the other non-cash items, have been deducted from total costs.

The Average Returns (which include the value of the very few birds remaining at the time of the closing valuation as well as that of the birds actually sold) were reduced between 1955 and 1956 by 40 per cent – from 70/6d. to 42/7d. per bird reared or from 4/7½d. to 2/7½d., per lb. liveweight produced.

The net results of these changes in costs and returns was that whereas in 1955 these farmers, as a whole, made handsome profits amounting to about 29/- per bird reared, in 1956 they suffered losses to the extent of 5/6d. per bird reared.

The following table shows the distribution of these farms according to their costs, returns, profits or losses and according to their current earnings or current losses:-

Table IV.

Number of Flocks with Average Costs, Returns, Profits or Losses and Current Earnings or Losses within the Stated Ranges.

Shillings per bird reared.	Costs.		Returns.	
	1955.	1956.	1955.	1956.
	(No. of Flocks).			
80 and over	2	1	5	—
70 - 80	—	—	9	—
60 - 70	—	1	1	1
50 - 60	4	7	3	4
40 - 50	7	9	—	9
30 - 40	3	—	—	4
30 & under	2	—	—	—

Shillings per bird reared.	Profits or Losses.		Current Earnings or Current Losses.	
	1955.	1956.	1955.	1956.
	(No. of Flocks).			
Profit –				
Over 40	1	—	4	—
30 - 40	7	—	5	—
20 - 30	8	1	7	1
10 - 20	—	1	—	1
0 - 10	—	3	1	8
Loss –				
0 to -10	—	8	1	3
-10 to -20	2	4	—	5
Over -20	—	1	—	—

In 1955 turkeys were killed, on average, at 24 weeks and weighed a little over 15 lbs. liveweight,[1] but in the following year the average age of killing was 27 weeks and the birds weighed just over 16 lbs. The average food consumption per bird reared increased from 77 lb. to 84 lb. whilst the cumulative conversion rate at killing-age deteriorated slightly from 5.2 to 5.3

(1) The weight of birds sold plucked or dressed were converted to their liveweight-equivalent on the basis of the following losses through (a) starving, bleeding and plucking and (b) drawing and trussing:-

	Plucked Weight as % of Liveweight.	Dressed Weight as % of Liveweight.
	%	%
Broad Breasted Bronze	91.2	80.25
Mammoth Bronze	90.0	77.0
Beltsville Small White	89.0	75.6
British White	88.5	75.2

lb. food per lb. liveweight. Only 10 of the 18 farms indicated clearly the proportion of all foods which was purchased or home-grown respectively and these farms, as a whole, fed proportionately slightly less home-grown cereals in the second year - 24 per cent compared with 29 per cent. There also appeared to be a distinct increase in the average prices paid for purchased compounds, for instance the average price paid for turkey starter crumbs or meal was 46/9d. in 1955 and 49/- in 1956 whilst the growers' meal price increased by 1/6d. per cwt.

Table V.

	1955.	1956.
Average Killing-Age (weeks)	24	27
" Liveweight (lb.)	15.2	16.1
" Food Consumption per Bird Reared (lb.)	77	84
" Cumulative Food-Conversion Ratio (lb.)	5.2:1	5.3:1
Proportion of Home-Grown Foods (%)	29	24
Average price of poults at:		
day-old	7s.4½d.	7s.6d.
8 weeks	18s.1d.	19s.0d.
Average death-rate (%)	13.7	12.7

The average death-rate, which has a bearing on the consumption and cost of food and on the cost of poults per bird and per lb, was slightly lower in 1956 than in 1955.

The cost of poults (mixed sexes) per bird reared increased from 10/4d. to 10/8d. The average price of day-old poults increased only by 1½d. each whereas that of 8-week poults increased by about 11d. The average price paid per head for all poults purchased increased from 8/10½d. to 9/4d.

The reduction in profits and current earnings were due much more to the reduction in the returns than to the increases in costs. Whilst the average weight per bird reared increased by about 1 lb. liveweight, the average sale prices per lb. in 1956 were very much below those obtained in 1955.

Prices.

The average price per lb. (plucked) received from wholesalers — and about two-thirds of the birds were sold in this way — was only 2/7d or little more than half the corresponding price received in 1955.

Table VI.

Average Prices per lb. for 18 Identical Flocks.

Year.	Consumer.			Retailer.			Wholesaler.		
	live-weight	plucked	dressed	live-weight	plucked	dressed	live-weight	plucked	dressed
	s. d	s. d	s. d	s. d	s. d	s. d	s. d	s. d	s. d
1955	5. 1	5. 7½	6. 8	5. 1	5. 3½	6. 5	4. 9	4. 10½	5. 10
1956	—	4. 1½	4. 10½	—	3. 1	4. 1	2. 2	2. 7	4. 3½

The following graphs show the average weekly prices at the Birmingham and London markets for the period September to January inclusive in 1955-56 and 1956-57. The prices of 1st quality hens and stags are shown separately; the quotations for 2nd quality birds are not complete and, therefore, have not been plotted. Unfortunately statistics of the weekly throughput of turkeys at these markets were not available.

The trends in the average prices during the period September to December 1956 reveal certain features which are very different from those for the same period in 1955. In the first place, the average prices for both stags and hens were much lower in 1956 throughout the period apart from Christmas week. From early November to mid-December 1956 the average prices both of stags and of hens declined gradually, whereas during this period in 1955 average prices for both sexes remained fairly stable with a tendency to improve. Then, in sharp contrast to the 1955 trend, the average prices per lb. of both hens and stags, of the latter especially, improved substantially in the third and the fourth weeks in December 1956.

It is of interest also to record that the prices of turkeys imported from Eire followed the same trend as those for home-produced birds.

What were the causes of the heavy fall in turkey-prices in 1956 ? Undoubtedly the root cause was the very large increase in the number of turkeys reared and sold. The knowledge of this increase amongst traders and possibly also their awareness that supplies were being carried forward from Christmas 1955 in deep-freeze depressed prices to a marked extent even in September. Then, according to the farming and poultry press, many producers, rearing more birds than previously and fearing a slump later, began killing and selling their birds much earlier than usual, a fact which forced prices downwards in November. Other producers, realizing that the market was becoming less favourable, followed suit with the result that in early December prices were at "rock bottom".

Not only were there increased supplies but, probably owing to a large number of new inexperienced producers, large numbers of birds of very low quality, badly killed and plucked, unpacked and ungraded, were dumped on the market. This undoubtedly contributed to the lowering of prices. Hens are in greater demand than stags, the latter being in demand more by the catering trade than by the general public. It appeared that the catering trade could not absorb the stags as rapidly as retailers purchased the hens and in consequence stag prices declined more rapidly than those for hens.

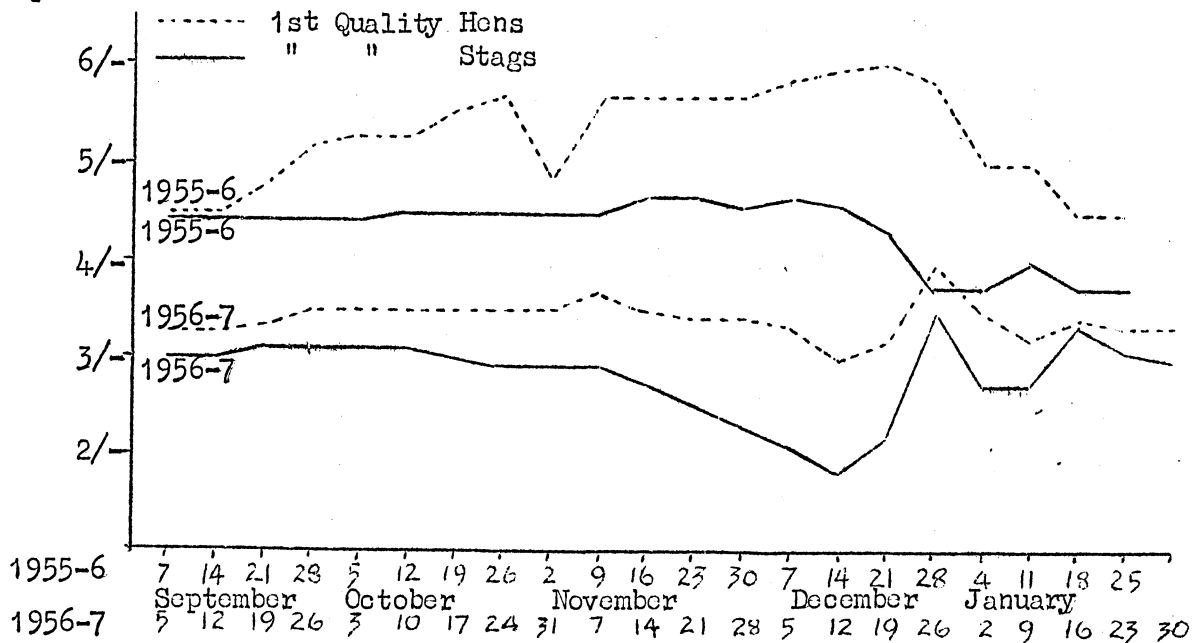Graph I.

