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FURTHER ASPECTS OF DAIRY FARMING ON THE LOWER NORTH COAST.

by

J. RUTHERFORD,

Assistant Economics Research Officer.

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1. INTRODUCTION.

A land-use survey was conducted by the Division of Marketing and Agricultural Economics during 1951 on sixty-five dairy farms on the Lower North Coast. An account of land-use practices, farm production and farm tenure on the survey farms was published in the previous issue of this journal.¹

The purposes of the present article are:—

- (a) To describe some additional features of farms, including the composition of farm families and certain characteristics of housing.
- (b) To present the results of a statistical analysis of the relationships between various characteristics of farms, including those aspects of land-use described in the article published in the previous issue.

¹ See J. Rutherford, "Some Aspects of Land Utilization on Dairy Farms on the Lower North Coast," *Review of Marketing and Agricultural Economics*, Vol. 19, No. 4 (December, 1951).

As previously described, the survey area covered all or part of four police patrol districts in the Manning River area, including country both north and south of the river. For purposes of discussion, the survey area was subdivided into the following four zones corresponding to parts of the four patrols.

Taree: Mostly river-flat country along the Lower Manning River.

Wingham: Portions of the hilly country in the upper drainage area of the Manning River.

Nabiac: Mostly ridge and creek country to the south of the main river, including the Wollamba, Wang Wauk and Gooloongook areas.

Comboyne: The Comboyne Plateau.

Of the sixty-five farms surveyed, the following number of farms were located in each of the above zones: Taree, 22; Wingham, 14, Nabiac, 13; Comboyne, 16.

The sample of farms surveyed constituted 6.4 per cent. of the dairy farms registered in the four police patrols in 1950.

The survey included a brief appraisal of social conditions on farms as it was considered that some knowledge of the farm family composition and conditions of housing, for example, were essential to the full appreciation of the character of farming activities.

The structure of the farm family seemed to play an important role in moulding the character of management on survey properties. In many cases farmers relied heavily on their children of both sexes, and of all but the youngest age groups, for assistance in their farming operations. Farmers' wives also formed a valuable element of the labour force on many farms and often acted as business partner to their husbands. The size and composition of the farm family, by affecting the variety and intensity of land-use practices adopted, affected to a large extent the level of incomes and standards of living.

In previous years, most survey farmers, in common with other dairy farmers throughout the State, were able to rely on full-time assistance from most members of their families. In recent years, especially since 1939, there has been a serious decline in this—the major—element of the rural labour force in dairying areas. An increasing number of the younger members of families have been attracted away from the home farms to take up work of a non-farming character in local forestry services, local towns and more distant metropolitan centres. The majority of survey farms have been affected by these changes to a varying extent and the consequent breakdown in the family structure has affected the character of farming activities. In particular, it has placed an increasing burden on fewer and older workers. The survey suggests that these changes might have had a significant adverse effect on the efficiency of land-use practices and levels of output. This conclusion was reached after a study of comparisons between groups of farms which had been affected to different degrees by losses of labour supplies.

An important factor which has contributed to the "drift" of younger members of families to non-farming activities has been the disparity in working and living conditions which developed between rural and urban

areas. In the earlier pioneering stage of agricultural development, there was probably not the same disparity as has existed during the last two decades. The chief difficulties of country life in coastal dairying and other rural areas in the pioneering phase sprang largely from problems of isolation and difficulties of regular transport of supplies to and from the farm. The same difficulties, however, encouraged a greater degree of consistent living than has been possible with the development of commercialized monocultural farming. Rural peoples have come to rely more heavily on local and distant urban centres for their daily needs and have thus felt to a greater extent any inadequacies of transport and communication.

Under the pressure of expanding populations, residents of urban areas, such as the larger country towns of Taree and Wingham, have progressed more rapidly in the acquisition of improved living standards than have most farm dwellers, particularly in the more isolated areas. Developments of the last two decades, which have tended to favour the town dweller, have included such factors as the introduction of reticulated water and electricity supplies, mechanical refrigeration, mechanized transport, and many other improvements to the social and economic way of life.

Notwithstanding the gap which inevitably arose between towns and rural areas in respect of living standards, dairy farms throughout the survey area, in common with areas throughout the coast generally, have been sharing to an increasing extent in scientific developments. The extension of the telephone, commercial bus services, and private motorized transport to many farming areas has meant that farm peoples have been availing themselves more fully, and more regularly, of the social and economic facilities which have sprung up in the major local towns. These facilities include banking, educational and recreational services. Farmers have greatly benefited from the development of centralized co-operative butter factories with strong financial resources and allied co-operative stores which have given them an assured market for, and regular transport of, their farm products and a regular delivery of daily farm requirements.

In a similar fashion, living conditions on farms have developed considerably, particularly on those managed by the more junior group of operators, including those who have had some experience working in town and city areas. Many of the properties operated by the older farmers, who have spent all their years on the land, have not seen the same development.

These changes are still in a transition stage. Although some of the rural dwellings encountered during the survey would compare favourably with those of the average resident of the larger country towns, this appeared to be the exception rather than the rule. Some areas had not shared to the same extent in regional improvements such as electricity reticulation as have other areas. However, the main differences between farm dwellings as regards living standards seemed to be related to differences in the attitudes of the particular farmer and the members of his family. It was obvious that some survey farmers placed greater importance on the introduction of certain kinds of farm improvements than on the acquisition of household amenities considered essential to adequate living in town areas. Similarly, some families, although they possessed amenities such as cars and radio sets, lived in dwellings which lacked proper household drainage and bathing facilities.

It is proposed to present in this article some details of social conditions on the farms studied. As this aspect of the survey was merely an adjunct to the main survey of land-use practices, the treatment of social factors is necessarily limited in its scope.

2. FARM HOUSEHOLDS AND FAMILIES.

Composition of Households.

On the sixty-five farms surveyed there were sixty-seven separate households². Information on the size and composition of sixty-five households was obtained, relating to sixty-three separate farms.

Households on survey farms were of three types as follows:—

<i>Types of Household—</i>	<i>Number of Households.</i>	<i>Number of Households as a Percentage of Total. per cent.</i>
<i>Non-family.</i>		
One or more unmarried male operators, with or without employees	3	4.62
<i>Families.</i>		
Male farmer, his family, with or without relatives and employees	60	92.31
Widow and family	2	3.07
	65	100.00

It will be seen that 95 per cent. of households consisted of families or broken families, whilst only 5 per cent. were made up of one or more male operators without families.

Nine of the households contained relatives of the operator, whilst farm employees provided with full board and lodgings resided in three of the households.

Family Size and Composition.

The following is a summary of the structure of families on survey farms³.

Size of Families.

Families varied in size and composition. The range of size of the families is summarized in Table I. The average size, when reference was made only to those elements who resided and worked on the farm, was three persons, i.e., farmer, wife and one child. When reference was made to all members of the family, whether resident and/or working on the farm or otherwise, the average size was five persons⁴.

² In this article the term "household" refers to all persons related or not related to one another residing on the farm, including employees, boarders and relatives, who at the time of the survey were receiving food and shelter from the operator.

³ The term "family" refers to all members of farm households who were in the relationship of man and wife, father and children, mother and children, or father, mother and children.

⁴ This includes members of two older families who were deceased at the time of the survey.

TABLE I.
Size of Families of Sixty-two Survey Farm Operators.

1. Total Family Present on Farm or Left Farm.			2. Members of Family Resident and Working on the Farm.	
Number of Persons.	Number of Families.	Number of Families as a Percentage of Total.	Number of Families.	Number of Families as a Percentage of Total.
		per cent.		per cent.
2	4	6.45	10	16.13
3	15	24.19	21	33.87
4	5	8.06	10	16.13
5	13	20.97	8	12.90
6	11	17.74	7	11.29
7	5	8.06	3	4.84
8	1	1.62	1	1.61
9 or more	8	12.91	2	3.23
Total ...	62	100.00	62	100.00

TABLE II.
Types of Families Resident on Survey Farms.

Type of Farm Family.	Number of Families.	Number of Families as a Percentage of Total.
		per cent.
Farmer and wife with no children	11	17.74
Farmer, wife and children of school age and/or pre-school age	24	38.71
Farmer, wife and children who have left school and those of school age and/or pre-school age ...	10	16.13
Farmer, wife and children who have left school ...	15	24.19
Widow and children who have left school	2	3.23
Total	62	100.00

Ninety-five per cent. of the married operators had had some children, the average number being three. Thirty-nine per cent. of farmers had had less than three children, whilst 46 per cent. had had more than three.

Family Composition.

The composition of families with respect to both sons and daughters is summarized in Table III. Examination of this table reveals the following factors in respect of farmers' sons and daughters.

Sons.

A total of fifty-one families had sons (i.e., 82 per cent. of all families). Twenty-nine had sons who had left school, while the remainder only had sons who were still at school or of pre-school age.

Most of the families with sons who had left school had been depleted by the departure of some or all of these sons from the farm to take up work either on another farm or in local and distant centres. Three of the families which have been reduced in this fashion still had sons at school or of pre-school age, some of whom may not eventually leave the home farm.

TABLE III.
Changes in Composition of Farm Families.

1. Sons.	Number of Families.	Proportion of Families with Sons.
		per cent.
Families with all sons left the farm*	7	13.73
Families with dependent sons at school which have "lost" * all sons who have left school	3	5.88
Families of which all sons who have left school have remained on the farm	5	9.80
Families of which only a portion of the sons who have left school have left the farm	14	27.45
Families with sons only of school age or pre-school age	22	43.14
Families with sons	51	100.00

2. Daughters.	Number of Families.	Proportion of Families with Daughters.
		per cent.
Families with all daughters left the farm*	17	37.78
Families with dependent daughters at school which have "lost" * all daughters who have left school	4	8.89
Families of which all daughters who have left school have remained on the farm	2	4.44
Families of which only portion of the daughters who have left school have left the farm	5	11.11
Families with daughters only of school-age or pre-school age	17	37.78
Families with daughters	45	100.00

* Sons or daughters who do not work or reside on the farm.

Daughters.

A total of forty-five families had daughters, including twenty-eight who had daughters who had left school; the rest possessed daughters of only school or pre-school age.

