A SURVEY OF SMALL NORTH COAST DAIRY FARMS*

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1. SUMMARY

In a survey carried out in 1953 by the Bureau of Agricultural Economics, in co-operation with State Departments of Agriculture the costs of producing butter in Australia were investigated. One conclusion emerging from this survey in New South Wales was that "low incomes (or high costs) were largely the result of the small scale of operations on the farms concerned . . . The problem of increasing efficiency and thereby reducing costs is, therefore, to a considerable extent one of raising the volume of production on the small farms".[1]

It was therefore decided in 1956 to contact a random sample of small dairy farmers in the Tweed, Richmond and Clarence valleys to ascertain the reasons for low production on these farms and to study how incomes could be increased and costs reduced. The farmers contacted were chosen at random from all suppliers in the area delivering less than 5,500 lb. of commercial butter in terms of milk or cream equivalent to butter to any factory in the area. On the basis of the survey it is estimated that there are between 900 and 1,150 dairy farmers in this area who derive their main farm income from dairying and produce less than 5,500 lb. of butter in an average season.[2] As there are approximately 5,650 registered dairy farmers in these three valleys the sample relates to a population of between 15 and 20 per cent of all dairy farms.

As might be expected, the farms included in the 1956 survey compare in many respects unfavourably with the farms chosen at random for the 1953 Dairy Cost of Production Survey. Broadly speaking the 1956 survey farmers had less land, poorer land and fewer improvements than the 1953 survey farmers. There is also evidence to show that herd and pasture management was somewhat poorer and the labour force somewhat older on the low production farms.

Of the 1956 survey farmers 30 per cent were aged or infirm or were female operators without adult male assistance. The average taxable income of the survey farmers for the three years ended June 30, 1956, was broadly comparable in real terms with incomes obtainable by male basic wage earners (*i.e.* unskilled workers) in the cities. However, as no allowance is made for the fact that the average survey farmer owns an asset worth more than £5,000, the return received for the operator's labour is obviously below that of an unskilled city worker. For reasons outlined in the text it is believed that a similar comparison for 1956-57 and for the current financial year would show a considerable deterioration in the survey farmers' incomes relative to that of basic wage earners.

Sixty-eight of the 74 farms surveyed in 1956 were afterwards visited by a Departmental extension worker—in most cases the local agronomist —to examine major weaknesses in the existing farm organisation and methods which could be used to increase the incomes of the operators concerned. On the basis of the agronomists' reports, the interviewers' comments and the information provided by the farmers, the main reason

[1] "Income and Costs in the Dairying Industry", *Review of Marketing and Agricultural Economics,* Vol. 23, No. 3 (September, 1955) p. 110.

[2] Ninety-five per cent confidence limits, the actual numbers being 894 and 1,169.

for the low production on each farm was ascertained. Although, as mentioned above, the labour force on the survey farms included a substantial proportion of people unable to work hard, the most frequent reasons for low production were to be found in the nature of the farms and were not the result of the disabilities of the operators.

Thirty-two of the 74 survey farms were considered too small to be developed by known economic techniques to produce 7,500 lb. of butter in an average season and rear their own replacement stock. This minimum standard was chosen because it was found in 1953 that "Generally speaking, farms producing less than this quantity of butter were unable to provide the labour force with a remuneration equal to the basic wage"[3] (*i.e.* after deducting interest on the bank valuation of the assets employed in production).

On an additional 25 farms the land available was regarded as markedly unsuitable for dairy farming (including six farms subject to severe and frequent flooding). In other words 57 of the 74 survey farms had certain deficiencies as farms—apart from the labour force operating them. For reasons outlined in the text these deficiencies are regarded as a more basic cause of low production than any deficiencies of the labour force—though these are of course contributory factors. Of the remaining 17 farms, five seem to be low producers because of bad management ; six because of lack of finance ; and six for a variety of reasons including the age of the operator, tenure conditions and institutional problems of ownership.

On the majority of the farms no improvements nor change of enterprises could be suggested by technical personnel which would provide the "reasonable minimum income" referred to above. In 35 cases amalgamation of two or more properties into larger units appeared to be the only feasible means of improvement. Such amalgamations are taking place—one of the 74 survey farms was going to be developed by the amalgamation of two adjoining properties—but without official assistance or encouragement the process will be very slow. Capital losses will normally be associated with amalgamation.

In order of increasing difficulty of accomplishment the most feasible or sole means of converting the survey farms to economic working units appeared to be—

Add horticultural or crop sidelines	4 cases
Better management (of which the present owner was not always capable)	8 cases
Change to agriculture or horticulture	8 cases
Increased investment (sometimes beyond resources of present operator)	10 cases
Amalgamation—to larger dairy farms	20 cases
Amalgamation—to form grazing properties	15 cases
No possibility of raising income	9 cases

[3] *Loc. cit.*

Five-sixths of the survey farmers had no definite development plans. This group included—

(*a*) Approximately one-third of the survey farmers who had personal problems of age and infirmity.

(*b*) One-sixth of the survey farmers who derived more than one-third of their income from non-farm work. Most of the part-time farmers had turned to off-farm work because their farms were too small to provide a reasonable living from dairying or any other farming activity.

(*c*) One-tenth of the survey farmers who stated that repeated floods had discouraged them from making any further attempts to develop their farms.

The remaining one-sixth of the survey farmers had firm intentions of developing their farms and had in most cases taken some steps in this direction.

Since more than half the survey farms had major physical defects preventing their development as economic units it is to be expected that no educational nor financial programme can be suggested which will substantially alter their status as uneconomic producers. Little optimism can be felt that research programmes will greatly alter the financial standing of these farmers.

Schemes for farm amalgamation and supervised investment programmes on the lines of the U.S. Farmers' Home Administration could eliminate many of the high-cost producers in the survey area. However, in some cases the small high-cost farm probably represents the best use of the limited resources—human and physical—available to it.

2. INTRODUCTION

In a survey carried out in 1953 by the Bureau of Agricultural Economics in conjunction with State Departments of Agriculture the costs of production of butter in Australia were investigated. At the time special attention was paid to the need to identify high-cost producers and to collect data which would serve to initiate action to increase net incomes of the high-cost producers.

