# THE VALUE OF INCENTIVES AND SUBSIDIES FOR INCREASING LIVESTOCK PRODUCTION

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SUMMARY

The current economic position of New Zealand is serious and the potential contribution which the agricultural sector can make towards increasing export receipts is significant. Over recent years assistance provided for the farming industry has been in various forms and has tended to be of an *ad hoc* nature. The recently introduced Livestock Incentive Scheme (being associated with output and giving some continuity) is preferred to the more traditional input subsidies. Declining farm gate receipts coupled with higher input prices have meant lower farm investment in recent years and this resulted in relatively static agricultural output.

Clearly the type of assistance provided in the past has not provided the necessary climate for exploiting the known potential of the industry. However, policies which will stimulate increased production are not easily found. The present disincentives to increase output are seen to be:

1. Industrial.
2. Uncertainty with respect to future farm gate prices and costs, and so the financial viability of increased output.
3. Climatic uncertainties and their impact especially on intensive farming systems.

There is physical potential within the agricultural sector to boost export receipts. What is required is an ongoing environment which will encourage and sustain investment and so increased output.

## INTRODUCTION

New Zealand at present faces its most desperate economic situation since the depression of the 1930s. The major attendant problems are a serious balance of payments deficit, high internal inflation, and the highest level of unemployment since the war. The need to generate increased export earnings has never been greater than at present.

It is against this background that the vital role which the livestock industry plays in the New Zealand economy must be viewed. As New Zealand's largest earner of overseas exchange, what can be expected from the livestock industry at this point, when the need is for increased export earnings? To generate $100 million extra exports over 1976-7 levels requires a 4.0% lift in

TABLE 1: EXPORT RECEIPTS ($m N.Z.)[1]

| | 1975[2] | 1976 | 1977 | 1978[3] |
|---|---|---|---|---|
| Dairy .... .... .... .... .... | 316.3 | 473.5 | 582.9 | 570 |
| Meat and wool (inc. B.P.) .... .... | 898.1 | 1366.5 | 1814.1 | 1830 |
| Other .... .... .... .... .... | 52.3 | 61.1 | 107.8 | 120 |
| Total agricultural receipts[3] .... | 1266.7 | 1901.1 | 2504.8 | 2520 |
| Total all exports[3] .... .... | 1658.0 | 2490.5 | 3330.4 | 3350 |

[1] Source: Reserve Bank
[2] Year ending June
[3] Estimates

pastoral exports, yet if the $100 million was generated from all other exports aggregated, they would need to lift by 12% (see Table 1).

At the same time it is desirable to focus attention on some of the other areas. New Zealand may be importing too much, and at too high a cost, just to provide raw materials as inputs to industries which provide employment but do not materially assist in solving the major problems. It is one thing to be employed, but quite a different matter to be productively employed and perhaps there is too high a proportion of the total work force in the first category.

Is New Zealand getting high enough prices for its exports? Can they be sold if they are processed to a higher, more sophisticated level? There are major problems of access in many markets when this approach is followed. While the concept of increased added value is attractive it brings with it many problems.

Undoubtedly there are new industries which can be developed and there have been many highly efficient units developed in recent years, especially those utilizing indigenous products.

However, it is quite clear that export receipts are required now in $100 m. lots. The livestock industry, being the one industry which is sufficiently large and with the physical potential to generate the increased exports in the magnitude now required, still has a vital role to play in the New Zealand economy.

## PROBLEMS OF STIMULATING INCREASED PRODUCTION

A recent report has suggested that it is physically possible to significantly increase agricultural production (MAF, 1976). The most important question is whether the financial and sociological environment is such that this potential is likely to be exploited.

What makes a farmer increase his output? First, he must have the physical capacity in terms of feed availability and labour, etc. Secondly, he must have the financial ability. Thirdly, and most importantly, he must have the will and incentive. Increasing output usually means increasing investment now (at the expense of current tax-paid income), in the hope of higher output and profit in the future. This implies that the farmer has some confidence that returns for increased output in the future will compensate for present income forgone. All these conditions must be met before a farmer is prepared to embark on a development programme aimed at increasing output and so profit.

