BEEF CATTLE AND SHEEP ON HILL COUNTRY FARMS

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Beef in the Old World was frequently a by-product of cattle used for other purposes, as cattle were once the main motive power on farms. It was not until after they were superseded by horses as draught animals that they were reared and fed primarily for beef.

Beef production became a typically British industry and the chief product of British cattle about 1775. Specialised beef breeds were developed and later spread abroad to supply high quality beef for other nations. Later these Aberdeen Angus, Herefords, Shorthorns, and others and their crosses came back to Britain from overseas as frozen and chilled beef.

In New Zealand cattle and sheep have long been regarded as useful grazing partners and North Island hill men in particular are well aware of the advantages of this cattle-sheep association. The improved sheep carrying on hill farms is often an indirect result of the good work done by cattle in controlling secondary growth and roughage.

And so in the past New Zealand cattle have acted more as living agricultural implements than as direct profit earners, but now, owing to an increased demand for beef, particularly good quality young beef, cattle have come to be regarded as meat producers in their own right.

Beef cattle and sheep have both increased greatly in numbers over the years and in general have kept pace with each other, the ratio of beef cattle to sheep remaining overall at about one beef animal to 14 or 15 sheep.

There are wide differences in distribution of beef cattle numbers and of the 3.3 million cattle in New Zealand only about 15 per cent are in the South Island, the majority of cattle being in the North Island, where the heavier rainfall areas have proved more suitable for cattle. Some limitation on cattle carrying is imposed in the south by colder and longer winters and overwintering problems as well as summer difficulties owing to low rainfall.

Beef Meat Markets

In these days of market uncertainties there is much serious discussion on the future of meat markets and prospects for New Zealand lamb, which is and will remain an essential part of our

sheep farming economy, but beef is an international commodity and lamb is not, and even in New Zealand we eat only about 4 per cent of the lamb we produce whereas we consume about SO per cent of our mutton and beef.

In the past most of the beef from New Zealand was exported with the bone in and most of it went to the United Kingdom, but by 1960-61 89 per cent of the total beef exports of just under 95,000 tons (94,933) was going to countries other than the U.K. and 79 per cent (75,117 tons) of that beef was boned and packaged. In this present season (1 October 1961 to 1 September 1962) 83,871 tons of beef has so far gone to 26 countries, the six main customers being shown in Table 1.

TABLE l-BEEF EXPORTS 1 OCTOBER 1961 TO 1 SEPTEMBER 1962

	Tons	Percentage of Total
1. U.S.A.	67,136	80.0
2. United Kingdom	3,079	3.7
3. Canada	2,704	3.2
4. West Indies	2,613	3.1
5. Honolulu	2,584	3.1
6. Japan	2,336	2.8
Other Countries	3,419	4.1
	83,871	100

(Source: N.Z. Meat Producers' Board Market Information Service)

Beef exports to the U.S.A. are very important, but we must endeavour to increase and spread our trade and not become as dependent on the U.S.A. for the beef trade as we are on the United Kingdom for a lamb market.

The extent to which beef figures in the diets of other countries is shown in Table 2.

TABLE 2-MEAT CONSUMPTION PER CAPITA BY PERCENTAGES, 1960

	U.S.A.	Canada	Denmark	U.K.	France	Germany (West)	Belgium
Beef	57	57	27	42	56	39	49
Pork	40	41	72	37	39	60	49
Mutton and Lamb	3	2	1	21	5	1	2
	100	100	100	100	100	too	100
Total meat (lbs) per capita	162	135	132	118	112	111	101

N.B.: The above does not include canned meat.
(Source: U.S.D.A. Foreign Crops and Markets, September 1961.)

In New Zealand in 1961 of the total of 232 lb of meat consumed per capita some 42 per cent or 97 lb was beef.

As there is such a widespread preference for beef it could be to our national advantage to put slightly more emphasis on beef production. However, wool is a very important part of the income, and cattle do not grow wool! Farmers are guided by ruling prices for lamb, mutton, wool, and beef; if there is a definite price trend, production changes may be made. But if lamb prices are good, lamb will be produced; if beef prices are good, there will be a trend toward beef; and if farm production is to be influenced, it can be done only by incentives.