One conclusion emerging from the survey in New South Wales was that the problem of the high-cost producers is to a considerable extent that of the farmer with low overall production. Of the 231 farms included in the survey in New South Wales 57 averaged less than 5,000 lb. of butter per annum (i.e., during the three years prior to June 30, 1953). The unweighted average net cost in New South Wales was 3s. 3d. per lb. of commercial butter. Of the 23 survey farmers who had net costs exceeding 5s. 0d. per lb. 20 were "small producers" (*i.e.*, below 5,000 lb.). If we define "high-cost producers" as the 30 per cent of farms with the highest costs, this group included 41 small producers and only 18 farmers with a production of 5,000 lb. or more.

It was therefore decided to examine small farmers in greater detail in a subsequent survey to ascertain the reasons for low production and means by which incomes could be increased (and costs reduced). In the new survey—undertaken in 1956—an attempt was made to contact a random sample of small producers. It was desired to obtain a sample which corresponded as closely as possible to the group of sample farms in the 1953 Dairy Cost of Production Survey which had produced less than 5,000 lb. of butter. During the three-year period 1953-54 to 1955-56 average production per farm was 10 per cent higher than for the three-year period covered by the 1953 survey. It was therefore decided to make the criterion for inclusion in the sample 5,500 lb. of commercial butter. Details of the sampling procedure are given in Appendix I.

3. SOME CHARACTERISTICS OF THE SURVEY FARMS

As might be expected, the farms included in the survey conducted in 1956 compare in many respects unfavourably with the farms chosen at random for the 1953 Dairy Cost of Production Survey. In both surveys farmers were asked to estimate the value of their farms and on the basis of their replies it is possible to make the comparison shown in Table I. Sixty-two per cent of the 1956 survey farmers were situated on land which they valued at less than £40 an acre, as compared with 38 per cent in the 1953 survey. According to information received from valuers there was no noticeable change in land values in this area between 1953 and 1956.

TABLE I

Farmers' Estimates of Land Values of Their Farms

Land Values per Acre	Per cent of Farms	
	1956 Survey Per cent	1953 Survey Per cent
£10–£39	62*	38*
£40–£79	26	33
£80 and over	12*	29*
Number of Farms	68	133

* Significant at 1 per cent level.

The land values obtained from farmers relate to the improved capital value of the farm—*i.e.*, they exclude the value of plant and stock but include the value of the house and other structural improvements such as fencing and sheds. It is not practicable to differentiate between the value of the improvements and the unimproved value of the survey farms. However, there is good reason to believe that the 1956 survey farms have—as a group—a lower value per acre, resulting both from the lower value of the improvements and from their lower carrying capacity. For instance, it was noticed that areas which are regarded as being of above-average fertility in the survey regions were considerably under-represented in the 1956

survey. Thus, 30 per cent of the 1953 survey farms in the Richmond-Tweed region were situated in red volcanic "Big Scrub" areas, as compared with only 19 per cent in the 1956 survey. In the 1953 survey, farmers on these soils obtained, on the average, twice as much butter per acre as on the other soil types of the Richmond-Tweed region.

Not only was the average improved value of the land per acre much lower among the 1956 survey farms, but the average value of the farm as a whole was much smaller (£7,250 as compared with £12,320 in 1953). Broadly speaking, the 1956 survey farmers had less land, poorer land and fewer improvements.

TABLE II

Farmers' Estimates of the Walk-in Walk-out Value of Their Farms

Walk-in Walk-out Value	Per Cent of Farms	
	1956 Survey	1953 Survey
£4,000–£5,999	28*	9*
£6,000–£7,999	37*	18*
£8,000–£9,999	19	16
£10,000 and over	16*†	57*
Number of Farms	68	133
Average	£7,250	£12,638

* Significant at 1 per cent level.

† Valuations of most of the farms in this group were based on a land use other than dairying. Some were suitable for cane growing while others were situated within or near town boundaries.

An attempt was made to have a Departmental extension worker—in most cases the local agronomist—inspect each of the farms drawn in the 1956 survey, to comment on the existing farm organisation and on methods which could be used to improve the incomes of the operators concerned.

Pasture and herd management and the utilisation of pasture forage—the main feed of the dairy herd—is dependent on effective sub-division. All available evidence points to sub-division and rotational grazing as the first requirement of efficient management in dairy farming "off the grass" in this area, both to maximise yields and to prevent a progressive deterioration in the species composition of the pastures. On half the farms sub-division was rated by the agronomists as poor and on another six as fair only. A third of the farms had five paddocks or less and less than a fifth of the farms had more than 10 paddocks. The number of paddocks on the 1956 survey farms was significantly less than on the 1953 survey farms. According to the agronomists' assessment pasture management was non-existent on 30 of 68 farms visited and rated as "poor" on another eight. Altogether 60 per cent of the 1956 survey farmers did not practice rotational grazing, as compared with 41 per cent of the 1953 survey farmers.[4] The reason, in many cases, would be the poor land available to the operator, which would make it uneconomic to go in for more intensive methods of farming. This point is elaborated below.

[4] This difference is statistically significant at the 1 per cent level.

TABLE III

Number of Paddocks on 1956 Survey Farms

Paddocks per Farm	Number of Farms
5 or less	25
6-10	38
11-15	8
16 or more	3
Total Number of Farms	74

Control of calving dates is generally accepted as being of considerable importance in proper herd management. In the 1956 survey, 55 per cent of survey farmers permitted the bull unrestricted access to the herd, compared with 45 per cent in the 1953 survey. Although the brief contact made with survey farmers does not permit full assessment of the standard of herd management, the standard gauged by adoption of this single practice is not high.

Evidence was found in many cases that farms had previously reached a level of development with production well in excess of current levels—either under different management or when the operator was younger. Deterioration of such farms could be observed in a considerable regrowth of trees and undergrowth and in the lack of maintenance of fencing, buildings and machinery in effective condition.

4. SOME CHARACTERISTICS OF THE SURVEY FARMERS

Two comparisons relating to the survey farmers may be of interest. Firstly, a rough comparison of the incomes of the survey farmers with incomes which are obtainable in other sectors of the economy is possible; secondly, some comparisons can be made of the labour force on the 1956 survey farms with the labour force on the 1953 survey farms.

