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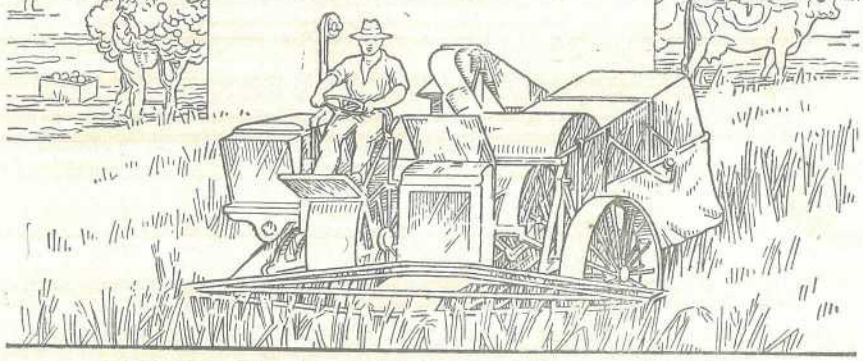
ISSUED BY DIRECTION OF

THE HONOURABLE
THE SECRETARY
FOR AGRICULTURE
AND STOCK

Edited by
C. W. WINDERS, B.Sc.Agr.



JANUARY, TO JUNE, 1953.

Vol. 76. Parts 1 to 6.

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VOL. 76. PART 1 JANUARY, 1953

DEPARTMENT OF AGRICULTURE

QUEENSLAND AGRICULTURAL JOURNAL

Dairy Pastures in the Maleny District.

LEADING FEATURES

Buffel Grass

Butter Production, 1951-52

Modern Milking Methods

Dairying on the Atherton Tableland

Cheese Production, 1951-52

Cattle Feeding Stalls

Cottage Cheese

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Volume 76 Part 1

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Issued by Direction of
THE HONOURABLE H. H. COLLINS
MINISTER FOR AGRICULTURE AND STOCK

GOVERNMENT PRINTER, BRISBANE

Contents

MESSAGE FROM THE MINISTER.

«»

Another year of mixed fortunes for the man on the land has just ended. Its opening weeks saw the culmination of a drought that will long be remembered. Fortunately, the few months succeeding the breaking of the drought proved highly favourable to most industries, and though stress conditions were experienced late in the year, the land in general is in good heart and there is every confidence in the prospects for 1953.

Hon. H. H. Collins.

It is greatly to be hoped that the vicissitudes of the next few years will be small enough to be taken by the primary industries in their stride. There is a strong need not merely for sustained production but for increased production from Australia's chief asset, the land, if the nation's economy is to be stabilised.

In April last the Australian Agricultural Council, on which I am the Queensland representative, drew up a list of farm targets which were considered desirable and practicable of attainment. This State's production of several major primary products will have to be rapidly and substantially increased if the national targets are to be reached in good time. Impressive starts have already been made with wheat and sugar expansion, and other products will quickly follow suit if growers are given sufficient incentive.

The Department of Agriculture and Stock, in common with other State Departments concerned with primary production, is doing all it can to increase production and the efficiency of farming. In wishing primary producers a fruitful 1953, I invite them to make full use of the services of my Department.

H. H. Collins

Minister for Agriculture and Stock.

TUBERCULOSIS-FREE CATTLE HERDS.
(AS AT 31st DECEMBER, 1952.)

Breed.	Owner's Name and Address of Stud.
Aberdeen Angus ..	The Scottish Australian Company Ltd., Texas Station, Texas F. H. Hutton, " Bingegang," Dingo
A.I.S...	F. B. Sullivan, " Fermanagh," Pittsworth D. Sullivan, " Bantry " Stud, Rossvale, *via* Pittsworth W. Henschell, " Yarranvale," Yarranlea Con. O'Sullivan, " Navillus Stud," Greenmount H. V. Littleton, " Wongalea Stud," Hillview, Crow's Nest J. Phillips and Sons, " Sunny View," Benair, via Kingaroy Sullivan Bros. " Valera " Stud, Pittsworth Reushle Bros., " Reubydale " Stud, Ravensbourne H. F. Marquardt, " Chelmer " Stud, Wondai W. G. Marquardt, " Springlands," Wondai A. C. and C. R. Marquardt, " Cedar Valley," Wondai A. H. Sokoll, " Sunny Crest " Stud, Wondai W. and A. G. Scott, " Welena," A.I.S. Stud, Blackbutt G. Sperling, "Kooravale" Stud, Kooralgin, via Cooyar C. J. Schloss, "Shady Glen," Rocky Creek, Yarraman W. H. Thompson, "Alfa Vale," Nanango
Ayrshire	L. Holmes, " Benbecula," Yarranlea J. N. Scott, " Auchen Eden," Camp Mountain "St. Christopher's and Iona " Studs, Brookfield Road, Brisbane E. Mathie and Son, "Ainslie" Ayrshire Stud, Maleny
Friesian	C. H. Naumann, " Yarrabine Stud," Yarraman
Guernsey	C. D. Holmes, " Springview," Yarraman A. B. Fletcher, Cossart Vale, Boonah W. H. Doss, Degilbo, via Biggenden
Jersey	J. S. McCarthy, " Glen Erin Jersey Stud," Greenmount J. F. Lau, " Rosallen Jersey Stud," Goombungee G. Harley, Hopewell, Kingaroy Toowoomba Mental Hospital, Willowburn Farm Home for Boys, Westbrook F. J. Cox and Sons, " Rosel " Stud, Crawford, Kingaroy Line R. J. Browne, Hill 60, Yangan P. J. L. Bygrave, " The Craigan Farm," Aspley R. J. Crawford, " Inverlaw Jersey Stud," Inverlaw, Kingaroy P. H. F. Gregory, " Carlton," Rosevale, *via* Rosewood E. A. Matthews, " Yarradale," Yarraman A. L. Semgreen, " Tecoma," Coolabunia G. & V. Beattie, " Beauvern," Antigua, Maryborough L. E. Meier, " Ardath " Stud, Boonah A. M. and L. J. Noone, "Winbirra," Stud, Mt. Esk Pocket, Esk W. S. Conochie and Sons, "Brookland" Stud, Sherwood Road, Sherwood Queensland Agricultural High School and College, Lawes Estate of J. A. Scott, "Kiaora," Manumbar Rd., Nanango F. W. Verrall, "Coleburn," Walloon
Polled Hereford ..	W. Maller, " Boreview", Pickanjinnie

AGRICULTURE IN THE MARY VALLEY AND ADJOINING DISTRICTS.

The reference to topdressing of pastures in the article on the above subject which appeared in the December issue may have given some readers the impression that in a soil deficient in both lime and phosphate these deficiencies may be remedied by applying lime, dolomite or superphosphate. The position is that superphosphate is needed to correct phosphate deficiency and either lime or dolomite to correct lime deficiency.

Buffel Grass (Cenchrus ciliaris L.).

S. MARRIOTT (Senior Agrostologist) and K. B. ANDERSSEN (Adviser in Agriculture)

BUFFEL grass occurs naturally in various forms in tropical and sub-tropical portions of Africa and southern Asia. It was introduced from India to north-western Australia in 1915, and since that time a number of African and Asiatic strains have been tested in the various States of the Commonwealth. Further strains have been isolated in Africa; these are expected to be available for testing in Queensland in the near future.

The strain at present in commercial use in Queensland is doing well in areas as widely separated as the Burnett Valley (Plate 1), the Cooktown hinterland and the Cloncurry district (Plate 2).

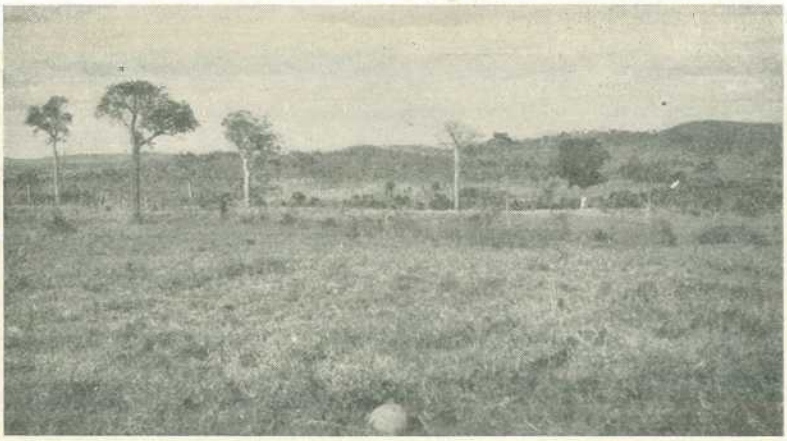


Plate 1.

A Good Stand of Buffel Grass After Heavy Summer Grazing. This pasture is on softwood scrub country in the Gayndah district.

Native species of the same genus as buffel grass are found in Australia, but these are of very minor value compared with the introduced strains. Common ones are Mossman River grass (*Cenchrus echinatus*), whose spiny fruits make it a pest in coastal tropical Queensland, and *Cenchrus australis,* which is known as hillside burr grass.

Plate 2.
Buffel Grass on Broken Spinifex Grass Country in the Cloncurry District.

Description.

Variations in growth habit occur in buffel grass (Plates 3 and 4), but it can best be described as an erect, perennial grass of the tussock-forming type which produces short underground runners; this latter habit is more pronounced in some strains than in others. Great variation in leafiness also exists between strains. It is a characteristic of this grass that stems from which the leaf has been stripped will shoot at the nodes, producing clusters of very short foliage. These old stems become hard and wiry; therefore the grass should not be allowed to reach this stage for grazing purposes.

Plate 3.
Buffel Grass on a River Alluvial in the Peachester District.

Plate 4.

A Strain of Buffel Grass Under Test on Biloela Regional Experiment Station.

The seedheads, which are purplish when young but change to a brownish hue on maturity, are of a foxtail shape, and are borne on rather short stems. The large "seeds" bear a number of bristles, particularly at their bases. In well-grown fields, the seedheads may be ripe while the leaves are green and the plant still making fresh growth from the base.

Climatic Requirements.

Buffel grass is a summer-growing grass and is best adapted to summer-rainfall districts. The grass is very drought-resistant, and in Queensland is suited to areas with an average annual rainfall as low as 20 inches. It is also considered worthy of trial in drier areas provided low seeding rates are used to establish stands no thicker than the sparse native pastures. While it is subject to leaf damage by frosts, it makes quick regrowth during any warm spells in the winter months, and shoots vigorously in the spring.

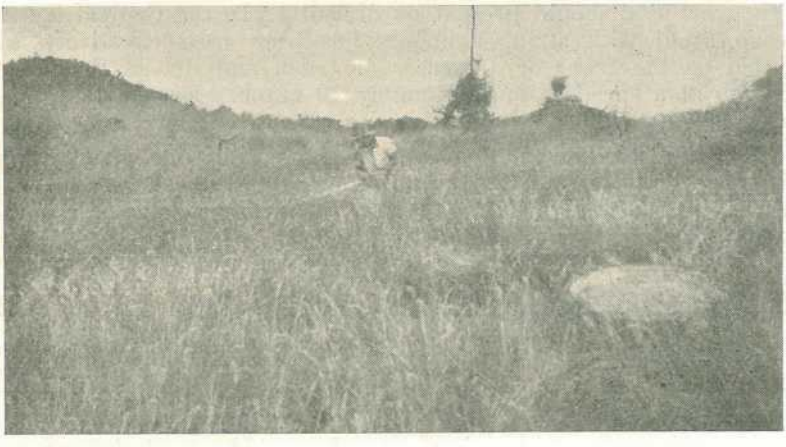


Plate 5.