In the United Kingdom we can see the effect of subsidies on farm production and how this farm production has developed, led by the subsidies and grants. In this country farming is our major industry and incentive payments or subsidies are almost ruled out. Also, farm products carrying a subsidy may not be acceptable in the U.S.A. It seems as though world prices alone will continue to be the guide in the shaping of our production trends.

Beef Cattle Numbers

There has been sufficient improvement in beef prices of late for the build up in beef cattle numbers to continue, and with aerial topdressing of hill country pastures the numbers of both sheep and cattle have increased considerably.

TABLE J-BEEF CATTLE NUMBERS 1951 TO 1961

Year	Total Beef Cattle	Beef Cows for Breeding as a Percentage of Total Beef Cattle
1951	2,148,592	Not available
1952	2,282,069	Not available
1953	2,478,302	27.3
1954	2,634,454	28.2
1955	2,807,724	28.8
1956	Not available	Not available
1957	2,861,085	30.0
1958	2,915,339	30.1
1959	2,969,651	30.9
1960	3,019,162	32.1
1961	3,334,309	31.4

(Source: Farm Production Statistics of New Zealand)

The proportion of breeding cows has also been increasing steadily, with the trend similar to the increase of breeding ewes in sheep flocks. It is a result of the effects of topdressing, oversowing, subdivision, and management techniques, all an indication of the

willingness of farmers, when able, to put money back into their properties. The build up in cattle numbers as well as sheep will have been influenced by the need to maintain the desirable cattle-sheep relationship on the hill farms, but it is also a reflection of the improved prices for cattle which have been contributing a steadily growing share of the gross returns to farmers.

TABLE I-REVENUE FROM BEEF CATTLE AND SHEEP ON NORTH AND SOUTH ISLAND HILL COUNTRY

	Revenue from Cattle as Percentage of Total Revenue		Gross Return Per Head of Sheep Wintered (Sheep, lambs and wool)	Return Per Head of Cattle Wintered
			£	£
1949–50	11.6	1949–50	2.1	2.6
1950–51	5.4	1950–51	4.7	3.0
1951–52	13.0	1951–52	2.5	4.1
1952-53	16.5	1952–53	2.7	4.9
1953-54	15.9	1953-54	2.8	5.1
1954–55	16.7	1954-55	3.0	5.1
1955-56	14.9	1955-56	2.9	4.3
1956–57	12.3	1956-57	3.3	4.2
1957-58	21.4	1957–58	2.8	7.2
1958–59	23.3	1958-59	2.3	6.7
1959–60	19.7	1959–60	2.4	6.8

(Source: Economic Service data.)

In the past cattle on much of the hill country were not expected to produce an income but were there for the job they did. This, as shown above, has changed somewhat and as well as doing their job cattle are now contributing a large part of the total gross income. This upward trend in cattle values is due partly to a change in class of cattle, as previously older cattle were kept a long time on the rougher hill country and these were sold at little profit. It is very desirable, if the supply of good quality young cattle is to be built up, that these heavier cattle, which develop excess fat in relation to weight, should be replaced by cows and that young cattle should move out regularly on to the fattening farms.

In the Economic Service, meat production is calculated for mutton, lamb, and beef and these figures compared with the respective gross returns for each provide interesting comparisons between groups of farms.

TABLE 5—AVERAGE PRODUCTION RETURNS AND VALUES IN 1959-60 FOR NORTH ISLAND HILL FARMS

	Net Beef Production		Net Sheep and Lamb Production		
	Lb meat per acre	Value per lb	Lb meat per acre	Value per lb	% lamb meal
Hard hill farms	25	1s. 2d.	28	8d.	25
Easier hill farms	30	1s. 2d.	51	1 1d.	37
Fat lamb farms	50	1s. 2d.	104	1s. ½d.	83

Note: 1. Meat value per pound of sheep meat also includes wool sold on sheep and lamb's back.

2. Meat production is calculated for all classes of stock sold whether as fats or stores.

3. The net production quoted is after allowing for deductions of weights of bought-in stock.

(Source: Economic Service data.)