Table IV gives the average taxable income for 55 survey farmers. Taxable incomes of 10 farmers who obtained more than one-third of their income from off farm work are not included. In some cases it was not possible to obtain tax returns, while a few farmers refused to allow their returns to be examined. However, an examination of the interviewing schedules does not disclose any difference in terms of average butter production per farm or in the size of the labour force between farms for which tax information was and was not available. The average taxable income of the 55 farmers who gained more than two-thirds of their income from their farms in the years 1953-54, 1954-55 and 1955-56 was £458.

TABLE IV

Taxable Incomes of 55 Survey Farmers

Income Range	Number of Farms	Number of Able-bodied Male Farmers	Number of Female Aged and Invalid Farmers
Negative	3	2	1
Nil–£199	6	1	5
£200–£399	13	11	2
£400–£599	15	12	3
£600–£799	16	10	6
£800–£999	1	1	...
£1,000–£1,199	1	1	...
Total Number of Farms ...	55	38	17
Average Income	£458	£483	£404

How does this compare with incomes obtainable in urban areas? During this three-year period the average annual male basic wage in Sydney was £631 per annum, and the average annual earnings per employed male unit in New South Wales was £889 per annum. However, before a comparison between the relative real income of the survey farmers and wage-earners in the city can be made certain adjustments are necessary. Firstly, allowances must be made for differences in the cost of living. Unfortunately, the Commonwealth Statistician does not collect cost of living figures for the country towns in the Tweed, Richmond and Clarence Valleys. The nearest town—apart from Brisbane—included in the Statistician's retail price collection is Toowoomba, some 100 miles north of the survey area, in Queensland. However, it is believed that the cost of living in Toowoomba would be a reasonably good indication of the cost of living in Murwillumbah, Casino and Lismore, three of the major towns in the area, and would be more comparable than the use of cost of living figures collected for country towns in New South Wales.[5]

On the basis of the estimated cost of living for Toowoomba the annual basic wage of £631 in Sydney during the three-year period corresponded to an annual wage of £580 in the survey area. Before we can compare the survey farmers' average real income with the "average basic wage earner", it is necessary to make some additions to the survey farmers' income to allow for goods and services obtained on the farm which are not normally included in taxable income. The most important items are milk and rent. For milk the figure added was £36 a year. This was arrived at by taking the average consumption for a family of four persons throughout the Commonwealth and valuing it at the price at which milk sells in Lismore and Grafton. The second adjustment is made because the survey farmers do not have to pay house rent. Here the figure used was the average rental payable for a cottage in New South Wales outside Sydney. According to the 1954 Census—adjusted for changes in rents since then—this amounts to £84 a year.

[5] The cost of living in Grafton—the other major town of the area—is probably somewhat higher, as many businesses supply Grafton from their Sydney office and the other towns from Brisbane. For instance, Grafton consumers pay the maximum price for petrol on the Sydney-Brisbane highway.

In addition, an allowance should be made for eggs. This was estimated by taking the average Australian consumption for a family of four persons, valued at retail prices during the survey period and deducting estimated requirements of purchased feed. The resulting allowance is £12 per annum.[6]

The average income of survey farmers should therefore be increased from £458 to £590 (adding £36 for milk, £84 for rent and £12 for eggs) and thus appears broadly comparable with the average real income of a Sydney *basic* wage earner, which would be in the vicinity of £580. But there seems little doubt that the survey farmers as a group—obtained substantially lower real incomes than the *average* male wage earner in New South Wales.

Three comments could be made at this point. Firstly, the average survey farmer owns an asset which—according to his valuation—could be sold for over £7,000; even after making allowances for known debts and possible overstatement of the market value of his farm, the equity of the average survey farmer probably exceeds £5,000. No deduction from taxable income has been made to allow any return on this investment. Hence the return received for the operator's *labour* is obviously below that of an unskilled city worker.

Secondly, a similar comparison of incomes for a later period such as 1956-57 or for the current year could be expected to show a distinct deterioration in survey farmers' incomes (relative to basic wage earners). This is because seasonal conditions during the survey period were considerably better than average; better than the three years prior to the survey period and the eighteen months since June 30, 1956. In addition, butter prices have since declined, costs have gone up and the basic wage has risen. The survey farmers' incomes have therefore declined relatively since the farmers were interviewed.

The third comment relates to the quality of the labour force on the survey farms. The earning ability of 30 per cent of the survey farmers can hardly be compared with that of able-bodied male employees in towns and cities. Of the 74 survey farmers 23 were over the age of 65 years or unable to work hard because of sickness or were women without adult male assistance. Table IV gives the number of persons falling into these categories in each of the income groups listed. Of the 55 survey farmers for whom tax information is given in Table IV, only 38 were able-bodied male workers who

[6] It might be considered that the farmers could supplement their income by producing fruit and vegetables in the home garden. However, this is done only to a very limited extent, probably less than in the case of town and city dwellers earning comparable incomes. Two factors provide the main reasons for the relatively little home orcharding and gardening undertaken—namely, diseases and insect pests and lack of water for irrigation. Despite the 40-in. to 70-in. annual rainfall over the survey area relatively long periods of drought are common. In most cases the house is built on a high part of the farm remote from a substantial permanent water supply. The high rate of moisture loss from the majority of soils on the survey farms precludes horticultural activities in the absence of a reasonable water supply. Insect pests and plant diseases are severe and frequent in their incidence, adding considerably to the difficulties of gardening as a part-time occupation and almost precluding the production of some fruit and vegetable crops.

Firewood is available on some, but by no means all, the properties. Fares are another item where comparison is difficult. The survey farmers' taxable car costs and the costs of cartage on small parcels, etc., may be regarded as an offsetting item for the urban wage earners' fares to work.

would command male wage rates in towns. The average annual income of these farmers was £483—or after making allowances for milk, eggs and rent—£615, 6 per cent above the "real" basic wage, but approximately 25 per cent below average wages as measured by the "average annual earnings per employed male unit" in New South Wales (adjusted for cost of living differences).