Harvesting Buffel Grass Seed by Hand in the Gayndah District.

Soils.

Buffel grass appears to thrive best on well-drained and fairly dry soils even though the fertility level may not be high. It does well on the deep, basaltic scrub soils of the Burnett Valley (Plate 1), but is also recommended for the sandy so-called desert country of central-western Queensland. In test plots it has failed to persist on some poorly drained clay soils in south-eastern Queensland, but in the lower rainfall areas does well on the heavy soils.

Seed.

Seed of buffel grass is available commercially, the main centre of production being the Gayndah district in the Central Burnett. Harvesting is done by hand (Plate 5), and as the ripe seedheads are easily distinguished, good samples can be obtained. Machine-harvesting

Plate 6.

Harvesting Buffel Grass Seed on a Tray Fitted in Front of a Utility Truck.

of this grass seed should present no difficulty. In the Central Burnett, a scoop fitted with stripper fingers has been used effectively when mounted on the front of a tractor or truck and driven through the seed crop at a speed of approximately 10 m.p.h. Even a tray on the bumper bar may suffice (Plate 6).

As with a number of other grass seeds, germination of buffel grass seed improves with storage. Samples collected and stored by the Department of Agriculture and Stock have shown the increases in seed germination set out in Table 1.

TABLE 1.

CHANGES IN GERMINATION PERCENTAGE OF BUFFEL GRASS SEED FOLLOWING STORAGE.

Sample No.	Germination at Harvest (March, 1949).	Germination in August, 1949.	Germination in August, 1952.
	%	%	%
1	3	67	82
2	11	43	46
3	5	32	30
4	18	72	74

Planting.

Buffel grass is readily established from seed, and as with most plants, the ease and speed of its establishment is closely correlated with the degree of soil preparation. Best stands are obtained from plantings made on well-prepared, fallowed land.

The seed may be broadcast in the ashes following scrub burns in brigalow, brigalow-belah or brigalow-softwood country. On cultivated land, broadcast seed should be lightly covered by harrows to a depth of half an inch to an inch.

In pastoral areas, the seed should be broadcast and if possible tramped into the soil by driving stock over the area. Pasture furrows can be used to provide the seedbed and in this way patches of the grass can be established through large paddocks. On sloping land, contour pasture furrows offer a useful seedbed for establishing the grass.

Small fenced areas sown on large properties can be used to provide a source of seed which may be distributed as desired. This grass has also shown distinct promise of being a good natural coloniser in open country provided it is allowed to set seed, but establishment in this way is necessarily slow.

Experience at Biloela Regional Experiment Station indicates that where machinery is available and soil erosion is not a problem, row cultivation of buffel grass may be worthwhile.

The light bristly "seeds" do not flow readily through a seed drill and are also difficult to broadcast. It is anticipated that hammer-mill treatment will remove most of the bristles and outer glumes or "husks" and leave the seed in a condition suitable for machine-sowing. Mixing with a large bulk of damp sawdust makes it easier to obtain an even distribution by broadcasting. Recommended planting rates vary from 4-5 lb. per acre on the coast to 2 lb. per acre in the 15-20 inch rainfall zone.

While no detailed information from local plots is available regarding suitable legumes for use in mixtures with buffel grass, lucerne at 1 lb. per acre in temperate or subtropical zones where the soil is suitable, or phasemy bean (*Phaseolus lathyroides*) at 1-2 lb. per acre, could be tried in all but the driest areas. Seed of the latter legume is not available commercially but can be collected by hand from natural stands which occur in many parts of south-eastern and central Queensland. In areas where frosts are not severe, Townsville lucerne (*Stylosanthes sundaica*) could be oversown without covering the seed, using 1-2 lb. per acre.

Planting may be carried out safely during spring and early summer, provided good rains are received, or during the wet season in February and March.

Management.

Buffel grass, once firmly established, can withstand heavy grazing and cutting. When it occurs in mixed pastures, buffel grass is often grazed in preference to other components of the mixture, and this may lead to its disappearance from the pasture or may hinder its further spread. Stocking should therefore be adjusted to overcome this.

Light grazing may result in undesirable stemmy growth with short, bunched leaf growth at the nodes (Plate 7). Such a condition can best be remedied by mowing or heavy grazing. Burning should not be used

Plate 7.

Buffel Grass in a Wiry Form When Left Ungrazed.

unless unavoidable. Where light stands only have been obtained, it is important that the grass be allowed to mature a seed crop before grazing.

Palatability.

The commercial strain of buffel grass is known to be very palatable and the chemical composition of samples so far tested indicates that its nutritive value is considerably superior to that of most native grasses. Results of some chemical analyses are given in Table 2.

TABLE 2.

CHEMICAL COMPOSITION OF BUFFEL GRASS AND QUEENSLAND BLUE GRASS (ON WATER-FREE BASIS).

Grass	Protein.	Fat.	Carbo-hydrate.	Fibre.	Ash.	CaO.	P_2O_5.	Remarks.
	%	%	%	%	%	%	%	
Buffel grass ..	18·0	1·6	40·7	27·0	12·7	·953	·670	Young growth
Buffel grass ..	5·6	1·2	52·8	30·4	10·0	·250	·154	Dry, stemmy plants
Buffel grass ..	8·3	0·8	43·7	38·5	8·7	·272	·157	Stemmy, leafy, in full seedhead with ripe seed
Queensland Blue grass	10·0	1·1	42·5	33·1	13·1	·544	·547	Green, in seed
Queensland Blue grass	3·9	1·0	47·6	36·4	11·1	·396	·334	In seed

Some samples examined have shown a protein value as high as 20 per cent.

It is reported that the grass makes hay of good quality. If it is established on open country, therefore, it could be a valuable source of bush hay, particularly in the lower rainfall areas.

Conclusion.

The growth of buffel grass over a wide range of climatic conditions in Queensland has shown such promise as to warrant its trial in all moderate to low rainfall zones in the State. It has displayed a high degree of drought-resistance, is palatable and has a good nutritive value. Where practicable, it should be treated as a crop and sown on a well prepared seedbed. However, it can also be established successfully in native pastures of the pastoral areas. The use of legumes such as lucerne, phasemy bean and Townsville lucerne in admixture with buffel grass is desirable and should be attempted wherever possible.

Brucellosis Testing of Swine.

The Department of Agriculture and Stock is operating a scheme whereby pig herds are tested at intervals for the occurrence of swine brucellosis (contagious abortion).

A herd listed by the Department as "brucellosis tested" is one in which all such animals as may be determined by the Director of the Department's Division of Animal Industry have been subjected to two successive tests for brucellosis, at intervals determined by him, without any positive reactors being found.

In order for a herd to be retained on the list of Tested Herds, a semi-annual or annual re-test of the herd, as determined by the Director, is required. If at a re-test any animal gives a positive reaction to the test the herd is removed from the list; it is not listed again until subsequent tests, as determined by the Director, have been carried out.

Full particulars of the Brucellosis Testing of Swine and application forms may be obtained from the Under Secretary, Department of Agriculture and Stock, William Street, Brisbane.

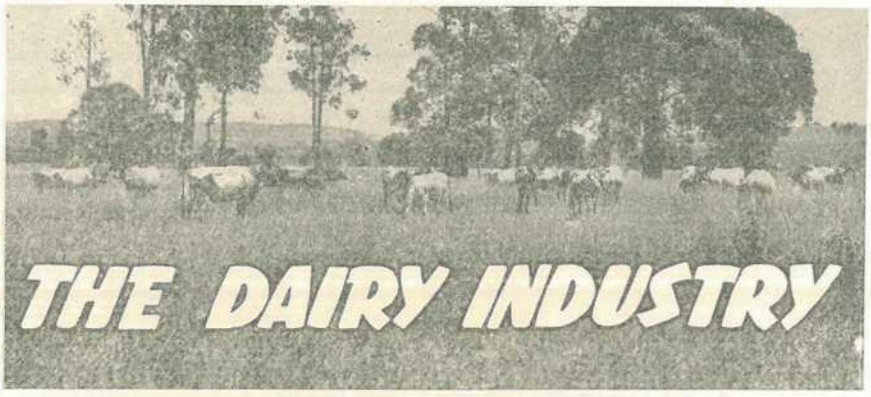
TESTED HERDS.

(AS AT 31st DECEMBER, 1952.)

Breed.	Owner's Name and Address of Stud.
Berkshire	J. J. Bailey, "Lucydale" Stud, East Greenmount
	S. Cochrane, "Stanroy" Stud, Felton
	Garrawin Stud Farm Pty. Ltd., 657 Sandgate road, Clayfield
	G. Handley, "Handleigh" Stud, Murphy's Creek
	J. L. Handley, "Meadow Vale" Stud, Lockyer
	R. G. Koplick, "Melan Terez" Stud, Rochedale
	O'Brien and Hickey, "Kildurham" Stud, Jandowae East
	E. Pukallus, "Plainby" Stud, Crow's Nest
	G. C. Traves, "Wynwood" Stud, Oakey
	E. Tumbridge, "Bidwell" Stud, Oakey
	Westbrook Farm Home for Boys, Westbrook
	H. W. Wyatte, Rocky Creek, Yarraman
	H.M. State Farm, "Palen Creek," Palen Creek
	A. R. Ludwig and Sons, "Cryna" Stud, Beaudesert
	H. H. Sellars, "Tabooba" Stud, Beaudesert
	F. Thomas, M.S. 373, Beaudesert
	D. T. Law, Trouts Road, Aspley
	C. F. W. and B. A. Schellback, "Redvilla" Stud, Kingaroy
	R. H. Crawley, "Rockthorpe" Stud, via Pittsworth
	F. R. J. Cook, "Alstonvilla," Woolvi, via Gympie
	D. E. and E. C. Apelt, "Thelmur," Oakey
	Mrs. I. M. James, "Kenmore" Stud, Cambooya
	H. L. Stark, "Florida," Kalbar
	J. H. N. Stoodley, "Stoodville," Ormiston
	H.M. State Farm, Numinbah
	V. G. M. and A. G. Brown, "Bardell", Goovigen.
	R. E. Paulsen, "Hillcrest" Stud, Binjour Plateau, M.S.670, Gayndah

TESTED HERDS—continued.

