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SYMPOSIUM

BEEF PRODUCTION

FUTURE REQUIREMENTS FOR EXPANDED BEEF PRODUCTION IN NEW ZEALAND

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SUMMARY

Beef is a universal meat and consumption is at a high level and increasing in most countries. Market prospects for New Zealand beef are good and a lot more will have to be produced if demand is to be met.

Preliminary investigations into the economics of beef production relative to other forms of production on sheep farms do indicate that beef meat production can be at a high level and very comparable in returns to those from lamb and wool production.

Beef output can be increased markedly, but in the immediate future traditional beef breeding herds will not be able to supply sufficient fattening stock, and many of these will have to come from dairy herds.

THE TITLE of this paper implies that beef production in New Zealand should be expanded. This is an opinion which is widely held but it does require considerable thought and consideration of the factors involved. If beef production is to be increased in this country, there are certain basic requirements to be examined. These are:

- (1) The market potential for beef.
- (2) The economics of beef production on sheep farms relative to other forms of production.
- (3) The potential for increasing beef meat output.

TABLE 1: ESTIMATED CONSUMPTION OF MEAT IN CERTAIN COUNTRIES*
(lb per capita)

	Beef & Veal			Mutton & Lamb			Pig meat			Poultry		
	1962/64†	1965	1966	1962/64†	1965	1966	1962/64†	1965	1966	1962/64†	1965	1966
Argentina	175	162	200	12	12	20	16	19	NA	small amount		
New Zealand	108	109	108	96	89	82	34	32	31	small amount		
United States	100	105	107	5	4	4	65	59	57	37.6	40.8	43.8
Canada	81	90	88	4	3	4	51	49	48	33	36.7	39.6
Australia	102	93	86	90	83	82	19	21	21	11.5‡	13.8	NA
France	68	68	75	6	7	7	47	50	50	22.3	24.1	NA
Belgium	54	51	56	small amount			44	51	46	18.2	18.1	18.5
West Germany	47	46	48	small amount			71	74	73	12.4	13.4	14.3
United Kingdom	50	44	45	24	23	23	48	51	50	15.2	16.4	17.5
Netherlands	45	40	44	small amount			36	40	50	7.3	7.2	10.0
Italy	36	35	41	2	2	2	16	19	19	11.8	15.9	NA
Denmark	38	36	40	small amount			76	77	75	8.1	8.6	8.9

*Compiled from *Meat* 1967, No. 17, Commonwealth Secretariat.

†Average for the period.

‡Data for 1964 only.

NA: Not available.

MARKET POTENTIAL FOR BEEF

Beef is the principal carcass meat consumed in many countries as indicated in Table 1.

Even in the principal mutton- and lamb-producing areas, beef consumption is high. Mutton and lamb consumption has remained fairly static in most countries but is at significant levels only in New Zealand, Australia, Argentine and the United Kingdom. Pig meat is also fairly static but seems to have decreased slightly in the areas where poultry meat consumption is at a high level and rising rapidly, such as in the United States and Canada. Poultry meat consumption is increasing in most areas.

In general, the consumption of beef and veal in total and *per capita* is rising but demand is unsatisfied in many countries through insufficient export production in some of the main producing areas. Droughts in Australia, after effects of a drought in South America, and the build-up of herds in New Zealand following on after a period of land development, have all had an effect.

Another factor limiting exports from beef-exporting countries is the high level of home consumption, and, with the increase in population in both exporting and importing countries, beef requirements are increasing fairly rapidly.

The estimates of production of beef and veal in certain countries such as Argentina, Australia and New Zealand are shown in Table 2. Note that the consumption of beef and veal *per capita* is high in the main exporting countries such as Argentina, Australia and New Zealand.

Meat exports from New Zealand (Table 3) consist of lamb, mutton and beef, with lamb predominant by weight and value, but beef exports are significant at 21% by weight and about 31% by value.

The destination of these meat exports is of considerable interest. Thus, in 1966-7, 92% of the lamb meat went to the United Kingdom; 76% of the ewe mutton went to Japan; and 70% of the beef and veal went to the United States.