Of the families with daughters who had left school, twenty-six (58 per cent.) had been depleted by the departure of some or all of their daughters from the farm to take up work elsewhere. However, of the six families who had "lost" all daughters who had left school, four still had daughters of school or pre-school age.

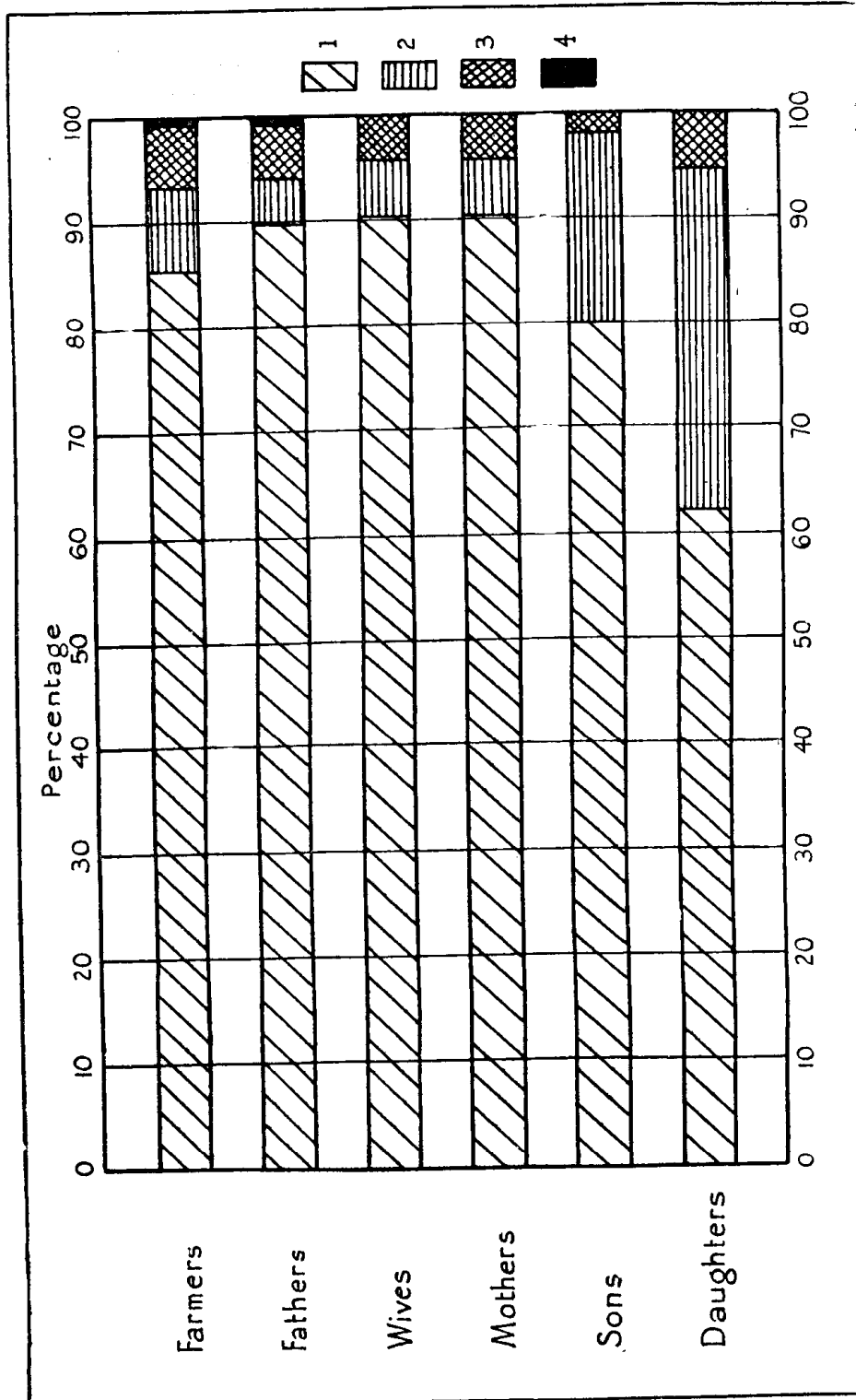


Fig. 1.—Comparison of schooling received by farmers and the members of farm families for sixty-six families.

1. Primary standard
2. Lower-secondary standard.
3. Higher-secondary standard.
4. Tertiary standard.

TABLE IV.
Age of Sixty-two Survey Farm Operators.

Age Group.	Number of Operators.	Number of Operators as a Percentage of Total.
20-29	8	per cent. 12.90
30-39	9	14.52
40-49	21	33.87
50-59	11	17.74
60-69	12	19.35
70-79	1	1.62
Total ...	62	100.00

Age of Farm Operators.

The average age of the operators of sixty-two farms was forty-five years. Table IV indicates the range of ages for all these farmers. It will be seen that the bulk of the farmers (52 per cent.) were between forty and sixty years of age; 27 per cent. were below forty years of age; whilst 21 per cent. were sixty years or more.

Education.

Each of the farmers interviewed during the survey provided information on the years of formal schooling received by him and the members of his family, including those still at school at the time of the survey. This data was used in the analysis of related factors, discussed in the latter part of this article.

Whilst years of schooling do not necessarily provide a true measure of the level of education, it nevertheless provides a useful basis for comparing formal educational standards with other factors.

TABLE V.
*Schooling of Farm Operators and Members of Their Families.**

Person.	Standard Attained Before Completing Schooling.								Total.	
	Primary.		Lower Secondary.		Higher Secondary.		Tertiary.			
Farmers ...	56	per cent. 86.15	5	per cent. 7.69	3	per cent. 4.62	1	per cent. 1.54	65	per cent. 100.00
Fathers ...	53	89.84	2	3.39	3	5.08	1	1.69	59	100.00
Wives ...	56	91.80	3	4.92	2	3.28	...	...	61	100.00
Mothers ...	54	91.53	3	5.09	2	3.38	...	...	59	100.00
Sons ...	45	80.36	9	16.07	2	3.57	...	...	56	100.00
(a) Working on the farm ...	22	84.62	2	7.69	2	7.69	...	...	26	100.00
(b) Work off the farm ...	23	76.67	7	23.33	...	...	...	...	30	100.00
Daughters ...	32	60.38	18	33.96	3	5.66	...	...	53	100.00
(a) Working on the farm ...	5	38.46	7	53.85	1	7.69	...	...	13	100.00
(b) Working off the farm ...	27	67.50	11	27.50	2	5.00	...	...	40	100.00

*All members of farm families whether resident and/or working on the survey farms or otherwise.

Table V summarizes the standards of formal schooling attained by farmers and members of their families who have completed their formal education. Reference is made to all members of the farmer's family for each survey farm, whether resident and/or working on the farm or otherwise. Similar information is demonstrated in graphical form by Fig. I.

It will be seen that the majority of farmers (86 per cent.) received only primary education. Of the nine farmers who proceeded beyond primary standard, five received secondary education at a lower level, i.e., for three or less stages; three farmers attended secondary school to higher level, i.e., to the fourth or fifth stages; whilst only one farmer received university education.

There was little difference between farmers and their wives in the amount of formal schooling received. Whereas about 10 per cent. of husbands attended a secondary school, about 8 per cent. of farmers' wives proceeded beyond the primary standard. Only two wives obtained the **Leaving Certificate**; one of these subsequently obtained her diploma in nursing.

Interesting comparisons relate to the amount of schooling of fathers with sons and mothers with daughters who have left school. Although not of significant proportions, it will be seen that, on the whole, both sons and daughters had received more formal schooling than the parent of the same sex. Also, of the children still at school, analysis shows that two boys and three girls were at the lower secondary level and one boy and one girl were at the higher secondary level.

The tendency for children to have received more formal schooling than their parents may indicate an increasing awareness on behalf of farmers and their wives of the need for secondary education for their children. It could be the result of one or both of the following two factors:

(a) Assuming normal rate of progress, the raising of the minimum school-leaving age, during recent years in New South Wales, has meant that all children will normally obtain schooling beyond the primary level, either at their former primary school in super-primary classes or at secondary schools in the key centres.

(b) The development of motorized transport facilities, such as daily commercial bus services, in rural areas during recent years has meant that, compared with their parents, most children have a greater chance of making the daily trip from farm to secondary school centres.

In the case of sons, it will be noted that a higher proportion of those who had received secondary education had left the farm than had remained on the farm. Also for sons, the proportion who had left the farm was greater for those who have received secondary education than for those who have received only primary education. This might indicate that the receipt of higher education had accentuated the drift of sons from the home farm. However, there is insufficient data to suggest anything conclusive in this respect.

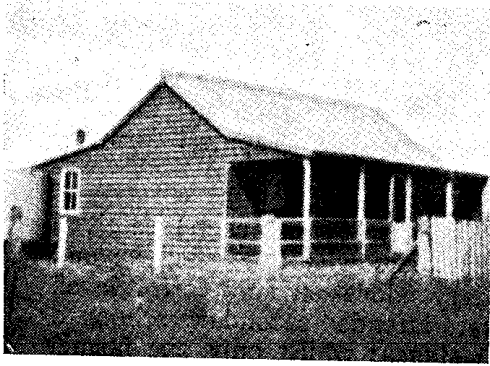


Fig. II.

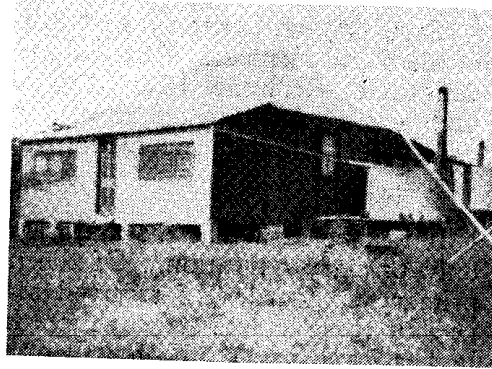


Fig. III.



Fig. IV.

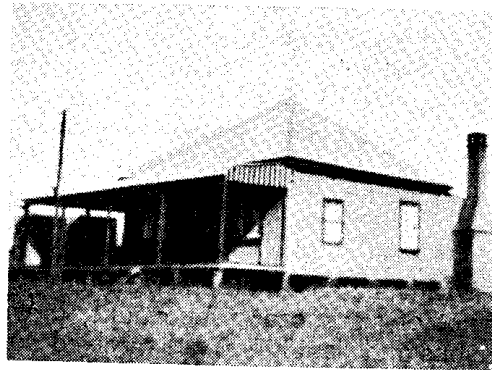


Fig. V.