The price per pound of sheep meat varies directly according to the proportion of lamb meat, which is only to be expected. The sales of cattle from the harder hill country could consist of a proportion of calves and yearlings, of two- to three-year-old beasts and of culled cows, but would be mostly store animals. The easier hill country would sell calves and a similar range of cattle, of which a number might be weaners, or else fat cattle, especially 1½- and 2½-year-olds and cows. The fattening farms on the whole would not be breeding, but turning off fats from bought-in young cattle.

The beef value on hill farms per pound of production as shown above is as good as that on fattening farms-an indication of the strong demand for good quality young store cattle.

Ratios of Cattle to Sheep

The actual ratios of cattle to sheep vary greatly from place to place and from district to district. A high proportion of cattle will be carried on some of the more extensive properties owing to labour difficulties and roughage control problems. As a property improves a lower ratio of cattle to sheep might be desirable, with sheep taking the place of some of the cattle, but this would depend on relative prices of beef, mutton, lamb, and wool as well as labour demands.

The ratio of cattle to sheep is considerably higher on the harder hill country; in our survey these places average about one cattle beast to seven sheep, whereas on the easier hill country the ratio

is about one to 11. The North Island fat lamb farms on the other hand average about one to 16. South Island hill farms do not as yet carry any great numbers of cattle and undoubtedly could carry more. The present ratio of cattle to sheep on South Island foothill survey farms is about one beast to 24 sheep and is increasing rapidly (for example, 13 per cent between 1961 to 1962).

Mr Tebb of the Economic Service, Hamilton, has found in general that relative to gross return from sheep and lamb, including wool, cattle gross return is only about half that of sheep on the basis of pound for pound net meat production. If we are to assume equality in that a pound of beef or a pound of sheep meat requires equal feed to produce, then sheep give a far better return. But other factors are also present, as we know that on many of the places where the cattle : sheep ratio is high (say, one beast to five sheep) the lamb weights are good, the wool is good, and the net return very satisfactory; and it does seem quite clear that the high cattle ratio makes for efficiency in sheep production under northern conditions.

Dr Allan Fraser of Aberdeen in his book "Beef Cattle Husbandry", discussing sheep and cattle relationships, says: "There is a balance in this business and the balance is a fine one . . .", and this is very true in our New Zealand hill farming. The number of cattle to carry will vary according to such factors as rainfall and its distribution, topography, degree of development, labour situation, adequacy of fencing and subdivision, and water supply as well as special winter or summer feed problems; and a big factor will be the personal likes and dislikes of the owner.

It would be very useful if the most suitable combination of sheep and cattle could be determined easily, as then it would only be a matter of variation either way to suit the current market values. It must be accepted that cattle and sheep on most hill farms are complementary grazers. In other words, the sum of the production of the two is greater than either all one or the other. This would be the case on some of the places where roughage control is a big factor and also on some of our high-country runs where swampy valleys are grazed by cattle with direct profit to the run and advantage to the sheep. At some stages of the year, however, even on this complementary grazing the animals could become competitive and at the higher levels of cattle numbers there could be substitution (cattle actually taking the place of sheep). Some degree of substitution may be desirable in the interests of stock health and property development as well as the labour situation, but it does introduce a difficult economic problem for the farmer.

Some farms may have too many sheep and others too many cattle for their own good, although there could be special reasons for a bias one way or the other and it is only by trial and error that the most suitable combination is established. To some degree this is the same sort of problem facing a South Island high-country farmer where if he goes for maximum ewe numbers he will get less wool but more surplus stock, and broadly a wool bias is preferable. For where, owing to difficult conditions, lambing percentages are low and losses high there is little point in keeping a lot of ewes which produce lambs and wool inefficiently. It is far better to use a few more dry sheep and benefit from an increased wool clip and lower costs. There is usually a suitable combination of numbers of breeding ewes and dry sheep to suit the case just as with the hill farmer of the North Island there is a suitable combination of sheep and cattle designed to give better production from the sheep flock and provide a satisfactory cattle return.