It would be of interest to compare the proportion of able-bodied males among the 1956 survey farmers with the random sample obtained in 1953. Unfortunately, information regarding the number of operators affected by sickness is not available for the 1953 survey. Two of the 133 survey farmers in 1953 were women operators without male assistance, compared with eight out of 74 in the 1956 survey. The age distribution for the two samples is available and shows that the 1956 survey farmers were somewhat older on the average. The relevant figures are given in Table V.

TABLE V

Frequency Distribution of Age of Farmers

Age of Farmer	1956 Survey	1953 Survey
Years	Per cent	Per cent
Under 33	6*	15*
33–42	23	28
43–52	29	24
53–62	26	24
Over 62	15	9
Number of Farmers	65	136

* Significant at the 10 per cent level.

5. REASONS FOR LOW PRODUCTION

There are, broadly speaking, three factors which can be responsible for unsatisfactory results from any farm business. These are, first, the unsuitability (or inadequate area) of the land; second, the inability of the labour force to operate the farm properly (this includes physical factors such as sickness and/or personal factors such as managerial ability); and last, institutional factors which may prevent the efficient utilisation of land and labour. The last group includes tenure conditions, problems of legal ownership and the inability to command (or obtain) sufficient finance to work the farm to capacity.

On the basis of the information provided by farmers and agronomists and the interviewers' comments, the authors have classified the farms according to reasons for low production. It was frequently found difficult

to specify a single reason for low production in a particular case. A labour force deficient in some respects was often associated with a problem farm situation.[7]

To overcome this difficulty, to some extent, an attempt has been made in Table VI to classify the reasons for low production according to both the suitability of the farm and the suitability of the labour force. This attempt at classification is useful in the majority of cases but it does break down on occasions when low production is caused by neither unsuitability of the land nor of the labour force, but is the result of factors such as tenure arrangements and institutional problems of inheritance, lack of funds, etc.

TABLE VI

Some Reasons for Low Production on 74 Survey Farms

Labour Force Characteristics	Farm Characteristics				Total
	Farm Too Small	Land Unsuitable	Floods	No Farm Problem	
	Number of Farms				
Female Labour ...	2	5	...	1	8
Aged Labour	3	2	...	2	7*
Sickness	1	4	...	1	6*
Bad Management ...	1	1	1	7*	10*
No Labour Problem ...	25	7	5	6	43
Total	32	19	6	17	74

* The " Bad Management " category contains two cases which were also included under " Aged Labour " and " Sickness ".

Of the 74 farms in the sample 68 can be regarded as problem farms on account either of the land or of the labour force. As shown in Table VI, the quality of the labour force can at most be held responsible for low production on 31 of the 74 farms; whereas 57 of the 74 farms have definite deficiencies as farms—apart from the labour force operating them.

The most frequent single reason for low production is therefore to be found in the nature of the farms operated by the survey farmers rather than in the characteristics of the labour force. There is an additional reason why it is believed that the farms rather than the farmers should be

[7] An example may illustrate this difficulty in an acute form.

Farm number 28 is somewhat larger than 200 acres but only 60 acres are cleared. The farm is operated by the wife of the owner. The owner is employed at a local mill and does the morning milking and helps at weekends. The farmer intends to clear the rest of the farm "when he can afford to buy a tractor". In fact, he went to work in the mill four years ago for the express purpose of saving money to buy a tractor. In the meantime his wife has been ill and can only do urgent maintenance work on the farm. Average butter production on the farm over the last three years has been 3,200 lb. The local agronomist regards the farm as marginal dairy country which could possibly produce 7,500 lb. to 8,000 lb. annually. (In the case of this farm the main reason for low production shown in Table VII was "lack of funds", with "illness" as a subsidiary reason.)

regarded as the main cause of the low incomes and low production of the survey group. This relates to the two "disabling" categories of the labour force included here—age and feminity. Neither of these necessarily lead to low production when the farm provides scope for the employment of able-bodied assistants. In other words, while female and aged farm operators constitute over 20 per cent of the sample there are many examples of women and elderly men successfully operating larger farms. It is largely because the survey farms are too small or otherwise unsuitable that they do not permit the employment of additional labour units. In some cases the son of the aged operator had left the farm because it did not provide sufficient scope for a young able-bodied man; in other cases the farm was expressly purchased by the operator for his retirement.

In Table VII the writers have attempted to classify the reasons for low production, giving one "main" reason for each case and—where applicable—a subsidiary reason or reasons. Such a classification is necessarily somewhat arbitrary. But for purposes of exposition it is desirable to show in one table the reasons for low production in each case. In Table VI there was a group of six farms with neither a labour nor a farm problem. In these cases lack of finance, tenure or other institutional problems were believed to be responsible for low production. A description of the most frequent causes of low production is given below.

Farm too Small

The biggest single group of farms is contained in the classification of "farms too small". The criterion adopted in this case was whether the property in question was capable of producing—in an average season and without purchased feed—7,500 lb. of butter and of rearing all replacement stock. This minimum standard was chosen because it was found in 1953 that "Generally speaking, farms producing less than this quantity of butter were unable to provide the labour force with a remuneration equal to the basic wage" (*i.e.* after deducting interest on the bank valuation of the assets employed in production). Of the 74 farms, 32 were definitely too small and in an additional three cases there was some doubt as to whether they could reach this limit. The capacity of the farm was judged on the basis of agronomists' estimates, those of the farmer and the comments of the interviewer.[8]

[8] The assessment of farm capacity by the farmer and the agronomist was generally in broad agreement. It is perhaps worth noting that the minimum size acceptable for soldier settlement in this area is a farm with a capacity of 10,000 lb. of commercial butter, suggesting that our criterion of reasonable size is certainly not excessive.

TABLE VII

Reasons for Low Production on 74 Survey Farms

Category	Main Reason	Subsidiary Reason	Total*
	Number of Farms		
Farm Too Small	32	3	35
Land Unsuitable	19	...	19
Floods	6	10	16
Lack of Finance	6	4	10
Bad Management	5	6	11
Age	2	6	8
Female Labour	1	7	8
Sickness	...	7	7
Tenure	2	3	5
Institutional	1	4	5
Poor Lay Out	...	2	2
Total	74	52	126

* These totals cannot be directly compared with the totals for the individual categories in Table VI. In the case of the first three categories of this table the "subsidiary" reasons could not be incorporated in Table VI. (e.g. most of the farms where floods were a subsidiary reason for low production had as the main reason either "farm too small" or "land unsuitable").