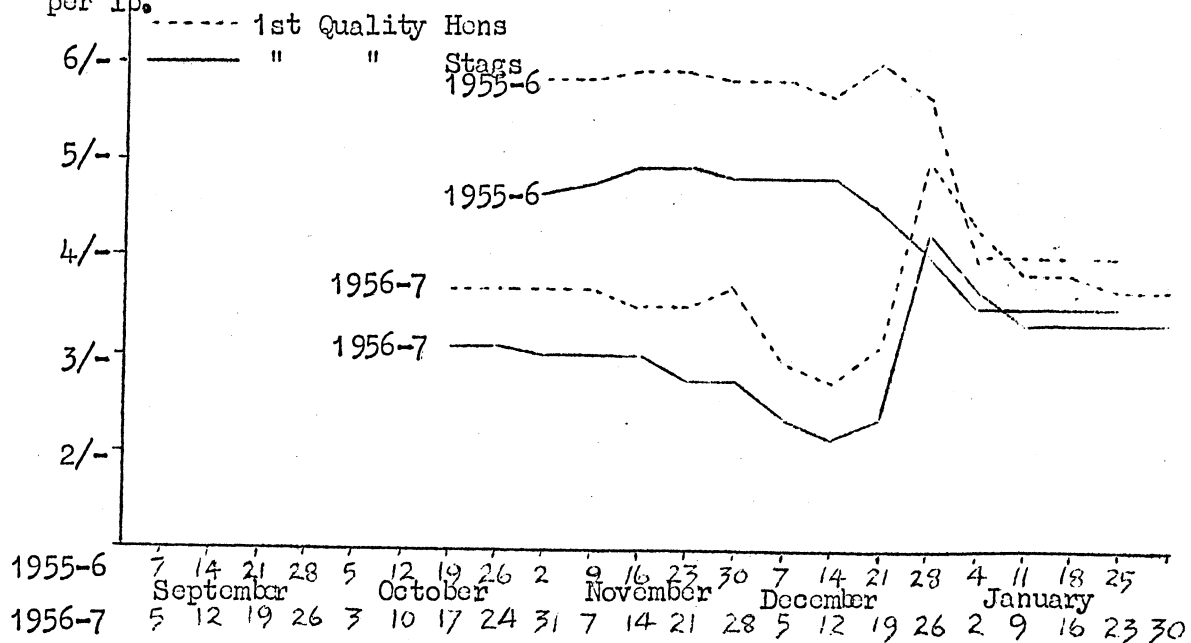Average Wholesale Prices of Home-Produced Turkeys
1955-6 and 1956-7.

(a)

LONDON.

(Clean - Plucked)

(b)

BIRMINGHAM.

(Rough - Plucked)

Source - Horticultural and Price Statistics Branch, Ministry of Agriculture,
Fisheries and Food.

Surprisingly, prices improved substantially just before Christmas 1956 probably because of a fall in supply due to the earlier killing and because a large section of the public, thinking there was a plentiful supply, left their buying until rather late.

Relative Importance of Cost-Items.

The relative importance of cost-items in turkey rearing is worth noting. Food alone accounts for approximately two-thirds of the rearing-costs, and the purchase price of the poult for about one-quarter; together these items amount to between 85 and 90 per cent of all rearing costs. Labour amounts to only 5 or 6 per cent of these costs.

AGE, LIVEWEIGHT AND FOOD-CONVERSION RATIO.

The Optimum Age to Kill.

Since the cost of food is such a large item in turkey rearing, economy in feed utilisation is of primary importance. The rate of growth of turkeys, at least the average rate of growth for the mixed sexes of the Broad Breasted Bronze and the average for Commercial White varieties, accelerates at about the 7th or 8th week, continues at a steady rate until about the 21st and 22nd weeks when it declines again. The daily food consumption increases continually until about the 22nd week after which it keeps fairly constant. The food-conversion ratio widens i.e. the number of lbs. of food per lb. liveweight gain increases, slowly up to about 16 weeks but more rapidly afterwards. Since food is the most important cost involved in the production of every extra lb. liveweight, it is evident that, at a given level of food-cost and turkey prices, there is an optimum food-conversion ratio at which the margin over the costs is at its maximum. At what age is this optimum food-conversion ratio reached ? In theory it should be at that age when the value of the additional lb. live-weight just equals the costs incurred in its production. In addition to food, some labour is also involved in carrying on production for an additional period, but since labour is so often a fixed charge on general farms and does not increase by keeping the birds for an additional week or two, it can be disregarded. The cost of the poult and the fuel for rearing are also fixed charges which do not change with the killing-age of the birds. But, the longer the birds are kept the additional foods consumed by the birds that die still further widens the food-conversion ratio and increases the food-cost per lb. liveweight gain; miscellaneous costs also increase with age. Therefore, the optimum age is reached when the cost of the food (adjusted for deaths) plus the additional miscellaneous costs, i.e. the total marginal costs incurred in the production of an additional lb. liveweight, are just covered by the price obtained for this additional lb. liveweight. At a younger age the conversion ratio is narrower and the total marginal costs lower, implying that further production can still leave a margin over these costs either to cover overheads or as an addition to profits . At a later

Graph II.

Weekly Liveweight and Weekly Food-Conversion Ratio.

Broad Breasted Bronze Turkeys (Mixed Sexes).

liveweight per bird (lb.)
weekly food conversion ratio (lb.)
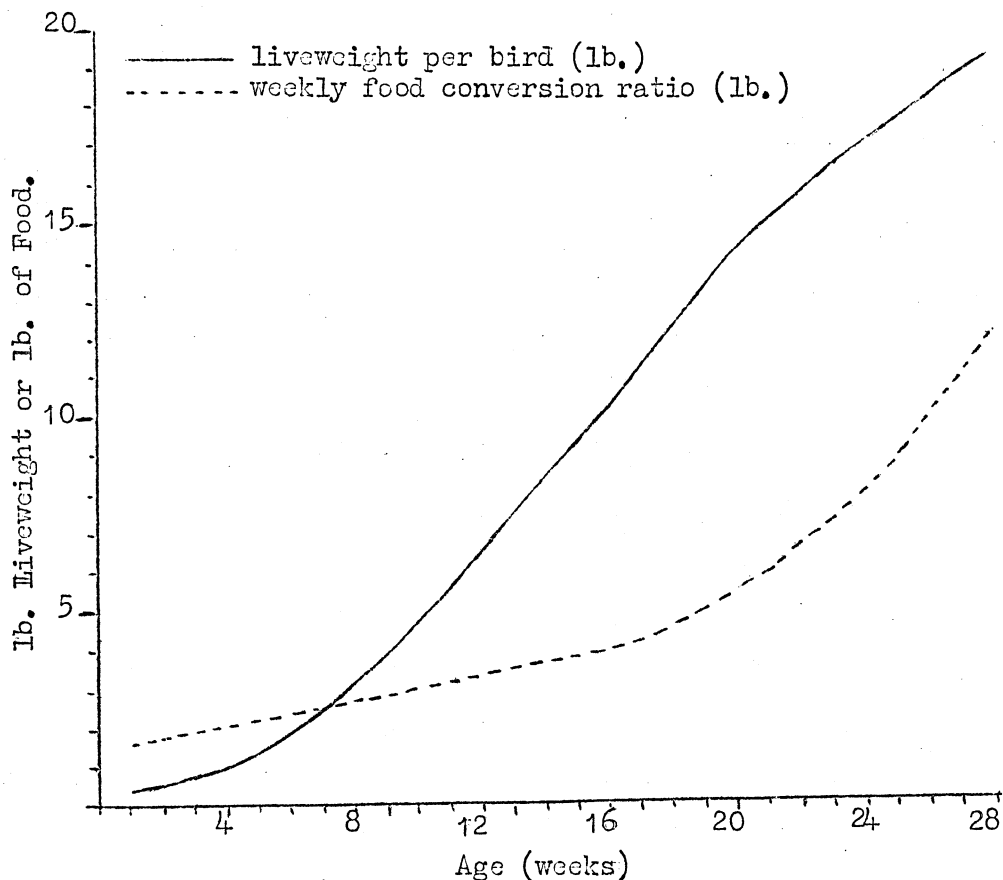
Source: A Pembrokeshire Farm.   Wyoming Experimental Station 1942.   B.O.C.M.
        Turkey Trials 1956.

Graph III.

Weekly Liveweight and Weekly Food-Conversion Ratio.

Commercial White Turkeys (Mixed Sexes).

liveweight per bird (lb.)
weekly food conversion ratio (lb.)
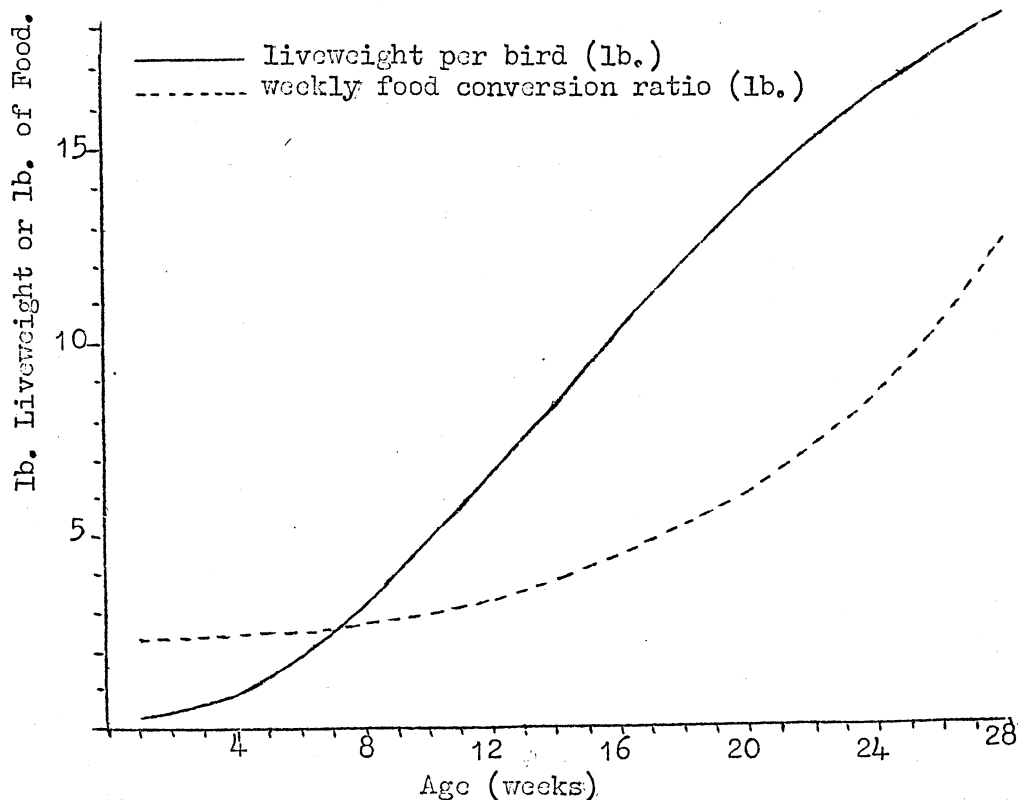
Source: 0-24 weeks from Norfolk Agricultural Station, Sprowston 1956.

date, the converse is true; the marginal costs exceed the value of the additional lb. liveweight produced and the profit is reduced or the loss is increased to the extent of this excess.

