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SOME ECONOMIC ASPECTS OF PIG PRODUCTION 1953 - 1954

by

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This report is based on the financial records of 39 farmers in the South of England who kindly cooperated with this Department. Nearly all the records began on either November 1st or December 1st 1953 and covered a full twelve months.

I. FLUCTUATIONS IN MARKETING OVER THE ACCOUNTING PERIOD

It is first necessary to examine briefly the changes which took place in the industry as a whole during the year under review.

(a) Changes in Marketing Methods

Up to June 30th 1954 the marketing of fat pigs was controlled by the Ministry of Food. From July 1st onwards, buying was left to the butcher (or curer), although the Government continued to support the farmer's price in various ways so that the terms of the February Price Review could be implemented.

For the individual farmer, therefore, there were now three new elements in the marketing system: (i) alternative channels of marketing became available, and it became necessary to compare these by calculation in order to judge the best channels of sale: (ii) large seasonal fluctuations in demand for pork affecting the price of both pork and bacon added a further complication to the farmer's choice of market and (iii) the emphasis on quality increased.

(b) Changes in Prices and Costs

For nearly all types of producer, whether pedigree or commercial, whether selling weaners or fat pigs, this was a year in which the gap between the prices obtained and the costs incurred narrowed.

For breeding herds, costs remained fairly stable while weaner prices fell sharply. The monthly fluctuations in the average price of weaners (8 - 10 weeks old), compared with the average prices of sow and weaner nuts and meal quoted by two of the largest firms selling balanced foods were :-

	Weaner Prices	Feed Price per cwt.
November 1953	142/-	35/10
December	149/-	34/8
January 1954	147/-	34/8
February	133/-	34/6
March	131/-	34/3
April	128/-	33/4
May	125/-	32/3
June	116/-	32/3
July	110/-	33/-
August	105/-	33/-
September	89/-	34/6
October	87/-	33/9
November	86/-	34/-
December	85/-	35/-

The price of weaners is seen to have fallen from 149/- to 85/- while the fluctuation in feed prices during the same period were small. Herds selling gilts and boars for breeding suffered from a similar slump in prices.

On the fattening side, bacon and pork prices maintained a fairly close relationship to feed prices because of the price/feed formula. Prices quoted for fattening meal, compared with fluctuations in the price of Grade A bacon and pork prices were :-

	≠Bacon Price per Score Deadweight	≠Pork Price per Score Liveweight	Feed Price per cwt.
November 1953	58/4	37/3	34/3
December	57/7	36/9	33/3
January 1954	56/7	36/-	32/6
February	55/7	35/7	32/9
March	55/7	35/7	32/-
April	54/4	33/7	31/-
May	51/9	33/-	30/6
June	51/9	33/-	30/6
July	55/6	38/-	30/6
August	54/6	38/6	31/6
September	54/3	34/1	27/6
October	52/3	34/1	27/6
November	52/6	39/9	31/9
December	53/6	43/3	32/6

≠ The Grade A price paid by the Ministry of Food before July 1st and by the F.M.C. after July 1st; the pork price for 5 score pigs sold to the Ministry of Food before July 1st, and through the auction, with guarantees where applicable, after July 1st.

Bacon and pork prices temporarily diverged from their close relationship to feed prices in the period directly after the new marketing arrangements were introduced. Pork prices again rose rapidly from the end of October and remained relatively high to the end of the accounting period.

This did not necessarily mean however that profits in fattening remained steady. Following the change in marketing methods, bacon grading became more stringent and there was a period of temporary confusion when some farmers were hindered from selling their pigs on a deadweight basis (through the Fatstock Marketing Corporation) either because the pigs presented were consistently below the standard required by the curers or because the supply line was temporarily overloaded. These sudden difficulties, together with the farmer's lack of experience with such a complex marketing system, undoubtedly resulted in considerable losses.

The extent to which profits fell during the year is suggested by the results of 15 cooperators who completed monthly forms. Whereas in the first half of the year 12 out of 15 recorded surpluses[*] of more than £10 per £100 gross output, in the second half of the year 8 out of 15 recorded surpluses of less than £10 per £100 gross output. In only two herds did profits actually increase in the second six months.

