Livestock Feeding

UNIVERSITY OF NOTTINGHAM
SCHOOL OF AGRICULTURE

UTILISING HOME GROWN FOODS.

THE ECONOMIC PRINCIPLES INVOLVED.

DEPARTMENT OF AGRICULTURAL ECONOMICS
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by

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(Should a farmer grow all the feed for his livestock? This paper shows that the answer varies from farm to farm and from time to time. It also indicates how a farmer can set about answering this important question for himself.)

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Our objective as a nation must be maximum production on the most economical terms possible. This can only be achieved by making our land produce all that it can economically and by using, in addition, all the imported feed that we can buy and convert economically into human food.

The individual farmer must also maximise his net production if he is to make a good livelihood. If he fails to do this he will not be using his land, his labour and his own skill as a manager to full capacity. The economic principle involved is the same for both the individual farm and the nation. We have a fixed amount of land, a supply of labour which is also almost fixed in amount and a supply of capital (Stock, implements, fertilisers, raw materials etc.) which is capable of some variation. The problem is to use these three factors of production, as they are called, to yield the best possible return to the farmer or the nation as the case may be.

If we are making the best use of our native resources, then any raw materials from other lands that we can buy at the right price will yield a net gain to us. Self sufficiency in itself has no particular virtue. In practice we never try to push it to its logical conclusions. There is no strong body of opinion in favour of doing without imported fuel or fertilisers, for example. We should not forego the advantages of using imported feed today because of the possibility that one day it will no longer be available.

We can eat all that we can grow in this country and produce from imported feed, because we still buy about half our food supply from overseas. But it is not a question of production at any cost. Any given set of resources, i.e. land, labour and capital can only be used for one thing at a time. This country is having a hard struggle to make ends meet just now and if there is any spare labour or capital available, it must go where it will yield the best dividend. Under free competition this would happen, some industries would outbid others for men and materials.

The scale of agricultural production in this country is determined in the first place by the volume of crops which we can produce. Part of these crops can be used directly for human food but the bulk of them must be converted into human food by feeding them to livestock. In fact only about 15 per cent of our land is used for crops for direct human consumption.

In 1951-52, $3\frac{3}{4}$ million tons of cereal concentrates or about one half the prewar supply were imported into this country. This is roughly the produce of the combined acreage of wheat and oats grown in England and Wales in the same year. In 1943-44, cereal production was about $2\frac{3}{4}$ million tons above the present level but our livestock carry then particularly of pigs and poultry, was much lower than it is now. The possibility of replacing imported cereal concentrates with home produced cereal concentrates therefore exists. But it is unlikely that the three quarter of a million tons of protein concentrates now imported could be produced in this country.

It is worth noting the changes that have taken place since prewar in the sources from which our animal feeding stuffs have been obtained. In 1951 only 16 per cent of the total starch equivalent fed was imported compared with 31 per cent in 1938.

After the decontrol of the rationing and prices of feeding stuffs farmers will be free to buy the type of feeding stuffs that best suit their requirements and the prices of the various types of feed will be influenced by the demand for them. Just how much of each type of feed farmers will buy will, of course, depend on the ratio between the cost of the feed and the price of the product and on the efficiency with which feed is converted into livestock and livestock products.

It has been estimated that the removal of the subsidy on April 1st. will add about £2.10s. 0d. per ton to feeding stuffs prices. The Government is expected to authorise imports at a rate sufficient to maintain the present supply and it has undertaken to authorise additional imports should they be needed to maintain an expanding livestock population. It is worth noting that the Argentine, Canada and the United States had record grain harvests last year and that grain prices on the Chicago futures market have fallen by about ten per cent since last November. Little is known about the position in Russia (but about one third of our imports of course grains have come from there in the last year or two).

What are the problems facing the individual farmer? Our subject matter - Utilising Home Grown Foods - implies that we are dealing with farms that already carry stock. These farmers have to decide what is the most economical method of feeding these stock and some of them will also be wondering whether to carry a few more or a few less. It is the dairy farmer more than any other type of livestock farmer who is concerned about the pros and cons of home grown versus purchased foods and to focus attention on this aspect of the problem the position on farms of three different types will be discussed.