Many of the farms classified as "too small" were situated on some of the best soil types in the region, on good river flats and the best of the "Big Scrub" soils. The small farms on the poorer soil types tended to be in the areas last taken up for settlement. Frequently they had topographical features which added greatly to the difficulties of management. For example, one small farm (70 acres) on Big Scrub soil was two miles long with buildings and water supply located at one end, while some small river flat farms liable to flooding depended on the use of dry runs up to five miles away. On the more marginal soil types it was common for tracts of relatively steep and impassable or highly infertile country to intersect the better soil types on the farm.

Land Unsuitable for Dairying

In classifying farms as "land unsuitable for dairying", soil fertility, terrain and weed problems were taken into account. Some of the farms on unsuitable country possessed a sufficient area to produce the target amount of butter, but were of such low overall fertility and so difficult of access as to be uneconomical to work at their theoretical capacity. Such farms were located generally in the poorest country in such areas as the Nimbin and Orara districts and had an overall average carrying capacity of less than one beast to four acres.[9]

[9] An example of a property on unsuitable country is afforded by one farm of over 300 acres containing 170 acres of forest country estimated to be incapable of supporting nine head of cattle.

Although the estimated carrying capacity of the whole property was 77 head of cattle (10,400 lb. of commercial butter) development beyond a butter production of 6,300 lb. of commercial butter (with replacement stock reared on the property) was not considered to be economic.

Even where areas of country of low carrying capacity were intersected by pockets of high fertility, difficulties of access and the expenses of maintaining fencing and implementing weed control measures constituted a substantial liability.

Until the time of the survey no effective means was available to economically control large areas of regrowth and such weeds as Crofton weed and Lantana which infest steep country of low carrying capacity.

Floods

Some flood-affected farms were obviously too small to be operated economically as dairy farms; however some farms in this category were large enough to be operated as cane farms and there is evidence that some changes to cane growing were being made at the time of the survey.

Other flood-affected farms were on country which can be classed as unsuitable for dairying apart from any influence of floods. Such farms generally contained large areas of permanent swamp or soil of very poor fertility. In addition they were intersected by water courses which rendered management of stock difficult.

The general situation on low lying flat farms subject to frequent and severe flooding was discussed in more detail by one of the authors after the 1953 survey.[10]

Many of these farms have had far more, and more severe, floods in the last decade than in the previous 60 years. Until 10 years ago such farms were considered highly desirable properties, operators of which gained very satisfactory incomes. In "average" seasons butter production per acre was twice as high as on the next best land classification (the Big Scrub soils) and the properties were almost immune from spring drought. Their high carrying capacity per acre greatly reduces the cost of fencing, weed control and other improvements and makes for ease of management. It is possible that in the long term these properties will prove as sound financially as they were believed to be in the past. However, their operators require a reserve of capital to tide them over unfavourable periods, which may last longer than 10 years, judging by the 1945-55 experience.

Lack of Finance

This group contains six farmers, most of whom have been on their farms for short periods of time. In all cases, the potential capacity of the property exceeds 7,500 lb. of butter and the main limiting factor was lack of finance to develop the farm. It may be of interest to describe a case falling into this category. Farm No. 18 was purchased by the present owner in 1953 for £4,500, of which the owner supplied £1,750 cash, the remainder being financed by a bank overdraft. The owner bought dairy cattle and pigs for £1,500 and paid for them from loans made by his butter factory and

[10] See F. H. Gruen, "Incomes of Dairy Farmers in the Richmond-Tweed Region," this *Review*, Vol. 23, No. 3 (September, 1955), p. 185.

from another source. His production was 3,300 lb. of butter in the first year and this has since increased to 5,300 lb. According to the agronomist, the farm has a potential of 12,000 lb. To achieve this potential would require the investment of a further £3,000 in stock, fencing, water supplies and some additional clearing. This estimate of costs agrees substantially with that made by the farmer. The farmer is developing his property as rapidly as possible out of his meagre income. He is living very frugally and has managed during a period of three years to repay £1,250, but he feels that it will take him another 10 years at the present rate of progress before he will reach a productive level of 12,000 lb. of butter.

However, not all farmers in this group are so heavily in debt. In fact, two such farmers had no debts. Neither of these farmers had tried to borrow to finance developmental expenditure.[11] The remaining four farmers had debts. In two cases they had tried to borrow additional amounts without success. The remaining two—to the use the phrase of one of them —"had not been game to go in any deeper".

Managerial Ability

On most farms costs could be reduced and incomes increased by better management and stock husbandry. The standard of disease control, regulation of calving dates, rotational grazing and top-dressing of pastures and availability of stock water supplies on the survey farms was not high, but not markedly inferior to that of a normal cross-section of dairy farmers in the region. Accordingly, increased incomes might be expected to follow attention to such practices, which require comparatively small outlays of capital. However, only on four farms—classed as badly managed in Table VII—would these measures have increased production to the adopted standard. One additional farmer was classified as a bad manager in Table VII because he had both land and machinery eminently suitable for earning a substantially higher income from cane growing and yet no attempt had been made to do so.

Two examples of farms placed in the "bad management" category are given here. One such farm was completely dilapidated. The owner blamed inability to obtain suitable sharefarmers for lack of success. However, it was fairly apparent that the owner's deficiencies as a manager and in personal and business relations as landlord were to blame. In another case an eccentric sharefarmer had completely disrupted the mating programme, resulting in a 3,000 lb. per annum fall in production at the end of three years.

In general, the least well managed of the farms tended to be those where management was most difficult or where the operators suffered from infirmity, illness, or physical disability. It should be mentioned here that while five survey farmers were patently bad managers, six were managing the meagre resources at their command very well.

[11] One of these farmers was a tenant whose "borrowing ability" would have been severely limited.

Other

In six cases the main reason for low production is given by a variety of reasons as shown in Table VII. The farms where tenure was the main problem were large enough to provide an adequate income for their operators provided they were properly managed and run in accordance with long-term objectives of sound pasture management and animal husbandry. Furthermore, the operators could see what was required and would have been able to make the necessary adjustment, but lack of security of tenure removed the incentive for such action. This was true in spite of the fact that in one case a farmer had tenanted a property for a period of 18 years but had always been refused a long-term lease by his landlord. He did not feel justified in spending money on improvements which would only yield him a return over a period of four or five years while he was continuously on a 12-months' tenancy.