When reviewing production trends it is not always recognized that a short-term increase in meat production can be achieved by a run-down in flock numbers and vice versa. In periods when stock numbers are increasing, meat production tends to fall initially.

In general a farmer will increase output, either through higher stock numbers and/or higher stock performances, or both, if he believes it will pay him to do so. Some farmers will increase production with other objectives in mind though these tend to be in the minority.

The situation in the pastoral industry now is quite different from that in the 1960s when the interests of the individual farmer and the nation were synonymous. Then when the nation required increased exports, farmers were encouraged to believe that by increasing output, largely through higher average stock numbers, their profit in the future would be higher. Subsequently, as a result of rapidly increasing costs, low prices and some unfavourable climatic seasons, many farmers became doubtful of the financial soundness of their decisions to try for higher levels of output.

At present, although the nation needs increased exports, the farmer is largely unconvinced that it will pay him to exploit the physical potential which exists on his farm. This is an unfortunate situation indeed and one which should be the concern of all in the community.

It is desirable that the financial reward to the producer be sufficient to encourage the continued output and expansion of those products in which New Zealand has some natural advantage. Unfortunately, this is not the case at present, and the production of high-quality pastoral products is in jeopardy because of declining farm-gate receipts. Governments, in recent years, have recognized the seriousness of this situation, and have

helped to provide the means to achieve a reasonable level of investment in the farming industry, in acknowledgement of its significance to the economic stability of New Zealand.

## METHODS OF PROVIDING INCENTIVES

Direct government assistance to the farmer generally falls into one of the following categories:

(1) Those aimed at lowering the price of a specific input — *e.g.*, fertilizer drench, transport.

(2) Those aimed at increasing output directly — *e.g.*, the Livestock Incentive Scheme.

(3) Those aimed at short- to medium-term supplementation of product prices or incomes — *e.g.*, $1 per head supplement paid on export lambs in 1975; the suspensory loan assistance.

(4) Specific adverse event assistance, generally localized — *e.g.*, flood, drought assistance.

Assistance of a specific short-term nature — *e.g.*, flood damage or drought relief — is obviously required in response to a regional problem which may occur on a random basis. These problems can be of an extremely serious nature, and crippling to the individual farmer concerned. While not large in total cost, the government assistance in some cases in the past may have been too specific. For example, in a drought situation, it may be assistance with water supply that is required for a specific farmer; yet the overall district may benefit more from financial assistance provided for hay or livestock cartage, and it is in the latter direction that government assistance is given. More flexibility in forms of assistance in this situation would be desirable and more effective — *e.g.*, suspensory loans, where the farmer is left to allocate the assistance money granted.

Input subsidies (*e.g.*, those on fertilizer, drench, weedicides and their application) have the long-term effect of lowering input costs and so production costs. There is a great tendency, however, for these types of assistance, if continued over time, to become built into the cost structure of the farming operation. The intention should be to use this form of assistance only to ensure the maintenance of a reasonable level of usage of a productive input, regardless of the financial situation of the farmer. In other words, for the full benefit of input subsidies to be felt, they should be increased in years of falling farm income and vice versa. Con-

tinued subsidization of inputs at a high level may not only induce waste, but even result in a lower usage of a vital input, when prices and incomes fall. In the latter case, a knowledge that, in at least the medium term, the relative cost of a particular productive input will be held is of considerable significance to a farmer involved in a major forward planning exercise.

More recently considerable sums have been advanced to the industry in the form of assistance to encourage the maintenance or expansion of livestock numbers, on the basis that higher stock numbers are synonymous with higher output. In this category has been the Livestock Retention Scheme of 1972, and more recently the Livestock Incentive Scheme.