THE SMALL FARM ON POOR LAND

The first example is near Chesterfield - it is Farm A. on Table 1. On 17 acre of land a stock of nine cows and followers, 40 feeding pigs and 220 hens is carried. All the farm is under grass - seven acres for mowing and 10 for grazing. All the feed for the pigs and hens and the production ration for the cows is bought. Each cow in the herd produced nearly 1,100 gallons of milk per annum. The S.E. derived from grass is roughly 1,800 lbs. per acre - a very good yield from the type of land on this farm.

This farmer could not make a livelihood without using purchased feed. There are about 280 full time dairy farms between five and 25 acres in size in Derbyshire. They all face the same problem - that of establishing a business big enough to yield them a living on a very limited acreage of rather poor land. If the farmer did not buy these 13 tons of cake for his cows he would save about £470 but with the same number of cows he could only provide for maintenance and one gallon from his own land and his net loss would be about £650.

A MEDIUM SIZED POOR LAND FARM.

The small farmer has no choice - he must have purchased feed. What about the farmer with more land? Take the example of a farmer near Bakewell who farms 192 acres of land rising from the 600 feet contour up to the 1,000 feet line. This is Farm B. on Table 1. The manner in which this farmer has improved his land and built up his dairy herd has been described in the Journal of the British Dairy Farmers' Association for 1950. It is a most inspiring story.

The interesting point is that this farmer is not compelled to buy any feed. With the land he has, in its improved state of fertility, he could have a business of reasonable size. But he has enlarged it still further by buying in feed - he has, in effect, added about 60 acres to the size of his farm. In other words, with his present yields he would need another 60 acres to grow the starch and protein he now buys. This is an example of how home grown and purchased feed can be used in conjunction on a farm of moderate size. The farm now carries 51 cows, 76 young stock, 24 breeding ewes, 14 pigs and 200 hens - a total of 117 cow equivalents. This represents a stocking, after making allowance for bought feed, of one cow equivalent per 2.13 acres.

Nearly all the crops grown on this farm are used to feed the farm stock. The problem is to provide as much feed for maintenance and production as possible. On this farm, the important crops are oats, rape, seeds hay and silage. About £300 worth of potatoes are sold but there is no real scope for the production of sale crops. Indeed it is essential to feed the crops on the farm and return the muck to the soil to maintain the fertility of land of this type.

A farmer in this position ought to ask himself - which of the crops that I can grow will produce the most feed; per acre and in terms of the effort required. Tables 2 and 3, illustrate how a farmer can set about answering these questions.

With the possible exception of sugar beet all the crops mentioned in these tables can be grown on the majority of dairy farms. You will all know the yields you can get on your own farms but with the yields in Table 2, the highest yields of starch equivalent per acre are derived from roots - fodder beet, cabbage, mangolds, kale and swedes. Silage and grazing come next in order of yield but hay is well down the list. Cabbage, kale and fodder beet are the best sources of protein. The final choice of crop will be influenced by the type of rotation followed, by the equipment and labour available and by the relative cost of each source of feed. The figures in Table 3 are of use in this connection. Only specific costs are given in this table. In other words it is assumed that the farmer has the necessary equipment and much of the necessary labour available on the farm. The machinery will depreciate whether it is used or not and the bulk of the labour is occupied for most of its time on other work. It is only necessary, for this purpose, to consider the extra costs of fuel and oil, casual labour, seed and other raw materials. The man days per acre in the second column represent the estimated total requirements per acre.

Column 3 of Table 3 shows the yield of S.E. per £100 specific costs at the level of crop yields assumed in Table 2. According to this measure the cheapest sources are grass, cabbage, kale, mangolds and silage. Column 4 gives another measure of cost - namely lbs. of S.E. per man day - this shows grass to be by far the cheapest source with silage and hay next.

It should be remembered that the figures in Tables 2 and 3 differ very greatly from farm to farm. Such costs may be calculated for a particular farm by reckoning how much fuel, casual labour, seed and other raw materials go to produce each crop.