The Optimum Killing-Age for Mixed Sexes.

Although there may be an advantage in killing hens sooner than stags or vice versa or of rearing only hens, the common practice is to buy unsexed poults and to kill all birds at about the same time. Turkey rearers will, therefore, be interested in knowing what average killing-age for the mixed sexes is likely to be the most advantageous financially.

Graphs II and III show the average weekly liveweight and weekly food-conversion ratios from 0 to 28 weeks for the mixed sexes of the Broad Breasted Bronze and the average for the various Commercial White[1] varieties respectively. Graph II is a compromise between the results obtained from one co-operating farmer, those for the B.O.C.M. Turkey Rearing Trial 1956 (0 to 22 weeks) and the results for an American Trial. The liveweight curves were remarkably similar for the three sources. The food-conversion curves were also reasonably comparable to about the 19th week - the American figures were, in fact, slightly more favourable than those from the other two sources. Afterwards the broadening that normally occurs was much more marked for the one co-operating farm than for the American Trial. In the absence of suitable British figures, the conversion curve was continued beyond the 19th week according to the assumption that the conversion ratios likely to be obtained after this particular week under 'trial' conditions in this country, would continue to be slightly less favourable than those obtained in the American Trial. Graph III represents the average results obtained at the Trials carried out with several varieties of White[1] turkeys from 0-24 weeks, at the Norfolk Agricultural Station, Sprowston. The conversion ratio actually fluctuated but the fluctuations have been smoothed into a curve. The Commercial Whites do not attain such large weights as the Bronze varieties and the conversion ratio begins to broaden more rapidly 3 or 4 weeks earlier than for the latter.

The optimum weekly food-conversion ratio and the optimum age for any one variety will obviously depend on the relative prices of turkeys and of food-stuffs. The higher the price per lb. of turkey relative to the price of food, the wider the conversion ratio and the higher the marginal costs it will bear, and the higher will be the optimum age of the birds. The marginal costs
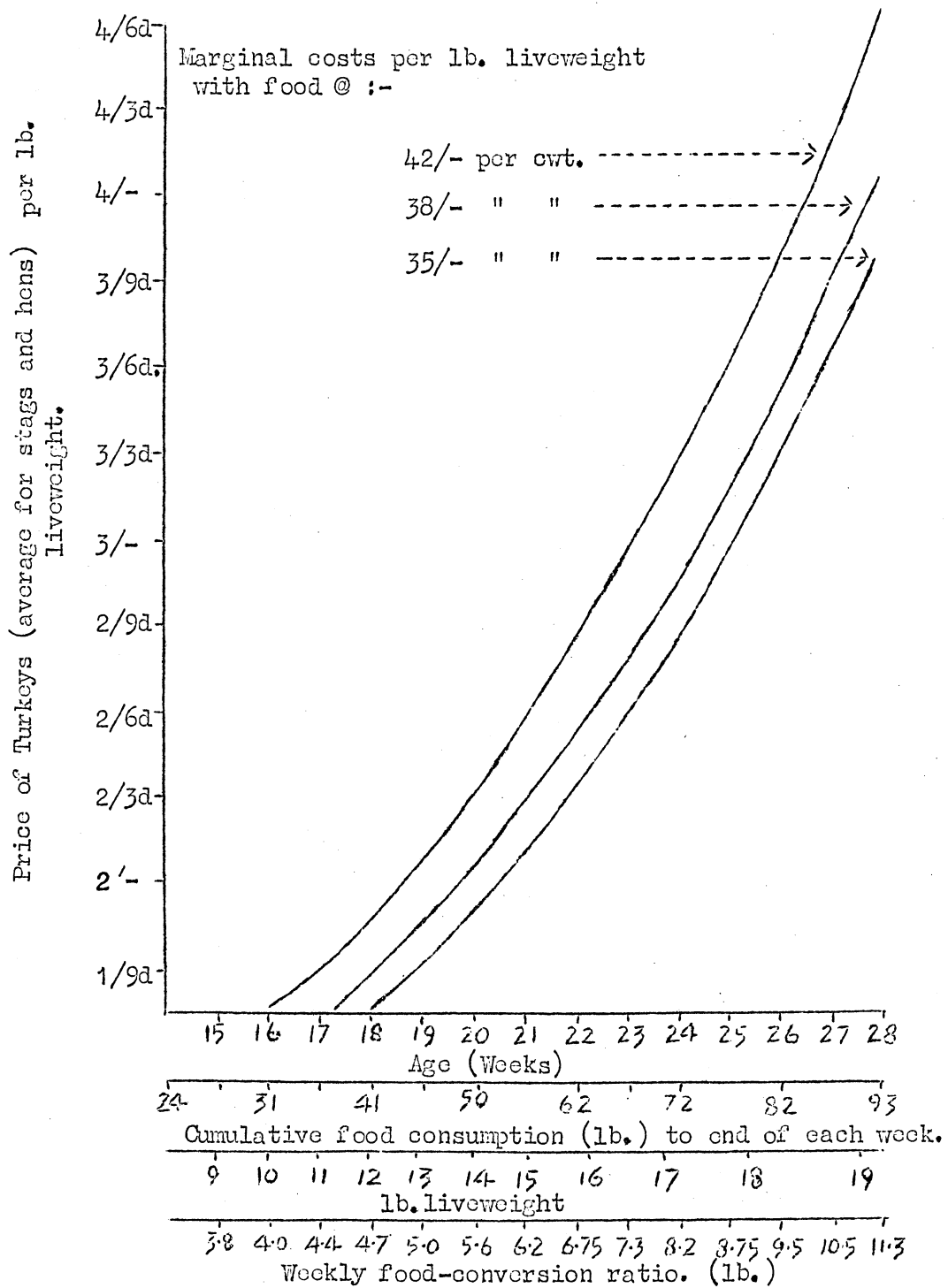
---

(1) The original stock of white turkeys at Sprowston was a random sample, as far as was possible, of white turkeys in commercial production. The statistics quoted in the report are therefore the average for the existing stock which has been developed from several varieties of white turkeys. The term 'Commercial White' is therefore used to cover the existing stock.

involved per additional lb. liveweight produced were calculated weekly from 16-28 weeks for Broad Breasted Bronze and Commercial White turkeys on the basis of the weekly food-conversion ratios given in Graphs II and III. In adjusting these ratios for deaths it was assumed that the death-rate was 9 per cent (of the poults purchased) up to 16 weeks, and that it increased by 1 per cent fortnightly up to 24 weeks and by $\frac{1}{2}$ per cent fortnightly from 25 to 28 weeks. The additional cost of food due to deaths and miscellaneous costs were, together, estimated to vary from about $1\frac{3}{4}$d. to 3d. per lb. liveweight gain between 16 and 28 weeks. The marginal costs per lb. liveweight gain were plotted at different ages to produce the curves on Graphs IV and V. They were, in fact, calculated at three levels of food-prices, namely, 42/-, 38/-, and 35/- per cwt., or $4\frac{1}{2}$d., 4d. and $3\frac{3}{4}$d. per lb. The former price represents a ration consisting almost entirely of purchased compounds whilst the latter two represent rations containing grain amounting, in quantity, to about one-third and one-half respectively/and valued at market prices. The optimum

of the total

age and optimum conversion ratio can be read directly from the Graphs. They are vertically below the point of intersection of the horizontal representing the price of turkeys and the appropriate marginal cost curve. Thus when turkeys fetch, on average, 2/6d. per lb. liveweight and food costing 42/- per cwt. is used, the best age to slaughter Broad Breasted Bronze turkeys (mixed sexes) is 21 weeks when they weigh, on average, about 15 lb. liveweight and when the weekly food-conversion ratio is about 6:1; but if the price is 3/6d. per lb, they should be killed at 25 weeks, weighing about 17-18 lb. and when the weekly conversion ratio is about 9:1. At any level of turkey-prices, the lower the price of the ration fed the longer the birds should be kept. For instance, when the average value of the food is 35/- per cwt. then the birds should be kept 8-10 days longer than when its value is 42/- per cwt.

The weekly food-conversion ratios on the majority of farms are probably slightly higher, at any given age over 10 weeks, than those shown in the graphs. If a farmer can judge reasonably accurately his weekly food-conversion ratio, the graphs will help to indicate the minimum price required for satisfactory returns at a particular age and he will, therefore, be able to judge, according to the movement of prices and the expected increase in the conversion ratio, whether to kill at that particular age or later. Or, if in the spring he feels that the prices of turkeys will be lower for the coming than for the previous Christmas, then he may be able to decide to buy his day-old poults at a later date than usual or, perhaps, earlier so that he can sell early. It is likely that a large number of farmers can, today, choose the date of purchase of their poults and also, with the increasing use of deep-freeze equipment by dealers, decide to kill many weeks, or even months, before Christmas. It must be borne in mind, however, that owing to the widening of the food-conversion ratio with age, especially after about 20 weeks, the time when the price is expected to be highest will not necessarily be the most profitable time to kill. Any expected

Graph IV.

Optimum Killing-Age for B.B.B. Turkeys (Mixed Sexes).

Price of Turkeys (average for stags and hens) per lb. liveweight.

Marginal costs per lb. liveweight
with food @ :-

42/- per cwt. - - - - - - - - - - - ->

38/- " " - - - - - - - - - - - ->

35/- " " - - - - - - - - - - - ->

| 4/6d |
| 4/3d |
| 4/- |
| 3/9d |
| 3/6d |
| 3/3d |
| 3/- |
| 2/9d |
| 2/6d |
| 2/3d |
| 2'- |
| 1/9d |

15 16 17 18 19 20 21 22 23 24 25 26 27 28
Age (Weeks)

24 31 41 50 62 72 82 93
Cumulative food consumption (lb.) to end of each week.

9 10 11 12 13 14 15 16 17 18 19
lb. liveweight

3·8 4·0 4·4 4·7 5·0 5·6 6·2 6·75 7·3 8·2 8·75 9·5 10·5 11·3
Weekly food-conversion ratio. (lb.)