The farms placed in the "Institutional" category were farms where litigation and conflict over ownership had prevented rational long-term management of the property. In one case the owner of the farm had been in a mental home for many years and the property was under the legal control of a trustee who maintained he was legally unable to sanction expenditure on maintenance or development; as a result, there had been a spectacular long-term deterioration in fertility and productive capacity.

6. METHODS OF RAISING FARM INCOMES

Possibilities of Investment

Since more than half the survey farms had major defects preventing their development as economic units it is to be expected that no educational or financial programme can be suggested which would substantially alter their status as uneconomic producers.

To ascertain the scope for increased investment on the survey farms the agronomists visiting each farm were asked to assess the increased development which would be economic on each farm; the increased capital and annual costs associated with such development and the labour required. On the basis of the assessments made the increased *net* income obtainable from investment on the survey farms can be estimated.[12] Of 68 farms visited by agronomists 47 provided no scope for further investment and in only nine cases could net income be increased by £200 or more. In Table VIII the number of farmers in each income group is shown. The capital investment required on the nine properties ranged from £300 to £2,000 and averaged £1,500. In some cases it is doubtful whether the full capital cost of improvements should be charged against the resulting increase in production and income because—as mentioned earlier—there is evidence of continuing

[12] These estimates were made by valuing the increase in production at 3s. 4d. per lb. of butter and deducting the costs of investment at the following rates: (a) 10 per cent of the estimated capital costs of development excluding labour costs, (b) all annual cash costs and (c) labour costs at award rates for all labour requirements in excess of six men-months. It was assumed that over a period of two or three years an operator could contribute six months to development work.

deterioration on many of the survey farms. In the absence of capital investment of the type suggested production would not remain stationary but decline, hence an exact estimate of the effect on income of any investment over a lengthy period is extremely difficult.

TABLE VIII

Scope for Increased Investment

Increase in Net Income Possible	Number of Farms
Nil	47
£25-£100	8
£101-£200	5
£201-£400	4
£401 and over	5
Total	68

Dairy farming in the Tweed, Richmond and Clarence valleys does not offer highly profitable avenues for investment such as exist, for instance, in some southern dairying districts as a result of recent advances in agrostology.

These regions contain a wide range of soil types and very variable rainfall, averaging 40 in. to 70 in. in different areas. Typically a winter—spring drought is experienced.[13] Shortage of water supplies and physically suitable country limits the possibility of irrigation in many parts. Dairy production almost exactly reflects the suitability of prevailing seasonal conditons for the growth of the two summer-growing introduced grasses, paspalum (*P. dilatatum*) and carpet grass (*Axonopus affinis*). Despite considerable research no satisfactory means have yet been found to maintain swards containing efficient nitrogen fixing pasture legumes.

It is significant that the most frequently recommended investment was an outlay on clearing regrowth and rubbish. This recommendation coupled with the fact that only nine survey farmers consistently used fertiliser on pastures—the usual annual application being less than one ton—makes it apparent that lack of maintenance has been a factor in the general decline of fertility since pioneer settlement.

Improvement in Stock Quality

The survey farmers were asked to estimate the likely increase in production which would follow replacement of their present cattle with a "top notch" herd. Eighteen farmers did not express an opinion. The remaining 56 made the following estimates—

No improvement	29 farmers
10 per cent or less	9 farmers
20-25 per cent	11 farmers
Over 25 per cent	7 farmers

[13] Questions designed to gauge the potential for irrigation on the survey farms indicated that on most farms there was no suitable water supply available.

Agronomists' impressions of the stock on survey farms were not as favourable as the owners' opinions, but generally it was apparent that an improvement in stock quality could not be expected to alter greatly the generally uneconomic status of operations. Speaking broadly feed supplies rather than stock quality appeared to be limiting production on most farms although production per cow was only 123 lb. (compared with 150 lb. for the 1953 survey farmers). Twenty-two survey farmers volunteered the opinion that improvement in the amount and quality of the feed supply was the main requirement for increased production.

In none of the 18 cases where farmers estimated that a 20 per cent or greater improvement in production would result from the acquisition of a "top notch" herd would the total production following this hypothetical change have exceeded 7,000 lb. butter. The absolute estimated increases ranged from 430 lb. to 2,500 lb. per annum and averaged 1,250 lb.

A permanent improvement in stock quality is not always possible—or economic—as many of these small farmers do not rear their own replacements and the cost of purchasing better cattle may be prohibitive.

A General Assessment

In Table IX suggested methods of raising farm income are given for all survey farms. These methods require little explanation. Of all 74 survey farms 10 were thought to be capable of transformation into economic units by means of increased investment.

It will be appreciated that operators whose income are as low as those of the survey group and whose present operations show little or no return to capital are badly situated to borrow or amass capital. Capital accumulation is generally only possible in the case of a physically fit operator by spartan living or by undertaking work off the farm.

Change of enterprise, either a complete switch to cane or banana production or the introduction of sideline production of vegetables, bananas or general crops is the indicated measure for 12 farms. The change to cane or cropping appears logical for certain high value farms on the Clarence and there is a trend in that direction at present. The relative profitability of cane growing has increased considerably in recent years.

Banana and vegetable growing as a sideline has been suggested for four farms on the better soil types in localities well suited to such sideline production where the present level of butter production is between 5,000 lb. and 5,500 lb. commercial butter per annum. However, generally speaking banana growing does not combine readily with dairy farming as a companion enterprise, particularly so if the bananas are located far from the dairy work centre.

Amalgamation to form larger dairy or grazing properties is the suggested method of increasing income on 35 properties at present classified as too small or situated on unsuitable or flood-affected land. There is some slight evidence that such amalgamations are proceeding but only one case was included in the survey group. In this instance the money for increased investment was being acquired by growing vegetables as a substantial enterprise.

The situation of these properties is such that in some cases they may be amalgamated with adjoining farms while others may require sub-division and the merging of parts of the farm with two or more adjoining properties.