Farmer B. has evolved a well balanced system of feed production on his farm. The oats make a useful contribution to the production requirements, the cabbage and silage supply a lot of starch per acre, and the hay, which yields well, fits into the available supply of labour. He intends to grow a little kale for autumn grazing this year.

A MEDIUM SIZED GOOD LAND FARM.

The next example, Farm C. on Table 1. is near Newark. Here conditions are entirely different. On this farm there is no real difficulty about growing crops for sale and although half the arable land consists of heavy clay it could be run as an arable farm carrying only a few stock. In fact the farm carries a stock of 18 cows, a bull, 18 followers and 100 hens. Despite this, only 22 acres out of the total farm acreage of 100 were devoted entirely to stock feed in 1952. In 1953, 37 acres will be under grass. More stock could easily be carried and it is intended to build up the herd.

The points of interest on this farm are -

(1) the key position of sugar beet in the cropping and feeding plan - it provides a good cash return, it entitles the farmer to buy dried beet pulp and the tops are eaten both fresh and as silage.

(2) the early bite obtained from grazing winter wheat and spring barley.

(3) the use of strip grazing

(4) the heavy purchases of concentrates and

(5) the high milk yields.

A farmer in this position must bear in mind the yield of S.E. per acre and the relative costs of the various crops that he can grow for stock feed but he must also consider questions such as -

(1) should I grow wheat, sell it and buy cake, or should I grow mixed corn and feed it to my cows?

(2) should I grow mangolds or kale or should I grow sugar beet, sell it and buy cake?

The answer to these question will vary from one farm to another because of yield and other differences and from one time to another because of the changes that occur in the price the farmer gets for what he sells and what he has to pay for what he buys.

WHEAT VERSUS MIXED CORN

How can a farmer decide whether to grow wheat for sale (buying cake with the proceeds) or mixed corn for feed. We are dealing here with two production foods - mixed corn and cake - which, subject to certain limitations, are interchangeable. It is assumed that this farmer can grow 30 cwts. per acre of either wheat or mixed corn. Table 4 shows how the calculation can be done. It assumes that the farmer can sell wheat for 30s. 0d. and buy balanced cake for 36s. 0d. per cwt. and that the mixed corn when properly balanced with high protein cake is equal in feeding value lb. for lb. to bought balanced cake. The calculation shows that under these conditions, it would pay better to grow and feed mixed corn properly balanced with high protein cake.

Many farmers cannot grow as good a crop of mixed corn as of wheat. If the wheat yield is about five cwts. more than the mixed corn yield then there is no difference either way. If the wheat yield is more than five cwts. greater, as on farm C, then it is better to sell wheat and buy cake. In fact with his wheat yielding 36 cwts. and his dredge corn only 20 cwts., Farmer C 'saves' about £20 per acre by selling wheat and buying cake.

If the prices of wheat and cake move in the same direction at the same rate the comparative advantage of one course over the other will not change.

If the price of cake falls compared with that of wheat then it will pay better to sell wheat and buy cake. If wheat prices fall and cake prices stay high it would be better to grow grain, buy a balancer and feed it to stock.

Some farmers are of the opinion that home balanced mixtures are not as palatable and that they do not produce as much milk as purchased cake, but there are other farmers who can use home mixed feeds to produce high yields. There is probably room for some difference of opinion on this point and this should be borne in mind in interpreting the results of a calculation such as that outlined above.

SUGAR BEET VERSUS MANGOLDS OR KALE.

What about the second question? Should I grow sugar beet for sale and buy cake or should I grow mangolds or kale? Here the position is different. Mangolds are excellent for providing maintenance but not as a production ration and the main problem for every dairy farmer is to provide a production ration, as cheaply as possible, to enable his cows to yield to capacity. Farmer C thinks that growing sugar beet is the answer and the figures in Table 5 show that he is right. He grows 13 tons of beet per acre and it has been assumed that he could equally well grow 30 tons of mangolds or 25 tons of kale.