Beef exports, which have averaged more than 20% by weight of total meat exports for a number of years, are worth examining in detail. They have not increased in quantity in the last ten years, although there have been considerable changes in destinations and a big increase in the proportion of boned and cuts to carcass meat. Increasing home consumption in New Zealand, and the

TABLE 2: ESTIMATED PRODUCTION OF BEEF AND VEAL IN
CERTAIN COUNTRIES AND PERCENTAGE CONSUMED*
(Thousand tons)

	1962/64†	1965	1966	Consumed 1966	% of Production Consumed 1966
Argentina	2,297.6	2,055.0	2,611.2	2,029.0	77.7
New Zealand	287.3	271.4	287.3	129.4	45.0
United States	7,901.1	8,803.1	9,198.2	9,244.1	Exceeds production
Canada	690.5	835.9	838.7	801.1	95.5
Australia	969.8	931.4	867.5	447.0	51.5
France	1,506.1	1,501.9	1,675.1	1,559.0	93.1
Belgium	198.5	189.4	203.9	210.6	Exceeds production
West Germany	1,135.1	1,074.8	1,157.4	1,350.3	Exceeds production
United Kingdom	898.0	818.4	853.2	1,128.2	Exceeds production
Netherlands	279.1	270.7	268.5	238.9	89.0
Italy	611.3	538.7	640.9	935.0	Exceeds production
Denmark	168.5	151.7	163.2	87.8	53.8

*Compiled from *Meat* 1967, No. 17, Commonwealth Secretariat.

†Average for the period.

Note: In those countries whose consumption is in excess of production, this is a net calculation as there will be imports as well as some exports of beef.

TABLE 3: EXPORT OF MEAT FROM NEW ZEALAND 1966-7*

			Tons	% by Weight
Lamb	....	....	294,017	55
Mutton (ewe and wether)	....	....	85,214	16
Beef and veal	....	....	109,155	21
Other	....	....	45,056	8
			533,442	100

*Source: New Zealand Meat Producers Board.

TABLE 4: EXPORTS OF BEEF AND VEAL FROM NEW ZEALAND*
(Data to September 30 in each season)

	U.K.		U.S.A.		Other Countries		Total Tons
	Tons	%	Tons	%	Tons	%	
1954-5 to 1956-7†	64,716	58	7,452	7	39,278	35	111,446
1960-1	10,356	11	69,287	73	15,290	16	94,933
1961-2	6,850	6	95,803	81	15,815	13	118,468
1962-3	1,463	1	104,988	87	14,229	12	120,680
1963-4	26,350	21	71,935	58	26,351	21	123,636
1964-5	29,107	26	44,537	41	36,635	33	110,279
1965-6	22,641	21	62,151	58	22,807	21	107,599
1966-7	9,507	9	76,838	70	22,810	21	109,155

*Source: New Zealand Meat Producers Board.

†Average for the period.

slaughter of younger and lighter (but more valuable) animals, as well as the fairly rapid build-up in herd numbers, has tended to hold back export production. The exports of beef and veal to the U.K., U.S.A. and other countries, and the percentage by weight for a period of years, are shown in Table 4.

The destination pattern has changed considerably and there has been a marked swing of beef exports away from the U.K. to the U.S.A. Some fluctuation has occurred, mainly about the 1964-5 period, owing to a shortage of beef from the Argentine and a diversion of beef back to the U.K.

The important point to note is that beef export tonnage has not increased, and that the major change is in the destination of exports. Beef has been taken away from the U.K. and transferred to the U.S.A. New Zealand has not produced any more beef for export, but has switched markets according to price levels.

There is another recent development to be considered and that is the effect of the recent outbreak of foot and mouth disease in the U.K. The British Minister of Agricul-

ture has banned the import of meat from countries where foot and mouth disease is endemic. In 1966, Britain imported 35% (£84,138,000 sterling) by value of her total meat requirements from these countries, and, of this, 67% (£56,527,000) was beef and veal. Just how long these restrictions are likely to last, and if there are likely to be any permanent changes is not known, but in the short term at least it will certainly increase demand for meat exports from New Zealand.