Naturally the disappearance of these small farms—many sub-divided in brief periods of optimism and high prices—will be slow if left to be undertaken by the present agencies. The observed deterioration of building yards and other capital assets will no doubt ultimately assist such amalgamations to be effected.

The aggregate carrying capacity of the 20 farms requiring amalgamation to form larger dairy farms would be sufficient to allow the formation of about eight units of the size assumed to be adequate for economic operations. The 15 farms suggested for amalgamation into grazing properties are about 20 per cent of the size considered economic for grazing in the district.

No method of increasing incomes to a profitable level could be suggested for nine of the farms. Generally these properties were in the areas last alienated, again in periods of optimism and temporary prosperity in the dairy industry. Of these four were so steep and liable to be overrun with weeds and regrowth or on such poor land that fairly obviously they should never have been cleared. On the remaining five the soil was predominantly of reasonable fertility but the area was too small and there was no adjacent land suitable for amalgamation.

TABLE IX

Methods of Raising Farm Incomes on 74 Survey Farms[14]

Method	Number of Farms
Amalgamation (Dairying)	20
Amalgamation (Beef Cattle)	15
Increased Investment	10
No Method of Raising Income	9
Change Enterprises—	
To Cane Growing	6
To General Cropping	1
To Banana Growing	1
Undertake Sideline Production of—	
Vegetables	2
Bananas	2
Better Management	4
Younger Operator	2
Security of Tenure	2

7. FARMERS' PLANS AND INTENTIONS

In one section of the interview the survey farmers were asked the following four questions—

(i) Have you any long range plans which would raise your farm income?

[14] A comparison between Tables VII and IX—*i.e.*, a reconciliation of the main reason for low production and "methods of raising farm incomes" is given in a table published in Appendix II, which shows the relation between these two classifications.

(ii) How long do you think it will take?

(iii) Have you done anything towards this development so far (specify)?

(iv) If not, why not?

On the basis of the replies to these questions two groups of farmers can be distinguished; first 12 farmers who were trying seriously to develop their farms and who had already taken some steps in this direction.[15] Second, the remaining 62 farmers where there was no evidence of any determined attempt at farm development.

A further examination of this latter group may be of interest.

Ten of the farmers had found more scope for increasing their income by obtaining off-farm work. In four cases the owner had obtained permanent off-farm work. In these situations the owner usually helped with the milking of the cows in the morning and the general farm work at week-ends but mostly daily chores were left to his wife and other family members. In six cases the owner obtained regular seasonal off-farm work for three to eight months a year. One farmer indicated that he intended to take up off-farm work in the near future. The off-farm work done by the survey farmers was cane cutting (2 farmers), unskilled work on the railways (2) and at saw mills, sugar mills and slaughter yards (one each). One farmer was employed in a skilled position in a local factory and the other two farmers owned a trucking and a blacksmith business respectively.[16]

Another group of 26 survey farmers who had no plans for development can be distinguished. These were farmers for whom personal factors such as sickness and age militated against long-term farm development plans. Twelve of the survey farmers said that they were "too old" to have any developmental plans. (This includes four farmers between 58 and 65 years). None of the female farm operators had any definite developmental plans. Typical comments were: "marking time until kids grow up" and "either my son will take over or we will sell out". Similarly only one of the seven sick operators had any firm intentions to develop the property.

Of the remaining 25 survey farmers, three mentioned that they were definitely trying to sell their farms and another seven stated that they were discouraged from long-term plans by floods which had "beaten them every time" in the last ten years.

Summarising the farmers' plans we can divide the survey farmers into four groups:

(i) Approximately one-third of the survey farmers were aged or infirm and therefore had no long-term plans;

[15] In six cases substantial improvements in earnings from the farm should be possible; in the other six cases farm income cannot be expected to increase by more than 20 per cent.

[16] In Table VII the main reason given for low production for the part-time farmers were as follows "farm too small" (5)—"land unsuitable" (3)—"lack of finance" (1)—and "bad management" (1).

(ii) One in every six survey farmers derived more than one-third of their income from non-farm work; none of these farmers had any firm intentions of developing their farms.

(iii) One in every six farmers had definite intentions of developing their farms and had in most cases taken some steps in this direction.

(iv) The remaining third of the survey farmers had no firm developmental plans; a third of this group (*i.e.*, 10 per cent of all survey farmers) stated that they had been too discouraged by repeated floods.

8. CONCLUSION

In this study an attempt has been made to examine in as much detail as possible the technical and economic characteristics of small farms and what would be needed to make the operators more efficient producers. While our results apply only to one—albeit very important—butter-producing region in this State, it is believed that the situation in neighbouring districts in Queensland may not be very different from that described here.

The picture which emerges from the survey is a typical one of a small-scale, high-cost, section of an agricultural industry. It seems unlikely that the prices of dairy products will rise sufficiently—relative to costs—to make economic producers of most of the survey farmers. Current research in the region and similar climatic areas offers no immediate prospect of spectacular advances in agronomic knowledge. Even assuming some very great advance in technical knowledge the application of such an advance would be equally profitable on larger farms and could place the present small-scale farmers once more in the position of uneconomic producers. Again it is very likely that advances in technical knowledge would require the use of farm machinery which the majority of the survey farms are far too small to use economically.

An advance in technical knowledge may affect the classification of land as suitable for dairying or other purposes but will not remove the necessity for amalgamation of many of the survey farms. The elimination of high-cost producers by means of amalgamation will require encouragement or sponsorship by official agencies. Otherwise this process will be lengthy, painful and incomplete.

Few of the survey farmers are in a position to command, or utilise, credit in their present enterprise, even if supplied under the most favourable terms. It appears to us that one desirable feature in alleviating hardship in this section of the industry would be the provision of credit to small farmers able to increase the size of their holdings by the purchase or long-term lease of adjacent land The scope for investment on small farms in the area is at present not very great, but on some farms supervised investment programmes on the lines of the U.S. Farmers' Home Administration could lead to spectacular results.

However, in some cases the small high-cost farm probably represents the best use of the resources available to it. The alternative would be a greater drain on public funds for social services—without leading to any marked improvement in land use.