Breed.	Owners Name and Address of Stud.
Large White	H. J. Franke and Sons, " Delvue " Stud, Cawdor
	Garrawin Stud Farm Pty. Ltd., 657 Sandgate road, Clayfield
	F. L. Hayward, " Curyo," Jandowae
	J. A. Heading, " Highfields," Murgon
	K. B. Jones, " Cefn " Stud, Pilton
	R. G. Koplick, " Melan Terez " Stud, Rochedale
	R. Postle, " Yarralla " Stud, Pittsworth
	E. J. Bell, " Dorne " Stud, Chinchilla
	L. C. Lobegeiger, " Bremer Valley " Stud, Moorang, via Rosewood
	J. H. G. Blakeney, " Talgai " Stud, Clifton
	H. R. Gibson, " Thistleton " Stud, Maleny
	H.M. State Farm, Numinbah
	K. A. Hancock, " Laurestonvale " Stud, Murgon
	O. H. Horton, Mannuem, Kingaroy
	V. P. McGoldrick, " Fairymeadow " Stud, Cooroy
	N. Woltmann and Sons, Wooroolin
	R. S. Powell, Kybong, via Gympie
	E. B. Horne, "Kalringal," Wooroolin
	S. T. Fowler, "Kenstan" Stud, Pittsworth
	J. A. and J. McNicol, "Camden," Canning Vale, Warwick
	H. L. Larsen, "Oakway," Kingaroy
	C. Allison, "Colrene" Stud, Lake and Reserve Rds., Slacks Creek
Tamworth	S. Kanowski, " Miecho " Stud, Pinelands
	N. R. Potter, " Actonvale " Stud, Wellcamp
	D. F. L. Skerman, " Waverley " Stud, Kaimkillenbun
	A. C. Fletcher, " Myola " Stud, Jimbour
	Salvation Army Home for Boys, Riverview
	F. Thomas, M.S. 373, Beaudesert
	A. J. Surman, Noble Road, Goodna
	P. V. McKewin, " Wattleglen" Stud, Goombungee
	Department of Agriculture and Stock, Regional Experiment Station, Kairi
	P. V. Campbell, Lawn Hill, Lamington
	E. C. Phillips, "Sunny View," M.S. 90, Kingaroy
	T. A. Stephen, "Withcott," Helidon
	W. F. Kajewski, "Glenroy" Stud, Glencoe
	A. A. Herbst, Bahr Scrub, via Beenleigh
	R. G. Koplick, " Melan Terez " Stud, Rochedale
	H.M. State Farm, Numinbah
Wessex Saddleback ..	W. S. Douglas, " Greylight " Stud, Goombungee
	D. Kay and P. Hunting, " Kazan " Stud, Goodna
	E. Sirrett, " Iona Vale " Stud, Kuraby
	C. R. Smith, " Belton Park " Stud, Nara
	H. H. Sellars, " Tabooba " Stud, Beaudesert
	H. Thomas, " Eurara " Stud, Beaudesert
	D. T. Law, Trouts Road, Aspley
	G. J. Wilson, " Glenbella " Stud, Silverleigh
	G. J. Cooper, "Cedar Glen", Yarraman
	J. B. Dunlop, Acacia Road, Kuraby
	A. Curd, Box 35, Jandowae
	C. Allison, "Colrene" Stud, Lake and Reserve Rds., Slacks Creek



Queensland Cheese Production, 1951-52

Prepared by the Division of Dairying.

THE drought of 1951-52 had a twofold effect on the production of cheese. In the first place, milk supplies to the factories fell to a low level. Secondly, cheese factories were called upon for a time to supply milk to Brisbane and other centres to make up deficiencies from the market milk supply areas. Production reached the lowest level recorded since the industry has been of major importance in Queensland.

Although quality was somewhat lower than in the previous year, the results achieved, having regard to the abnormal conditions, may be regarded as reasonably satisfactory.

SUMMARY.

Cheese Production.

Cheese Manufactured	10,528,124 lb. (4,700 tons).
Cheese Graded	4,050,357 lb. = 38·5% of manufacture.

Manufacturing Data.

Yield of Cheese per 100 lb. Milk	10·01 lb.
Yield of Cheese per lb. Butterfat	2·73 lb.
Average Butterfat Test of Milk	3·69%

Gradings.

	lb.	%
Choice	22,047	·54
First	2,870,922	70·88
Second	1,120,454	27·66
Third	33,734	·83
Reject	3,200	·08

MANUFACTURE AND GRADINGS OF QUEENSLAND CHEESE FACTORIES FOR THE YEAR ENDED 30TH JUNE, 1952.

Factory.	Milk Used for Cheese-making.	Production and Yield.					Official Gradings.					
		Cheese Green Weight.	Butterfat.	Cheese Yield.		Average Test.	Total Submitted (lb.) and Percentage of Manufacture.	Choice.	First.	Second.	Third.	Reject.
				Per 100 lb. Milk.	Per lb. Butterfat.							
	lb.	lb.	lb.	lb.	lb.	%						
Biddeston	4,542,084	484,579	171,038	10·67	2·83	3·77	146,904	..	96,954	49,950	..	..
							30·3%	..	66·0%	34·0%	..	..
Coalstoun Lakes	1,823,205	192,471	71,040	10·56	2·71	3·9	28,484	..	..	28,484	..	..
							14·8%	..	..	..	..	..
Dare Bros. Pty., Daredale ..	566,725	51,121	20,127	9·02	2·54	3·55	40,525	..	..	37,798	2,727	..
							79·3%	..	..	93·27%	6·73%	..
Dare Bros. Pty. ,Woodleigh ..	869,713	80,329	31,841	9·24	2·52	3·66	56,989	..	16,589	34,483	5,277	640
							70·9%	..	29·11%	60·51%	9·26%	1·12%
Downs Association, Toowoomba	11,607,746	1,214,966	420,656	10·47	2·89	3·62	316,792	13,760	301,253	1,779	..	..
							26·1%	4·34%	95·09%	·56%	..	..
Dundarrah	707,138	72,938	27,772	10·31	2·63	3·93	4,654	..	..	4,654	..	..
							6·4%	..	..	..	..	..
Felton	2,991,453	305,872	111,548	10·22	2·74	3·73	84,472	..	74,546	12,926	..	..
							28·6%	..	85·22%	14·78%	..	..
Greenmount	1,852,509	196,838	68,670	10·63	2·87	3·71	3,640	..	..	3,640	..	..
							1·8%	..	..	..	..	..
Irongate	2,496,180	255,205	88,207	10·22	2·89	3·53	179,008	8,287	153,396	17,325	..	..
							70·1%	4·63%	85·69%	9·68%	..	..
Kooroongarra	1,402,834	129,515	48,236	9·23	2·69	3·44	126,155	..	98,640	27,515	..	..
							97·4%	..	78·19%	21·81%	..	..
Malling	3,826,829	353,041	134,997	9·23	2·62	3·53	No Gradings					
Maclagan Association, Maclagan	6,379,794	621,616	238,939	9·74	2·60	3·75	425,478	..	247,982	175,736	1,760	..
							68·4%	..	58·28%	41·3%	·41%	..
Maclagan Association, Kulpi ..	3,643,982	344,721	127,232	9·46	2·71	3·49	207,584	..	177,875	28,513	1,196	..
							60·2%	..	85·69%	13·74%	·57%	..
Maryborough Association, Tansey	4,324,543	425,246	177,566	9·83	2·39	4·11	4,068	..	4,068	..	..	..
							1%	..	..	..	..	..
Maxam Cheese Products, Cooranga North	3,937,238	402,654	153,425	10·23	2·62	3·9	190,660	..	138,013	45,542	5,985	1,120
							47·4%	..	72·39%	23·89%	3·14%	·59%
Maxam Cheese Products, Lilyvale	1,934,360	199,494	72,031	10·31	2·77	3·72	191,114	..	177,966	13,148	..	..
							95·8%	..	93·12%	6·88%	..	..
Moola	2,920,483	281,213	104,461	9·63	2·69	3·58	164,148	..	133,368	30,198	426	..
							58·4%	..	81·33%	18·41%	·26%	..
Mount Sibley	345,810	38,573	13,268	11·15	2·91	3·84	25,970	..	173	22,729	3,068	..
							67·3%	..	·67%	87·52%	11·81%	..
Mount Tyson	3,581,394	358,689	*131,142	10·02	2·74	3·66	21,396	..	18,042	3,354	..	..
							6·0%	..	84·32%	15·68%	..	..
Pittsworth Association, Pittsworth	6,736,730	690,240	251,452	10·25	2·75	3·73	196,236	..	186,222	10,014	..	..
							28·4%	..	94·9%	5·1%	..	..

Pittsworth Association, Linthorpe	1,305,747	135,466	48,644	10·37	2·78	3·73	124,358	..	41,651	82,707	..	..
							91·8%	..	33·49%	66·51%	..	..
Pittsworth Association, Yarranlea	1,502,984	145,551	53,931	9·68	2·70	3·59	61,246	..	17,014	43,377	855	..
							42·1%	..	27·78%	70·82%	1·4%	..
Port Curtis Association, Bracewell	1,757,770	184,964	66,645	10·52	2·78	3·79		No Gradings				
Q.A.H.S. and College, Lawes ..	43,140	4,525	1,774	10·49	2·55	4·11		No Gradings				
Quinalow	5,231,675	531,338	187,812	10·16	2·83	3·59		No Gradings				
Ramsay	527,535	50,020	18,641	9·48	2·68	3·53	59,670	..	..	59,670	..	..
							100·00%	..	..	..	..	..
Rockview	1,735,829	175,717	65,248	10·12	2·69	3·76	158,006	..	149,615	8,391	..	..
							89·9%	..	94·69%	5·31%	..	..
Rocky Creek	1,635,715	159,834	56,308	9·77	2·84	3·44	144,101	..	79,220	64,881	..	..
							90·2%	..	54·98%	45·02%	..	..
Southbrook	3,632,973	366,658	129,440	10·09	2·83	3·56	170,799	..	122,044	48,755	..	..
							46·6%	..	71·45%	28·55%	..	..
South Burnett Association, Murgon	n.a.	70,474	n.a.	..	..	..		No Gradings				
South Burnett Association, Goomeri	n.a.	297,685	n.a.	..	..	..	232,035	..	202,180	29,855	..	..
Sugarloaf	1,256,803	125,275	49,231	9·97	2·54	..	77·9%	..	87·13%	12·87%	..	..
						3·92	88,608	..	19,249	69,359	..	..
Sunnyvale	922,410	92,855	37,862	10·07	2·45		70·7%	..	21·72%	78·28%	..	..
						4·1	22,597	..	3,407	18,710	480	..
Warwick Association, Greymare..	877,350	84,804	32,320	9·67	2·62	3·68	24·3%	..	15·08%	82·8%	2·12%	..
Warwick Association, Talgai ..	376,292	38,250	*14,842	10·16	2·58	3·94		No Gradings				
Warwick Association, Victoria Hill	701,580	68,576	25,291	9·77	2·71	3·6		No Gradings				
Warwick Association, Mill Hill ..	8,289,281	854,650	309,368	10·31	2·76	3·73	292,229	..	288 165	4,064	..	..
							34·2%	..	98· 1%	1·39%	..	..
Yamsion	1,126,655	114,463	39,805	10·16	2·88	3·53	93,680	..	1 000	63,680	10,560	1,440
							81·8%	..	19·21%	67·98%	11·27%	1·54%
Yargullen	3,199,176	320,927	116,446	10·03	2·76	3·64	185,751	..	105,134	79,217	1,400	..
							57·9%	..	56·60%	42·65%	·75%	..