He can buy two tons of balanced cake with the proceeds of each acre of beet and he is entitled to buy almost a ton of dried pulp for each acre of beet he sells. The tops are all collected and fed green or made into silage. The yield per acre of feed from these three sources is rather more than 6,000 lbs. S.E. and 1,000 lbs. P.E. Had he grown 30 tons of mangolds, he would have produced only about two thirds of the S.E. and one quarter of the P.E. The 25 tons of kale would have yielded only about 80 per cent of the starch and 75 per cent of the protein obtained by the first method.

With the yields and returns assumed, more feed is obtained by growing sugar beet, selling it and buying in cake and pulp and making full use of the tops. The bulk of this feed can be used for production but the kale and mangolds can only be used for maintenance. All things considered the extra cost of about £20 per acre is clearly very reasonable.

No general answer can be given regarding the crops to be grown and the use to be made of them. Each farmer should attempt to think out the answer on his own farm bearing in mind the crop yields he can obtain and the cost of cakes.

FEEDING THE DAIRY HERD - THREE EXAMPLES

TABLE 1

Description	Farm A		Farm B		Farm C	
	Derbyshire small with poor land		Derbyshire medium with poor land		Nottinghamshire medium with good land.	
	acres	yield per acre	acres	yield per acre	acres	yield per acre
Land Utilisation						
Total	17	-	192	-	101	-
Oats	-	-	22	27cwts	9	15cwts
Wheat	-	-	2	27 "	24	36 "
Barley	-	-	2	20 "	11	24 "
Sugar beet	-	-	-	-	20	13tons
Cabbage	-	-	4	20tons	-	-
Potatoes	-	-	4	11 "	-	-
Mangolds	-	-	1	15 "	-	-
Ley hay	-	-	37	2 "	)	
" silage	-	-	18	5 "	)12	-
" grass	-	-	100	-	)	
Meadow hay	7	2½tons	-	-	-	-
" grass	10	-	2	-	25	-
Stocking						
Pigs	40		14		-	
Sheep	-		24 ewes + foll.		-	
Poultry	220		200		100	
Young stock	9		76		18	
Dairy cows and bulls	9		51		19	
Yield per cow - gallons	1,100		840		980	
			£ per cow			
Return from milk (1951-52)	177		135		165	
Feed costs (at market value)	75		75		97	
Margin over feed costs	102		60		68	
Group average	54		50		54	

FEEDING THE DAIRY HERD - THREE EXAMPLES

TABLE 1 cont.

	Farm A	Farm B	Farm C
ESTIMATED FEED REQUIRED BY AND FED TO THE DAIRY HERD (Lbs. S.E.)			
Required for:-			
Maintenance	23,400	152,600	46,800
Production	24,750	107,100	44,100
Total	48,150	259,700	90,900
Supplied by:-			
(1) Purchased feed			
Dairy cake	18,700	63,100	41,600
Dried beet pulp	-	9,500	7,460
Beans	-	4,420	-
Potatoes	-	8,660	-
Brewers grains	-	14,420	-
Total	18,700	100,100	49,060
(2) Home grown feed			
Hay	11,000	21,510	3,600
Oats or mixed corn	-	27,300	9,820
Dried grass	-	-	2,700
Sugar beet tops/fresh or silage	-	-	5,700
Grass silage	-	19,300	-
Cabbage	-	10,130	-
Straw	-	8,500	from litter
Grazing (balance)	18,450	72,860	20,020
Total	29,450	159,600	41,840
Total consumption	48,150	259,700	90,900

FORAGE CROPS - YIELD PER ACRE

TABLE 2

Crop	Yield per acre(1)	Yield - lbs. per acre: Dry matter	Starch equivalent	Protein equivalent
	Col. 1	Col. 2	Col. 3	Col. 4
Turnips) for stock-	14.5) tons	2,750	1,450	130
Swedes) feeding		3,750	2,350	230
Mangolds	22.5 "	6,150	3,200	200
Fodder beet (Roots	15.0 "	6,850	4,600	280
(Hunsballe) (Tops	8.0 "	2,200	1,150	150
Beet tops	11.0(2) "	3,000	1,600	200
Kale	14.5 "	4,650	3,000	400
Cabbage	19.0 "	5,600	3,450	510
Arable silage	6.5 "	4,000	1,850	230
Grass silage	4.75 "	2,900	1,350	180
Hay	22.0 cwts	2,100	750	100
Oats - Grain	20.0 "	1,950	1,350	170
- Straw	20.0 "	1,950	450	10
Grazing	-	-	1,500	-