Graph V.

Optimum Killing-Age for Commercial White Turkeys (Mixed Sexes).

Marginal costs per lb. liveweight
with food @:-

42/- per cwt. - - - - - - - - →

38/- " " - - - - - - - - →

35/- " " - - - - - - - - →

Price of Turkeys (average for stags and hens) per lb. liveweight.

| 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |

Age (weeks)

| 29 | 32 | 36 | 40 | 44 | 49 | 54 | 60 | 65 | 70 | 75 | 81 | 86 | 91 |

Cumulative food consumption(lb.) end of each week.

| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

lb. liveweight.

| 4·0 | 4·4 | 4·8 | 5·2 | 5·6 | 6·0 | 6·5 | 7·1 | 7·7 | 8·4 | 9·2 | 10·0 | 11·1 | 12·1 |

Weekly food-conversion ratio (lb.)

change in price must always be related to the expected increase in weight of
the birds and the cost of the additional food that will be consumed.

In 1956, the average market value of the food fed by the co-operating
farmers, taken as a whole, was about 39/6d. per cwt., and the average price of
turkeys in December was about 2/9d. per lb. liveweight. Therefore, according
to Graph IV, the optimum age to kill was 23 weeks when the expected weight
of the birds was 16.5 lb. liveweight each; but the birds in our sample of
farms were killed, on average, at 27 weeks and averaged just over 16 lb. liveweight.
It is obvious, therefore, that the birds in our sample were, generally, too
old to ensure the maximum profit from their sale at the existing prices.
Allowing for their slower rate of growth and higher weekly food-conversion
ratio, to have obtained full advantage of these prices, the birds should not
have been more than 23 weeks at killing in 1956. In 1955, when the average
price just before Christmas was about 4/6d. per lb. liveweight, farmers would
have benefited had the birds, which on average were killed at 24 weeks,
been older and heavier for, at that price, the optimum killing-age would not
have been less than 28 weeks.

A comparison of the dates of purchase of the day-old poults and the dates
of sale of the mature birds for 1955 and 1956 suggests that some of our turkey
farmers realizing that, with such high prices, they had bought their poults
at too late a date in 1955, attempted to rectify this the following year; but,
of course, the unexpected slump in the 1956 Christmas turkey-prices completely
upset their plans. As things turned out, it would have been better had
they continued to buy their poults in July and August.

Table VII.

Date of Purchase of Poults and Sale of Mature Turkeys.
(Results for 18 Identical Farms 1955 & 1956).

Date of Purchase of Poults	Number of Farms.		Proportion of Poults Purchased		Date of Sale.	Number of Farms.		Proportion of Birds Sold.	
	1955	1956	1955	1956		1955	1956	1955	1956
			%	%				%	%
March	1	2	2.5	9.3	Sept.	1	—	0.8	0.3
April	3	—	14.9	—	Oct.	1	2	3.7	1.0
May	5	8	10.1	29.9	Weeks to				
June	3	7	7.7	33.1	Christmas				
July	4	7	19.2	26.9	8 & 7	1	2	1.3	2.4
August	5	1	45.6	0.8	6 & 5	4	4	7.8	8.4
					4 & 3	4	4	7.1	14.9
					2 & 1	18	17	79.3	73.0
								100.0	100.0

The above table shows an attempt by some farmers to sell some of their birds
about a fortnight sooner in 1956 than in the previous year. But, whereas in 1955
prices dropped just before Christmas, they actually improved during the same
period in 1956. Assuming that all birds reared were of the same age, and that

prices increased from 2/6d. to 2/9d. per lb. liveweight during the fortnight before Christmas, the question arises whether any benefit was gained by selling a fortnight early ?

<u>Difference in costs</u> -

Food consumption between 25 and 27 weeks	=	10.5 lb. per bird
		s. d
.˙. additional cost of food (at 4d. per lb.)	=	3. 6 " "
Adjustment for deaths and miscellaneous costs	=	<u>0. 3</u> " "
.˙. Total additional costs	=	<u>3. 9</u> " "

<u>Difference in returns</u> -

		s. d
At 27 weeks, 16 lb. @ 2/9d.	=	44. 0
At 25 " 15.25 lb. @ 2/6d.	=	<u>38. 2</u>
Increase in returns	=	5.10
But additional costs	=	<u>3. 9</u>
.˙. Net increase in returns	=	<u>2. 1</u>

It would appear therefore that those selling a fortnight earlier, unless their birds were considerably younger when killed than the others, were 2/1d. per bird worse off than those who sold late.

The approximate cumulative food-consumption to various ages is shown on Graphs IV and V. It should be noted that at 20 weeks the Broad Breasted Bronze turkeys had consumed about 50 lb. of food per head and attained a liveweight of 14 lbs., but during each of the periods 21-24 weeks and 25-28 weeks they consumed just over 20 lb. whilst increasing only 3 lb. and 2 lb. respectively in liveweight. Roughly similar figures are shown in respect of Commercial White turkeys.

<u>Estimated Costs and Profits at Varying Age and Price.</u>

In arriving at the optimum age to kill only the marginal costs were taken into consideration. Table VIII shows the estimated <u>total</u> costs, per bird reared and per lb. liveweight, from 18 to 28 weeks i.e. all costs, including a charge for labour, depreciation on equipment, fuel, vet and medicines, as well as these marginal costs. The total costs per bird reared and per lb. liveweight increase with age and with the increasing liveweight of the birds. The profits per bird derived over these total costs at increasing age and increasing average prices are shown in table IX. It should be noted that the age where maximum profit is obtained at different prices, as shown by this table, is about a week earlier than the optimum age indicated, for corresponding prices, by the graph. This difference results from the cost of labour, depreciation and vet and medicines, as well as that of food, deaths, and miscellaneous costs, having been included in the total costs used in arriving at these profits.

Table VIII.

Estimated Cost of Rearing per Bird and per lb. Liveweight.
(Broad Breasted Bronze:Mixed Sexes).

Age (weeks)	Live weight(1) lb.	Food(1) Consumed	Costs per Bird Reared.				Total Costs per lb. Liveweight
			Food(2) s. d	Labour(3) s. d	Other(4) Costs s. d	Total Costs. s. d	s. d
18	12.3	41	15. 5	1. 6	11. 2	28. 1	2. 3½
19	13.2	45	16.11	1. 7	11. 2	29. 8	2. 3
20	14.1	50	18. 9	1. 8	11. 4	31. 9	2. 3
21	14.9	55	20. 8	1. 9	11. 5	33.10	2. 3
22	15.9	62	23. 3	1.10	11. 7	36. 8	2. 3½
23	16.5	67	25. 2	1.11	11. 8	38. 9	2. 4
24	17.2	72	27. 0	2. 0	11.10	40.10	2. 4½
25	17.8	77	28.10	2. 1	11.11	42.10	2. 5
26	18.3	82	30. 9	2. 2	12. 1	45. 0	2. 5½
27	18.8	88	33. 0	2. 3	12. 2	47. 5	2. 6
28	19.3	94	35. 3	2. 4	12. 4	49.11	2. 7

(1) As for Graph II.

(2) Food at 4½d. per lb.

(3) Labour at 1d. per bird per week.

(4) Poults 7/6d. each throughout; Cost of Deaths increasing from 1/5d. at 18 weeks to 1/8d. at 28 Weeks. Fuel 3d. throughout; Depreciation on equipment 1/6d. throughout; Miscellaneous Costs increasing from 7d. at 18 weeks to 11d. at 28 weeks.

Table IX.

Estimated Profits at Different Ages and Various Prices for Turkeys.

(Broad Breasted Bronze:Mixed Sexes).

| Age | Live-weight. | Total Costs per Bird Reared. | Profits per bird reared at the following average prices per lb. liveweight for mixed sexes:- | | | | | | |
			2/6d.	2/9d.	3/-.	3/3d.	3/6d.	3/9d.	4/-.
weeks	lb.	s. d	s. d	s. d	s. d	s. d	s. d	s. d	s. d
18	12.3	28. 1	2. 8	5. 9	8.10	11.11	14.11	18. 1	21. 1
19	13.2	29. 8	3. 4	6. 8	9.11	13. 3	16. 7	19.10	23. 2
20	14.1	31. 9	3. 6	7. 0	10. 7	14. 1	17. 7	21. 1	24. 8
21	14.9	33.10	3. 5	7. 2	10.10	14. 7	18. 4	22. 1	25. 9
22	15.9	36. 8	3. 1	7. 1	11. 1	15. 0	19. 0	22.11	26.11
23	16.5	38. 9	2. 6	6. 8	10. 9	14.11	19. 0	23. 2	27. 3
24	17.2	40.10	2. 2	6. 6	10. 9	15. 1	19. 5	23. 8	28. 0
25	17.8	42.10	1. 5	5.10	10. 3	14. 8	19. 2	23. 6	28. 0
26	18.3	45. 0	0. 6	5. 0	9. 7	14. 2	18. 9	23. 3	27.10
27	18.8	47. 5	-0. 7	4. 2	8.10	13. 6	18. 2	22.11	27. 7
28	19.3	49.11	-1. 9	3. 0	7.10	12. 8	17. 6	22. 3	27. 1

Graph VIA.