*Estimated

Queensland Butter Production, 1951-52.

Prepared by the Division of Dairying.

THE drought of 1951-52 had a very serious effect on dairy production in Queensland. Butter production was the lowest for many years and was even substantially below that of 1946-47, which also was a drought year.

The official gradings of butter show that quality was somewhat lower than in the previous year. This was caused largely by infrequent and irregular deliveries of cream to factories, which was brought about by the low volume of supplies. Most factories for a time received cream only twice a week. Inadequate farm water supplies also contributed to the poorer quality of cream reaching the factories.

SUMMARY.

Butter Production.

Butter Manufactured	62,385,094 lb. (27,850 tons)
Commercial Butter Equivalent of Cream Sold ..	248,326 lb. (111 tons)

Manufacture in Grades.

	lb.	%
Choice	44,353,502	71·10
First	16,317,434	26·16
Second	1,699,990	2·72
Pastry	14,168	·02
Total	62,385,094	100·00

Payment to Suppliers (in Grades).

(Including payment for cream sold as fresh cream.)

	lb.	%
Choice	40,653,129	64·93
First	20,446,701	32·66
Second	1,506,207	2·40
Pastry	6,355	0·01
Total	62,612,392	100·00

Official Grading.

(Submitted for grading—689,699 boxes of 1,114,020 boxes manufactured.)

Factory Grading.			Grading by State and Commonwealth Graders.				
Grade.	Boxes.	%	Choice.	First.	Second.	Pastry.	Prohibited From Export.*
			Boxes.	Boxes.	Boxes.	Boxes.	Boxes.
Choice ..	396,020	57·41	237,116	157,351	933	393	227
First ..	264,935	38·41	..	244,761	19,108	380	686
Second ..	28,532	4·14	..	..	21,187	6,971	374
Pastry ..	212	·03	..	..	..	212	..
Total ..	689,699		237,166 (34·4%)	402,112 (58·3%)	41,228 (6·0%)	7,956 (1·1%)	1,287 (0·2%)

* Does not include prohibitions for over-moisture, short-weight, bad finish, etc.

TABLE 1.
FACTORY PRODUCTION AND PAYMENTS, 1951–52.

Factory.	—	Manufacture and Payments.					Over-run.
		Total.	Choice.	First.	Second.	Pastry.	
		lb.	lb.	lb.	lb.	lb.	%
Atherton Tableland, Malanda ..	Make	1,815,604	1,815,604	..	..	..	..
	Pay	1,816,764	1,816,764	..	..	..	3·92
Caboolture Association, Caboolture ..	Make	1,769,058	1,629,451	139,607	..	..	..
	Pay	1,775,243	1,643,563	129,866	1,814	..	4·4
Caboolture Association, Eumundi ..	Make	1,373,058	1,229,306	143,752	..	..	..
	Pay	1,370,360	1,247,470	122,256	634	..	3·72
Caboolture Association, Pomona ..	Make	993,547	903,359	88,936	1,252	..	..
	Pay	993,341	945,757	47,064	520	..	3·57
Chinchilla	Make	1,139,679	569,543	467,152	93,688	9,296	..
	Pay	1,140,026	461,730	583,012	89,083	6,201	2·92
Daintree	Make	80,548	..	80,548	..	..	..
	Pay	80,548	..	80,548	..	..	3·66
Dayboro	Make	86,680	..	86,680	..	..	..
	Pay	95,695	94,727	968	..	..	..
Downs Association, Clifton	Make	795,648	547,344	245,672	2,632	..	..
	Pay	795,696	545,577	247,695	2,424	..	3·37
Downs Association, Crow's Nest ..	Make	918,904	456,680	462,168	56	..	..
	Pay	918,918	446,322	470,298	2,298	..	2·97
Downs Asssociation, Dalby	Make	1,190,110	752,078	417,200	20,832	..	..
	Pay	1,190,856	752,934	423,845	14,077	..	2·08
Downs Association, Goombungee ..	Make	1,070,104	794,080	276,024	..	..	..
	Pay	1,070,081	784,022	286,059	..	..	1·29
Downs Association, Jandowae ..	Make	1,137,974	576,854	496,552	64,568	..	..
	Pay	1,138,120	579,281	495,351	63,488	..	2·59
Downs Association, Miles	Make	391,180	132,888	190,652	67,640	..	..
	Pay	391,537	133,008	190,837	67,692	..	2·92
Downs Association, Toowoomba ..	Make	1,628,923	1,423,047	84,112	121,764	..	..
	Pay	1,725,671	1,525,905	83,269	116,497	..	2·87
Esk	Make	1,409,516	842,348	567,168	..	..	..
	Pay	1,409,757	788,098	617,815	3,844	..	3·55
Evelyn Tableland Association, Ravenshoe	Make	419,601	419,601	..	..	..	..
	Pay	420,082	419,985	17	80	..	4·31
Gayndah	Make	816,832	546,520	270,312	..	..	..
	Pay	816,516	556,165	260,145	206	..	4·42
Killarney	Make	1,057,258	856,050	170,296	30,912	..	..
	Pay	1,057,217	747,216	288,183	21,818	..	2·01
Logan and Albert Association, Beaudesert	Make	2,122,325	1,515,621	606,704	..	..	..
	Pay	2,122,083	1,560,564	559,662	1,857	..	3·38
Maleny	Make	1,800,634	1,688,466	112,168	..	..	..
	Pay	1,801,130	1,669,821	130,440	869	..	2·97
Maryborough Association, Biggenden	Make	929,771	481,899	446,248	1,624	..	..
	Pay	930,699	415,555	513,039	2,105	..	3·34
Maryborough Association, Kingaroy	Make	2,167,489	1,922,769	168,448	76,272	..	..
	Pay	2,166,687	1,741,821	369,664	55,202	..	4·51
Maryborough Association, Maryborough	Make	424,828	332,669	92,259	..	..	..
	Pay	421,061	298,640	121,774	647	..	5·32
Maryborough Association, Mundubbera	Make	1,461,530	809,806	596,004	55,720	..	..
	Pay	1,461,302	785,018	627,878	48,406	..	3·67
Maryborough Association, Wondai ..	Make	1,351,226	911,514	402,920	36,792	..	..
	Pay	1,354,279	912,486	416,949	24,844	..	3·08
Millaa Millaa	Make	829,008	829,008	..	..	..	..
	Pay	838,698	838,698	..	..	..	1·31
Millmerran	Make	640,382	332,758	257,040	59,584	..	..
	Pay	649,357	304,920	304,142	40,295	..	2·59
Nanango	Make	1,616,736	593,898	966,222	56,616	..	..
	Pay	1,616,847	586,636	985,425	44,786	..	1·98
Oakey	Make	2,360,780	1,917,428	355,768	87,584	..	..
	Pay	2,361,657	1,785,656	511,156	64,845	..	2·93
Port Curtis Association, Biloela ..	Make	2,276,273	2,143,945	126,112	5,432	784	..
	Pay	2,276,359	868,556	1,403,070	4,733	..	2·17
Port Curtis Association, Bundaberg ..	Make	958,418	277,384	681,034	..	..	..
	Pay	962,693	274,500	686,159	2,034	..	2·74
Port Curtis Association, Gladstone ..	Make	1,624,098	900,970	614,208	108,920	..	..
	Pay	1,642,119	432,154	1,116,302	93,663	..	2·83
Port Curtis Association, Mackay ..	Make	380,278	82,677	297,601	..	..	..
	Pay	384,432	85,041	294,363	5,028	..	2·29
Port Curtis Association, Monto ..	Make	1,969,277	1,535,746	425,656	7,875	..	..
	Pay	1,969,405	1,071,755	889,787	7,863	..	2·18
Port Curtis Association, Wowan ..	Make	1,382,415	1,229,031	148,400	952	4,032	..
	Pay	1,382,614	299,757	1,062,729	20,128	..	2·78
Q.A.H.S. and College, Lawes ..	Make	50,848	50,848	..	..	..	..
	Pay	50,820	43,473	5,445	1,902	..	1·87
Queensland Farmers Association, Boonah ..	Make	2,409,540	863,709	1,455,392	90,439	..	..
	Pay	2,409,618	781,270	1,558,468	69,880	..	3·15
Queensland Farmers Association, Booval	Make	1,795,747	1,240,853	384,260	170,578	56	..
	Pay	1,808,306	1,245,376	427,409	135,521	..	2·57
Queensland Farmers Association, Grantham	Make	1,469,332	513,969	951,443	3,920	..	..
	Pay	1,469,498	533,595	932,594	3,309	..	1·76
Queensland Farmers Association, Laidley	Make	1,258,532	659,348	566,477	32,707	..	..
	Pay	1,257,308	676,122	557,236	23,950	..	4·88
Queensland Farmers Association, Lowood	Make	467,283	124,632	338,514	4,137	..	..
	Pay	467,146	125,891	338,338	2,917	..	2·12

TABLE 1.—*continued.*

FACTORY PRODUCTION AND PAYMENTS, 1951–52.—*continued.*

Factory.	—	Manufacture and Payments.					Over-run.
		Total.	Choice.	First.	Second.	Pastry.	
		lb.	lb.	lb.	lb.	lb.	lb.
Roma	Make	261,394	..	261,394	..	..	..
	Pay	261,394	57,113	168,979	35,148	154	3·45
South Burnett Association, Murgon..	Make	1,385,212	1,071,108	289,968	24,136	..	..
	Pay	1,385,205	1,091,134	286,229	7,842	..	3·0
South Burnett Association, Proston ..	Make	755,216	605,360	148,736	1,120	..	..
	Pay	755,552	559,794	173,838	21,120	..	3·88
South Queensland Association, Kingston	Make	2,416,015	1,714,447	626,192	75,376	..	..
	Pay	2,469,940	1,686,236	715,798	67,906	..	3·17
Stanley River, Woodford	Make	802,025	665,597	136,428	..	..	..
	Pay	807,480	689,833	116,694	953	..	1·93
Warwick Association, Warwick ..	Make	837,625	813,756	8,512	15,357	..	..
	Pay	844,571	715,567	120,401	8,603	..	3·22
Warwick Association, Allora ..	Make	961,163	914,350	16,886	29,927	..	..
	Pay	961,145	851,865	82,098	27,182	..	2·91
Warwick Association, Inglewood ..	Make	221,479	211,140	8,659	1,680	..	..
	Pay	221,512	90,785	128,630	2,097	..	3·43
Warwick Association, Texas	Make	83,582	..	83,582	..	..	..
	Pay	83,552	..	83,552	..	..	2·54
Wide Bay Association, Cooroy ..	Make	880,027	634,635	216,552	28,840	..	..
	Pay	879,993	728,699	140,726	10,568	..	3·61
Wide Bay Association, Gympie ..	Make	3,931,382	3,269,408	340,816	321,158	..	..
	Pay	3,931,502	3,356,177	290,516	284,809	..	3·03

TABLE 2.

OFFICIAL GRADINGS, 1951–52.