Fig. VI.

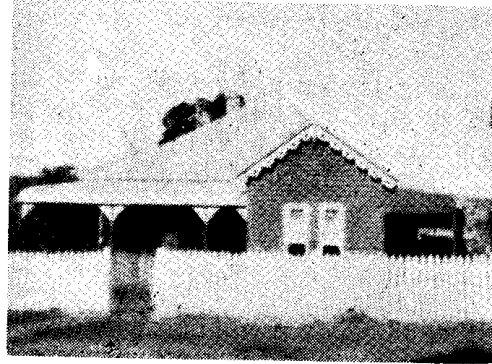


Fig. VII.

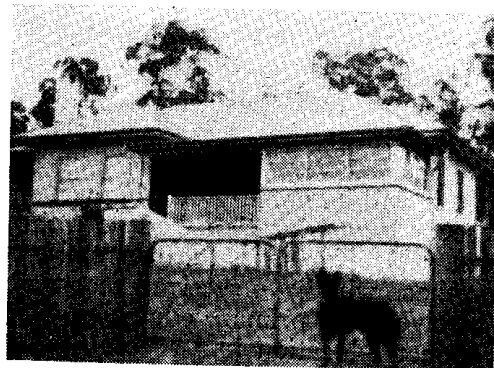


Fig. VIII.

Figs. II-VIII. Views of the various types of farm dwellings which are typical of the survey district.

The prints have been arranged in an order which summarizes the development from the more elementary type of house to the more sophisticated. Figs. II and III illustrate the simple type of structure which typifies the small class of dwelling. It consists of a central core of two rooms, often separated by a hallway. To this has been added verandahs at the front and the back. In some cases only the rear verandah has been closed in to provide additional rooms, whilst in other cases both verandahs have been enclosed.

Figs. IV and V represent an expansion of the former design, repeating the principle of the verandahs, but the central core consists of four rooms. In these and the former types of houses, the area formed by the rear verandah enclosure is often used as a kitchen and/or laundry area and is sometimes further subdivided into two separate rooms and a porch. The enclosed front verandah and the central rooms provide sleeping and living areas.

The type of dwelling illustrated by Fig. V is perhaps the most common design throughout the survey area. Unlike the former three types, verandahs are built around the whole central core and only a portion of the rear verandah has been enclosed to form a bathroom or a kitchen.

The types of dwellings shown in Figs. VI, VII and VIII are typical of the better-class rural dwelling and are little different from the style of home encountered in most country towns and suburban areas.

3. FARM HOUSING AND HOUSEHOLD EQUIPMENT.

Studies of housing conditions, whether in rural or urban areas, have varied considerably in their scope and content according to the basic aims of each survey. The object of the study of housing conditions on survey farms was to assess the adequacy of dwellings in certain respects with the view of obtaining a general measure of the standard of living of rural people, using housing conditions as a partial index.

Types of Houses.

Most dwellings on survey farms were constructed of timber, i.e., weatherboards or planks (vertical boards). Only 8 per cent. of dwellings were lined on the outside with materials other than wood, such as fibro asbestos or galvanized iron. One dwelling was constructed of rammed earth.

The majority of dwellings were lined with timber, although two were lined with fibro-asbestos and two with timber and fibrous plaster.

The preference for timber homes reflects the fact that, in coastal areas, hardwoods suitable for building purposes are readily available from local sources, whilst other building materials are not so readily available and are more costly.

All of the sixty-six houses studied had corrugated galvanized iron for roof covering. Galvanized iron is the most popular roofing material on country houses mainly because of its relatively low cost, ease of transport, and its suitability for roof catchments which provide the main source of domestic water supplies.

Only 52 per cent. of the dwellings were painted on the outside walls, including 15 per cent. on which paint coverings had greatly deteriorated.

Most dwellings had unpainted roofs, although 9 per cent. of the roofs had been painted with silver paint to act as a cooling agency.

The lack of painted exteriors to dwellings was confined mostly to farms operated by non-owners and to those operated by older farmers. Many of the more youthful group of farmers were obviously more aware of the material and aesthetic advantages of well painted exteriors to dwellings.

Houses were classified according to their state of repair based on outside appearance. The following basis of classification was arbitrarily employed:—

A. *Superior*.—Houses of comparatively recent construction, or those which had been maintained in sound condition, which were well painted and did not appear to need repair.

B. *Mediocre*.—Houses of fairly sound basic construction, which were unpainted or in need of repainting, and which were in need of minor repairs.

C. *Poor*.—Houses which had been neglected for a considerable period of time, and had suffered serious weathering and/or deterioration of structural alignments.

Of the sixty-six farm dwellings inspected, twenty-one were classified as “superior,” thirty-three as “mediocre,” and twelve as “poor.”

Many of the dwellings were of poor appearance by comparison with the majority of houses usually encountered in country towns. It is considered that several factors contributed to this difference:

- (i) Many houses were not painted on the outside, and being of timber construction, had suffered considerable weathering with the passage of time and had assumed a dirty grey appearance.
- (ii) Flower gardens, lawns, paths and boundary fences around building allotments, although features of most houses in town areas, were rarely encountered on survey farms.

However, relatively poor exteriors often masked superior inside conditions. For example, many dwellings classified as “mediocre” or “poor” in outside appearance, were found to be well cared for inside with well polished floors, preserved floor coverings and highly polished modern furniture.

TABLE VI.

*Number of Rooms per Dwelling on Survey Farms.**

Number of Rooms.	Number of Dwellings.	Number of Dwellings as a Percentage of Total.
4	8	per cent. 12.12
5	30	45.45
6	18	27.27
7	8	12.12
8	1	1.52
9	1	1.52
Total ...	66	100.00

*The term “room” refers to bedrooms, living rooms, dining rooms, and kitchens. It excludes bathrooms and laundries.

Rooms in Houses.

Rooms per Dwelling.

The average number of rooms per dwelling was five. Houses ranged in number of rooms from four to nine; the most frequently occurring size being five rooms.

Bedrooms.

Table VII indicates the number of dwellings with various numbers of bedrooms. The average number of bedrooms per dwelling was three. The greatest number of bedrooms in any dwelling was six, and the smallest number was two.

TABLE VII.

*Number of Bedrooms per Dwelling on Survey Farms.**

Number of Bedrooms.	Number of Dwellings.	Number of Dwellings as a Percentage of Total.
		per cent.
2	11	16.66
3	36	54.55
4	16	24.24
5	2	3.03
6	1	1.52
Total ...	66	100.00

*The term "bedroom" includes closed-in verandahs or sleepouts.

Occupants per Bedroom.

The number of persons per bedroom has been calculated as a measure of the degree of overcrowding in survey farm dwellings. It was not possible to collect data which would permit a detailed appraisal of this problem such as the age and sex of the persons using each bedroom.

A separate analysis has been made for persons ten years and over and for those under ten years of age. Table VIII summarizes the number of dwellings which occurred in the various classes of persons per bedroom.

It will be seen from the table that, if all occupants are counted as one unit, 52 per cent. of the dwellings had less than 1½ persons per bedroom. Only 21 per cent. had two or more persons per bedroom. The average number of persons per bedroom was 1.3.

If children under the age of ten years are counted as only half a unit, then the average number of persons per bedroom was 1.2.

Other Rooms.

The number of farm dwellings with rooms other than bedrooms are summarized in Table IX. Most dwellings (76 per cent.) possessed a separate room used solely for dining purposes or as a combined dining-living room. Fifty per cent. of the dwellings possessed a lounge room not used as a dining room. A room used solely as a kitchen or as a combined kitchen-dining room was found in all the dwellings.

TABLE VIII.

*Persons per Bedroom.**1. Counting Persons of any Age as One Unit.*

Equivalent Persons per Bedroom Ratio.	Number of Farm Dwellings.	Number of Farm Dwellings as a Percentage of Total.
Less than $\frac{1}{2}$	10	per cent. 15.38
1 and under $1\frac{1}{2}$	24	36.92
$1\frac{1}{2}$ and under 2	17	26.15
2 and under $2\frac{1}{2}$	9	13.85
$2\frac{1}{2}$ and under 3	2	3.08
3 and under $3\frac{1}{2}$	3	4.62
Total	65	100.00

2. Counting Those under Ten Years as One-half Unit.

Equivalent Persons per Bedroom Ratio.	Number of Farm Dwellings.	Number of Farm Dwellings as a Percentage of Total.
Less than $\frac{1}{2}$	16	per cent. 24.62
$\frac{1}{2}$ and under 1	28	43.08
1 and under $1\frac{1}{2}$	15	23.08
2 and under $2\frac{1}{2}$	5	7.69
$2\frac{1}{2}$ and under 3	1	1.53
3 and under $3\frac{1}{2}$ ... ..	.....	.....
Total	65	100.00

A room used principally as a laundry, but not as a bathroom, was found in only 53 per cent. of the dwellings, whilst 74 per cent. of the dwellings possessed a room used solely as a bathroom. A combined bathroom-laundry was found in about 15 per cent. of the dwellings. Many of the farm families laundered on verandas, out in the open, or in sheds used principally for other purposes.

Electricity.

The provision of electrical appliances in the home has played an important part in reducing the work load on farmers' wives and by this and other means has helped to raise the standard of living of rural peoples.

As indicated in an earlier context⁵, only parts of the survey area as yet were covered by regional electricity reticulation. In other areas, only the occasional farmer who had installed his own home generating plant was able to use electrical appliances in the home.

⁵ J. Rutherford, *op. cit.*, p. 216.

TABLE IX.
Rooms Other Than Bedrooms in Survey Farm Dwellings.

Type of Room.	Number of Dwellings.	Number of Dwellings as a Percentage of Total.
		per cent.
Dining room or combined dining-lounge room ...	50	75.8
Kitchen or combined kitchen-dining room ...	66	100.0
Lounge room	33	50.0
Laundry	35	53.0
Bathroom	49	74.2
Combined laundry and bathroom	10	15.2

Table X summarizes the number of dwellings supplied with electricity and the number with various electrical appliances.

Electricity supplies are available only to 50 per cent. of the dwellings. About 45 per cent. of farm houses actually used electricity including 8 per cent. which were lit by home generating plants.