Weekly Liveweight and Weekly Food-Conversion Ratio.
Commercial White Turkeys (Stags).
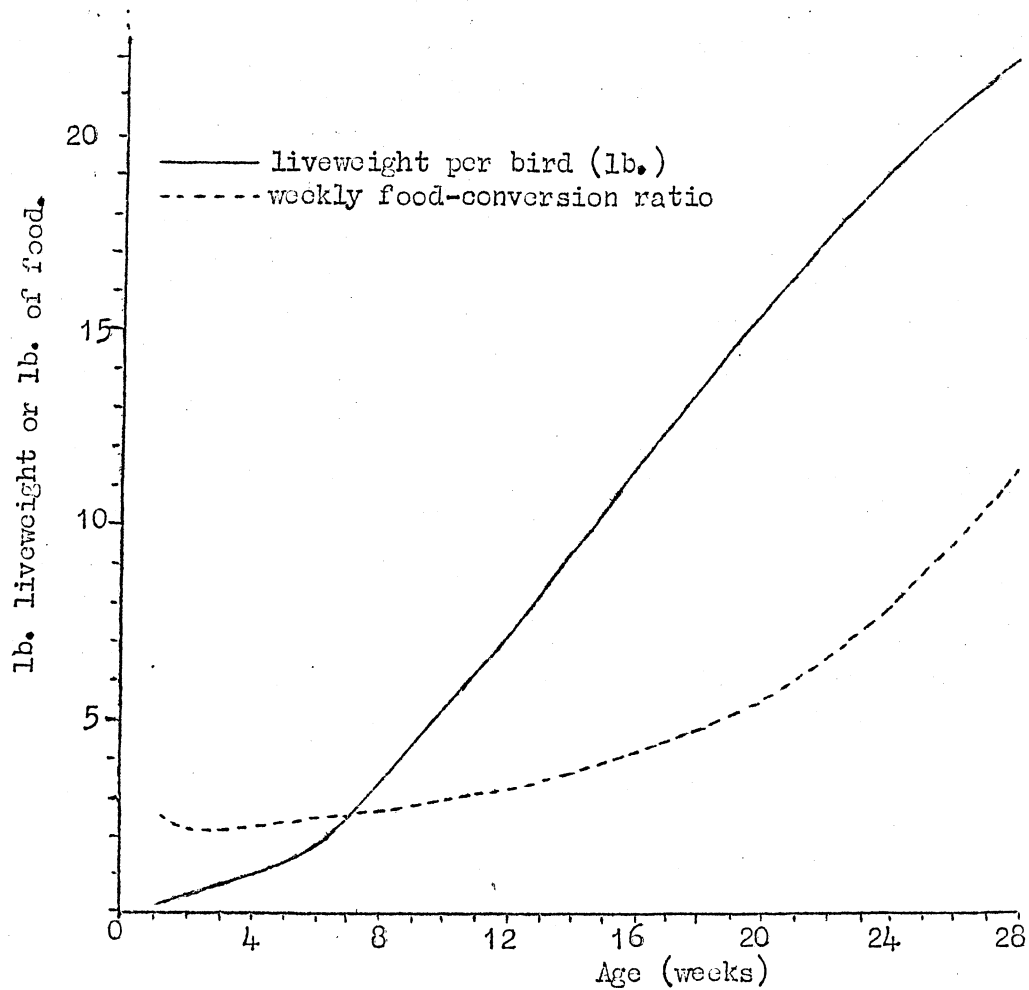
Source: 0-24 weeks from Norfolk Agricultural Station, Sprowston.

Graph VIB.

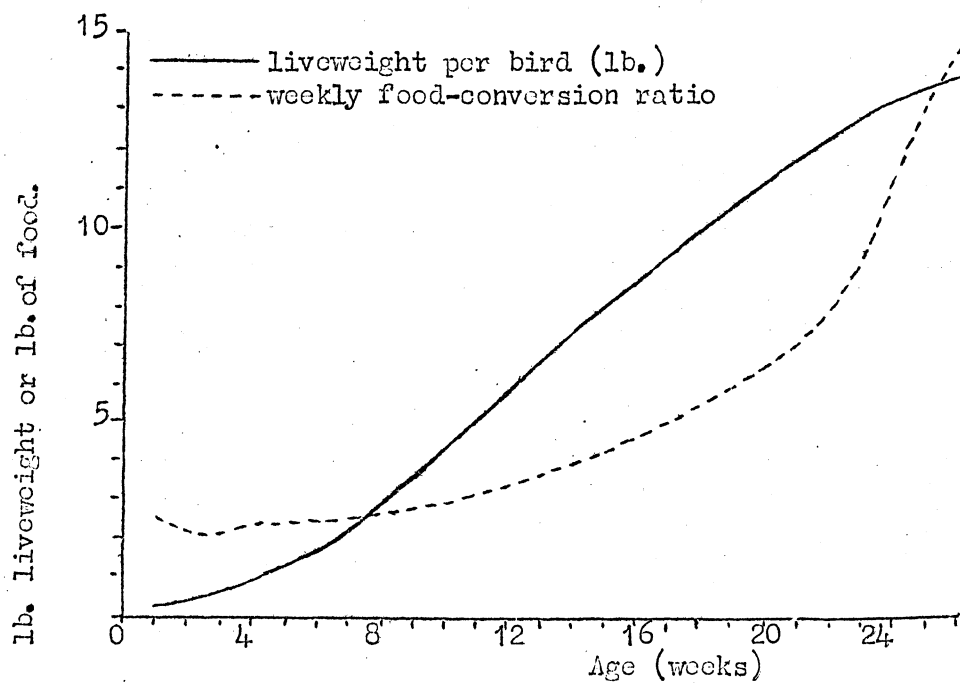### Weekly Liveweight and Weekly Food-Conversion Ratio.
Commercial White Turkeys (Hens).

Source: 0-24 weeks from Norfolk Agricultural Station, Sprowston.

The Optimum Killing-Age for Stags and Hens.

Graphs VIA and VIB present the weekly liveweight and weekly food-conversion ratio for both sexes of Commercial White turkeys from 0 to 24 weeks. They illustrate the qualities of faster growth, larger size, and higher efficiency as food-converters of stags as compared with hens. But it does not follow from the greater efficiency of the stags as food-converters that the optimum age is greater for them than for hens. There is a price-differential in favour of hens as a result of their smaller size and tender-ness. In fact, Graphs VIIA and VIIB suggest that, if the price of hens is 3/6d. and that for stags is about 2/5d. per lb. liveweight, then the hens should be killed and sold at 22 or 23 weeks but the stags at least a week earlier.

Sexed or Unsexed Birds ?

It is thought by some people that, since they mature earlier and claim higher prices per lb. than stags, it is more profitable to rear only hens, although their purchase price at day-old is appreciably greater than that for mixed sexes. The answer to this problem depends on the difference between the sale-prices for hen-and stag-turkeys and on the age at which the birds are killed. Turkey-rearers cannot judge accurately in the summer, when they normally buy their poults, what the average sale-prices or the difference between those for stags and hens will be at Christmas. Neither can they judge accurately, so early in the year, what the optimum age is likely to be for the mixed sexes and for the hens. To tackle this problem, the following assumptions are made:-

(1) Both the mixed batch and the hen – poults are purchased, at day-old, in mid-July at these prices:- mixed sexes 7/6d. each, hens 12/- each and Stags 3/6d. each.

(2) All birds are killed at 22 weeks.

(3) They are fed on food valued at 42/- per cwt. or $4\frac{1}{2}$d. per lb.

Graph III indicates that at 22 weeks the mixed Commercial Whites weight, on average, 15 lb. per head and have consumed 60 lb. food. At 22 weeks the hens average 12.5 lb. each and have consumed 50 lb. food.

	s. d		
Additional cost of hen-poults	= 4. 6	per bird	
Saving in food cost = 60-50 lb. = 10 lb. @ $4\frac{1}{2}$d.	= 3. 9	"	"
∴ Net Increase in costs by keeping hens only	= 0. 9	"	"

With the average sale-price of mixed sexes at:-

(a) 2/6d. per lb. liveweight;

	s. d		
15 lb. per head at 2/6d. per lb.	= 37. 6	per bird	
Additional cost for hens	= 0. 9	"	"
Returns required for hens	= 38. 3	"	"

Graph VIIA.

Optimum Killing-Age for Commercial White Turkeys (Stags).

Marginal costs per lb. liveweight with
  foor @:-

  42/- per cwt. - - - - - - - - →
  38/- "   " - - - - - - - - →
  35/- "   " - - - - - - - - →

Price of Turkeys (Stags) per lb. liveweight.

4/6d
4/3d
4/-
3/9d
3/6d
3/3d
3/-
2/9d
2/6d
2/3d
2/-
1/9d

Age (Weeks)
15 16 17 18 19 20 21 22 23 24 25 26 27 28

31 35 39 44 49 55 61 68 75 81 87 96 102 109
Cumulative food consumption (lb.) to end of each week.

10 11 12 13 14 15 16 17 18 19 20 21 22
lb. liveweight.

4.0 4.2 4.4 4.7 5.1 5.5 6.0 6.7 7.3 8.0 8.7 9.7 10.5 11.7
Weekly food-conversion ratio (lb.)

Therefore, if the profit from hens is to equal that from mixed birds, a price per lb. of $\frac{38/3d.}{12.51b.}$ = 3/-$\frac{3}{4}$d. is required for hens. This means a price-differential of 6$\frac{3}{4}$d. between hens and mixed sexes and 1/1$\frac{1}{2}$d. between hens and stags, or that the price must be 58 per cent higher for hens than for stags.

(b) 3/- per lb. liveweight, if the profit from hens is to equal that from mixed birds, the price for hens must be 3/8d. and that for stags 2/4d., or it must be 57 per cent higher for hens than for stags.

(c) 3/6d. per lb. liveweight, hens must fetch 4/3d. per lb. if the profit is to equal that from mixed sexes. Stags must then be at 2/9d per lb. and the price for hens 54 per cent more than that for stags.

(d) 4/- per lb. liveweight, hens must fetch 4/10d. and stags 3/2d. i.e. the price for hens must be 53 per cent more than that for stags.

The above calculations indicate that if the profit from hen-turkeys is to _equal_ that from mixed sexes, the sale-price for hens must be about 58 per cent above that for stags when prices are at a low level i.e. averaging from 2/6d. to 3/- per lb. liveweight for mixed sexes, and at least 53 per cent more when prices average from 3/6d. to 4/-. To ensure an increased profit of 2/6d. per bird for the hens over that for the mixed sexes, then, at the lower level of prices hens must sell for at least 85 per cent more than stags and at the higher level they must sell for at least 70 per cent more. Graph I indicates that the price-differential in favour of hens was below 50 per cent except for the first and second weeks in December 1956 when it was 60 per cent and 64 per cent respectively. Although this differential broadens with the approach of Christmas it is hardly likely to be large enough to ensure that the rearing of hens only rather than mixed sexes is worthwhile; except possibly in the cases of the few specialists who have established a reputation as producers of very high-quality birds. In these few cases a small difference in profit per head in favour of hens could result in an appreciable increase in total profit for all birds since, if the rearing space is limited, as under intensive systems, roughly 25 per cent more hens than mixed birds can be reared on a given space.