(1) It is not suggested that there is any proportionality between these crop yields. The yields given here are merely representative.
(2) 75 per cent recovered.

FORAGE CROPS - SPECIFIC COSTS, LABOUR REQUIREMENTS AND YIELDS

TABLE 3

Crop	Specific(1) costs £ per acre	Man days per acre	S.E. - lbs. per £100 specific costs	S.E. - lbs. per man day
	Col. 1	Col. 2	Col. 3	Col. 4.
Turnips) for stock-	10	12	14,500	120
Swedes) feeding			23,500	200
Mangolds	10	14	32,000	230
Fodder beet (Hunsballe)	10	15	-	-
Beet tops	-	2	-	800
Kale	10	10	30,000	300
Cabbage	10	10	34,500	350
Arable silage	10	3	18,500	620
Grass silage	5	2.5	27,000	560
Hay	5	2	15,000	370
Oats - Grain)	8	4	16,500	330
- Straw)			5,500	120
Grazing	4	1	37,500	1,500

(1) Based on estimated requirements of fuel, casual labour, seed and other raw materials. No charge has been included for regular labour, machinery depreciation or other overheads.
(Tables 2 and 3 are from an unpublished series prepared by K. Dexter and W.S. Senior, University of Nottingham).

TABLE 4. COMPARISON OF FEEDING VALUE OF WHEAT AND MIXED CORN

It is assumed that:-

(1) the land can grow 30 cwts. per acre of wheat or mixed corn.

(2) the wheat can be sold for 30s. 0d. per cwt.

(3) balanced dairy cake can be bought for 36s. 0d. per cwt.

(4) 10 cwts. of High Protein Cake is required to balance 30 cwts. of mixed corn.

(5) H.P.C. can be bought for 40s. 0d. per cwt.

(6) the mixed corn balanced with H.P.C. is equivalent to balanced dairy cake, lb. for lb. for milk production.

Then:-

One acre wheat yields 30 cwts. sold for 30s. 0d. per cwt. = £45.

£45 will buy 25 cwts. of balanced dairy cake.

One acre mixed corn yields 30 cwts. grain which when balanced with 10 cwts. H.P. cake yields 40 cwts. of balanced food at a cost of:-

(1)	the value of the wheat which could have been grown and sold	= £45
(2)	the cost of 10 cwts. H.P. Cake @ £40 per ton	= £20
	∴ 40 cwts. of home balanced food costs	£65
	40 cwts. of bought balanced cake costs	£72
	Difference in favour of home balanced cake	£ 7

Conclusion:- It would pay this farmer to grow and feed mixed corn balanced with H.P. Cake.

TABLE 5. COMPARISON OF FEEDING VALUE OF SUGAR BEET, MANGOLDS AND KALE

It is assumed that:-

(1) 13 tons of 16 per cent beet worth £5.11s. 0d. per ton can be grown per acre.

(2) 13 tons of tops x 75 per cent recovered.

(3) 30 tons of mangolds or 25 tons of kale can be grown on same land.

(4) specific growing costs per acre are equal for all three crops.

(5) 1½cwts. dried beet pulp (@ £17.10s. 0d. per ton) may be bought for each ton of washed beet delivered.

(6) a contract with factory exists.

13 tons 16 per cent beet @ £5.11s. 0d. = £72. 0s. 0d.

If balanced cake costs £36 per ton £72 buys 40 cwts.

Entitlement to dried pulp say 20 cwts. = £17.10s. 0d.

Tops recovered say nine tone at cost of fuel for collection £2. 0s. 0d.