A noteworthy feature was that the number of dwellings using electricity for purposes other than lighting was much smaller than the number with electricity connected. Items such as electric stoves (ranges), electric washing machines, electric bath heaters and electric room heaters were possessed by very few households. This is probably due to the fact that most farms have been connected to electricity only in recent years so that some time must necessarily elapse before old ways of living are replaced by such modern ones as electricity supplies would permit.

TABLE X.
Electricity and Electrical Equipment on Sixty-six Survey Farm Dwellings.

Type of Connections.	Number of Dwellings.	Proportion of all Dwellings.	Proportion of Dwellings with Electricity Connected.
		per cent.	per cent.
Electricity available	33	50.00	.....
Electricity connected	30	45.45	100.00
Electric iron	22	33.33	66.67
Electric stove (cooking)	8	12.12	26.67
Electric bath heater	3	4.54	10.00
Electric refrigerator	8	12.12	26.67
Electric washing machine	1	1.52	3.33
Electric sewing machine ... ..	...	.....	.....
Electric room warmer	5	7.58	16.67

Water and Drainage.

The numbers of dwellings with various types of water and drainage connections are summarized in Table XI. In about 91 per cent. of the dwellings, running water (from tanks) was connected to one or more interior points. Occupants of 9 per cent. of the houses had to carry water from outside for all domestic purposes.

Little more than three-fifths of the dwellings had running water connected to the kitchen and laundry; whilst about three-quarters of the bathrooms were supplied with running water. This was mainly supplied to baths as only 9 per cent. of the dwellings had a shower. Although about three-quarters of the dwellings had baths connected to both running water and some drainage, similar connections to kitchen sinks existed in less than two-fifths of farm houses.

Laundry facilities serviced by running water and drainage were found in little more than one-half of the dwellings. Only about one-quarter of the farm houses possessed bath heaters. In all the other houses, hot water for bathing purposes was carried from the kitchen, laundry, or an outside stove. One of the farm dwellings was equipped with a hot water service supplying running hot water to several points in the house.

Most houses possessed only simple drainage facilities, such as a short length of pipe from which waste water flowed over the ground immediately adjacent to the dwelling. From only one-quarter of the dwellings was waste water piped away by means of concrete drains for disposal at a distance or by subterranean drainage into cess-pits.

All but one of the survey farmers relied solely on water gained from roof catchments for all household needs. It is probable, therefore, that the possibility of recurrent shortages of water supplies is the main reason why many dwellings lacked a wide range of appliances connected to running water.

TABLE XI.

Household Water and Drainage Connections.

Types of Connections.	Number of Dwellings.	Number of Dwellings as a Percentage of Total.
		per cent.
Running water connected to inside of house ...	60	90.9
Running water in kitchen	41	65.1
Running water in bathroom	47	74.6
Running water in laundry	38	60.3
Kitchen sink connected to running water and drainage	24	38.1
Bath connected to running water and drainage ...	47	74.6
Shower	6	9.1
Hot water for bathing obtained from bath heater in bathroom	17	25.8
Tubs connected to running water and drainage ...	37	56.1
Copper connected to running water	36	54.5

Several reasons can be advanced to explain the general lack of adequate drainage facilities in farm dwellings. First, as most dwellings were built on well-drained sites, waste water did not tend to accumulate to a very great extent close to the houses with only simple drainage. As country homes are not located in close proximity to each other as are the dwellings of town areas there is not the same urgent necessity for the type of drainage usually implemented in towns. Second, waste water on farms was often allowed to drain over gardens adjacent to dwellings because of the scarcity of water supplies.

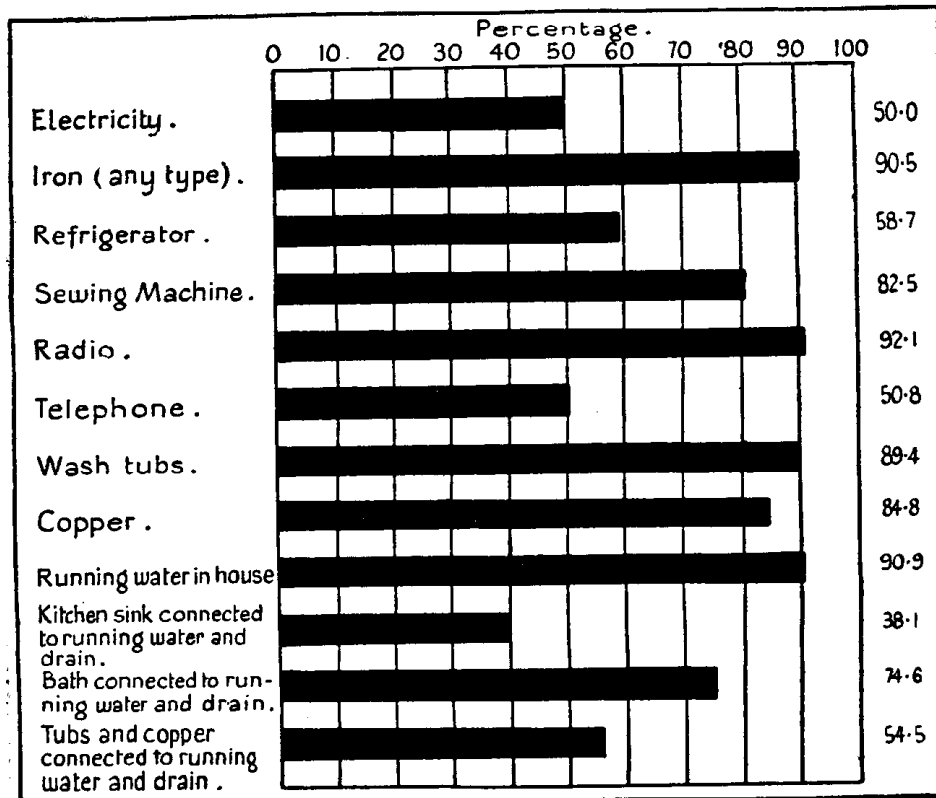


Fig. IX.—Proportion of farm dwellings with various amenities.

Other Household Equipment.

Further information on household equipment is given in Table XII

Less than three-fifths of the households possessed a refrigerator (kerosene or electric) despite the fact that an amenity such as this would assist greatly in reducing problems of regular delivery of perishable foodstuffs to the farm. One reason for the general lack of refrigerators is the fact that many farms were located in close proximity to the major towns and most farmers could receive regular deliveries (by milk lorry for example) of ice.

Although the possession of a telephone can do much to obviate difficulties of isolation, many farms lacked this facility. In most cases, however, this was due to the fact that the introduction of telephone services has occurred only in recent years in parts of the survey area and many portions of the district are not supplied with telephone connections, especially the more isolated areas away from the main valleys.

TABLE XII.
Other Household Equipment.

Type.	Number of Dwellings.	Number of Dwellings as a Percentage of Total.
		per cent.
Refrigerator	37	58.7
Self-heating iron (benzene or electric)	57	90.5
Sewing machine	52	82.5
Radio	58	92.1
Telephone	32	50.8
Washtubs	59	89.4
Copper	56	84.8
Washing machine	1	1.5

4. A STUDY OF RELATED FACTORS.

In order to determine whether or not certain characteristics of survey farms were related, some sections of the data have been the subject of statistical analysis. The results of this analysis are summarized in the Appendix.

The object of the study of related factors was to permit a more detailed interpretation of the data on land utilization and social characteristics to be made than mere description of each characteristic. One of the aims of the analysis, for example, was to find out if farmers with the largest permanent labour force adopted a greater variety of improved management practices, milked larger herds, and/or achieved a greater level of output per cow than those with the smallest labour force. Another aim was to see if levels of production were related to such factors as the size of the herd, the degree of farm mechanization and the tenure status of the farm operator. The analysis also tested for differences in farm management practices between farmers with different tenure status.

The analysis of related factors has made possible the enumeration of the more important factors affecting the main differences in farming activities between various groups of farms. Whilst the types of tests employed may indicate relationships or associations between sets of factors, the results of the tests, however significant, do not prove *causal* relationships. For example, a test has shown that there was a negative relationship between the size of herd and the production per cow. However suitable the latter factor may be as an index of efficiency in farm management, the results of such a test do not necessarily imply that smaller herds were managed more efficiently than larger herds. As indicated below, variations both in herd size and production per cow appear to have been affected wholly or partly by a number of factors including the "natural" suitability of the land for dairying, the size of the farm labour force, and the tenure status of the farm operator.

Success in dairy farming depends on the skilful and balanced management of the many resources—soil, pasture, and stock—which together constitute the farm as a production unit. Any particular circumstance

under which one man was found to be operating could normally be ascribed to a number of causes. To single out one factor as the sole determinant would, in most cases, be misleading.

The most efficient method, whereby the varying conditions on survey farms can be interpreted and casual factors suggested, is for a wide variety of conditions to be considered. An analysis of this kind could feasibly involve many tests, so that it is necessary to select for analysis only those factors which appear to be the most important for the purpose at hand.

In this article the following sections of the data gathered during the survey have been analysed in relation both to each other and to other factors: farm management practices, production levels, farm labour force, herd size, and farm tenure.

For those readers interested in the statistical basis of this analysis, the types of tests employed, the values of the coefficients derived from the tests and the various indices employed, are summarized in the Appendix.

Definition of Terms.

Various terms have been employed throughout the discussion of related factors, and the following is a brief summary of the sense in which each has been used:

Herd Size: The number of cows contributing to the annual output of milk/cream on each farm.

Size of Farm: The total area of those land units (contiguous or otherwise) used for the management of the dairy farm as an economic unit.

Annual Butter Production: The yearly output of commercial butter (equivalent) per farm based upon an average of the three-year period ended 31st March, 1951.

Production per Cow: The annual butter production from the farm divided by the total number of cows which contributed to it.

Total Farm Output: The value of gross cash income derived each year from all enterprises.

Farm Labour Force: The number of males permanently engaged full-time on farm work, including the operator responsible for both work and managerial decisions. *One-man* farms were those on which the farm labour force was provided only by the operator.

More-than-one-man farms were those on which the farm labour force consisted of more than the operator.

Farm Management Score: An index of the variety of farm management practices undertaken on each survey farm (see the Appendix).

Farm Mechanization Score: An index of the variety of farm machines and implements found on the farms (see the Appendix).