There have also been supplementary payments such as the additional $1.00 per head paid by the government on all export lambs slaughtered in the 1975 season. This latter type of assistance aimed at supplementing prices and/or incomes can have the reverse effect of that hoped for, and may encourage a high lamb kill with the resultant effect on the capacity of the industry to expand in subsequent years.

When there are scarce resources, then clearly there is a need to allocate these where the response is likely to be of greatest benefit to both the individual and the nation. In this respect the Livestock Incentive Scheme has much to commend it, even though it relies on the use of increased stock units as a proxy for increased production. It does not reward the farmer who increases output through higher stock performance. If the need is for increased output, then any scheme which ties the assistance to increased output tends to be an effective way of administering limited assistance and is less wasteful than many of the input subsidies which the industry had over earlier years become adjusted to. One good aspect of the Livestock Incentive Scheme is the fact that it is designed to run for several years, and thus induces some medium-term confidence.

If the need is for farm income maintenance, because of generally low prices or high costs, then price supplementation or adjustment may be necessary, using a currency change or other means of transfer of resources.

In whatever form the assistance is given, it is imperative that the true price relativities between individual products are not disturbed, and ideally that the farmer is left with the decision as to the allocation of his total gross income, including any assistance he may qualify for.

The case has been made for increased output from the livestock industry, yet the farm-gate receipts for all agricultural products are (as a proportion of the final market value) falling. More of the final market value is now being absorbed by those activities outside the farm gate.

For example, with export lamb in the decade to 1970-1, the farm-gate share of the final market value averaged 64%. This year, 1977-8, it is expected to fall to 44%, continuing a steady decline since the early 1970s (see Table 2). The product at the farm gate is the raw material or input for an increasingly sophisticated transport, processing and marketing industry. These activities outside the farm gate add value to the product and the farm but also incur costs, and it is these which are increasing at a marked rate. New Zealand must ensure that it pays the farmer to produce lamb, mutton, beef, wool, etc., for while in the very long run there may be some alternative source of export receipts, in at least the medium term there is none. If those who operate outside the farm gate realized their dependence on the farmer, perhaps the value added to the product at farm gate could be achieved at lower cost. There is interdependence in the "farm to market chain", especially in livestock products, but, unless there are some real improvements made in this segment of the industry, there is a real danger of the major traditional products becoming uneconomic for the farmer.

TABLE 2: DISTRIBUTION OF EX-HOOKS SMITHFIELD VALUE OF LAMB (%)[1]

| | *1972-3* | *1977-8* |
|---|---|---|
| Schedule return .... .... .... | 61.80 | 44.27 |
| Transport to works .... .... | 1.24 | 1.19 |
| Works to f.o.b. .... .... .... | 15.31 | 15.94 |
| f.o.b. to Smithfield .... .... .... | 21.65 | 38.60 |
| Total .... .... .... .... .... | 100 | 100 |

[1] *Source*: N.Z. Meat Producers Board.

Either the government must intervene and transfer resources from the rest of the community (*e.g.*, by a devaluation) to sustain the farm sector, or an alternative source of export receipts must be found. The latter appears unlikely. The possibility of a major breakthrough in the methods of processing and handling of our traditional products also appears unlikely. These products tend to be low value per unit of volume, and go to markets at the

other side of the world, so freight has become a major item in total costs.

In relation to the last point, it is of interest that today nearly 43% of the total government research effort goes into the agriculture sector, and the bulk of the agricultural effort (83%) goes towards "on farm" or production research. When the activities outside the farm gate are absorbing such a high proportion of the final market value, perhaps a case can be made now for the allocation of a greater proportion of this research effort into that area, in the hope of improving overall efficiency and thus retaining a greater share of the final market value at the farm gate. The potential gains in the off-farm area are now very significant.