Factory.	Boxes Submitted and Percentage of Make.	Grading.*					
			Choice.	First.	Second.	Pastry.	Prohibite Export.
Atherton Tableland, Malanda			No Butter Submitted for Grading				
Caboolture Association, Caboolture	12,071 38·2%	a	9,398 77·9%	2,673 22·1%	—	—	
		b	5,317 44·0%	6,545 54·2%	209 1·7%		
Caboolture Association, Eumundi	18,879 77%	a	16,386 86·8%	2,452 13·0%	41 ·2%		
		b	8,364 44·3%	9,236 48·9%	969 5·1%	115 ·7%	195 1·0%
Caboolture Association, Pomona	15,150 85·4%	a	13,134 86·7%	1,994 13·2%	—	—	
		b	5,102 33·7%	8,898 58·7%	897 5·9%	96 ·6%	157 1·0%
Chinchilla	9,730 47·8%	a	821 8·4%	6,940 71·3%	1,757 18·1%	212 2·2%	
		b	701 7·2%	5,551 57·1%	2,676 27·5%	802 8·2%	
Daintree			No Butter Submitted for Grading				
Dayboro	758 49·0%	a		758			
		b		590 77·8%	168 22·2%		
Downs Association, Clifton	10,900 76·7%	a	6,472 59·4%	4,381 40·2%	47 ·4%		
		b	4,927 45·2%	5,664 52·0%	262 2·4%	47 ·4%	
Downs Association, Crow's Nest	14,907 90·8%	a	6,697 44·9%	8,209 55·1%	1		
		b	5,060 33·9%	9,569 64·2%	278 1·8%		
Downs Association, Dalby	11,272 53·0%	a	3,505 31·1%	7,407 65·7%	360 3·2%		
		b	2,780 24·7%	7,971 70·7%	317 2·8%	204 1·8%	
Downs Association, Goombungee	13,179 69·0%	a	8,194 62·2%	4,895 37·1%	90 ·7%		
		b	4,248 32·2%	8,708 66·1%	223 1·7%		
Downs Association, Jandowae	18,058 88·9%	a	8,459 46·8%	8,523 47·2%	1,076 6·0%		
		b	7,450 41·3%	8,681 48·1%	1,524 8·4%	403 2·2%	

* a = grades into which the butter was manufactured and packed at the factory.
b = gradings by official State and Commonwealth graders.

TABLE 2.

OFFICIAL GRADINGS, 1951–52.

Factory.	Boxes Submitted and Percentage of Make.		Grading.*				
			Choice.	First.	Second.	Pastry.	Prohibited Export.
Downs Association, Miles	4,153 59·5%	a	104 2·5%	2,861 68·9%	1,188 28·6%		
		b	104 2·5%	2,357 36·8%	1,433 34·5%	259 6·2%	
Downs Association, Toowoomba	5,202 17·9%	a	1,689 32·5%	1,509 29·0%	2,004 38·5%		
		b	1,500 29·0%	1,698 32·6%	1,903 36·6%	101 1·9%	
Esk	22,135 87·9%	a	12,172 55·0%	9,963 45·0%			
		b	4,776 21·6%	17,276 78·0%	83 ·4%		
Evelyn Tableland Association, Ravenshoe			No Butter Submitted for Grading				
Gayndah	12,482 85·6%	a	7,740 62·0%	4,742 38·0%			
		b	4,200 33·6%	7,410 59·4%	857 6·9%	2	13 ·1%
Killarney	5,311 28·1%	a	1,886 35·5%	2,967 55·9%	458 8·6%		
		b	1,638 30·8%	3,182 59·9%	348 6·6%	143 2·7%	
Logan and Albert Association, Beaudesert	34,556 91·2%	a	23,662 68·5%	10,881 31·5%	13		
		b	11,298 32·7%	22,519 65·2%	591 1·7%	13	135 ·4%
Maleny	27,401 85·2%	a	25,422 92·8%	1,979 7·2%			
		b	15,562 56·8%	11,652 42·5%	187 ·7%		
Maryborough Association, Biggenden	10,169 61·2%	a	2,042 20·1%	8,098 79·6%	29 ·3%		
		b	1,136 11·2%	7,495 73·7%	1,245 12·2%	153 1·5%	140 1·4%
Maryborough Association, Kingaroy	7,197 18·6%	a	2,701 37·5%	3,163 43·9%	1,333 18·5%		
		b	2,135 29·7%	3,729 51·8%	921 12·8%	412 5·7%	
Maryborough Association, Maryborough	1,232 16·2%	a		1,232			
		b		983 79·8%	249 20·2%		
Maryborough Association, Mundubbera	20,270 77·7%	a	8,739 43·1%	10,541 52·0%	990 4·9%		
		b	5,161 25·5%	14,119 69·7%	659 3·3%	207 1·0%	124 ·6%
Maryborough Association, Wondai	12,612 52·3%	a	4,956 39·3%	6,974 55·3%	682 5·4%		
		b	3,082 24·4%	7,974 63·2%	1,250 1·0%	306 ·2%	
Millmerran	7,633 65·8%	a	2,224 29·1%	4,406 57·7%	1,003 13·1%		
		b	881 11·5%	5,348 70·1%	834 10·9%	570 7·5%	
Nanango	25,897 89·7%	a	8,148 31·5%	16,784 64·8%	965 3·7%		
		b	3,487 13·5%	19,283 74·5%	2,703 10·4%	306 1·2%	118 ·5%
Oakey	35,879 85·1%	a	27,963 77·9%	6,352 17·7%	1,564 4·4%		
		b	15,693 43·7%	18,465 51·5%	1,569 4·4%	152 ·4%	
Port Curtis Association, Biloela	20,769 51·1%	a	18,909 91·0%	1,763 8·5%	97 ·5%		
		b	14,540 70·0%	5,876 28·3%	198 1·0%	70 ·3%	85 ·4%
Port Curtis Association, Bundaberg	7,078 41·4%	a		7,078			
		b		7,078			
Port Curtis Association, Gladstone	16,747 57·7%	a	4,058 24·2%	10,913 65·2%	1,776 10·6%		
		b	1,931 11·5%	11,735 70·1%	2,600 15·5%	394 2·4%	87 ·5%
Port Curtis Association, Mackay			No Butter Submitted for Grading				

* a = grades into which the butter was manufactured and packed at the factory.
b = gradings by official State and Commonwealth graders.

TABLE 2.

OFFICIAL GRADINGS, 1951–52.

Factory.	Boxes Submitted and Percentage of Make.		Grading.* Choice.	First.	Second.	Pastry.	Prohibited Export.
Port Curtis Association, Monto	23,650 67·3%	a	16,648 70·4%	6,887 29·1%	115 ·5%		
		b	14,738 62·3%	8,729 36·9%	183 ·8%		
Port Curtis Association, Wowan	4,965 20·1%	a	2,715 54·7%	2,233 45·0%	17 ·3%		
		b	2,015 40·6%	2,880 58·0%	70 1·4%		
Q.A.H.S. College, Lawes			No Butter Submitted for Grading				
Queensland Farmers Association, Boonah	39,368 91·5%	a	12,274 31·2%	25,500 64·8%	1,594 4·0%		
		b	7,137 18·1%	30,457 77·4%	1,514 3·8%	260 ·7%	
Queensland Farmers Association, Booval	9,797 30·6%	a	138 1·4%	6,772 69·1%	2,887 29·5%		
		b	90 ·9%	6,539 66·7%	725 7·4%	105 1·1%	
Queensland Farmers Association, Grantham	22,504 85·8%	a	6,028 26·8%	16,406 72·9%	70 ·3%		
		b	750 3·3%	20,619 91·7%	1,135 5·0%		
Queensland Farmers Association, Laidley	19,592 87·2%	a	9,271 47·3%	9,762 49·8%	559 2·9%		
		b	3,487 17·8%	15,173 77·4%	716 3·7%	216 1·1%	
Queensland Farmers Association, Lowood	7,030 84·2%	a	868 12·3%	6,096 86·7%	66 ·9%		
		b	270 3·8%	6,447 91·7%	274 3·9%	39 ·6%	
Roma			No Butter Submitted for Grading				
South Burnett Association, Murgon	21,133 85·4%	a	15,742 74·5%	5,001 23·7%	390 1·8%		
		b	4,308 20·4%	15,460 73·2%	1,165 5·5%	200 ·9%	
South Burnett Association, Proston	12,465 92·4%	a	10,044 80·6%	2,421 19·4%			
		b	6,406 51·4%	5,109 41·0%	517 4·1%	433 3·5%	
South Queensland Association, Kingston	41,806 96·9%	a	29,634 70·9%	10,862 26·0%	1,310 3·1%		
		b	27,324 65·4%	13,172 31·5%	1,272 3·0%	38 ·1%	
Stanley River Association, Woodford	11,323 79·1%	a	8,971 79·2%	2,352 20·8%			
		b	2,518 22·2%	8,624 76·1%	181 1·6%		
Warwick Association, Allora	2,272 13·2%	a	1,440 63·4%	310 13·6%	522 23·0%		
		b	— —	1,440 63·4%	700 30·8%	132 5·8%	
Warwick Association, Inglewood	206 5·2%	a	— —	176 85·4%	30 14·6%		
		b	— —	— —	176 85·4%	30 14·6%	
Warwick Association, Texas			No Butter Submitted for Grading				
Warwick Association, Warwick	1,270 8·5%	a	858 67·6%	136 10·7%	276 21·7%		
		b	— —	899 70·8%	326 25·7%	45 3·5%	
Wide Bay Association, Cooroy	13,355 85·0%	a	8,907 66·7%	3,933 29·4%	515 3·9%		
		b	3,581 26·8%	8,557 64·1%	1,032 7·7%	165 1·2%	20 ·2%
Wide Bay Association, Gympie	58,310 83·1%	a	47,001 80·6%	5,650 9·7%	5,659 9·7%		
		b	33,419 57·3%	18,415 31·6%	5,450 9·3%	918 1·6%	108 ·2%

* a=grades into which the butter was manufactured and packed at the factory.
b=gradings by official State and Commonwealth graders.

The Dairying Industry on the Atherton Tableland.

W. F. MAWSON, Adviser in Cattle Husbandry.

THIS article is an account of the dairying industry within the shires of Atherton and Eacham, on the Atherton Tableland in North Queensland (Plate 1). These shires are separated from the coastal plain by the Bellenden Ker Range and bounded on the west by the Great Dividing Range. They embrace the greater portion of the Tableland which forms the hinterland of the coastal area between Innisfail and Cairns, and are located between 17° and 18° south latitude and 145° and 146° east longitude at an elevation of between 2,000 ft. and 3,000 ft. above sea level.

The Tableland runs roughly parallel to the coastline and narrows as it extends northwards to a point about 40 miles from the coast. The shires of Atherton and Eacham embrace the main dairying lands north of Mackay, although the districts of Evelyn and Ravenshoe, in the adjoining Herberton shire, are important dairying areas and smaller centres occur at Julatten, north-west of Mareeba, and on the Daintree River 70 miles north of Cairns.