Living Standard Score: A measure of some aspects of the farmer's standard of living (see the Appendix).

Non-owner Operators: Tenant farmers and sharefarmers.

Significant: This refers to the nature of the relationships between factors where tested and is defined in its statistical sense in the Appendix.

Farm Management Practices.

An analysis was made of the relationship between agronomic practices in use on the farms and a number of other factors. In the first instance, farm management practices were examined as a composite whole by means of a *farm management* index which was used to provide a crude measure of the variety of improved practices being employed on each farm. A brief description of how the index was derived is provided in the Appendix.

It was considered necessary to examine management practices in the aggregate because successful dairy farming depends more on the adoption of a variety of improved practices than on the adoption of any particular practice alone.

It has been found that there was a significant association between farm management scores and each of the following factors:—

- (i) Size of the farm labour force.
- (ii) The degree of mechanization.
- (iii) Total annual butter production.
- (iv) Average annual production per cow.

Farm Labour Force.

Analysis shows that those farmers, who had full-time male assistance in working their farms, achieved a significantly higher farm management score than those who had only their own labour. This suggests that the supply of permanent labour was an important factor determining the extent to which the farmers were willing or capable of improving their production methods.

Farm Mechanization.

A test shows a significant relationship between farmers' farm management scores and their *farm mechanisation* score. The latter index was developed in a similar way to the former, the procedure being described in the Appendix. Most improved practices were employed by farmers who possessed the greatest variety of machines and implements of the type covered by this analysis (such as tractors, pasture renovators, fertilizer distributors, etc.).

The relationship between the farm management score and the farm mechanization score was significant for the forty-nine properties surveyed outside the Comboyne zone. No apparent relationship existed between these two factors for the sixteen farms visited in the Comboyne zone. Although most of the farmers in the latter area had been adopting a comparatively wide variety of improved management techniques and had attained relatively higher levels of output per cow, most of the farms concerned were "lowly" mechanized. In particular, equipment such as cars, trucks, mowers and stationary engines were comparatively rare.

Production.

Farmers who undertook the greater number of improved practices attained the highest level of output. The converse applied to those who undertook relatively few improved practices. This, of course, does not necessarily imply that the various practices were economic. However, it does give strength to the contention that, to achieve an increase in existing production, many farmers with low production would need to implement some or all of these practices.

Analysis has shown that there was a significant positive relationship between output per cow and each of the following factors: the amount of pasture improvement by sowing soft grasses, the annual topdressing of paspalum pastures, all-year-round supplementary feeding, renovation of paspalum pastures and the maintenance of a high intensity of property subdivision. On the other hand, analysis did not indicate any significant relationship between production per cow and the practice of mowing paspalum pastures or the conservation of fodder.

As indicated elsewhere, although Comboyne farmers attained high output per cow, few conserved fodder mainly for geographic reasons^o. If the twenty-two farms surveyed in the Comboyne zone are excluded, analysis shows that, for the remaining forty-nine farms, there was evidence of a positive relationship (approaching significance) between production per cow and the practice of fodder conservation.

The survey has demonstrated that the various improved management practices considered in this analysis tended to be characteristic of certain properties and non-characteristic of others. That is to say, rather than many farmers adopting a few of the practices, most practices were carried on in conjunction with one another on certain farms but were mostly absent on others. The former types of farms were achieving a significantly greater output per cow.

The analysis of production levels and management practices has certain limitations. It does not relate production levels to the more subtle differences in management techniques, such as the varied intensity and efficiency with which each practice was employed. To distinguish merely between those farmers who did, or did not, adopt a particular practice or set of practices, provides only a limited basis for describing important differences in the efficiency of husbandry. Because of the comprehensive scope of the survey, however, it was not possible to collect all the data necessary for such a refined analysis.

It is considered that due to the abovementioned limitations, more reliance can be placed on that portion of the analysis which treats farm management practices in the aggregate (the farm management index) than that dealing with individual practices.

Age of Farm Operator.

A test was made to see if younger operators were adopting significantly more improved farm practices than older farmers. Taking all farmers into account, a higher proportion of those below the age of forty years achieved a high farm management score than was the case with farmers forty years and over. The difference, however, was not statistically significant.

Inspection of the data suggests that the relationship between the farmer's age and farm management score had been influenced by variations in the farm labour force, since older operators appeared to possess a more favourable labour supply than younger operators and farm management scores were related significantly to variations in the labour force. Hence, many of the farmers over the age of forty years were probably assisted in attaining a high farm management score by the additional labour force available to them. To take account of this factor, farms operated by only one man have been analysed separately.

^o See J. Rutherford. *Op. cit.*, p. 213.

A test for simple correlation indicates a negative relationship (approaching significance) between the age of operators of one-man farms and farm management scores. It was not considered practicable to carry out a similar test for properties using the full-time labour of more than one man. The coefficient so derived would have little value since it would not indicate to what extent the relationship had been affected by variations in the labour force.

It can be concluded, however, that whilst the scale of operations tended to decrease with the increasing age of the operator on one-man farms, the influence of the life cycle was less marked where older operators were assisted by one or more youthful labourers. This reflects the importance of the farm family on production since family labour was a major element of the permanent farm labour force. It was not until most of the farmers with families had attained an age close to, or above, forty years that one or more of their sons had been able to take his place on the family farm as a permanent help. Particularly during periods of shortages of non-family labour, those farmers who had raised children who were willing to remain on the farm appeared to have attained not only a larger scale of operations but to have maintained such a scale over time to a greater extent than had their "less fortunate" counterparts.

Educational Standards.

There did not appear to be any relationship between the amount of formal schooling received by farmers and the variety of management practices they have adopted. When the educational qualifications of farmers' sons and daughters were taken into account, there was still no apparent relationship between management practices adopted and the educational standards of the "most educated" person remaining on the farm. As indicated previously, most members of farm families had attended only primary school.

Size of Herd.

Analysis shows that the size of the dairy herd was related to a number of factors apart from the tenure status of the farm operator⁷.

Production per Cow.

There was a negative association between herd size and production per cow which is indicated graphically in Fig. X. As demonstrated, this association was more marked for more-than-one-man farms (for which it was significant) than for one-man farms (for which it was not significant). It will also be observed that, whereas for both types of farms increases in herd size were associated with decreases in production per cow, properties with the larger labour force generally attained the higher level of output.

Farm Size.

Analysis shows that there was a positive correlation between herd size and the size of the farm. This is demonstrated graphically in Fig. XI. This type of correlation was only significant for the survey farms as a whole and for the twenty-two properties surveyed in the Taree zone. The correlation depicted in Fig. XI might have been influenced largely by the results achieved for the latter zone.

⁷See pp. 80-81 for discussion of tenure and herd size.

In analysing the relationship between herd size, farm size, and production per cow, it was necessary to differentiate between the various zones surveyed within the survey area as a whole. In the Wingham and Nubiac zones, for example, increases in farm size often reflected poorer country. Hence, for both areas, these increases were often accompanied by relatively smaller increases in herd size, whilst both of these conditions tended to be associated with declining levels of production per cow.

There did not appear to be any relationship between farm management practices (as measured by the farm management score) and either herd size or farm size in the Wingham and Nubiac zones. Therefore, for these areas, the relationship between herd size on the one hand, and both farm size and production per cow on the other, would appear to have been a reflection at least in part, of variations in the quality of the country and its suitability for dairying.

In contrast to the Wingham and Nubiac zones, the farms in the Taree zone showed a tendency towards a positive relationship between herd size and production per cow, and the larger farms tended to carry the larger herds. It might be inferred from this that the size of farm tended to limit the efficiency of farm management in the Taree zone. However, as with other zones, a test does not show any relationship between the farm management score and either property size or herd size.

The Taree zone was more homogeneous in physical characteristics than the other zones (with the possible exception of the Comboyne zone) so that increases in property size in that area meant greater areas of river-flat pasture available. This is possibly the reason why larger farms were associated with larger herds and higher output levels to a greater extent than smaller farms in the Taree zone. Since the farmers relied mostly on paspalum pastures for feed supplies, the larger properties had an advantage over the smaller ones.

This does not necessarily mean, however, that farm size in the Taree zone tended to limit the *potential* level to which farmers could increase production, since few of the operators had adopted a well balanced programme of improved management techniques designed to attain the maximum use of farm resources.

Labour Force.

The size of the herd was related positively to the size of the farm labour force. The average size of herds on properties operated by only one man was thirty-nine cows, whilst that on properties operated by a farmer with full-time male assistance was forty-six cows.

Age of Farmer.

Herd size was not related significantly to the age of the farmer, although there was some tendency for the two factors to be associated. Since herd size and tenure status were shown to be significantly related, the analysis of age in relation to herd size distinguished between farmers with different tenure status.

Although older farm operators did not appear to achieve a scale of operations significantly smaller than younger farm operators, it is necessary to allow for the role played by farmers' sons and other farm labourers in assisting some farmers to maintain such a scale.