Much has been said of the level of "on-farm" technology at present available in the industry. Scientists and advisers have a responsibility to demonstrate the cost effectiveness of their research findings to the farmer. The farmer will adopt a technique and build it into an effective management system if he can be shown that it pays him to do so. The technical evaluation of research is only one leg of a three-legged stool. Economic evaluation must follow, and thirdly the building of the technique into a farm-scale management system. To stop at the first leg is doing the industry an injustice.

Increased farm output can and has been achieved by greatly improved on-farm practices in recent years. This can continue, but the marginal cost of increased farm output is much greater now. The industry is at present moving from 100 million stock units, not 80 million as was the case in the 1960s. A higher proportion of the farmer's total costs now is becoming "fixed" in nature, leaving him with little scope for adjustment of expenditure in periods when the terms of exchange move against him. In particular, high stocking rate systems involve increased risk and vulnerability, especially in a period of rapid escalation in input prices.

A recent study of 124 hill country farms (Taylor and MacRae, 1977) showed quite clearly that those farms with a high stocking rate, as well as high productivity per stock unit, produced 70% higher net incomes per hectare than a group of farms with similar stocking rate but lower productivity (wool weights, lambing percentages). This increased net income per hectare was achieved with only $3 per hectare higher expenses, than the low stock performance group. What this means is that high stock performance must have great appeal to farmers who may already

be at a reasonably high stocking rate, and who for various reasons are unwilling to embark on a policy of more stock with the attendant increased risk, higher overheads, and increased vulnerability, with respect to profit. The annual cost of maintaining a breeding ewe or cow has increased sharply in recent years, and unless the associated level of performance is reasonably high there is likely to be little scope for increases in stock numbers.

Increased stock performance as an alternative to more stock is becoming increasingly desirable for many farmers. The value can be demonstrated clearly on an industry basis. An extra 0.5 kg of wool from 58.5 million sheep would generate almost $60 million extra at the farm gate, while an extra 5% increase in lambs from 41 million ewes would produce just over 2 million lambs worth nearly $20 million at the farm gate. The Livestock Incentive Scheme would be far more effective if it could be altered to take account of changes in livestock productivity, as opposed to simply stock numbers. There are however major problems in this regard. It should be noted that there are many in the industry for whom higher stock units per hectare will be of high priority, but higher stock units are not the only means of increasing output.

Psychological barriers to increased output have become very important recently. Many farmers are concerned about industrial problems, particularly in the freezing and cargo handling industries. It is difficult to convince a farmer who has had a draft of lambs returned from his local freezing company twice in the space of two weeks that increased stock numbers will be of benefit to him, and also the country! Thus, while in financial terms the marginal cost of increased stock units may be higher than a decade ago, the non-financial constraints are reaching alarming proportions, and these pose a major problem for the policy-makers. For example, in the calendar year 1976 of all the man-days lost in New Zealand industry, agriculture-related industries accounted for 54%, and of these stoppages 86% occurred in the freezing industry. More significantly, this proportion is increasing annually.

The experience of the 1960s when increased output was followed by lower prices, higher costs and adverse seasons has seriously affected the farmer's attitude towards large-scale (and frequently capital intensive) development programmes. In addition to the usual climatic uncertainties, there still remain considerable risks and uncertainty in relation to the future movement

TABLE 3: SHEEP FARMERS' TERMS OF EXCHANGE AT THE FARM GATE

| *Year Ended June* | *Prices Received* | *Prices Paid* | *Terms of Exchange* | *Expenditure/ s.u. ($)* |
|---|---|---|---|---|
| 1973 | 1810[1] | 1333[1] | 1358[1] | 5.02[2] |
| 1974 | 1857 | 1520 | 1222 | 5.20 |
| 1975 | 1308 | 1724 | 759 | 4.19 |
| 1976 | 1958 | 1932 | 1013 | 4.72 |
| 1977[3] | 2501 | 2291 | 1092 | 4.43 |
| 1978[3] | 2363 | 2635 | 897 | 4.10 |

[1] 1965-6 = 1000.
[2] Expenditure ($) per stock unit in real terms; proportional to the volume of inputs.
[3] Estimates.

of both farm input prices, and farm-gate receipts and so farm income (see Table 3). The present stabilization policies have helped to cushion out wide price fluctuations; however, when associated with farm input price movements of the magnitude experienced in recent years, farm incomes still fluctuate widely. This all introduces considerable uncertainty as to the financial viability of any drive for higher output on the part of the individual farmer, whether through higher stock numbers or higher stock performance.