Is there any point in rearing stags only rather than the mixed birds, assuming that the relative purchase-prices of sexed poults remain as quoted above ? Assuming that all birds are to be killed at 22 weeks, the stags will average about 17.5 lb. liveweight each and the mixed lot about 15 lb., but the stags will have consumed 68 lb. of food and the mixed birds only 60 lb. Food for the stags, therefore, will cost 8 x 4$\frac{1}{2}$d = 3/- more per bird. But since there is a saving of 4/- in the price of poults a net saving in cost of 1/- per bird will result from rearing stags only.

Calculations based on these assumptions show that to make the rearing of stags only, as distinct from mixed sexes, worthwhile stags must fetch a price which is at least 75 per cent of the price for hens. If the relation between the sale-prices for stags and hens in 1955 and 1956 is a guide to future relationships then it is possible that up to the end of November or early December the sale prices of stags may be as much as 80 per cent of those for hens. This would ensure a higher profit of 3/- per bird if stags only were kept, and even if only 325 stags can be kept on the same floor space as 400 mixed birds the profit would be increased by almost £50.

The Advantage of Purchasing Poults at Day-Old.

Three of the 18 identical co-operators in 1955 and 1956 preferred to purchase their poults at 7 or 8 weeks rather than at day-old. The rearing costs for these farms appeared to be higher and the profit per bird lower or the loss per bird greater than the average for all farms. However, owing to differences in system of rearing, quality of management, and in the age of the birds when sold, and in the method of sale, the farms in our sample do not provide a sound basis for judging by comparisons, whether buying poults at 8 weeks is more advantageous than buying them at day-old.

The factors to consider when deciding whether to buy at day-old or 8 weeks are:-

(1) The higher cost of the poult.
(2) Saving in costs of:-
   (a) food due both to the shorter growing period on the farm and also to the lower incidence of deaths after than before the end of the 8th week;

   (b) fuel and/or electricity for brooding.
(3) The possible margin for the alternate use of labour in July and August.

To estimate the changes in costs, the following assumptions are made:-
(1) That labour is a general farm overhead cost.
(2) That the death-rate up to and including the 8th week is 8 per cent and from the 9th to 22nd week inclusive 4 per cent of the original number purchased. These assumptions are based on the evidence obtained from some of the farms co-operating in our survey.
(3) That 100 birds are sold at 22 weeks in both cases. This means that 114 poults (mixed sexes) are purchased at day-old and 104 at 8 weeks.
(4) That the birds consume, on average, 7 lb. of food each from day-old to 8 weeks.
(5) That the 10 birds that die from day-old to 8 weeks consume, on average, $2\frac{1}{2}$ lb. of food each i.e. a total of 25 lb.
(6) That the purchase prices of mixed poults are 7/6d. at day-old and 18/6d at 8 weeks.

<u>104 poults, 8 weeks old, at 18/6d. each</u>   = £96. 4. 0(a)

The costs from day-old to 8 weeks are as follows:-

		£. s. d
114 day-old chicks at 7/6d. each	=	42.15. 0
Food for 104 birds from day-old to 8 weeks = 104 x 7 lb. x 4½d.	=	13.17. 0
Food for the 10 birds that die = 10 x 2½ lb x 4½d=		0. 9. 5
Cost of fuel & electricity at 3½d. each for 114 poults	=	1.12. 0

<u>Total costs from day-old to 8 weeks</u>   = £58. 13. 5(b)

∴ Saving in costs by buying day-old poults (a-b)   = £37.10. 7

Therefore, buying at day-old rather than at 8 weeks means a saving in costs of about £37.10. 0 per 100 birds reared to killing-age. For a man who rears 500 birds the saving is £188 or for 1,000 birds it is £376. Unless the employment of the labour on some other enterprise in July and August will result in a margin over the direct costs which exceeds this rate of saving in the cost of rearing turkeys, then turkey poults should be purchased at day-old rather than at 8 weeks.

<center>DEATH-RATE.</center>

<u>Costs of the Poult and Food.</u>

The death-rate is important because both the purchase price of the poults that die and the cost of the food they consume before death occurs have to be borne by the surviving birds. The older the birds when they die the greater is the additional food-cost per bird reared. Fortunately the majority of deaths generally occur at a young age. Details as to the occurrence of death at various ages was available only for four farms in 1955 and for six in 1956. Deaths were recorded by all these ten farms during the first four-week period, by six of them during the second month and then only by the odd farm for the succeeding monthly periods. The evidence obtained from these farms for both years, taken as a whole, suggests that about 47 per cent of all deaths occur during the first month and another 18 per cent during the second month. The fact that the average death-rate for three farms purchasing poults at 8 weeks was 5 per cent compared with an average of 13 per cent for all other farms supports these figures. Although mixed sexes of the heavier breeds consume a total of about 7 lb. of food up to the end of the 8th week, since the majority of deaths occur in the earlier weeks, the average consumption by all birds dying up to the 8th week is not likely to be more than 2½ lb. each, whereas the average consumption by birds dying after 8 weeks can average anything from 15 to 40 lb. each or even more.

The average cost of the food consumed, and the initial cost of the poults lost at various death-rates are expressed per 100 birds reared in the following table. It was assumed that birds dying during the first two-months each consume, on average, 2½ lb. of food, and that those dying

afterwards each consume 25 lb. food; that food costs 4½d. per lb. and that the poults cost 7/6d. each at day-old.

Table X.

Costs Resulting from Deaths ..to about 22 weeks..

	Per 100 Birds Reared.			Total Cost per lb. liveweight*
Death-Rate.	Cost of Dead Poults.	Cost of Food Wasted.	Total Cost.	
Per cent.	£. s. d	£. s. d	£. s. d	pence.
8	3. 0. 0	1.13. 0	4.13. 0	0.5
12	5. 5. 0	2. 8. 0	7.13. 0	1.15
20	9. 7. 6	4. 1. 9	13. 9. 3	2.00
30	16. 2. 6	7. 3. 0	23. 5. 6	3.75

* Assuming that the birds average 16 lb. each when killed.

The above table shows the increase in costs resulting from various death-rates. It does not, however, show the fall in profit resulting from an increasing death-rate. As the number of deaths increase fewer birds remain to bear the increasing costs and to contribute to the total returns. The following table shows the fall in profit which results from the increasing costs and reduced returns at increasing death-rates. It was assumed that 500 day-old poults were purchased, that the average cost of rearing when no deaths occurred was £2 per bird ·· and that the average sale price of the birds was £2.10. 0. If it were possible to rear all the 500 birds

Table XI.

Fall in Profit Resulting from Deaths.

Death Rate.	No. of Poults Reared.	Cost of Rearing (No deaths).	Cost Resulting from Deaths.	Total Rearing Cost.	Returns.	Profit.	Fall in Profit.
%		£. s. d	£. s. d	£. s. d	£. s. d	£. s. d	£. s. d
0	500	1000. 0. 0	—	1000. 0. 0	1250. 0. 0	250. 0. 0	—
8	460	920. 0. 0	21. 8. 0	941. 8. 0	1150. 0. 0	209.12. 0	40. 8. 0
12	440	880. 0. 0	33.13. 0	913.13. 0	1100. 0. 0	186. 7. 0	23. 5. 0
20	400	800. 0. 0	53.17. 0	853.17. 0	1000. 0. 0	146. 3. 0	40. 7. 0
30	350	700. 0. 0	81. 9. 3	781. 9. 3	875. 0. 0	93.10. 9	52. 9. 3

purchased, then, of course, the maximum profit of £250 would be obtained. If 8 % of the birds died, then, on the basis of all the above assumptions, the profit would be about £40 less, and an increase in death-rate from 8 % to 12 % would result in a further fall of £23. 5. 0. On the contrary, a reduction in deaths from 12 % to 8 %, would result in the profit being £23. 5. 0 more.

Causes of Deaths.

The following table shows the relative importance of the various causes of deaths in our identical sample of flocks for 1955 and 1956. The results are presented as an average for the two years.

Table XII.

Mortality-Rate and Causes of Deaths in Christmas Turkey Rearing. Results for 18 Identical Farms in Wales.

Total Number of Poults Purchased (1955 and 1956)	22,350
	Average for 1955 and 1956.
Death-Rate	13.1%
	%.
Causes of Deaths:	
B.W.D.	10
Coccidiosis	38
Blackhead	8
Accident or Neglect (1)	30
Miscellaneous (2)	14
	100

(1) Suffocation, trampling, electricity failure, killed by fox etc.

(2) Weakness at birth, respiratory trouble, rickets etc.

It is evident from this table that coccidiosis was the most important cause of death but the number of deaths resulting from accidents or neglect were also substantial.

Coccidiosis is a parasitic disease which can not only be treated when an outbreak has occurred but also prevented by the use of sulphur drugs in the food or water. The disease is spread by the droppings but the organisms are relatively harmless until they have been on the ground for at least 24 hours. Therefore, with intensive rearing of poults on wooden or concrete floors, daily cleaning is helpful. The disease is not easily spread when wire floors are used or when the poults are moved about in folds, but serious outbreaks can occur on free-range.

B.W.D. is a bacterial disease which can cause very heavy losses in poults during the first few weeks. Although treatment by the use of some of the sulphur drugs has, in some cases, been encouraging, it is not wholly satisfactory. Since any birds that recover from an outbreak may then serve as carriers, it is advisable to dispose of the whole affected batch and thoroughly clean and disinfect their equipment.

Blackhead is a parasitic disease which is very prevalent in turkeys but which can now be treated with reasonable success. Although no drug can be guaranteed to give complete success in its prevention, the inclusion of 0.05 per cent of Enhaptin in fact may well prevent it.

MARKETING.

The presentation of the birds for sale and their marketing, although the last of the turkey producers' tasks, are not the least important. The preparation of plucked or dressed birds for sale is a skilled job which must be done well if the highest prices are to be obtained. Deciding on the best time to kill and finding the best market are problems to which farmers generally have, so far, paid too little attention.