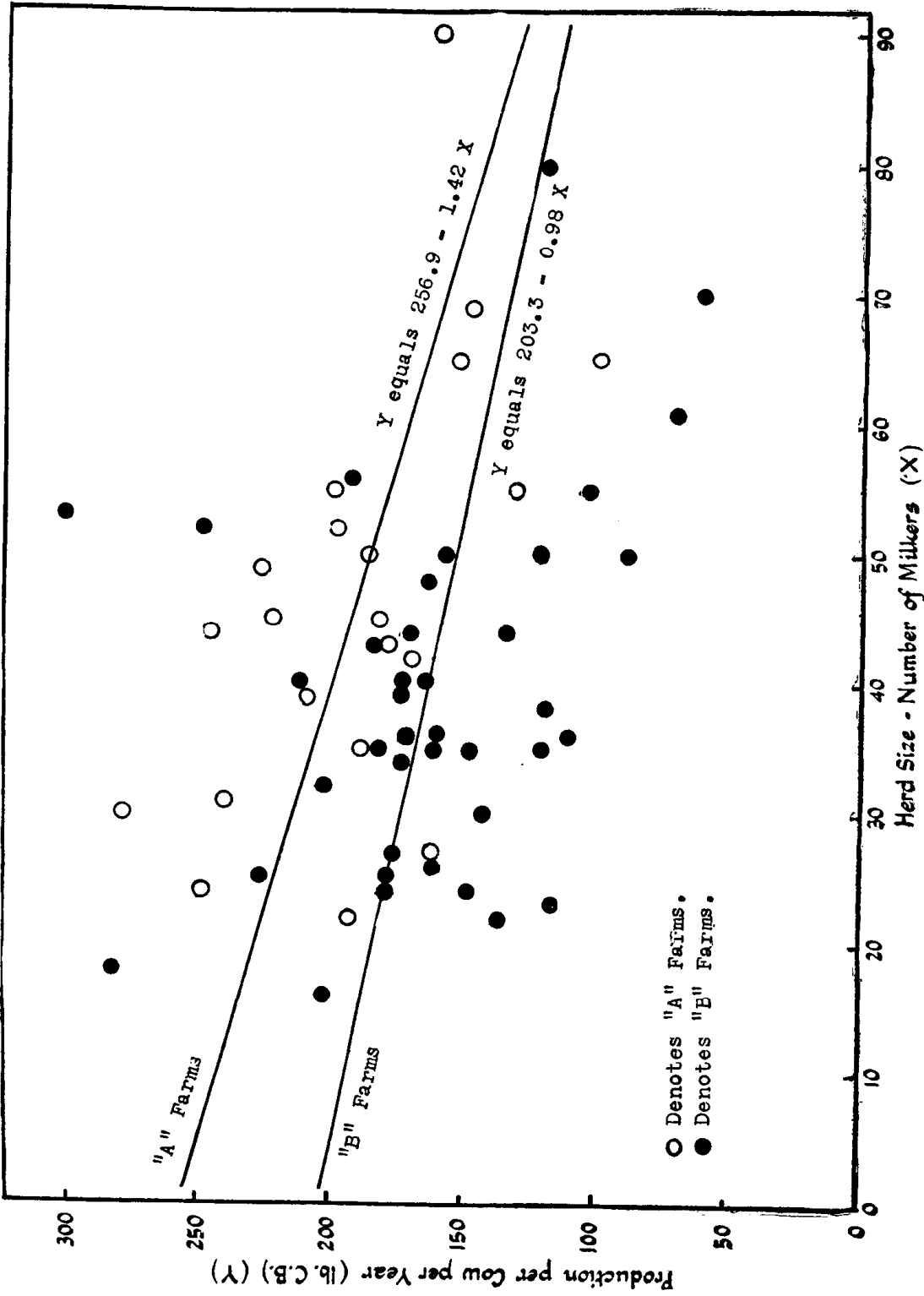


Fig. X.—Diagram showing the relationship between herd size and production per cow for sixty survey farms. "A" farms—those worked by one man with full-time male assistance. "B" farms—those worked by only one man.

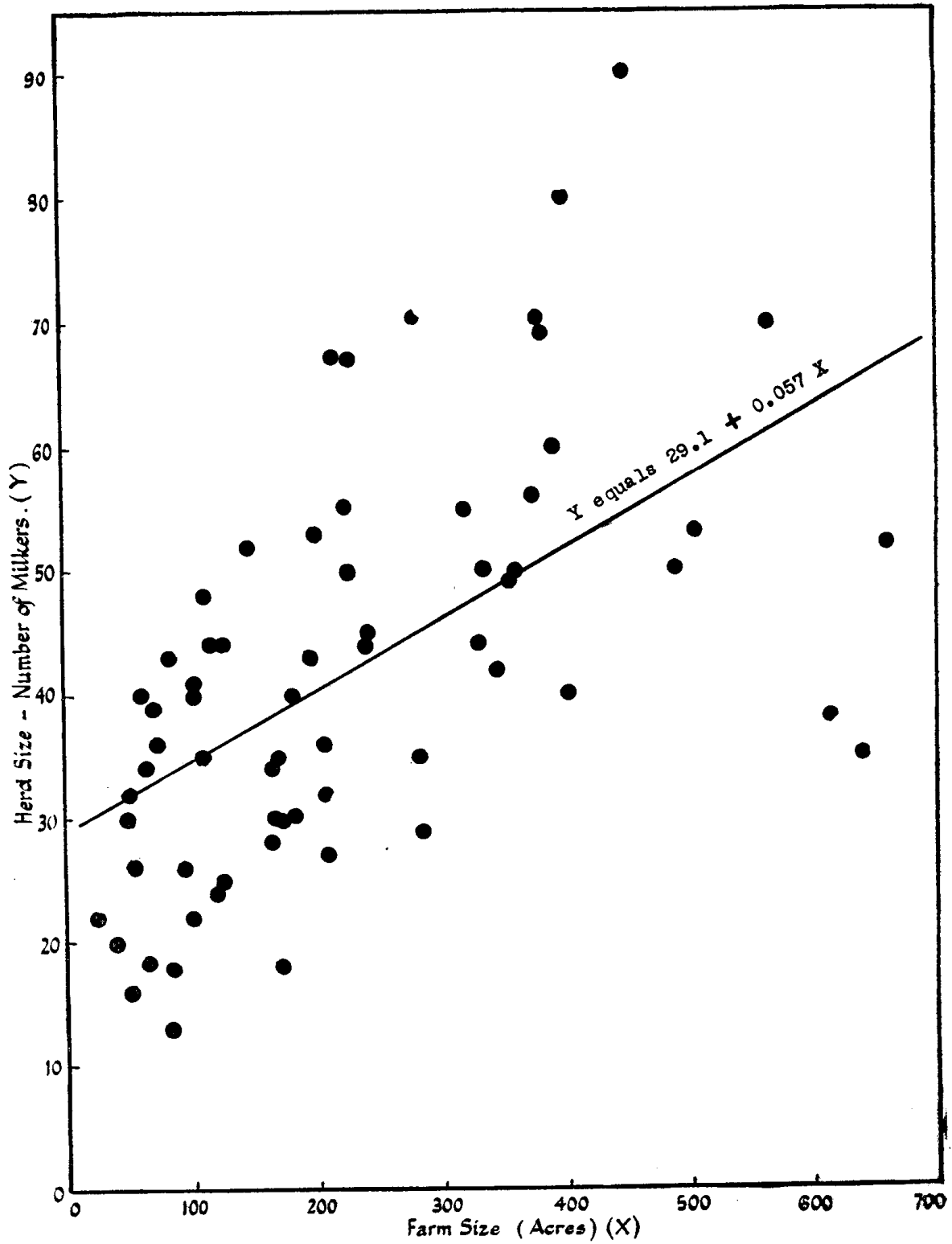


Fig. XI.—Diagram Showing the relationship between the size of the herd and the size of the farm for sixty-five survey farms.

On one-man farms there was some tendency for herds to be smaller the older the operator, although the reduction in herd size on these properties was not as marked as was the reduction in farm management score and production per cow with increases in the age of the operator. It would seem, therefore, that, because of reduced farming efficiency with increasing age, many operators on one-man farms attempted to maintain herd size to preserve a given volume of output.

By contrast, operators with full-time male assistance were able to maintain intensity of farming practices to a greater extent as their age increased.

Production Levels.

An analysis was made of the relationships between levels of output and several other factors, of which the property size, the farm management score and the tenure status of the farm operator have been considered elsewhere in this article. However, a number of other characteristics also require consideration, and these are dealt with below.

(a) Annual Production Per Cow.

Farm Labour Force.—There was a significant relationship between the size of the farm labour force and production per cow. For example, approximately 36 per cent. of the farmers, with full-time male assistance, achieved an output greater than 200 lb. of commercial butter per cow. By contrast, this level was attained only by about 18 per cent. of operators on one-man farms.

It is suggested that the relationship between the labour force and production per cow might be due to the apparent positive association between the labour force and the number of improved management practices adopted on farms.

Age of Farmer.—There was no significant relationship between the age of the operator and farm management efficiency measured in terms of annual output per cow. For the survey area as a whole, there was a tendency for older farmers to be achieving a higher output per cow than younger farmers. However, this could have been due to the fact that many older farmers possessed a larger labour force than their younger counterparts and were thus able to adopt more improved practices.

Analysis shows that one-man farms tended to display a negative correlation between age of farm operator and production per cow. One reason for this might have been that, for these farms, age of operator and the farm management score were negatively related⁹.

On the other hand more-than-one-man farms did not display the same tendency for a reduction in production per cow the greater the age of the operator. This was undoubtedly because of the assistance rendered by the additional labour available to many of them.

Farm Mechanization.—For the survey farms as a whole, there did not appear to be any relationship between output per cow and the farm mechanization score. However, when the sixteen farms surveyed in the Comboyne zone were excluded from the analysis, it was found that

⁹ See p. 74.

there was a significant positive relationship between the farm mechanization score and production per cow. Although many of the farms in the Comboyne zone attained high scores for management practices and production per cow, most were relatively poorly mechanized.

The analysis has indicated that the degree of mechanization *per se* did not appear to influence greatly the level of output on some farms but there are indications that it might have played a part in boosting production on others when allied with other improved farming methods.

The high production levels attained by farmers in the Comboyne zone were probably the result of all of the following factors:—

- (i) The area experienced comparatively good seasons for two of the years included in the analysis of production levels⁹. Although climatic conditions over the period enabled Comboyne farmers to achieve record or near-record levels of output, heavy rains produced the opposite effect on many properties in low-lying parts of the survey area outside the Comboyne zone.
- (ii) The Comboyne zone has been recently developed by comparison with other areas included in the survey, so that its natural resources are probably less exhausted.
- (iii) In the aggregate, farmers in the Comboyne zone had adopted many of the improved practices designed to build up output, such as pasture topdressing and the sowing of improved pasture plants with a higher nutritive value per acre than paspalum.

Standards of Living.

There was evidence of only a slight positive relationship between the standard of living score of farmers and output per cow. This could have been due to the fact that the greater output per cow was achieved by operators with smaller herds who might not have attained a net income sufficiently high to enable them to afford some of the factors included in the measure of living standards.

(b) Annual Butter Production (lb. commercial butter).

Total output of butter per year was related positively to the following factors: farm management score, the size of the labour force and the size of the herd.

Total butter output was not found to be significantly related to the following factors: the farmer's tenure status, the farm mechanization score, and the age of the farmer (probably for the reasons already outlined in reference to the size of herds and production per cow). In addition, total butter output was not related to the living standard score, although there was some evidence that farmers with a higher output attained a higher living standard.