II. ANALYSIS OF THE RECORDS

In Table I the results of the 39 herds are divided into four broad types - commercial mixed herds which are mostly self-contained with a fattening section supplied by home-produced weaners; breeding herds selling weaners or stores; fattening herds; and pedigree mixed herds.

Gross output has been taken as the datum line for the purpose of comparing the results from these types of herds. Gross output as used here comprises the total herd sales, adjusted for the change in valuation between the beginning and end of the accounting period, less the value of any pigs purchased. The figures of each herd included in Table I have been ajusted to make all components of the herd costs conform to a Gross output of £100 and the results for each group of herds have then been averaged.

[*] For definition of 'surplus' see Appendix I.

TABLE I

Financial Results of 39 Pig Herds 1953-54 (Gross Output = £100.0)

	Commercial Mixed Herds	Breeding Herds	Fattening Herds	Pedigree Mixed Herds	All Herds
Number of Farms	16	8	10	5	39
	£.	£.	£.	£.	£.
Sales	91.4	107.0	171.1	100.7	116.3
Valuation Change	+20.8	+12.5	+11.2	+ 5.9	+14.8
Less Pig Purchases	-12.2	-19.5	-82.3	- 6.6	-31.1
GROSS OUTPUT	100.0	100.0	100.0	100.0	100.0
Purchased Foods	55.5	60.8	57.2	63.9	58.1
Home Grown Foods	18.5	10.8	20.4	6.7	15.9
Labour	7.3	13.2	7.9	11.1	9.2
Other Costs	3.2	8.9	4.6	13.1	6.0
TOTAL COSTS	84.5	93.7	90.1	94.8	89.2
SURPLUS	15.5	6.3	9.9	5.2	10.8

From such a small group of herds it is not possible to draw many conclusions about the relative profitability of the four types; the purpose here is rather to give the individual farmer an opportunity to compare his own results with those herds most like his own. Nevertheless Table I shows (i) that substantial increases in valuation occurred, indicating that herds were tending to expand during the costing year; (ii) that feed represented a very high proportion (83%) of the total cost; (iii) that the pedigree and breeding herds incurred relatively higher labour and 'other' costs; (iv) that commercial mixed herds were generally the most successful.

III. MEASURE OF PRODUCTION EFFICIENCY

The conditions under which pigs are kept vary widely. While there are certain measures of production efficiency by which the performance of the herd may be assessed they should be used with caution; in particular they should not be regarded as the final criteria in deciding whether a pig enterprise is or is not a valuable element in the system of any particular farm. There

may be farms on which fixed resources such as land, buildings and regular labour would otherwise be underemployed where an apparently inefficient pig unit may be a profitable venture. The following paragraphs draw attention to those points in the production process where improvements are likely to be most effective in raising profits.

(i) Breeding

The first concern in mixed herds and breeding herds is to produce healthy weaners as cheaply as possible. Over the 29 available records the average weaner cost was £4. 9. 0 but costs varied widely: they averaged only £3. 1. 7 per weaner in the five most efficient herds as against £6. 4. 9 for the five herds with the highest weaner cost. The important factors affecting this cost are (a) the number of pigs weaned every year per sow, and, (b) the cost of feeding the breeding herd.

Other studies≠ have shown that an increase in the number of weaners per sow per year scarcely adds to the overall cost of the breeding herd since the bulk of the costs are incurred in maintaining the sows themselves. The cost difference between two sows, one producing 12 pigs and the other 16 pigs a year works out at about £4. 5s (i.e. the cost of increased feed to the nursing sow, and extra creep feed). But this extra cost is ~~almost~~ covered by only one of the four extra piglets produced. With sow and weaner meal at about 35/- per cwt and allowing £6 per sow for labour and other costs, 14 weaners a year fetching £4. 10s each are necessary to cover the sow's cost before a profit can be made. Large litters with low pre-weaning mortality are therefore essential for profitable breeding.