An area of 680 square miles is included within Atherton and Eacham shires and it supports a population of about 9,000 people. The main centres included are Atherton, Malanda, Millaa Millaa, Yungaburra, Peeramon, Tolga, Kairi, Kulara, Topaz, Butcher's Creek, Jaggan, Minbun, Tarzali, Barrine, North Johnstone, Danbulla, East Barron and Upper Barron.

Dairying began about the beginning of this century when men and their cattle from the North Coast of New South Wales arrived by boat. The first butter factory was established near Atherton, but was abandoned in 1923 when its branch factory at Malanda became the main factory of the Atherton Tableland Co-operative Butter Association Limited. A factory was opened at Millaa Millaa in 1930.

In addition to manufacturing butter, these two factories supply wholemilk to areas as far south as Townsville and as far west as Mount Isa. In normal seasons, some of the butter manufactured is exported. Sales of butter and wholemilk amount to over £500,000 annually.

Three other organisations transport wholemilk to Cairns, the milk being picked up at the farms and either taken direct to Cairns or pre-treated at a depot on the Tableland.

The area is served by a rail connection with Cairns. One line extends through Atherton into the adjoining shire of Herberton to terminate at Ravenshoe. A branch line from Tolga passes through Kairi, Kulara, Yungaburra, Peeramon, Malanda, Tarzali and Minbun to terminate at Millaa Millaa. Both passenger rail motors and goods trains provide regular services.

There are three main highways, mainly bitumen-sealed, to the coast. One via Kuranda is the shortest route from Cairns to Atherton (62 miles). The Gillies Highway runs from Gordonvale to Yungaburra, and the Palmerston Highway connects Innisfail with Millaa Millaa.

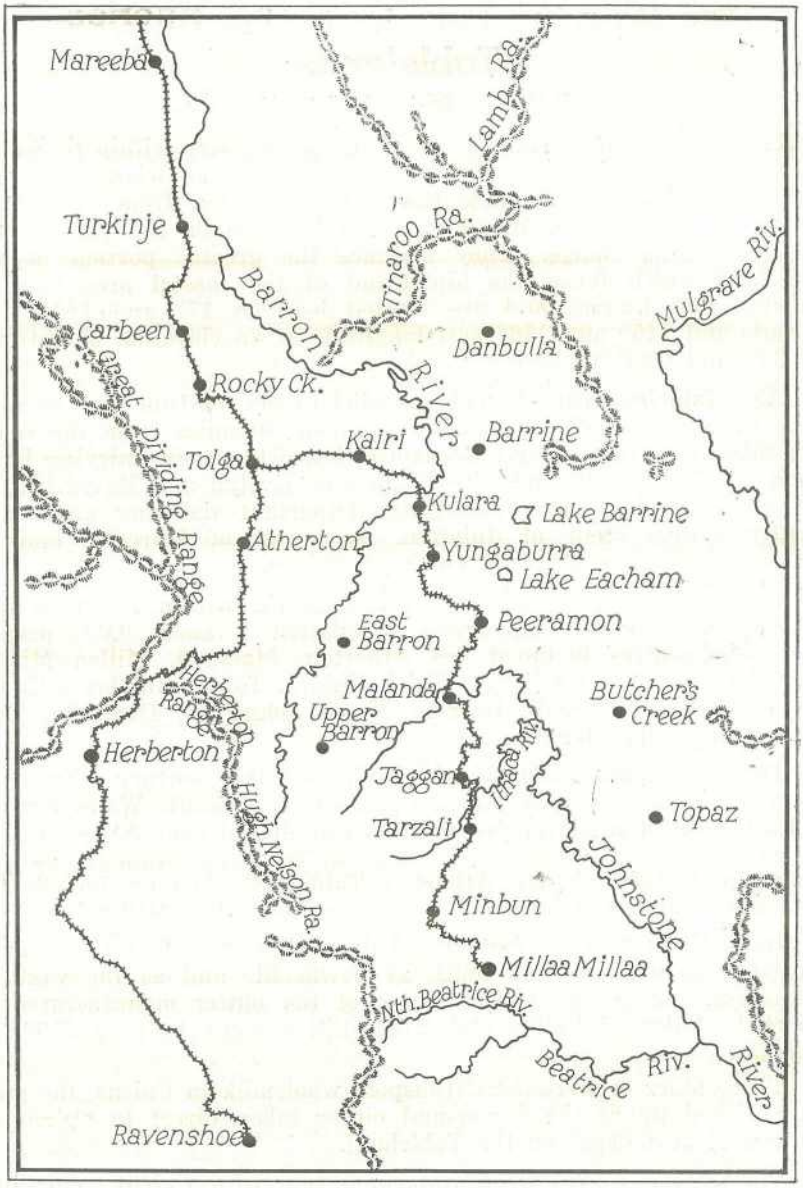


Plate 1.

Sketch Map of the Atherton Tableland.

The Tableland itself is well served by a network of roads, many of which are of bitumen and few of which ever become impassable after rain.

TOPOGRAPHY.

Quite a contrast is presented by the topography of the country. Along the southern and eastern fringes around Millaa Millaa, Butcher's Creek and Topaz, the land is generally hilly and broken by many

streams (Plates 2 and 3). Such land is unsuitable for cultivation because of the frequency of heavy storms. This area is the highest and coldest, the altitude ranging from 2,500 ft. to 3,000 ft. It is almost exclusively dairying land.

Proceeding northward, a gradual change occurs until Malanda is reached. There is an area of undulating land around Malanda (Plate 4) and appreciable areas can be cultivated. Streams are not so numerous and the altitude is 2,200-2,400 ft. This is primarily a dairy-farming area with a little maize-growing on the northern fringe.

Plate 2.
A Dairy Farm in the Millaa Millaa District.

Plate 3.
The Herd and Buildings on a Millaa Millaa Dairy Farm.

Another type of land is seen in the area between Atherton, Kulara, Kairi and Tolga, where the country has a very gentle slope (Plate 5). The elevation remains in the 2,000-2,400 ft. range. This is a concentrated maize-growing area.

Plate 4.

A Dairy Farm in the Malanda District.

Plate 5.

Maize Stubble on a Kairi District Farm. The stubble is being cleaned up by dairy cows.

Because of the loose nature of the soil and the heavy storms which are prevalent during early summer, the cropping of slopes above 6% requires great care if soil erosion is to be avoided. Land with a slope greater than 10% should not be ploughed and cropped, since bare soil is in danger of being eroded. In general, therefore, it can be said that the topography of the land prevents crop cultivation in the Millaa Millaa-Topaz area, permits a limited amount in the Malanda-Yungaburra-Peeramon area, and is favourable for intensive cultivation in the Atherton-Tolga-Kairi triangle. The area between the Barron River on the east and the Great Dividing Range on the west contains the bulk of the most suitable agricultural land within the two shires.

A feature of the area is the splendid network of streams on the southern end. There is a shortage of small permanent streams on the northern fringe, although this portion is served by the Barron River.

There are two main river systems and one smaller one. The Barron River rises in the Herberton ranges and flows northwards until it turns abruptly in an easterly direction as it leaves the Tableland. A comparatively small area in the Topaz district is drained by the Russell River. The central and southern portions are drained by the Ithaca, Beatrice and North Beatrice Rivers, Dirran Creek, and other small, permanently flowing streams which run into the North Johnstone.

CLIMATE.

Temperature.

The tropical situation is influenced by the elevation and the result is a climate without extremes of heat and cold. Temperature readings are available for Atherton only, and the average minimum and maximum readings for the past four years are given in Plate 6. This shows that the average maximum of 82.5° is reached in December/January and that for six months of the year the maximum exceeds 80°. A temperature of 100° is rarely recorded. The average minimum temperature in the coldest month (August) is 50°.

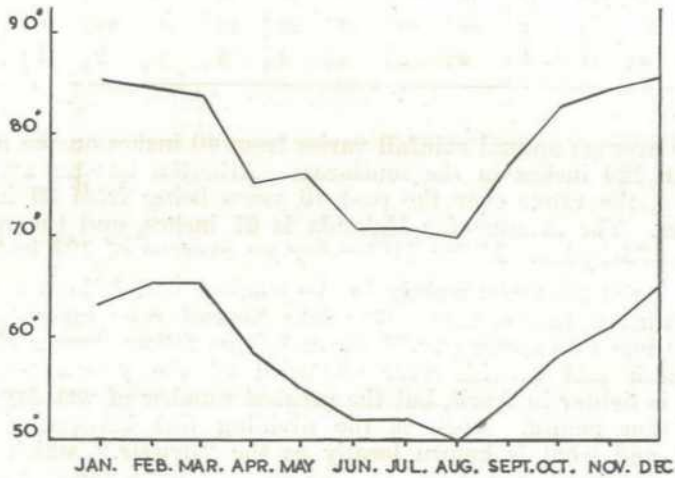


Plate 6.

Graph Showing the Average Maximum and Minimum Monthly Temperatures for Atherton, 1947-50.

Frosts are occasionally recorded in lowlying spots in the Atherton area. Southward and eastward from Atherton, frosts are more common, while the maximum temperatures also tend to be lower. Heat comparable to that of the adjacent coast is seldom experienced, and even in midsummer the night temperatures are not uncomfortably high.

Rainfall.

Rainfall data for the years 1935-1950 are summarised in Table 1.

TABLE I.

RAINFALL DATA FOR THREE ATHERTON TABLELAND CENTRES.

—	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
ATHERTON.													
Aver. Rain	964	1,545	1,267	450	256	218	154	100	104	98	328	659	6,105
Max. Rain	1,941	2,956	2,332	1,328	507	470	344	499	248	257	787	2,389	8,982
Min Rain	433	365	131	79	11	25	22	0	0	8	37	89	3,896
Av. Wet Days	14	17	16	14	12	10	10	6	6	5	7	10	
Max. Wet Days	22	21	22	24	20	17	16	16	11	8	11	21	
Min. Wet Days	5	13	5	5	1	3	1	0	0	1	4	4	
MILLAA MILLAA.													
Aver. Rain	1,408	2,002	2,208	1,121	716	575	480	341	309	252	454	738	10,597
Max. Rain	2,465	3,434	4,288	2,723	1,413	1,173	946	1,154	735	932	1,081	2,967	15,446
Min. Rain	225	817	506	165	78	107	142	4	0	0	135	47	6,744
Av. Wet Days	15	17	19	18	16	14	12	9	7	7	9	9	
Max. Wet Days	21	23	27	30	29	26	24	18	13	14	14	18	
Min. Wet Days	4	9	5	5	3	4	7	1	0	0	3	3	
MALANDA.													
Aver. Rain	971	1,589	1,425	635	317	284	192	171	131	112	309	624	7,347
Max. Rain	1,862	2,394	2,952	1,576	607	615	383	563	257	257	769	2,527	9,613
Min. Rain	222	364	257	188	33	66	18	11	3	14	60	86	4,479
Av. Wet Days	17	20	19	18	15	14	13	10	9	8	10	13	
Max. Wet Days	23	28	27	28	26	23	23	22	21	16	16	23	
Min. Wet Days	9	11	3	6	2	4	4	0	1	2	4	5	

The average annual rainfall varies from 40 inches on the northern fringe to 120 inches in the south-east. Atherton has an average of 62 inches, the range over the past 16 years being from 39 inches to 90 inches. The average for Malanda is 67 inches, and the range 44 inches to 96 inches. Millaa Millaa has an average of 108 inches.