Farm Labour Force.

The relationship between the size of the farm labour force and various characteristics of the farms has been discussed in the appropriate context elsewhere in this article. However, several other factors remain to be considered.

⁹ The analysis of production levels involved the three-year period from 1st April, 1948, to 31st March, 1951.

Total Farm Output.

A significant positive relationship existed between the size of the labour force and the gross cash value of production on the properties each year from all enterprises. There is evidence also that operators of more-than-one-man farms undertook enterprises supplementary to the production of milk or cream to a greater extent than operators of one-man farms. This applied to such enterprises as the winter production of vegetable crops and the production of pigs.

Wife Working in the Dairy.

A test was made to see if there was a greater tendency for wives to undertake regular work in the dairy on one-man farms than on properties with more than one man. This was found to be the case, but the difference between the two groups of farms in this respect was not of significant proportions.

Tenure.

In the study of farm tenure in relation to other factors it was not possible to treat this group separately owing to the small number of tenant farmers included in the survey. Tenant operators and share farmers have been grouped together as "non-owner" operators and compared with "owner" operators.

Farm Management.

Analysis shows that there was a relationship between a farmer's tenure status and the size of his herd. That is to say, herds were significantly larger on non-owner operated farms than on owner operated farms.

This difference in herd size may have been a reflection of one or both of two conditions:

- (i) Non-owner operators may have been working properties relatively poorer in natural resources than farms worked by owner operators. If this were the case, they might have attained lower production per cow, and thus milked larger herds to achieve a total output comparable with that attained by owners.
- (ii) Conditions of tenure on properties operated by non-owners might have induced these farmers to neglect farm improvements but at the same time milk larger herds, because the enhanced total output would compensate both for lower yields per cow and for payments made to landlords as rent or a share of the farm income.

The first of these hypotheses appeared to be true to an extent for some farms. Where a tenant farmer or sharefarmer worked a property owned by a farmer landlord to whom he was not closely related it was found that the non-owner operator invariably occupied the poorer farm of the two. However, some of the properties were owned by persons who once worked the farms and who had close relatives as their tenants. Other farms were owned by landlords who did not farm on their own account. For these groups of operators significant differences in the natural productivity of the farm were not evident.

For the survey farms as a whole there was insufficient evidence to determine whether differences in herd size as between tenure groups could be explained adequately in terms of variations in the suitability of types of country for dairy farming.

With reference to the second of the aforementioned hypotheses, analysis shows some difference between tenure groups with respect to the types of farm practices being adopted. These differences are summarized in Table XIII. Compared with non-owners, relatively more owner operators adopted the following practices: annual topdressing of paspalum pastures, regular sowing down of improved grass and clover pastures, and all-year-round supplementary feeding to the dairy herd. In addition, relatively more owners kept herds predominantly of pedigreed stock.

By contrast, compared with owner operators, relatively more non-owners made a practice of regularly renovating and mowing paspalum pastures, and conserving fodder. In addition, non-owners displayed a somewhat higher intensity of property subdivision than owner- operators.

Each of the latter practices was more common to farmers in the Taree zone than to those in other survey areas. This appeared to be a reflection of geographic conditions peculiar to this area rather than any other factor. It is possible, therefore, that the difference between tenure groups in respect of these practices was not related to the farmers' tenure status but was merely an indication that the practices were more common to certain types of country which, for other reasons, had a higher proportion of farmers of a certain tenure status.

If the twenty-two survey farms of the Taree zone are excluded from the analysis, differences between tenure groups in respect of intensity of property subdivision, renovating, fodder conservation and mowing of paspalum are less marked than that shown in Table XIII.

TABLE XIII.

Proportion of Owner-Operators and Non-Owner Operators Who Were Undertaking Improved Farm Management Practices.

Practice.	Owner Operators.	Non-owner Operators.
	per cent.	per cent.
Renovation of Paspalum Pastures	41.0	42.3
— Sowing of Improved Grasses and Clovers	61.5	42.3
— Annual Topdressing of Paspalum Pastures	33.3	26.9
— All-Year-Round Supplementary Feeding	35.9	23.1
— Conserving Fodder	30.8	38.5
— Mowing Paspalum	15.4	26.9
— Bulk of Herd Pedigreed Stock	17.9	11.5
— " High " Degree of Farm Sub-division	51.3	72.7

It is important to note that none of the differences in farm management practices between tenure groups was statistically significant. Likewise, there was no significant difference between tenure groups with regard to farm management scores and farm mechanization scores.

As noted earlier, the various factors, which have been used to measure the farm management score, provide only a crude basis for determining differences between farmers in respect of management efficiency. However, if any real differences had existed in this respect between tenure groups, they should be revealed in differences in levels of output.

Production Levels.

Non-owner operators showed a tendency for higher levels of production measured in terms of total output of butter (equivalent) per year or the value of all production. The following differences are indicative of this:—

- (i) About 48 per cent. of non-owners attained a total yearly butter (equivalent) production of 7,000 lb. or more, compared with 41 per cent. of owners who achieved this level.
- (ii) Similarly, whereas about 64 per cent. of non-owners achieved a total output from all enterprises with a gross cash value per year greater than £800, this level of output was achieved by only 49 per cent. of owner operators.

However, overall there was no significant difference between tenure groups in respect of production levels measured in either of the above-mentioned terms.

Similarly, there was no significant difference between tenure groups in respect of average output per cow per year. The mean output for owner operators was 172 lb. and that for non-owners 180 lb. Whereas about 23 per cent. of owners attained 200 lb. per cow or more, this level was attained by about 19 per cent. of non-owner operators. However, although about 28 per cent. of owners produced less than 150 lb. per cow, only about 23 per cent. of non-owners produced below this figure.

The important conclusion which can be reached is that there was no evidence of any significant difference between tenure groups with respect to most aspects of farm management and levels of output.

Standard of Living.

It has sometimes been alleged that conditions of farm tenancy, on many dairy farms, have been conducive, not only to comparative inefficiency in farming techniques, but to a relative poverty in living standards on properties operated by non-owners, particularly with regard to household amenities. Some elements of this problem were considered during the course of the survey.

The relationships between tenure status and some aspects of living conditions on farms are summarized in the Appendix. Analysis has shown a significant difference between tenure groups, when all the various factors included in the standards of living index were considered as an aggregate score for each farm. A higher standard of living score was associated more with owner operators than with non-owner operators.

Analysis of various components of the standard of living index has demonstrated the need to distinguish between two broad types of factors. The "basic" factors mentioned in the Appendix include those factors which the landlord might be expected to control in the case of non-owner-operated farms. They include the following: The possession of a kitchen sink, wash basin, and telephone; items related to the household water and drainage system and various rooms in the household. "Non-basic" factors include those factors over which the tenant or share-farmer might be expected to exercise control, including possession of a refrigerator, car, radio, flower garden, self-heating iron and also the standard of education.

Whilst analysis shows that owner operators were significantly "better off" than non-owner operators in respect of basic factors, this was not the case in respect of non-basic factors. It would seem, therefore, that differences in living conditions between tenure groups were more the result of the relatively poor standard of housing facilities offered by landlords on non-owner-operated farms, than of the standards which non-owners provided for themselves. It is known that some tenant-farmers and share-farmers have, at their own expense, improved their living standards in respect of some of the factors included in the measure of basic factors. Unfortunately it is not known to what extent this applied to non-owners as a whole. However, if this factor had been fully assessed throughout the survey, differences between tenure groups for basic items would have been more marked than was found to be the case.

The survey has given some weight to the contention of some non-owner operators that landlords were loth to offer them standards of housing comparable with their own.

Conclusions.

1. The adoption of a comparatively wide range of improved farm management practices, with respect to both pastures and stock, has apparently enabled some farmers to attain a higher level of farm production than those farmers who undertook few of these practices. Increases in output along these lines appeared to be more marked for farmers who supplied the Milk Board than those who did not supply the Board.

2. There was a positive relationship between the variety of farm management practices adopted and the size of the farm labour force. Mean output per cow was also significantly higher for farms employing more than one man (including the operator) than for one-man farms.

The character of farm management practices undertaken on farms was related to the degree of farm mechanization; the more mechanized farms being characterized by more intensive farm management.

3. The scale of operations on survey farms, measured in terms of herd size or the intensity of farm management or levels of output, tended to be negatively associated with the age of the farmer on one-man farms. This did not appear to be the case on farms with more than one man.

4. The smaller herds were associated with the greater output per cow both for one-man farms and farms with more than one man.

5. There was no evidence that non-owner operators had attained a level of production per cow significantly below that attained by owner operators, despite the fact that non-owners milked herds significantly larger than owners and tended to achieve a larger total output from their farms.

In the aggregate, owner-operated farms possessed better living standards than farms worked by non-owners. The relative inferiority of non-owners in this respect appeared to be more the result of the failure of landlords to provide adequate housing facilities for their tenants than of the failure of non-owner operators to improve their own living standards.

APPENDIX.**A. Farm Management Score.**

A score which provided a measure of the variety of improved farm management practices employed was given to each of the sixty-five farms surveyed.¹⁰ The aspects of farm management taken into account by the score and the arbitrary basis of scoring were as follows:—

<i>Farm Management Factor.</i>	<i>Score.</i>	<i>Basis of Scoring.</i>
Topdressing of paspalum pastures ..	2	If practiced.
	1	If not practiced.
Sowing of improved pastures	2	If practiced.
	1	If not practiced.
Bulk of the herd consisting of pedigreed stock	2	If so.
	1	If not so.
All-year-round supplementary feeding	2	If practiced.
	1	If not practiced.
Conservation of fodder	2	If practiced.
	1	If not practiced.
Intensity of property subdivision ..	2	If "high."
	1	If "low."
Mowing of paspalum pasture	2	If practiced.
	1	If not practiced.

Intensity of property subdivision was classed as low if there were more than five cows per paddock and high if there were five cows or less per paddock.

B. Farm Mechanization Score.

In a fashion similar to the farm management score, each of the survey farms was allotted a score for farm mechanization on the basis of the possession or non-possession of certain items of farm machinery and farm implements. The items taken into account were as follows:—

- Tractor.
- Pasture renovator.
- Manure spreader.
- Stationary engine (not used for milking machines).
- Mower.
- Feed Stalls.
- Truck or car.
- Irrigation plant.
- More than one plough.