While sturdy pigs are required at weaning, extra heavy weaning weights may be less important than large number of pigs per sow. Much depends on the level of prices for fat pigs, and the level of profit to be expected. While it certainly costs about 12/- more to fatten a pig weighing 30 lb at weaning than one weighing 40 lb, sixteen 30 lb weaners will be a better proposition than twelve 40 lb weaners if the profit on the more backward pigs is over £2 each. If the profit to be expected is less than £2 the smaller litter of larger pigs is likely to be more profitable. The breeder's target, however, should be large litters of 40 lb rather than 30 lb pigs.

≠ "Profits in Pig Production", Farmers Bulletin No.17, School of Agriculture, Cambridge.

Although the number of piglets weaned per sow per year has a marked effect on weaner cost the feed cost per sow is also of great importance. While more careful use of concentrated feeds may sometimes be possible the practice of feeding home grown fodders as part of the ration seems to be the most likely way of cutting down feed costs. In the majority of the breeding herds recorded, the empty sows and in-pig sows were run out of doors; in some cases even farrowing and suckling took place outside. The amount of concentrates saved however depended on the quality of the herbage provided; this varied from derelict woodland where the sows were employed as a reclaiming agent, to leys specially designed for pig grazing. While rooting and manuring may be valuable services provided by the sows it is difficult to place realistic values on these benefits; there is no clear evidence that breeding herd costs are materially reduced by this practice. On the other hand the policy of designing a cropping system which provides a productive ley for pig grazing is the practice in some of the most efficient herds recorded and it is suggested breeding costs may be reduced in this way. For example, one grazing mixture successfully used was 2-lb of S.215 meadow fescue, 6-lb of common chicory and 3-lb of late flowering red clover.

The use of forage crops depends, of course, on the general economy of the farm. The farmer has to satisfy himself that no better alternative use can be made of the land set aside for the pigs. The availability of water and fencing and the situation of the land for ease of pig management are also factors to be taken into account in the individual case.

The third possible way of reducing the cost of weaner production is the degree to which labour and general expenses can be cut. These tend to be higher in breeding than in fattening units. In many of those commercial herds which are fitted into a complex farming system, it is likely that labour can be most effectively reduced by adjustments in the size of unit to the labour available. Extra care and attention, higher veterinary bills and travelling expenses were largely responsible for the relatively high cost per weaner (£5. 6. 0) in the pedigree herds costed.

(ii) Fattening

In the mixed commercial herds, it cost approximately £4 to produce a weaner and approximately £15 to produce a bacon pig. Thus the fattening phase is nearly three times as expensive as the breeding phase.

The problem of reducing fattening costs is almost entirely one of obtaining the greatest amount of growth of the right quality for the minimum feed cost because feed costs tend to form an even greater proportion of total costs in the fattening than in the breeding process. Economy in feeding depends on, (i) conversion rate (during the post-weaning period), and, (ii) the cost per cwt of feed.

The Cambridge enquiry≠ showed that in 1952-53 a deterioration in the conversion rate of 0.1 lb of feed per lb of liveweight gain added 5/- to the cost of a bacon pig. This still remains substantially true. Conversion rates varied widely in the herds costed, from 3.5 lb to 5.05 lb of feed per lb of liveweight gain. This variation is partly to be explained by the fact that pigs were sold fat at different weights in different herds. (The conversion rate up to 120 lb tends to be better than from 120 lb on). In the eight mixed commercial herds where most of the pigs were sold for bacon the average conversion rate was 4.4, the most profitable herd having the lowest conversion rate of 3.8. In the fattening herds the conversion rate averaged 4.5.

The way in which the conversion rate can be improved is a complex technical problem which varies from farm to farm. The effects of housing, feeding methods and other management factors could not be isolated in the accounts examined.

The feed cost of the fattening stock in the commercial mixed herds and in the fattening herds averaged 30/5 per cwt and 30/3 per cwt respectively. There was however a considerable range from 26/- to 33/7 per cwt between extreme cases. Since it takes about 7 cwts of feed to fatten a bacon pig the difference between the cheapest and most expensive feed amounts to some £2 per pig fattened.

≠ Op. cit.