## WHAT OF THE FUTURE?

New Zealand has a farming industry controlled by farmers who have the management capacity and the physical capacity to increase output by significant amounts in the future. What they require is an environment which will encourage them to exploit at least part of this potential. This requires adequate financial reward for the increased effort, and a removal of the costly and extremely frustrating barriers which are increasingly being placed in the way of the farmer. These latter disruptions undoubtedly constitute a greater disincentive to increased output than does any other single area at present, probably including taxation.

As far as the future is concerned, it is hoped that additional incentives to encourage increases in output are not required, and that the farm-gate share of the final market value is alone sufficient to induce the increased output required by the nation. If assistance is required, then the form and placement of such assistance should be investigated carefully.

There is an urgent need to create an on-going environment which will engender longer term confidence by farmers in the future profitability of their industry, and so encourage sustained farm investment. This will require policy measures in the future designed to underpin the industry and maintain farmers' confidence long term, in contrast to the rather *ad hoc* and more fragmented measures which have been a feature of recent years. These measures do not appear to have created the necessary climate for exploiting the known physical capacity of the industry. The trends in total volume of output from the industry in recent years clearly illustrate this point (see Table 4).

TABLE 4: GROSS AGRICULTURAL OUTPUT RELATIVE TO 1971-2[1]

| *June Year* | *Total* | *Sheep and Lamb* | *Wool* | *Cattle* |
|---|---|---|---|---|
| 1972 | 1000 | 1000 | 1000 | 1000 |
| 1973 | 966 | | | |
| 1974 | 937 | | | |
| 1975 | 950 | | | |
| 1976 | 1002 | | | |
| 1977[2] | 990 | | | |
| 1978[2] | 960 | 890 | 976 | 814 |

[1] *Source*: Department of Stastitics.
[2] Estimate.

To summarize, the disincentives to increased output would, in order of importance at this point, appear to be:

(1) Industrial.

(2) Future uncertainty with respect to farm-gate prices, input costs and hence income levels, and so the financial viability of increased output.

(3) Climatic uncertainties and their impact, especially on the more intensive farming systems.

It is highly probable that some form of stimulation of investment will be required in the future, and the value of this in maintaining and increasing livestock output will be largely dependent on the ability of such assistance to maintain farm investment at adequate levels in the medium to long term.

The short-term problems facing the farming industry are very serious, yet they can be solved if they are recognized, and if there is a will to pull together. Unless something is done to

ensure that a fair share of the final market receipts are returned to the farmer, the likelihood of achieving even a 2% compound increase in agricultural output will be low. This situation must be of major concern throughout New Zealand. Agriculturists should devote more effort towards finding satisfactory solutions to these problems. Without these the results of a well-developed agricultural research team concerned mainly with on-farm problems will remain largely under-utilized.

To conclude, one can only hope that common sense will prevail in the total industry, and that the interdependence within the "pasture to market chain" will be acknowledged. New Zealand has a natural advantage in pastoral production, and this should be capitalized on by those further down the chain for the benefit of the whole nation. Before the end of the century these present problems should be overcome and New Zealand will be selling agricultural products as the O.P.E.C. nations have sold their oil in recent years. There is no alternative industry as a major source of increased export receipts, and thus the maintenance of a strong, healthy pastoral industry is the essential ingredient in the maintenance of New Zealand's future standard of living.

## REFERENCES

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