APPENDIX I

Sampling Method

The purpose of the survey was to contact a random sample of small dairy farmers in the Tweed, Richmond and Clarence valleys (including the shires of Byron, Copmanhurst, Gundarimba, Harwood, Kyogle, Nymboida, Orara, Terania, Tintenbar, Tomki, Tweed and Woodburn). According to the New South Wales Government Statistician, these shires contained 5,748 registered dairy farmers on March 31, 1954, 5,691 on March 31, 1955, and 5,659 on March 31, 1956.

However, to draw a list of small dairy farms (in the sense of low producers) it was necessary to get lists of suppliers from all the dairy factories in the area. The number of suppliers to the dairy factories in this area was 6,041 in 1954, 6,123 in 1955, and 5,919 in 1956. The discrepancy between the Statistician's figures and the number of suppliers to factories arises because (a) a small number of suppliers to factories on the northern fringe of New South Wales are situated in Queensland and (b) some farmers supplied two factories at the same time or within a 12-month period.

The sample drawn was a 10 per cent random sample from all suppliers delivering less than 5,500 lb. of butter in 1954-55 to any factory in the area (with the exception of one[17]). The figure of 5,500 lb. was used because it was desired to obtain a sample which corresponded as closely as possible to the group of sample farms in the 1953 Dairy Cost of Production Survey which had—during the three-year period from the year ended June 30, 1953—produced 5,000 lb. of butter or less. The 1953 dairy survey had shown that the vast majority of high-cost producers were to be found among this group of farms. For instance, of the 231 New South Wales farms included in the 1953 survey, 57 produced less than 5,000 lb. of commercial butter; of these, 38 showed a negative rate of return on capital and only three obtained a return on capital exceeding 5 per cent.

In view of the nature of records kept by most dairy companies, it was impractical to obtain a list of suppliers who had, over three years, averaged less than a certain quantity of butter. It was necessary to base the sample on production figures for a single year. During 1955-56 many dairy cows in the area were affected by "Three Day" sickness, which it was believed could have had a substantial differential effect on the production on different farms. It was therefore decided to base the sample on the production of the year 1954-55. During 1954-55 average butter production per farm in the area considered was 10 per cent higher than for the three-year average 1950-51 to 1952-53. It was therefore decided to make the criterion of production for inclusion in the sample 5,500 lb. of butter.

The sample is therefore based on the universe of all farmers supplying the factories in this area (with one exception mentioned above) who produced 5,500 lb. of butter or less during 1954-55. The total number of suppliers to factories falling into this category was 1,502, or 24.9 per cent of all suppliers to these factories. The 10 per cent sample contained, therefore, 150 farms.

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[17] The exception is the Norco factory at Bonalbo, which processes cream from less than 100 suppliers—*i.e.*, probably 25 "low producers". As this area is rather inaccessible, it was decided to exclude farms supplying this factory from the sample.

Of these 150 suppliers 24 were found to have a production exceeding 5,500 lb. These were farmers falling into one of the following categories:—

(1) They supplied two factories at the same time and thus were included among suppliers of less than 5,500 lb.; (2) they had switched from one factory to another during 1954-55; (3) they were supplying the bulk of their milk for local consumption, but had small quantities (*i.e.*, falling short of 5,500 lb. in 1954-55) available for manufacturing purposes; (4) they produced less than 5,500 lb. in 1954-55, but averaged more than 5,500 lb. for the three-year period 1953-54 to 1955-56. An additional four suppliers were ineligible, being situated in Queensland.

Of a total of 122 farmers left in the sample a further 48 had to be rejected for a variety of reasons which are given in Table X. Five people could not be reached by the interviewers; three of these were known to be part-time dairy farmers with a job in a neighbouring town who could not be contacted at their places of work. The number of farmers who had either moved or given up dairying was 12 per cent—over a period of 18 months (the average time between the date of the interview and the period to which the factory figures apply). This percentage is very similar to that obtained for the Richmond-Tweed region in the 1953 Cost of Production Survey, where 22 per cent of the farmers had to be rejected because they had not been engaged in dairy farming on the one farm for a period of three years.

Farmers who derived more than half of their farm income from other forms of rural production were also excluded. Of these, approximately half were cane farmers for whom dairying was a sideline—often of little financial importance.

TABLE X

Reasons for Rejection of Sample Farms

Reason for Rejection	Number of Farms	
1. Unable to Interview because of—		
(*a*) Sickness	3	
(*b*) Not at Home on Third Visit	5	
(*c*) Inaccessible	1	
(*d*) Refusal	1	
	—	10
2. Left Farm, District, or Had Given up Dairying ...		15
3. Main Farm Income Derived from—		
(*a*) Sugar-cane	8	
(*b*) Bananas	3	
(*c*) Beef	3	
(*d*) Vegetables and Peanuts	3	
	—	17
4. Other		6
5. Number of Farmers Interviewed		74
Grand Total	...	122

APPENDIX II

Reasons for Low Production Related to Methods of Raising Farm Income

TABLE XI

Reasons for Low Production and Suggested Methods of Raising Farm Incomes on 74 Survey Farms

Reasons for Low Production	Suggested Methods of Raising Farm Incomes										
	Amalgamation—Dairying	Amalgamation—Beef	Increased Investment	No Method of Raising Income	Better Management	Younger Operator	More Secure Tenure	Change to: Bananas	Change to: Cane	Change to: Vegetables	Total
Too Small	17	3	...	5	...	...	...	2	2	3	32
Land Unsuitable ...	1*	12	...	4	...	...	...	1	1	...	19
Lack of Finance ...	...	...	6	...	...	...	...	...	...	...	6
Floods	2	...	2	...	...	...	...	2	...	...	6
Bad Management ...	...	...	...	...	4	...	...	...	1	...	5
Age	...	...	...	...	...	2	...	...	...	...	2
Tenure	...	...	...	...	...	...	2	...	...	...	2
Female Labour ...	...	...	1	...	...	...	...	...	...	...	1
Institutional	...	...	1	...	...	...	...	...	...	...	1
Total	20	15	10	9	4	2	2	5	4	3	74

* A property comprising a small area of flood liable flats and a relatively large area of poor high land. It might serve as a dry run for a dairy or have an area of the good flats adjoining added to it, but as at present constituted it is "unsuitable" rather than "too small" or "flood affected".