Where feed cost was kept low, economies were achieved by, (a) grinding and mixing on the farm, (b) cutting down the intake of protein to the minimum required, (c) making careful changes in the ration according to the variation in the market price for the ingredients purchased. It may be noted that those farmers whose feed costs were below average avoided buying wholly proprietary meal.

TABLE II

The relation between Conversion Rate, Feed Cost & Surplus per Pig. (In shillings)

Assumptions: A 30 lb Weaner costs £4; A Grade A Baconer of 210 lb liveweight makes £20; Feed Cost is 85% of Total Costs.

Food Cost per Ton	Conversion Rate					
	5.5	5.0	4.5	4.0	3.5	3.0
£ 35	-44	-11	+23	+56	+89	+122
33	-23	+ 8	+40	+70	+102	+133
31	- 2	+27	+57	+86	+116	+145
29	+19	+46	+74	+101	+129	+156
27	+40	+64	+91	+116	+142	+167
25	+60	+83	+108	+131	+155	+178

Cheap feed, of course, should not mean feed of inferior quality, otherwise the gain achieved by reducing cost might be more than outweighed by losses incurred through a poorer conversion rate. This relationship, assuming certain other conditions of production, is demonstrated in Table II. The table shows for instance that, under these conditions, there is no advantage in reducing feed costs from £33 to £31 per ton if the conversion rate changes from 4.0 to 4.5 at the same time.

In order to grind and mix feeds on the farm the farmer needs sufficient capital for the necessary plant, suitable accommodation and some knowledge of nutrition. If these are available however there is no doubt that the capital invested can soon be saved by reduced feed bills on all but the smallest herds. If an automatic hammer mill and a mixer priced £150 and £200 respectively cost £56 a year≠ and if the cost of operating be estimated at £1 per ton of feed

≠ Assuming a machine 'life' of 10 years and the cost of borrowing the necessary capital at 6%.

prepared, the total grinding and mixing cost for a 10 sow self-contained herd would be approximately £120. On 65 tons of feed consumed, this is less than £2 per ton additional to the cost of the feed. The use of the same equipment for a larger number of pigs or for other livestock would reduce the cost still further.

IV. THE FARMER'S FUTURE POLICY

Between the wars pig farmers experienced rapid changes of fortune due to the free play of supply and demand and pig numbers fluctuated widely. In recent years also there has been a rapid change in the pig population following the easing of restrictions on foodstuffs and the encouragementof controlled prices. Between 1949 and 1953 the numbers of pigs on farms in England and Wales doubled. Rapid fluctuation seems likely to occur in the future in the absence of strict and comprehensive control of pig marketing.

Furthermore the home producer is faced with severe competition from overseas suppliers at any rate in the bacon market. Denmark in particular is eager to supply bacon at highly competitive prices. In 1953-54 home produced bacon cost the Ministry of Food £400 per ton while Danish bacon cost £252 per ton.

The English pig producer must, therefore, be prepared not only to combat sharp fluctuations in the demand for pigs at home but also to improve his efficiency at such a pace that the subsidy on home production may be progressively reduced.

(a) Planning to take maximum advantage of changes in market prices

The majority of pig producers are faced with the choice of producing either pork or bacon. While the demand for bacon is controlled by a static bacon factory capacity, the pork demand fluctuates widely according to season, the greatest demand being in the winter months. Knowing this the farmer has to plan production to suit his own conditions. As yet it is too early to say what the annual average price for pork will be under free market conditions. The first few months of free marketing illustrated well the difficulty of the choice facing many farmers, however.

TABLE III

Comparison of Auction Prices for Pork & Fatstock Marketing Corporation Prices for Bacon

Assumptions: A 30 lb Weaner costs £4: Feed cost averages £30 per ton: Feed cost is 85% of total cost: The conversion rate assumed is 3.5 for pork pigs, 3.75 for bacon pigs.