The FAO agricultural projections for 1975 suggest that there will be a deficiency in world beef production of between 450,000 and 680,000 tons with production and consumption in exporting and importing countries taken into account. The report further states: "On the whole the projections suggest that world production and consumption of beef as well as international trade can be expected to grow and prices are expected to move along a rising long term trend, although the projected imbalance in world markets might not warrant the expectation of spectacular increases."

The report also warns that the world beef market could be affected by important changes in import policies.

In summary, therefore, it is clear that beef is a universal meat and consumption is at a high level and increasing in most countries; considerably more beef will have to be produced if demand is to be met. In countries with a potential for beef production, the pros and cons of beef production in addition to, or even in some degree instead of, other forms of production should be under serious consideration.

THE ECONOMICS OF BEEF PRODUCTION ON SHEEP FARMS RELATIVE TO OTHER FORMS OF PRODUCTION

There is a lack of precise information on the economics of beef production relative to other forms of output. A major difficulty in obtaining such information has been to find a unit of measurement comparable in terms of cattle and/or sheep. Generally, a sort of recipe is given ("take so many sheep as being equal to one breeding cow" etc.) and the case is stated from that point onward. This is not a criticism of the validity of established dry matter intake levels for animals of differing weights, but the problem lies in the number of animals a given area of land can support and this depends not only on dry matter intake but also on the amount of dry matter likely to be available under the differing forms of grazing practised by cattle and sheep.

The carrying ability of pasture for sheep is often assessed and production measured, but, with cattle alone, it is seldom considered, and there is a great lack of information on this point. A good deal more needs to be known about stocking rates and weight gains of cattle before any really comparable figures can be produced. Some work has been done in this field and the results so far have been quite revealing.

Reeves (1967) has shown that in mid-Canterbury it is possible to carry $1\frac{1}{2}$ to $1\frac{3}{4}$ beasts per acre from weaner to chiller weights and that the net meat production per acre would be over 500 lb. He has suggested that 600 lb of beef per acre is quite a reasonable goal.

Work done at Ruakura Agricultural Research Centre (Joblin, 1966) clearly indicated that beef meat production can be at a high level. At Ruakura, 470 lb per acre was reached, but the large amount of fat trim from the carcasses suggested that a higher initial stocking rate was desirable.

Beef cattle are an integral part of much of the New Zealand sheep industry, and, although specialization in beef production has not been common, beef meat production is quite high on many farms. In a farm survey conducted by the Economic Service, mutton and lamb-meat production levels are recorded for many sheep farms and where cattle are carried beef production is recorded also. Data for meat production (Table 5) from North Island survey farms indicate the importance of the beef meat production.

TABLE 5: NORTH ISLAND FARMS—1965-6 SEASON

	<i>Hard Hill</i>		<i>Easy Hill</i>		<i>Intensive Fattening</i>	
	<i>lb Meat /acre</i>	<i>%</i>	<i>lb Meat /acre</i>	<i>%</i>	<i>lb Meat /acre</i>	<i>%</i>
Lamb	10	17	26	27	83	52
Mutton	22	37	35	36	26	16
Beef	27	46	36	37	50	32
TOTAL	59	100	97	100	159	100

It has never been possible, however, to indicate to what extent cattle contribute to, or even, perhaps, in some circumstances, detract from mutton and lamb production, but it is generally agreed that, on hill country at least, cattle are most acceptable as grazing partners with sheep, and that the improved carrying for sheep is often an indirect result of the good work done by cattle. The breed-

ing cow has very largely taken the place of the heavier cattle as a means of roughage and pasture control with the result that there is an increasing supply of younger and more valuable beef cattle for fattening or for increasing the numbers in herds.

It would appear that the best way to obtain reliable information on the economics of beef production is to establish production levels by continuing with trials at Ruakura and elsewhere, and by obtaining field information where possible for such "all beef" farms as may be available. There are a number of such farms being established on high-producing, fattening country, where the carrying capacity is approximately 2 beasts per acre or better. In addition, there are a few of the more extensive hill country farms where all or almost all stock carried are cattle.

The Economic Service has taken a small number of these "all beef" farms into survey, not for inclusion in the normal farm survey but as studies in meat production. These farms are mainly on the extensive hill country. The indications are that the meat production on such farms is approximately 50% above what might be expected from the normal sheep/cattle ratio on similar country. It will be necessary to continue this survey for a number of years not only to establish production levels, but also to obtain further information on the general economics of the enterprises.