The rainfall occurs mainly in the summer and follows a pattern. Storm rains usually commence in late November or early December and continue into January. Monsoonal rains follow during February and March and provide over one-third of the year's total. The rainfall is lighter in April, but the greatest number of wet days occurs during that month. April is the dividing line between the "wet season" and what is known locally as the "drizzle," which extends through May into June and is characterised by a large number of wet days without much effective rain. The "drizzle" is heaviest and most prolonged on the south-eastern fringe and gradually tapers off towards the north.

Sporadic rain occurs during the period July to November, which represents the "dry season." Rainless months recorded on the Tableland include August and September at Atherton, August at Malanda, and September and October at Millaa Millaa.

Atherton usually experiences earlier storms, but the wet season rainfall is lighter and terminates earlier than in the Millaa Millaa area. The average number of wet days per annum during recent years was 129 at Atherton (range 81 to 157) and 165 at Malanda (range 99 to 220).

Despite the moderate to high average annual rainfalls experienced, there is often a shortage of soil moisture from July to November.

Humidity.

Humidity gradually rises during November with the approach of the storms and continues to be high until the end of the "drizzle," usually in June. There is then a sharp drop in humidity, and crisp, clear mornings followed by bright sunny days are the general rule during the winter months.

SOILS.

The predominant soil type is a red volcanic clay loam of basaltic origin; there are smaller areas of lighter-coloured soil derived from granites and schists. There are sharp differences in soil fertility even within a small area, and it is not uncommon to find two or three different soil types within the boundaries of one holding.

The soils can be roughly divided into "scrub" and "forest" soils according to the nature of the original vegetation. "Scrub" refers to the dense growth of tropical softwoods and hardwoods, accompanied by smaller shrubs and vines. "Forest" is characterised by hardwoods without dense undergrowth and with some native grasses in evidence.

All scrub soils are red basaltic clay loams, of great depth, quite porous and originally very fertile. The original fertility is quickly lost unless proper measures of pasture management are undertaken. Scrub soils occur in the higher rainfall areas of 50 inches and over.

Forest soils vary from light red to sandy and are generally located in the drier areas and on the fringe of the shires—for example, at Danbulla, Kulara and Barrine. These soils are not so fertile as scrub soils but generally have a more retentive subsoil and will hold moisture for a longer period.

VEGETATION.

Some of the finest cabinet timbers in Australia—including red cedar, black walnut and maple—were to be found in the original scrub, but most of these have now been removed.

The main forest species comprise bloodwood, yellow stringybark, grey box and ironbark and form an open woodland. Kangaroo grass (*Themeda australis*), forest blue grass (*Bothriochloa intermedia*), Queensland blue grass (*Dichanthium sericeum*), spear grasses (species of *Stipa* and *Heteropogon*), love grasses (species of *Eragrostis*), three awned spear grasses (species of *Aristida*), and wild sorghum (*Sorghum plumosum*) are the main native grasses. Three varieties of lantana are to be found under natural conditions, usually along creek banks.

Blady grass (*Imperata cylindrica* var. *major*) also occupies a portion of the forest country under natural conditions, together with bracken fern (*Pteridium aquilinum*). The native grasses provide bulky grazing during the wet season but usually dry out to become quite brittle during late winter and spring.

Following the removal of the natural vegetation, various grasses have been established. Kikuyu grass predominates in the wetter areas to the south and east, although there are some areas of paspalum and some of molasses grass. White clover has been successfully incorporated in the pasture on a few farms. Paspalum is the main pasture species in the Malanda district and is the sole constituent of the pasture on a large portion of this area. Further north, in the drier areas around Kairi, and on forest soils, paspalum gives way to Rhodes grass and some of the native species. A little green panic (*Panicum maximum* var. *trichoglume*) has been sown; this grass appears to be both more palatable and more nutritious than Rhodes grass.

TYPES OF DAIRYING.

With the exception of one or two small dairies which supply wholemilk to towns, dairying is of two types. In one type, cream only is supplied to a butter factory and the skim-milk is utilised on the farm as a feed for calves and pigs. In the second type, both wholemilk and cream are supplied, the quantities varying according to the demand for wholemilk. Normally, during the flush of the season wholemilk is taken in the morning only on two or three days a week. As the supply decreases, the milk is taken more frequently until it is being taken on six mornings a week. Since farmers supplying wholemilk and cream usually rear their heifer calves and run pigs, some supplementary feeding is necessary for these stock. Difficulties in providing feed for calves and pigs are sometimes experienced when the farmer cannot accurately forecast the amount of skim-milk he will have available. For this reason, some men prefer to supply cream and feed more pigs at less cost.

Some dairymen on the Tableland supply wholemilk to a milk products company in Cairns and on occasions this company is willing to take the whole day's supply provided it can be picked up in one trip. To meet this demand, these suppliers are installing refrigeration plants in which the night's milk is held prior to delivery next morning. Should this trend develop, these farmers will probably cease to raise pigs and use calf meals and limited wholemilk feeding in order to raise their heifers for herd replacements.

Apart from stud cattle, very few male calves are reared on the farms. Progressive dairymen have found that pig-raising is more profitable and does not involve the use of so much land. Many good-framed A.I.S. calves are sold weekly for slaughter at a price usually between £1 10s. and £2. Where farmers who supply cream only have a paddock which cannot be used for dairy cows, a profitable sideline can be built up by purchasing these week-old calves.

No cheese is manufactured in North Queensland.

SIDELINES ASSOCIATED WITH DAIRYING.

Pig-raising is the almost universal sideline to dairying and the industry is well developed. There is a co-operative bacon factory situated at Mareeba, and the Northern Pig Marketing Board controls the marketing of all pigs in the area. In the shires of Atherton and Eacham, two factors have had a retarding influence on expansion since the end of the war. One is the increasing quantities of wholemilk which are being marketed; the other is the very high price of maize. During the year 1950-51, a total of 13,985 pigs was purchased by the Marketing Board, and of these 8,154 went to the bacon factory. It can be said that at present prices a well-managed piggery is a profitable sideline. The main breeds used are Large White, Berkshire and crosses between the two. It is likely that pasture will play an increasingly important part in providing feed for the pig-raising industry.

Maize-growing is an important sideline in the area which embraces Atherton, Tolga, Kairi, Danbulla, East Barron and portion of Upper Barron. Many holdings in this area are purely maize farms. Dairying as a sideline to maize-growing is conducted on some farms, and as the topography and rainfall become limiting factors to maize-growing, maize becomes a sideline to dairying.

More maize farmers are turning to dairying as a means of combating the bad effects of monoculture. Without the use of green manures and fertilizers, yields are falling, and farmers are finding that by sowing a pasture or lucerne (where suitable) and running a few dairy cows to utilise this growth they are maintaining their income without depleting soil fertility. With proper utilisation of animal manure it may be expected that soil fertility will gradually be built up and the farmer assured of a reasonably good living. He is also in a far more secure position to meet adverse conditions, such as falling prices and unfavourable seasons.

In the area around Rocky Creek and Carbeen, and in other small areas, peanut-growing is a very useful sideline. Being a legume, the peanut has the advantage of increasing the nitrogen content of the soil. The tops may be utilised as roughage for the dairy herd.

Vegetable-growing is becoming an increasingly popular sideline where irrigation can be practised. At certain times of the year there is a good demand from coastal towns for beans, peas, potatoes and other vegetables. In the drier part of the Tableland where irrigation and labour are available there is room for expansion of vegetable production. Flower production for Cairns and Innisfail is another avenue capable of being exploited.

In areas which roughly correspond with the maize areas there are possibilities for lucerne-growing on a commercial scale, but irrigation and suitable machinery are essential. The small quantity of locally-grown lucerne hay which is available is inadequate. Allowing for some losses on account of bad haymaking weather in summer, an acre of lucerne should yield four tons per year.

Poultry provide another avenue of income which is not inconsiderable. Eggs not required for local trade on the Tableland can be sold in Cairns.

SIZE OF FARM.

The information given in Table 2 has been compiled from returns made by farmers.

TABLE 2.

FARM SIZE AND CARRYING CAPACITY.

District.	Total Area.	Average Area.	No. of Farms.	Total No. of Animals.	Average No. of Animals.	Acres Per Animal.
	acres.	acres.				
Atherton	27,671	208	133	6,574	49	4·2
Malanda	45,433	228	199	13,809	69	3·3
Millaa Millaa	30,081	228	132	9,357	71	3·3
Yungaburra	17,307	219	79	5,088	64	3·4
Total or Average	120,492	222	543	34,828	64	3·5

When the Atherton returns are subdivided into purely dairy farms and dairying plus maize farms, the comparison is as follows:—

—	No. of Farms.	Area (acres).	Average Area.	Average No. of Animals.	Acres per Animal.
Dairying only	83	16,629	200	51	3·9
Dairying + Maize	50	11,042	221	47	4·7

Table 2 shows that the average farm size in the Yungaburra district is less than that in the Millaa Millaa district. However, many properties in the latter district still carry some areas of scrub, which means that the effective acreage is considerably less than that shown. Most of the properties in the Yungaburra area are cleared and the whole area is available for grazing. It is generally considered that land in the Millaa Millaa area has a higher carrying capacity than land in the Yungaburra district.

Stock numbers embrace cattle of all ages, plus horses. The average milking herd comprises roughly two-thirds of the total number of animals.

FARM PRODUCTION.

The output of dairy produce per farm varies greatly and depends on many factors, such as fertility of the soil, quality of the stock, ability of the farmer, and amount and incidence of rainfall. Production figures for four individual farms are as follows:—

No. 1.

Millaa Millaa area. Paspalum and kikuyu pastures. No cultivation, but limited feeding of concentrates.
Area—246 acres.
Total milking herd—58.
Production—5,509 lb. commercial butter and 10,617 gallons wholemilk.

No. 2.

Malanda area. Mainly paspalum pasture. Herd provided with some oat grazing and limited concentrate feeding.
Area—360 acres.
Total milking herd—61.
Production—5,982 lb. commercial butter and 11,511 gallons wholemilk.

No. 3.

Millaa Millaa. Paspalum, kikuyu and clover pasture; practically no supplementary feeding.

Area—210 acres.

Total milking herd—56.

Production—8,047 lb. commercial butter and 13,150 gallons wholemilk.

No. 4.

Malanda area. Paspalum and molasses grass. Cultivation areas being developed. Limited hand-feeding.

Area—236 acres.

Total milking herd—53.

Production—2,672 lb. commercial butter and 7,345 gallons wholemilk.

The first three farms are above average, while the fourth is in the process of being developed in respect of both the herd and the farm and is probably below average.

While there are many herds which yield much more heavily, the average annual production of all cows milked is about 160 lb. commercial butter. Over the total farm acreage the average butter production would be about 35 lb. per acre. The best farms can double that figure, while those at the bottom of the list are scarcely worth the title of dairy farm.