Maintaining Farm Income

At a time when overseas prices are uncertain the New Zealand farmer is faced with problems. He cannot influence overseas prices other than by maintaining and improving quality of meat, wool, and dairy produce. The usual methods of maintaining income will be through increasing production to compensate for lower prices or by reducing costs.

Maximum utilisation of all items of farm expenditure is desirable at any time, but very necessary when profit margins are well back. We have seen a virtual disappearance of the investment surplus on farms in the last few years and farm expenditure also has been reduced. It is highly desirable that items influencing production, such as fertiliser, are not reduced, as in a comparatively short time farm production could be affected.

When considering farm expenditure the aim should be to get maximum return for all outgoings. In some areas the more extensive use of cattle could well make for better utilisation of farm expenditure. On the more extensive grazing properties, particularly, the carrying of cattle does not seem to make much, if any, difference to the cost structure. The suggestion is that on a sheep property carrying cattle the cattle add to the income and at the same time enable a better utilisation of the expenditure. If these cattle are complementary to the sheep carrying, as they will be on many places, they will also add to the sheep returns. The ratio of cattle numbers to sheep numbers has not changed over the years, but the ratio of cattle returns to sheep returns has changed considerably in favour of cattle.

One of the main items of expenditure on hill farms is labour and this accounts for up to 35 per cent of the total on harder hill country of the North Island. Cattle work seldom clashes with sheep work and it is reasonable to assume that the carrying of cattle could result in a better utilisation of labour.

Topdressing, too, accounts for an appreciable expenditure (10 to 20 per cent) and it is very possible that a fuller utilisation is gained by the use of cattle with sheep, **and** other expenditure items could also be considered in like manner.

Conclusion

No overall recommendation can be made to the effect that a marked swing to beef is desirable, but some trend in that direction could come by itself as a result of the need by farmers to make maximum use of all inputs. On the foothills of the South Island, despite the fact that we are not yet fully adjusted to cattle, something better than one beast to 24 sheep would be desirable and cattle numbers could be doubled with advantage to the sheep carrying.

The cattle breeding potential of this country must be fully exploited if we are to have a thriving beef industry, as ever-increasing numbers of suitable young cattle must be available to fattening farms and to farms capable of fattening.

The future of this beef industry will depend on many things and indeed, as we have seen, it is an essential part of our sheep industry. With the need to find new markets for our produce and because of the marked preference for beef shown by established and potential customers, beef must continue to play an important and developing part in our export trade.

DISCUSSION

Comment (H. Thorpe): T feel that insufficient emphasis has been given to the economic differences between the production of mutton and wool and that of beef.

Chairman: In fairness to Mr Ward it must be remembered that he pointed out that a farmer could expect double the return from mutton and wool as from beef.

A. (F. Ward): I tried to stress that the gross return is not the whole story. We do know that half the gross return from sheep goes out in expenditure. What we would like to know is how much of your gross income from beef goes out in expenditure. I suggest it might be less than you think if you consider the factors raised in the paper.

Q. (I. L. Elliott): Have we any average figures for the North and South Island? I have often noticed the great difference between store cattle prices in the North and South Island. It seems it would almost pay to fly cattle down from the North to the South Island.

A. One of the reasons for the difference in prices between North and South is the very rapid build-up of the cattle industry in the South which is creating a big demand for cattle. The rate of increase is double that of the North Island. Because there are insufficient store cattle we find some people breeding cattle when they should be fattening only. We must develop our cattle breeding areas in the South if we are to move into this very important beef industry.

Q. (A. Pantall): Do you think the dairy industry should contribute to the production of beef?

A. Farmers need some incentive before they take action. When suitable prices offer they will do it, or if dairy products depreciate in value, they will give favourable consideration to the idea.

Q. Are we going to be assured of a continuing and expanding profitable market for beef production?

A. I did try to show that beef is eaten all over the world and lamb is not, therefore we should be able to sell beef where we cannot sell lamb. At present 80 per cent of our beef is going to U.S.A. and I would like to see a wider distribution. At present we are not in a very strong position with beef because we haven't very much to sell.

Comment (Dr Stewart): Is the reluctance of the dairy farmer to accept beef stock largely owing to the lack of information on the value of such stock? I feel it would be a very useful function to see that this information was obtained and disseminated.