Total feed produced	S.E.	P.E.
	lbs.	lbs.
(1) 13 tons beet grown and sold:-		
2 tons balanced cake	2,880	680
1 ton dried pulp	1,360	115
9 tons beet tops	1,800	240
Total	6,040	1,035
(2) 30 tons mangolds	4,500	270
(3) 25 tons kale	5,000	750

Conclusion:- That at the levels of yields and returns specified, more feed per acre, in a better balanced and more convenient form is obtained by growing and selling sugar beet than by growing kale or mangolds, with virtually no increase in out-of-pocket expenses.

PIGS AND POULTRY.

The derationing of feeding stuffs supplies is likely to affect the production of pigs and poultry more than any other class of farm stock. Both pigs and poultry are incapable of digesting much bulky or fibrous foods and although suitable feed can be grown on most farms - the bulk of the feeding stuffs fed to pigs and poultry is bought on many of these farms.

Prior to the war, specialist pig and poultry producers, relying entirely on purchases for their feed supply, were not uncommon. There is no doubt that if feeding stuff supplies remain freely available and egg and pig prices are favourable, that this type of producer will reappear. Such a system of production offers an opportunity to the man with little or no land but with some skill in the management of stock.

In recent years, pig and poultry producers have taken a keen interest in the use of home grown feeding stuffs. They were forced to do this mainly in order to build up their pig or poultry enterprises to a reasonable size, not because of cost differences between purchased and home grown food. When supplies are again freely available, this consideration will not apply. The producer will only be interested in the type of feed which yields him the most profit.

Cattle and sheep are often kept to consume roughages which might otherwise be wasted but nearly all the home grown feed suitable for pigs or poultry can be readily sold. The farmer must, therefore, consider whether it will pay him best to sell his crops direct or to feed them to pigs or poultry. There is evidence[1] that many pig producers prefer to use purchased meals even when these are more expensive than home grown meals. This may have been due to some difficulty in obtaining animal protein supplements and to the greater ease of handling compound meals. A farmer with a limited supply of labour and without facilities for grinding and mixing his home grown meal is probably wise in using his labour to look after a few more pigs.

The cost of home grown food, such as potatoes and fodder beet, may be cheaper than that of an equivalent weight of meal but this must be balanced against the disadvantage of a slower rate of fattening. A higher rate of profit per pig may leave a lower total profit if there is a significant fall in the number of pigs that can be fattened each year. If feeding stuffs are freely available it will probably pay a farmer to accept a lower profit per pig if he can turn out many more pigs each year by buying in feeding stuffs.

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(1)

Farmers Bulletin No.13. Cost and Returns in Pig Production 1947-51. University of Cambridge Farm Economics Branch, School of Agriculture, Cambridge.

Even when charged at market value home grown poultry foods are cheaper than purchased foods. It was found in a recent Cambridge study[1] that birds in yards, depp litter or on range consumed less purchased feed and more home grown grain than birds in batteries. Food costs were lower as a consequence; so were egg yields but the profits from the yard, litter and range birds compared very favourably with those from battery birds. Those battery enterprises that fed grain in addition to pellets obtained reasonable yields and secured profits per bird several shillings above average.

There are clearly some profitable opportunities for substituting home grown for purchased foods for both pigs and poultry but these will be more limited under conditions of free supplies of feeding stuffs than under the system of rationing that has operated in recent years. After derationing, if a farmer wants to build up his pig or poultry enterprise, he can buy more food. He will only use home grown foods if he can secure the same overall profits by so doing,

CONCLUSIONS.

Although they are different in many ways, the three farms taken as examples have one important feature in common - they are using their land to produce as much feed as possible and supplementing the home produced supply of feed with purchased supplies. That is what we must do on the national farm, by using our labour efficiently, by using the best techniques, good varieties and suitable manurial dressings. The nation wants all the production it can get from agriculture, but it cannot afford to pour more labour and more capital into the industry. The Government has said that the current livestock expansion programme assumes that the addition to the livestock population will be supplied entirely from additional home produced feeding stuffs. It is quite clear that this is desirable both from the point of view of making the best use of our land, labour and materials as well as to ease the supply and cost position for imported feeds.