	Early October 1954								Early December 1954							
	Pork (120 lb L.W in 20 weeks)		Bacon (210 lb L.W in 30 weeks, Killing Out % 73)						Pork		Bacon					
			A		B		C				A		B		C	
	s	d	s	d	s	d	s	d	s	d	s	d	s	d	s	d
Price per score L.W	20	-							30	-						
Percentage addition	7	-							10	6						
Individual Guarantee Increment	5	6							-							
Collective Guarantee	1	7							2	9						
≠Total price per sc.L.W	34	1	38	3	35	-	28	9	43	3	39	9	36	-	32	10
Price per pig	204	6	401	7	367	6	301	10	259	6	417	7	378	-	344	9
Standard Cost	179	-	293	-	293	-	293	-	179	-	293	-	293	-	293	-
Profit per pig	25	6	108	7	74	6	8	10	80	6	124	4	85	-	51	9
Profit per pig week♂	2	1	4	11	3	5		5	6	8	5	8	3	10	2	4

≠ Transport and marketing costs omitted.

♂ Profit per pig week is that rate of profit, calculated over the period of fattening, which would apply in a fattening house, filled with pigs carried to a uniform weight.

Table III shows the profit per pig and profit per pig-week just before and during the pre-Christmas boom in pork prices last year, making certain assumptions as to costs of production. In the first period profit per pig-week for pork sold by auction is seen to be (on the standard costs assumed) intermediate between that obtained for Grades B and C bacon; in the second period the profit per pig-week for pork is better than Grade A bacon.

While the policy which aims to produce pork when pork is in demand and bacon at other times may seem theoretically the best, the Fatstock Marketing Corporation has announced its intention of encouraging a steady supply of bacon by guaranteeing a sale for bacon pigs in the summer months only equal to those offered for sale during the winter months. It is also true[¤] that the

¤ See D. N. Hicks, Farmers Weekly, February 18th 1955.

Fatstock Marketing Corporation varies its prices from season to season as a method of encouraging a steady flow of bacon (quite apart from the money it receives from the curers). It is therefore to the producers' advantage to maintain a steady production in order not to lose the extra bacon price incentive in the winter season. There might be scope in some herds for overcoming this difficulty by temporarily stepping up the late summer farrowings above normal average for the herd by, for example, deferring the culling of old sows a few months after the introduction of their replacements in the herd.

The other factors which will influence the individual farmer's decision are concealed in Table III by the use of standard costs. The most important are the difference in the conversion rate of pigs before and after 120 lb liveweight, the amount of accommodation available, and the price (or cost) of weaners.

The greater the difference between the conversion rate of pigs up to 120 lb liveweight and over 120 lb liveweight, whether it be due to the feeding or housing conditions, the greater is the likelihood that pork will prove more profitable. Every farmer who considers the possibilities of pork and/or bacon production really needs to know the conversion rate he can expect in his herd during the two phases.

Even if the differential price and the differences in conversion rate before and after 120 lb liveweight suggested that pork production was more profitable it might still be worth while keeping pigs on to bacon weight if the accommodation available would otherwise be left idle, since in this case profit per pig is more important than profit per pig-week.

The price (or cost) of the weaner affects the relative profitability of pork and bacon because it forms a larger 'overhead' charge on pork than on bacon. The cost of the weaner in Table III above is 45% of the standard cost for the pork pig but only 27% for the bacon pig. A fall in the price (or cost) or weaners, therefore, is relatively favourable to pork production; conversely a rise in the price (or cost) of weaners is less unfavourable to bacon production.

(b) Planning to Reduce Costs

In the foregoing discussion on standards of efficiency the main ways of reducing costs have been discussed. The recent report of the Ministry of Agriculture and Fisheries[*] analyses the cost structures of Danish as against English production.

T A B L E IV

The Relative Costs of Producing Bacon in England & Denmark.
(Adapted from "Costs and Efficiency of Pig Production", Table 8, Page 15)

	Costs per Pig of 7½ score Deadweight					
	England		Denmark		Difference	
	s.	d	s.	d	s.	d
Food	274	0	166	0	108	0
Labour	35	0	20	7	14	5
Miscellaneous	22	6	20	7	1	11
Total Costs	331	6	207	3	124	3
Sale Value	427	0	290	0	137	0
Margin	95	6	82	9	12	9

Differences in costs amounting to £6. 4s per pig are estimated here, £5. 8s of which are in feed costs. Although some of the reasons for this difference are beyond the English farmer's control, considerable economies are possible, particularly by reducing the cost of feed and the amount consumed in the fattening period.