Method of Sale and Prices.

Table XIII.

Distribution of Sales, Average Weights and Prices.

Method of Sale.	Total Sales.				Average Weight of Birds.		Average Price per lb.	
	1955.	1956.	1955.	1956.	1955.	1956.	1955.	1956.
Consumer:	No.	No.	%	%	lb.	lb.	s. d	s. d
liveweight	155	—	1.9	—	16.5	—	5. 1	—
plucked	131	420	1.6	3.8	14.2	12.6	5. 7½	4. 1½
dressed	401	641	4.9	5.8	12.1	11.1	6. 8	4. 10½
Total	687	1061	8.4	9.6	—	—	—	—
Retailer:								
liveweight	442	—	5.4	—	16.9	—	5. 1	—
plucked	892	918	10.9	8.3	15.3	13.9	5. 3½	3. 1
dressed	90	520	1.1	4.7	12.6	12.5	6. 5	4. 1
Total	1424	1438	17.4	13.0	—	—	—	—
Wholesaler:								
liveweight	597	155	7.3	1.4	13.3	17.5	4. 9½	2. 2
plucked	4861	7343	59.4	66.4	13.7	15.4	4. 10½	2. 7
dressed	615	1062	7.5	9.6	12.3	11.1	5. 10	4. 3½
Total	6073	8560	74.2	77.4	—	—	—	—
All Sales	8184	11059	100.0	100.0	—	—	—	—

Selling to the wholesale market was by far the most common practice amongst our co-operating farmers. Of the total of 18 identical farms, in 1955 and 1956 respectively, 12 and 13 farmers sold over 50 per cent of their birds to wholesalers and 6 and 4 of these, respectively, sold over 90 per cent to wholesalers. In both years only two farms sold all or the very large majority to retailers whilst only in 1955 did another exceed the 50 per cent mark to retailers. In each of these years only one farmer sold all or practically all his birds directly to consumers whilst another one or two sold about 55 to 60 per cent to consumers. One farmer sold 5 per cent of his birds to hotels in 1955.

Roughly 75 per cent of all sales were to wholesalers, about 15 per cent to retailers and just under 10 per cent directly to consumers. Seventy-two per cent of all birds were sold plucked in 1955 and 78 per cent in the succeeding year; the proportion sold dressed increased from 13.5 to 20 per cent and those sold on a liveweight basis declined from 14.6 to 1.4 per cent. Over 80 per cent of the birds sold wholesale were in the plucked state; about 62 per cent of those sold to retailers were also, surprisingly, in the plucked state; and only 60 per cent of those sold directly to consumers were dressed.

Selling directly to consumers, naturally, ensured higher prices than selling to retailers or wholesale. The average wholesale price for dressed birds was unexpectedly higher in 1956 than the average price paid by retailers for dressed birds. This may well have been/the result of the dressed birds having been sold earlier to wholesalers and kept in deep-freeze.

A few farms indicated, in 1956, the prices for stags and hens separately. The differential in favour of hens varied from 4d. to 1/3d. for plucked and dressed birds.

Destination of Sales.

The following table shows the ultimate destination of the birds sold from 17 co-operating farms in Pembrokeshire.

Table XIV.

Destination of Turkeys Sold from 17 Identical Pembrokeshire Farms.

	1955.		1956.	
Total Number Sold	7,536		10,318	
	No. of Farms.	%	No. of Farms.	%
Destination:-				
Local*	14	8.6	13	6.9
South Wales	13	77.6	9	51.6
London	2	11.3	4	26.8
Other English Towns	1	1.5	3	10.0
Unspecified	1	1.0	4	4.7
		100.0		100.0

* Within Pembrokeshire.

The fact that the industrial valleys and towns of South Wales provide a ready market for Pembrokeshire turkey-producers is well illustrated by the above table. Varying numbers were sold in Cardiff, Swansea, Newport, Neath, Llanelly and Carmarthen. At least 30 % of the total number were sold in Cardiff in 1955. Sales to Cardiff and other South Wales towns were not so clearly distinguished in 1956, but it appeared that Cardiff was not as important a market in this as in the previous year.

It is clear that London, especially, and also other English towns absorbed a much larger proportion of sales in 1956 than in 1955. Sheffield was the only 'other English' market in 1955 whilst in the following year, Birmingham, Manchester and Chesterfield came under this category. The

majority of the co-operating farmers sold varying numbers of birds locally as well as elsewhere. In 1955 two small-flock keepers sold all their birds locally and one sold all his at Llanelly. In the following year only one farmer sold all his birds at one market.

The increase in the sales from these farms to English markets in 1956 was, no doubt, the result of the increase in number of turkeys reared forcing some farmers to dispose of their 'surplus' birds in more distant markets.

Price-differentials for Live, Plucked and Dressed Birds.

Turkey-farmers are, no doubt, interested in knowing what price-differentials are needed to make the selling of plucked or dressed birds worthwhile. Figures have recently been published[1] comparing the times taken to rough-pluck and clean-pluck birds by hand and by machine.

Table XV.[1]

Method of Plucking.	Rough-plucking Average per bird.	Method of Stubbing.	Stubbing: Average per bird.	Clean-plucking: Average per bird.
	min.		min.	min.
Hand	12.5	Hand	14.5	27.0
		Wax	7.0	19.5
Dry Plucking machine	1.8	Hand	22.0	23.8
		Wax	10.8	12.6
Wet Plucking machine	1.4	Hand	8.4	9.8
		Wax	5.3	6.7

Plucking and dressing normally calls for the use of casual labour which is paid for at rates varying from 3/- to 5/- per hour. Assuming that the birds average 16 lb. liveweight, 14.4 lb. plucked (i.e. a reduction of 10 per cent), and 12 lb. dressed weight (i.e. a total reduction of 25 per cent), that the average price per lb. liveweight is 2/9d., the price-differentials can be calculated as follows:-

1. Hand-Plucking.

(a) rough-plucked:

Total returns by selling on a liveweight basis:- 16 lb. x 2/9d
= 44/- per bird

Extra cost of rough plucking:- 12.5 min. + 1 min. (for killing)
= $13\frac{1}{2}$ min. @ 4/6d per hour = 1/- per bird

$\therefore$ To ensure an equal profit from rough plucked birds the price required

= $\frac{45/-}{14.4}$ = 3/1$\frac{1}{2}$d. per lb. rough-plucked.

(1) "Machine Plucking of Turkeys". J. Shemtob, N.D.P. (Hons.), National Institute of Poultry Husbandry, Harper Adams Agri. College; Journal of the Ministry of Agriculture, August 1957.

i.e. an addition of $4\frac{1}{2}$d. to the price per lb. liveweight.

To ensure an extra 1/- per bird profit from rough-plucked birds the price required $= \dfrac{46/-}{14.4} = 3/2\frac{1}{4}$d. per lb. rough-plucked.

i.e. an addition of $5\frac{1}{4}$d. per lb. to the price per lb. liveweight.

(b) Clean-plucked:

(i) hand-stubbing:

Extra cost of hand-plucking and hand-stubbing:-
28 mins. at 4/6d. per hour = 2/1d.

∴ to ensure the same profit as by selling on a liveweight basis the price required $= \dfrac{46/1d.}{14.4} = 3/2\frac{1}{2}$d.

i.e. an increase in price of $5\frac{1}{2}$d. per lb.

∴ to ensure an extra profit of 1/6d. the price required
$= \dfrac{47/7d.}{14.4} = 3/3\frac{1}{2}$d.

i.e. an increase of $6\frac{1}{2}$d. per lb.

(ii) wax-stubbing:

To ensure the same profit as by selling on a liveweight basis, the increase in the price required is $5\frac{1}{4}$d. per lb., after allowing 6d. per bird for wax and coal. To ensure an extra profit of 1/6d. per bird the increase required is $6\frac{1}{2}$d. per lb.

(c) Dressed Birds:

It is assumed that drawing and dressing takes 12 minutes per bird.

(i) hand-stubbing:

To equal the profit obtained by selling on a liveweight basis the price required is $3/11\frac{1}{2}$d. per lb. dressed.

To ensure an additional profit of 2/6d. per bird the price required is 4/2d. per lb. dressed.

(ii) wax-stubbing:

The price required for dressed birds, to ensure the same profit as by selling on a liveweight basis, is 3/11d. per lb. dressed, and to obtain an additional profit of 2/6d. per bird the price needs to be $4/1\frac{1}{2}$d. per lb. dressed.

Plucking by machine saves a considerable amount of time. For instance, wet-plucking by machine can save from 13 to 17 minutes per bird, which means a reduction of 1/1d. in the labour cost per bird. But the number of birds to be feathered must be large enough to ensure that the depreciation on the machine does not exceed about 9d. per bird. Thus, if fewer than 400 birds are to be feathered the purchase of a new machine, costing £110 and which has a working life of from 8 to 10 years, will hardly be worth-while, unless difficulty is experienced in finding the additional labour required for plucking.

ANALYSIS OF RESULTS BY SIZE OF FLOCK.

It has been indicated early in this report that the flocks for which economic data was recorded varied widely in size in both years. It is now intended to examine, as far as the size of our sample and the recorded information will permit, in what respects and to what extent the size of the business affects the management of the birds, their marketing, and the ultimate financial success achieved in Christmas-turkey production.

For the purpose of analysing the results according to the size of flock, the sample was distributed into three groups on the basis of the number of poults purchased. The grouping chosen divided the sample for the two successive years into three nearly equal and equal sections respectively.

Financial Results.

Table XVI.

Average Costs, Returns, Profits and Current Earnings per Bird Reared.