The gross return from a cattle unit with a 50% or greater meat production margin over the sheep/cattle farm is very comparable and somewhat in favour of cattle at past prices and distinctly favourable at present prices.

Costs involved in running sheep and/or cattle will have considerable bearing on the matter and are an important consideration. The labour component on the sheep farm is largely determined by sheep numbers and not affected greatly by even quite substantial numbers of cattle, the reason being that the timing of sheep and cattle work does not clash. Surveys conducted by the Economic Service have shown that labour costs are a major item of total farm expenditure and this is particularly notable with the more extensive types of sheep farms.

THE POTENTIAL FOR INCREASING BEEF MEAT OUTPUT

A major move into beef production in New Zealand may not be feasible, but there is no doubt that beef exports and thus beef production should be increased. Beef pro-

duction could have been increased in the past at a greater rate on many properties with profit to the individual and to the country, and this is even more desirable in present circumstances. Such increased production could well be in addition to current mutton and lamb production.

Beef cattle numbers increased to more than 4 million in 1967 and must increase still further if beef production is to rise. An increase in herd size, of necessity, means that cattle are temporarily held back from slaughter and it will not be possible for traditional beef breeding herds to supply sufficient weaners for fattening at current rates of demand. Gunning and Everitt (1967) have shown that, in Matamata county, which is typical of the more highly-developed farming areas, beef breeding cows decreased by 4% but total beef cattle increased by 60% during the 8-year period to 1965. The authors comment: "Clearly the only long term source of weaners to satisfy rising demand is from our dairy herds."

The role of the beef animal has long been secondary to that of sheep; cattle have been used as living agricultural implements to control roughage and keep pastures suitable for sheep. Now, however, the production of beef has to be considered in its own right, and at meat production levels of 500 and even 600 lb per acre, beef production on high-quality grassland is a practical proposition.

The case for some degree of substitution of cattle for sheep is beginning to emerge with this surprisingly high meat production from farms carrying solely beef animals. It is not anticipated that a marked swing to "all beef" farming units will occur, except on certain specialized properties, or where the owner has special skills or preferences, but there is a case for a much higher proportion of cattle than is at present being carried in many sheep farming areas, and it is certain that another 0.5 million cattle could be accommodated and make a very worthwhile contribution to meat exports.

There is also a case for review of beef cattle management, and the weight gains of young animals and the performance of sires is of very great importance. There is also a need for study of individual records within the herd in order to eliminate the "passengers"—those animals carried for another year because they do not fatten or the cows that do not calve. Cattle mortality too, seems excessively high in some areas. Financial returns from cattle are a good deal lower than they should be on many properties for these reasons.

As there is a case for an increase in beef production in New Zealand, it may be suggested that an authoritative lead should be given in this regard. But general directives or advice suggesting a move into one aspect of farm production can have unfortunate results in that farm management changes harmful to the individual could be precipitated. In all cases where a change in the emphasis of farm production is contemplated, such change should not take place until all its factors are fully considered by the farmer and his advisers. Some farms and some people, for example, will not be suited to beef production. It is better that, with the knowledge of a beef market potential, farmers should consider their own cattle potential and management factors and direct their production accordingly.

CONCLUSIONS

- (1) Market prospects for beef are good as this product is in the class of a "most favoured meat" and world consumption both in total and *per capita* is rising.
- (2) The meat market, however, is at all times subject to restrictive import practices and major importing countries can impose quotas to protect their own meat producers.
- (3) Economics of beef production relative to other forms of production depend very largely on the level of beef meat production and indications are that production levels are probably 50% above that expected from the normal sheep or sheep/cattle carrying on similar country. At this level of production, beef returns compare very favourably with sheep-meat and wool production.
- (4) If beef production is to be increased significantly, traditional beef breeding herds will be unable to supply sufficient weaners for fattening and the most immediate and practical source will be dairy herds.
- (5) Increased efficiency in beef production can add considerable beef meat to the New Zealand export tonnage and improve the returns to farmers on both breeding and fattening country.

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