Table II provides a basis for assessing the task. With a weaner cost of £4 and a bacon price of 53/- per score deadweight (£20 per pig) the profit to be expected per pig can be calculated for any level of conversion rate and feed cost which might be reached in future. At the same time, if conversion rate and feed cost remain stable the change in profit arising from any change in weaner cost or bacon price can also be calculated. For instance, a farmer obtaining an average profit of £3 per pig under the conditions assumed in Table II would be obliged either to improve the conversion rate in his fattening herd by more than .6 or reduce his feed cost by £4. 10s a ton (or part of each) in order to maintain profits following a fall of £2 in the price of bacon pigs.

[*] "Costs and Efficiency of Pig Production", England & Denmark, 1954.

(c) Increasing the quantity and quality of pigs produced

In some cases there may be possibilities of increasing or maintaining profit by increasing the number of pigs produced. Even if the rate of profit falls from £3 to £2 per pig it is theoretically possible to maintain profit by expanding production by 50%. In practice difficulties arise.

Firstly, expansion involves further capital investment; secondly, pigs are often a subsidiary enterprise which is fitted into a complex farming system. The size of unit is frequently decided by the fixed resources, such as regular labour, building accommodation, and land which would otherwise be unemployed if the pig enterprise were absent. Any decision to expand pigs therefore generally involves complex budgeting in various alternative enterprises in terms both of cost and of capital employed.

It has already been observed that an increased emphasis on quality is one of the new elements in pig economics. The premium on quality is now considerable, particularly on baconers. This premium is likely to increase, moreover, at those times of the year when the supply of pigs is excessive to demand. During the period July 1st to December 1st 1954 the difference between Grades A and C bacon pigs varied but the difference was never less than £3. 10s per pig.

T A B L E V

Bacon Grading Results, Recorded Herds

	Grade A		Grade B		Grade C		Others		Total
	Nos.	%	Nos.	%	Nos.	%	Nos.	%	No.
Commercial Mixed Herds:									
5 most profitable)	309	79.6	42	10.8	15	3.9	22	5.7	388
5 least profitable)	296	57.3	106	20.6	93	18.0	21	4.1	516
All 16 Herds	1249	65.6	354	18.6	186	9.7	118	6.1	1907
Pedigree Mixed Herds	157	54.6	67	23.4	42	14.7	21	7.3	287
Fattening Herds	1316	38.4	620	18.2	1158	34.0	320	9.4	3414
T O T A L	2722	48.5	1041	18.6	1386	23.7	459	8.2	5608

Table V summarises the grading results of the herds costed. The differences in grading between the most profitable and least profitable mixed commercial herds suggest that grading had considerable influence on profitability.

There were also heavy penalties for failing the keep within the prescribed weight ranges. For instance, from July 1st to the end of the accounting period there was a penalty of no less than £7 on those pigs weighing 1 lb or more above 8 sc. 15 lb deadweight, except when the Government assisted in the clearing of overweight pigs.

APPENDIX

Definitions used in Table I

Sales	Net Sales after deducting marketing charges. They also include income from boar services.
Valuation Changes	The difference between the opening and closing valuations of livestock. In those cases where standard market values have been applied to known age groups and/or liveweights of pigs, the closing values of store pigs were slightly reduced in the light of the lower weaner and bacon prices and more difficult marketing conditions. Retention of the original scale of valuation for store pigs would raise the surplus as recorded in Table I by £2.9, £1.2, £1.9 in the Commercial Mixed, Pedigree Mixed and Fattening herds respectively, and by £1.4 in the 39 herds as a whole.
Pig Purchases	Includes hire of boar.
Homegrown Foods	Have been entered at market price, together with an appropriate charge for processing.
Labour	Cost includes only manual labour.
Other Costs	Include all minor expenses except accommodation costs and farm overheads. It was found impossible to calculate accommodation costs in some herds where housing was being shared with other types of stock.
Surplus	The sum remaining to cover the cost of accommodation, a return on the capital invested and a reward to management.