	1955.			1956.		
Number of Poults Purchased:	50-200	201-600	Over 600.	50-200	201-600	Over 600.
Number of Flocks	7	6	5	6	6	6
Average Number of Poults Purchased per Farm	113	415	1273	129	466	1522
Average Size of Flock	84	345	1133	98	414	1336
Costs:	s. d	s. d	s. d	s. d	s. d	s. d
Average Purchase Price of Poults	10. 9	15. 9	8. 3	11. 4	13. 4	9. 9½
Food - Home-grown	2. 8	4. 5	4. 7	2. 9	3. 6½	2. 9
- Purchased	20. 4½	21. 7	19.11½	30.10	24. 2	27. 2
Labour - Family	3. 4	1. 1	0. 5	2.10	1. 6	0. 5
- Hired	0. 3	1. 2	1.10	0. 7	1. 0½	1. 9½
Other Costs	3. 2	3. 5	2. 3	2.10	2. 4½	2. 1
Total Rearing Costs	40. 6½	47. 5	37. 3½	51. 2	45.11½	44. 0
Credit Manurial Residues	0. 3½	0. 3½	0. 3	0. 4	0. 3½	0. 3
Total Net Rearing Costs	40. 3	47. 2½	37. 0½	50.10	45. 8	43. 9
Total All Costs (1)	42. 6	49. 5	38. 9	54. 6	49. 4	47. 3
Current Costs (2)	36. 2	46. 4	37. 3	48. 8	46. 1	45. 8
Total Returns	70. 1	73. 4	69. 6	50.11	46. 4	40. 9
Profit or Loss	27. 7	23.11	30. 9	-3. 7	-3. 0	-6. 6
Current Earnings or Loss	33.11	27. 0	32. 3	2. 3	0. 3	-4.11
Average Age when Sold (days)	170	177	162	192	186	189
Average Liveweight of Birds at Sale (lb.) (3)	14.2	15.7	15.1	17.5	16.0	16.1
Cumulative Food Conversion Ratio (lb.)	4.8:1	5.6:1	5.1:1	5.5:1	5.6:1	5.3:1
Average Death-Rate (%)	26.1	16.8	11.0	24.0	11.1	12.2

(1) Rearing Costs plus costs of preparation for sale and marketing.

(2) Total All Costs excl. charge for family labour (rearing & preparation for sale) and depreciation on buildings and equipment.

(3) Liveweight equivalent.

Judging from the average profit or loss per bird reared, it appears that in 1955 the largest flocks, as a whole, fared best and the middle-sized flocks fared worst; in the following year the largest flocks showed the heaviest and the middle-sized flocks the lowest average loss per bird reared. But on the basis of current earnings the smallest flocks, as a whole, showed the best results in both years.

The largest flocks had the lowest, and the middle-sized flocks the highest, average rearing costs and total costs in 1955. In the following year the average rearing costs declined with increasing flock-size. It needs to be explained that, in 1955, the three farms purchasing poults at 8 weeks were in the middle size-group and it is shown in the above table that the high average cost of poults was the main reason for the total costs being higher for this group in 1955. Two of these three farms were again in this group in 1956, the third being in the largest.

It is always expected that the labour-hours and labour-cost per bird will decline with increasing size of flock, for the time taken to perform the various tasks of management does not vary in proportion to the number of birds.

Table XVII.

Size-Group.	Labour Cost per Bird Reared.		Hours per 100 Birds per Day [1]		Proportion of Family Labour [2]	
	1955.	1956.	1955.	1956.	1955.	1956.
	s. d	s. d	Hours	Hours	%.	%.
50 - 200	3. 7	3. 5	0.69	0.55	93	83
201 - 600	2. 3	2. 6	0.41	0.44	50	59
601 & over	2. 3	2. 2	0.43	0.35	19	19

The above table indicates that labour-costs per bird reared to the killing-age and the labour-hours per 100 birds carried were much higher, in both years, for the 50-200 size-group than for the other two groups. But only for 1956 do the results exhibit economies in labour derived from an increased scale of production. However, on plotting the costs per bird carried [1] and the hours per 100 birds carried [1] against the average number of birds carried for each farm, it was found that, whilst the highest costs occurred amongst the smallest flocks, some of the small flocks also exhibited very low costs and not all the largest flocks showed low costs. Thus for the smallest flocks the average labour-hours per 100 birds

(1) Based on the average number of birds carried during the average rearing period for each size-group.

(2) Based on cost.

carried ranged from 0.2 to 0.8 hours per day and for the largest from 0.1 to 0.6 hours per day. The labour-hours and-costs for some of the smallest flocks may well be exaggerated since in this group the use of family labour was far more prevalent. The system of management did not differ much from group to group, for 12 of the 18 farms reared their birds on deep litter and only two reared all their birds on free-range; these two were not in the same size-group.

It is also to be expected that some economy in the use of equipment will be achieved by the larger flocks. But in this sample so many of the flocks made partial use of farm buildings and poultry equipment also used for other purposes that it was not possible to make a fair comparison between groups of farms. The costs of fuel and electricity, transport, and marketing did not decline with size of flock.

Since there was no positive correlation between size of flock and size of farm, the importance of home-grown foods did not increase, and total food-cost per bird reared did not decline with size of flock.

It happened that, in both years, the medium-sized flocks, as a whole, were the least efficient food converters but many factors affect the conversion rate and the sample was too small for much significance to be attached to this.

Death-Rate.

Another interesting fact revealed by this analysis was that, in both years, the average death-rate was very much higher for the smallest flocks than for the other two size-groups, a fact which suggests that the smallest producers were even more efficient feeders than the average conversion ratios indicate. The average death-rates for the middle-sized and largest flocks were not very different. But, as was stated earlier, the middle-sized group included, in 1955 all the three flocks, and in 1956 two of the three, in which the poults were purchased at 8 weeks rather than at the customary day-old stage. Had all the farms purchased their poults at day-old the average death-rate would probably have declined with increasing size of flock. A reasonable explanation for this relationship would be that in the smallest flocks all birds are probably kept together in one batch, and a disease can spread to a larger proportion of the poults before it is detected and treated than would be likely in larger flocks which are probably split into several batches. Three of the farms in the smallest size-group showed high death-rates in both years. On one of them coccidiosis was the main cause of death in both years, but the causes of death in the other flocks were not identical in the two years and did not include contagious diseases. The occurrence of rickets, chills and suffocation among the causes of death suggest that inefficient management was an important contributory cause, but this explanation is in conflict with the favourable food-conversion rate for the smallest flocks. The quality of housing, as far as one could

judge from the information obtained, was not inadequate.

Method of Sale and Prices.

The total returns per bird reared depend largely on the weight of the bird at killing and on the price, which varies to some extent with the method and time of sale.

The average return per bird reared was, in 1955, slightly more for the middle size-groups than for the smallest and the largest size-group. In 1956 the average returns per bird declined for each successive size-group. The producers with the smallest flocks sold, on average, smaller birds than the other two groups in 1955, but in the following year they sold larger birds than the others. The average weight of the birds at killing-time was greater for each group in 1956 than in the previous year - as a result, no doubt, of their being generally older when killed in the second year. On average, the birds in the smallest and largest flocks were three or four weeks older and those in the middle-sized flocks about 9 days older, when killed in 1956. It has already been suggested that the high prices and profits in 1955 encouraged the earlier purchasing of poults in the following year so as to ensure heavier birds for sale. It is also possible that the favourable early spring weather in 1956 led to earlier egg-production and to earlier hatching, factors which would also encourage the earlier purchasing of poults.

Table XVIII.
The Classification of Sales by Size of Flock.

Number of Birds Purchased.		1955. 50-200	201-600	Over 600.	1956. 50-200	201-600	Over 600.
Number of Birds Sold		584	2072	5528	587	2479	7993
Sold to:-		%	%	%	%	%	%
Consumer	(a)	1.0	-	2.8	-	-	-
"	(b)	-	6.2	-	0.5	-	5.2
"	(c)	29.1	4.6	2.4	30.2	7.7	3.5
Total		30.1	10.8	5.2	30.7	7.7	8.7
Wholesaler	(a)	23.3	14.4	2.9	8.3	2.8	0.4
"	(b)	17.1	41.0	70.8	56.2	22.2	80.8
"	(c)	21.1	23.5	-	2.2	27.4	4.6
Total		61.5	78.9	73.7	66.7	52.4	85.8
Retailer	(a)	1.4	-	7.8	-	-	-
"	(b)	1.0	10.3	12.2	-	19.7	5.4
"	(c)	6.0	-	1.1	2.6	20.2	0.1
Total		8.4	10.3	21.1	2.6	39.9	5.5
		100.0	100.0	100.0	100.0	100.0	100.0

(a) Liveweight.   (b) Plucked.   (c) Dressed.

Table XVIII shows that all size-groups catered mainly for the wholesale trade in both years but that the smallest producers, as a group, sold a comparatively larger proportion of their birds directly to consumers than the other two size-groups. In 1955 the smallest producers sold the majority of their birds in a dressed state whereas the other size-groups sold the majority of theirs in a plucked state. But it is interesting to see how these size-groups of producers differed in their response to the heavy fall in turkey prices in 1956. The smallest producers increased slightly the proportion of total sales to wholesalers at the expense of retailers and very much increased the proportion of plucked birds sold to wholesalers. The largest producers also increased their sales to wholesalers and the proportion of plucked birds; but the middle-sized producers increased their sales to retailers, sold proportionately/ fewer to wholesalers, and increased the proportion of dressed birds.

It was noticeable that, in both years, the smallest producers, as a whole, showed better average prices for dressed birds sold to consumers and for plucked birds sold to wholesalers. This may well be the result of the smaller flockmasters being in a position to do most of the plucking and dressing themselves and being able to devote more time to this work.

APPENDIX.

Charges for Labour and Home-Grown Foods.

Labour has been charged at the actual costs recorded or otherwise at the following hourly rates:-

	1955.	1956. Prior to Sept. 24th	After Sept. 24th
	s. d	s. d	s. d
Farmer	3. 3	3. 3	3. 4
Wife	2. 6	2. 6	2. 6
Sons & Daughters & Hired Labour:			
Males over 21	3. 0	3. 0	3. 2
Females over 21	2. 3	2. 3	2. 6
Males under 21) Females under 21)	according to age		

Home-Grown Foods, consisting mainly of mixed corn and oats, have been charged at the following market values:-

	1955.	1956.
	s. d	s. d
Wheat	29. 9	30. 0
Oats	23. 3	25. 0
Barley	24. 8	26. 0
Mixed Corn	23. 0	25. 0

An additional charge of 1/- per cwt for grinding was made where necessary.