It will be seen that the score does not include reference to all types of machines and implements found on dairy farms. Some items, such as milking machines, were common to most farms, so that, in developing a farm mechanization score, only the relatively less common (but nevertheless important) types of equipment have been taken into account.

¹⁰ In the absence of an empirical basis for weighting the scores, most of the factors taken into account by the three indices have been given a similar score. In the several cases where weighted scores have been employed, an attempt has been made to allow for the greater importance of the factor to the relevant analysis. Although a 2 to 1 points basis has been used for most of the index values, other methods of scoring would have been equally efficient.

C. Living Standard Score.

Some of the factors considered by the survey have been grouped together to provide a crude measure of living standards on survey farms and compared with other characteristics. The factors taken into account and the arbitrarily allotted scores for each item were as follows:—

<i>Factors.</i>	<i>Score.</i>	<i>Basis of Score.</i>
1. Units connected to running water .	2	More than three.
	1	Three or less.
2. Units connected to some drainage (piped away as distinct from carried or merely draining over the surface of the ground) ..	2	More than three.
	1	Three or less.
3. Kitchen sink	2	Possession.
	1	Non-possession.
4. Refrigeration	2	Possession.
	1	Non-possession.
5. Shower	2	Possession.
	1	Non-possession.
6. Wash basin (bathroom)	2	Possession.
	1	Non-possession.
7. Bath heater	2	Possession.
	1	Non-possession.
8. Heating appliance in a room (other than the kitchen stove) . ..	2	Possession.
	1	Non-possession.
9. Car	2	Possession.
	1	Non-possession.
10. Radio	2	Possession.
	1	Non-possession.
11. Telephone	2	Possession.
	1	Non-possession.
12. Self-heating iron	2	Possession
	1	Non-possession.
13. Flower garden	2	Possession.
	1	Non-possession.
14. Sealed footpath (concrete, etc.) ..	2	Possession.
	1	Non-possession.
15. House painted	2	Yes.
	1	No.
16. Outside appearance of the house ..	2	Superior or Mediocre.
	1	Poor.

	<i>Factors.</i>	<i>Score.</i>	<i>Basis of Score.</i>
17. Educational standard attained by operator		4	Secondary or Tertiary.
		1	Primary.
18. Separate laundry		2	Possession.
		1	Non-possession.
19. Separate bathroom		2	Possession.
		1	Non-possession.
20. Persons per bedroom		4	One or less.
		2	1 to 1.9.
		1	2 or more.
21. Number of rooms which could be lit at the same time		2	Three or more.
		1	Less than three.

Scores were allotted on the above basis for each of the survey farms and in each case a total score calculated.

For each farm, the standard of living score has been broken down into two separate elements—a “basic factor” score and a “non-basic” factor score.

The score of basic factors included of the above items those numbered as follows: 1, 2, 3, 5, 6, 7, 8, 11, 14, 15, 16, 18, 19.

The score of non-basic factors included of the above items those numbered 4, 9, 10, 12, 13, 17, 20, and 21.

TABLE XIV.

Results of Tests for Related Factors.

First Variable.	Second Variable.	Type of co-efficient.	Value of co-efficient.	Mean Value for t Tests.	d.f.	Inter-pretation.	P	Direction of Relationship (X ² Tests).	
Farm Management Score.	Annual Butter Production	X ²	5.99	.....	1	x	Between .02 and .01	+ ve
	Production per Cow	X ²	12.89	.....	1	xx	Less than .01	+ ve
	Farm Labour Force	X ²	10.35	.....	1	xx	Less than .01	+ ve
	Farm Mechanisation Score—								
	(a) All Farms	X ²	9.60	.....	1	xx	Less than .01	+ ve
	(b) Without Comboyne Farms	X ²	14.83	.....	1	xx	Less than .01	+ ve
	Education	X ²	0.26	.....	1	A.S.	Between .70 and .50	.....
	Age of Operator on One-Man-Farms.	X ²	-0.202	.....	38	A.S.	Between .10 and .05	.....
	Farm Labour Force	X ²	12.69	.....	2	xx	Less than .01	+ ve
	Farm Mechanisation—								
Annual Butter Production.	Score—								
	(a) All Farms	X ²	1.93	.....	1	...	Between .30 and .10	.....
	(b) Without Comboyne Farms	X ²	0.84	.....	1	...	Between .50 and .30	.....
	Herd Size								
	All Survey Farms	X ²	0.667	.....	59	xx	Less than .01	.....
	Three Zone Farms	X ²	0.899	.....	16	xx	Less than .01	.....
	Wingham Zone Farms	X ²	0.749	.....	12	xx	Less than .01	.....
	Nabiac Zone Farms	X ²	0.630	.....	11	x	Between .05 and .02	.....
	Comboyne Zone Farms	X ²	0.683	.....	14	xx	Less than .01	.....
	Standard of Living Score	X ²	4.44	.....	2	...	Between .20 and .10	.....
Production per Cow	Herd Mostly of Pedigreed Stock...	X ²	10.07	.....	1	xx	Less than .01	+ ve *
	Amount of Soft Grass Pasture Sown.	X ²	9.48	.....	2	xx	Less than .01	+ ve *
	Annual Topdressing of Paspalum Pastures.	X ²	9.69	.....	1	xx	Less than .01	+ ve *
	All-year-round Supplementary Feeding.	X ²	5.45	.....	1	x	Between .02 and .01	+ ve *
	Intensity of Property Subdivision	X ²	26.12	.....	1	xx	Less than .01	+ ve
	Mowing Paspalum Pastures	...	t	0.871	38	...	Between .40 and .30
		Conserving Fodder (excluding Comboyne Farms).	t	1.726	42	A.S.	Between .10 and .05
		Membership of the Milk Board (excluding Comboyne Farms)	t	2.383	42	xx	Less than .01
		Farm Labour Force	t	2.081	38	x	Between .05 and .02
		Farm Size—							
All Survey Farms		t	-0.222	.....	59	A.S.	Between .10 and .05	.....
Three Zone Farms		t	0.681	.....	16	...	Greater than .10	.....
Wingham Zone Farms		t	-0.249	.....	12	...	Greater than .10	.....
Nabiac Zone Farms		t	-0.551	.....	11	A.S.	Between .10 and .05	.....
Comboyne Zone Farms		t	0.936	.....	14	...	Greater than .10	.....
Farm Labour Force	Size of Herd—								
	(a) One-Man Farms	t	-0.277	.....	36	...	Greater than .10	.....
	(b) More than One-Man Farms	t	-0.549	.....	20	xx	Less than .01	.....
	Farm Mechanisation Score—								
	(a) All Farms	X ²	1.42	.....	1	...	Between .30 and .20	.....
	(b) Without Comboyne Farms	X ²	7.30	.....	1	xx	Less than .01	+ ve
	Education	X ²	1.07	.....	1	...	Between .50 and .30	.....
	Standard of Living Score	X ²	2.10	.....	2	...	Greater than .10	.....
	Age of Operator on One-Man-Farms.	t	-0.200	.....	39	...	Less than .01	.....
	Total Farm Output (£)...	X ²	18.85	.....	1	xx	Between .50 and .30	+ ve
Herd Size	Wife Working in the Dairy	X ²	0.55	.....	1	...	Between .50 and .30	.....
	Farm Labour Force	t	1.971	.....	38	x	Between .05 and .02	.....
	Farm Size—								
	All Survey Farms	t	0.537	.....	63	xx	Less than .01	.....
	Three Zone Farms	t	0.741	.....	20	xx	Less than .01	.....
	Wingham Zone Farms	t	0.266	.....	12	...	Greater than .10	.....
	Nabiac Zone Farms	t	0.462	.....	11	...	Greater than .10	.....
	Comboyne Zone Farms	t	0.215	.....	14	...	Greater than .10	.....
	Age of Operator—								
	(a) Owners	X ²	0.49	.....	1	...	Between .50 and .30	.....
(b) Non-Owners	X ²	0.61	.....	1	...	Between .50 and .30	.....	
(c) All Operators of One-Man-Farms.	X ²	0.066	.....	1	...	Between .80 and .70	.....	
Farm Management Score	X ²	0.048	.....	1	...	Between .90 and .80	.....	

Variable	Correlation	Significance	Direction	Mean	Direction	Significance	Mean
Farm Labour Force	1						
Age of Operator on One-Man-Farms	X ²						
Total Farm Output (£)	X ²						
Wife Working in the Dairy	X ²						
Herd Size	t						
Farm Labour Force							
Farm Size—							
All Survey Farms							
Taree Zone Farms							
Wingham Zone Farms							
Nabiac Zone Farms							
Comboyne Zone Farms							
Age of Operator—							
(a) Owners	X ²						
(b) Non-Owners	X ²						
(c) All Operators of One-Man-Farms	X ²						
Tenure Status	X ²						
Farm Management Score	X ²						
Mowing Paspalum Pastures	X ²						
Annual Topdressing of Paspalum Pastures	X ²						
Amount of Soft Grass Pastures Sown	X ²						
Renovation of Paspalum Pastures	X ²						
Herd Mostly of Pedigreed Stock	X ²						
All-Year-Round Supplementary Feeding	X ²						
Conserving Fodder	X ²						
Intensity of Property Subdivision	X ²						
Farm Mechanisation Score	t						
Production per Cow	t						
Herd Size	X ²						
Annual Butter Production	X ²						
Total Farm Output (£)	X ²						
Standard of Living Score—	X ²						
(a) All Factors	X ²						
(b) Basic Factors	X ²						
(c) Non-Basic Factors	X ²						
Refrigerator	X ²						
Room Heater	X ²						
Bath Heater	X ²						
Kitchen Sink	X ²						
Number of Units Connected to Running Water	X ²						
Number of Units Connected to Drainage	X ²						
House Painted on Outside	X ²						
Telephone	X ²						

Type of Test Employed: X²—Chi-square test for independence of association; F—test for simple correlation; t—test for significant difference between mean values.
 Interpretations: xx—highly significant; x—significant; A.S.—approaching significance; S.L.—significantly low.
 Direction of Relationships: * The direction in which variations in the first variable are associated with the adoption of the practice shown as the second variable; † larger values of second variable more associated with non-owners; ‡ larger values or possession of second variable more associated with owners.
 † 5071