The problem facing the nation and each individual producer is - how to make the most of the resources of land, labour and capital over which they have control. We have seen three different ways of tackling this problem and there are lots more. The man with labour and capital, but no land, will, when feeding stuffs are derationed, be able to produce pigs or eggs. It is up to him to decide which is the best way to use his (own) labour and capital. There is no general answer. One man may be an expert at looking after cows but not much of a hand at producing crops. His neighbour may grow first class crops but be without the knack of looking after stock. The sensible thing is for them both to specialise as far as possible - one growing feed - the other using it. Their joint output would then be greater than the sum of their individual efforts.

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(1) Report No. 47. Some Economic Considerations of Commercial Egg Production 1951-52. University of Cambridge Farm Economics Branch, School of Agriculture, Cambridge.

If, when feeding stuffs are derationed, farmers buy more and do not increase the sales off their farms, if in other words they curtail their production of home grown feed without growing more sale crops then they will be using their land and their labour less effectively. Any saving of labour, fuel and other raw materials achieved would almost certainly not upset the increased expenditure on imported feeds.

What is the answer to the question often asked just now namely "What will happen to home grown feed production if the prices of imported feed fall?". For a short time farmers will carry on as before because on many farms the machinery is available and the labour is there and must be paid for anyway. But there can be little doubt that if feed prices continued to fall, farmers would begin to curtail the production of arable feed crops, they would tend to reduce the labour force on the farm and they would hesitate to replace cultivating equipment as it became obsolete.

But there is no reason to believe that there will be a significant fall in feeding stuff prices. There has been a big increase in world population since prewar years and many of the countries which previously exported food and animal feed to this country are retaining what they produce for consumption within their own borders.

SUMMARY

(1) As a nation we are not finding it easy to make ends meet. We must use our available land, labour and capital to the best possible advantage. We must do this by making our land produce as much as possible without drawing more capital and labour from the national pool and by using, in addition, all the imported feed that we can buy and turn into human food at a profit.

(2) We are probably making better use of our own land now than prewar. With the same carry of livestock, we are managing with half the feed we used before the war.

(3) The control of prices and supplies of feeding stuffs will end soon. The removal of the subsidy may cause a temporary price increase but grain prices on the world markets have fallen recently. There is no reason to expect significant changes in prices and supplies.

(4) Every farmer should use all the resources of land, labour and capital under his control to make his business as big as possible. Buying feed may enable him to use his land, his labour and his skill to better advantage.

(5) The reliance which an individual farmer should place on home grown feed varies with the size and fertility of his farm and with his relative skill as a crop husbandry man and as a stockman.

(6) The farmer with a small acreage of poor land must buy feed. It is the only way in which he can make his farm business big enough to yield him a livelihood.

(7) The farmer with a larger acreage of poor land may not have to buy feed but by doing so he can enlarge his business and increase his profit.

(8) He will probably be unable to grow crops for sale. In deciding which feed crops to grow he must consider which crops produce most feed per acre and the comparative cost in time and money of feed from each source. When he is doing this, he need only think of the specific costs involved - i.e. fuel, casual labour, seed, fertiliser etc. It is not necessary to allocate overheads such as depreciation, repairs etc. to individual crops.

(9) The farmer with good land must also decide whether to grow crops for feeding direct to his stock or whether to sell crops and buy in feed.

(10) The choice between wheat for sale and mixed corn for feed will be influenced by the relative yields of each crop, the sale price of wheat and the cost of cake. Here it is a matter of substituting one form of production ration for another.

(11) The choice between sugar beet for sale and mangolds or kale for feeding will be influenced by the fact that the cake and dried pulp bought with the proceeds of selling beet will provide a production ration but the kale or mangolds can be used only for maintenance.

(12) There is no conflict between the ideas outlined above and the Government's plea for greater production of home grown feeds. Both are based on the need for avoiding any waste or under-employment of the resources available to the farming industry.