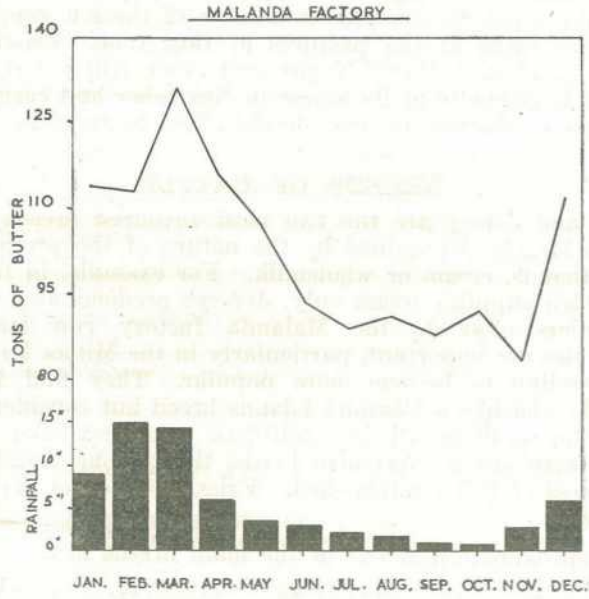


Plate 11.

Graph Showing the Relationship Between Rainfall and Butter Production at the Malanda Factory.

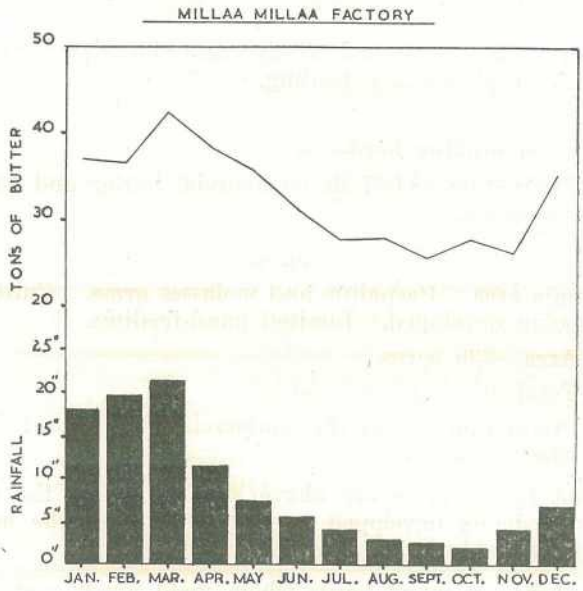


Plate 12.

Graph Showing the Relationship Between Rainfall and Butter Production at the Millaa Millaa Factory.

A good idea of the seasonal production can be gained from the graphs of monthly production of the two factories (Plates 11 and 12). In the drier northern end of the Eacham shire, production during the months of August to October is very low unless extensive hand-feeding is practised. This is because of the low rainfall and the low nutritive value of the pastures at that time. Production from farms in the Millaa Millaa, Topaz and Glen Allyn areas is not so variable; it is normally at its lowest in November and early December. The seasonal production is very closely allied to rainfall.

BREEDS OF CATTLE.

A.I.S. and Jersey are the two most favoured breeds; the choice of breed is largely determined by the nature of the product which is supplied—that is, cream or wholemilk. For example, in the Danbulla district, which supplies cream only, Jerseys predominate, while wholemilk suppliers close to the Malanda factory run mainly A.I.S. Guernseys also are important, particularly in the Millaa Millaa district, and are tending to become more popular. They find favour with those people who like a Channel Islands breed but consider the Jersey to be a little small for their conditions. An occasional Ayrshire is used, but there are no Ayrshire herds, though one Ayrshire stud is in the process of being established. Friesians are not represented on the Tableland.

The approximate numbers of the main breeds are:—

A.I.S.	18,000
Jersey	15,000
Guernsey	2,000

HUSBANDRY METHODS.

Herd Management.

The general practice is to have cows calving in the second half of the year. This enables advantage to be taken of the lush pastures which are usually evident from December to June. An analysis of data from group herd recording from 1948 to 1950 made by the Department's Herd Recording Section shows that seven-eighths of the total number of cows freshened in the period July to January. The average yield of these cows was 166 lb. butterfat. This is in marked contrast with the yield of 107 lb. butterfat which was made by the cows which calved from February to June. While these figures give a general picture of the best calving months, it does not necessarily follow that good production cannot be obtained all the year round. Production is largely a matter of what feed is available to the cow. Except on highly developed farms of good soil in very favourable areas, the cost of production during the winter months is considerably greater than during the summer because of the necessity for supplementary feeding. However, considering the all-the-year-round demand for milk and the increased winter price which operates from April 1 each year, added to the fact that some skim-milk is available for pig-feeding, some farmers believe that it is a sound policy to calve cows all the year round.

One other factor which operates against seasonal calving is the lack of a bull paddock on many farms. It is highly desirable that the bull be contained in a special paddock and the cows taken to him for service. By this means a good check can be kept on breeding records, health of the herd, and season of calving. The bull will also work more effectively and is not so likely to be injured in fights with other bulls.

Farmers in herd recording units have the opportunity of proving their sires by recording their daughters. The main problem here is to keep a bull until such time as the production of a sufficient number of daughters becomes known without recourse to inbreeding. Those with herds large enough to warrant the use of two bulls can avoid close breeding by using one bull on the daughters of the other. Another device is to use a bull for one season, then lease it to another farmer; sometimes bulls are exchanged between farmers. On other occasions a bull may be sold with the option of re-purchase within a specified time, though some men do not like to bring a bull back into a herd from elsewhere for fear of introducing disease.

Husbandry methods adopted for the purpose of controlling diseases and pests include vaccination of calves with strain 19 vaccine, control of ticks and buffalo fly by the use of insecticides, routine drenching of calves with phenothiazine, and the testing of milk-supply herds for tuberculosis. Footrot, milk fever and calving paralysis are by no means uncommon, and a temporary sterility often shows up in herds.

Dehorning is not practised to any great extent, although those farmers with dehorned herds consider the operation worthwhile.

"Steaming-up" of cows prior to calving is not generally in vogue, but many farmers aim to have their cows in a handy paddock as the day of calving approaches.

Nutrition of the Herd.

Pasture is the basis of feeding, the main pasture plants being paspalum and kikuyu grasses, followed by molasses grass (Plate 7), Rhodes grass (Plate 8) and common Guinea grass. Lack of a pasture legume is a severe handicap, though white clover grows fairly well in isolated areas. Some farmers have shown that subdivision into smaller areas, rotational grazing, frequent harrowing of pastures to spread the manure, distribution of manure from the bails, and the use of the mowing machine are valuable aids in pasture improvement.

In many areas on the northern end of the Tableland, pastures deteriorate very quickly from July to November and in this period it is important that some other form of feed be available. Silage is the most suitable. Though the amount of labour involved in

Plate 7.

Molasses Grass on a Dairy Farm in the Millaa Millaa District. This stand was established on a scrub burn eight years previously and has been maintained in good condition by careful management.

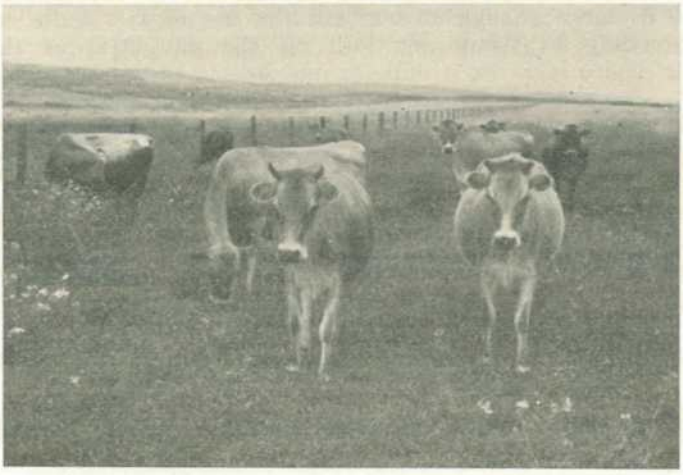


Plate 8.

Dairy Cows Leaving a Mixed Lucerne and Rhodes Grass Pasture on a Kairi District Property.

making and feeding this material is a handicap, there are now a couple of mechanical harvesters available in the district. Most silos in the district are of the underground circular type with a concrete collar to prevent the top from falling in.

Crops which can be grown for silage include maize, sorghum, millets and Sudan grass. The incorporation of a legume such as cowpea or Mauritius bean improves the feeding value of the silage. If sown with the main crop, these legumes render harvesting rather difficult, and for this reason separate plantings may be desirable. It is probable that some lucerne silage will be made as the area under lucerne expands.

A popular method of providing roughage is to plant a paddock of cowcane or elephant grass. The former stands for long periods in the paddock, and although it becomes fibrous it still supplies a large quantity of roughage. A good crop of cowcane should yield about 30 tons of green feed per acre. Cowcane is best fed chaffed to the cows in stalls.

Elephant grass has a higher feeding value than cowcane but becomes very fibrous if allowed to grow too tall. It gives a good bulk of feed and comes away quickly after cutting provided it receives plenty of farmyard manure. Like cowcane, it should be cut with a cane knife and put through a chaffcutter before being fed to stock; otherwise wastage occurs.

In most years a small area of cowcane and elephant grass would supply sufficient roughage to carry the stock over a dry season. A pit of silage should also be retained as an insurance against drought.

Peanut straw is becoming available in increasing quantities and is eagerly sought by dairymen who have no conserved fodder. The quality varies considerably according to the amount of leaf retained on the plant and the number of nuts which have escaped the threshing machine. A hammer-mill is sometimes used to convert the straw into a meal, which is quite palatable. A little cowpea and other leguminous straw is also available from those farms in the north which produce green manure seeds.

High grain prices over the last few years have made farmers reluctant to feed grain to stock, but on some mixed farms the whole cob is put through a grinder to produce a cob and corn meal. This meal is rather low in protein, and best results are usually obtained by adding meatmeal to give a concentrate mixture of 18-20% protein.

Molasses has usually been readily available and is fed almost universally, often all the year round. Farmers claim that the feeding of molasses brings the cows to the bails at milking time, keeps them contented in the bails and has a desirable medicinal effect.

Farmers who are short of roughage in winter and spring sometimes obtain peanut hulls from the Peanut Marketing Board's depot and feed them with molasses; this feed has a low value.

A small quantity of wet brewers' grains is transported from the brewery at Cairns; it is a useful feed, though it can be stored for only a few days.

A phosphorus deficiency exists in some herds, and many farmers aim to meet the mineral needs of their stock by providing a lick of salt and bonemeal. No definite cases of deficiencies of other minerals have been found in milking cows.

Breeding Policies.

Breeding policies are of two classes—stud-breeding and commercial breeding. Stud-breeders generally are adopting a policy of either out-crossing or wide line-breeding. Where more than one herd sire is maintained, it is not unusual to find that the sires in use are from different studs and unrelated. The more progressive men are beginning to recognise and build up cow families, and it is expected that they will in time breed their own sires to a much greater extent than at present.

The commercial herds generally are being graded-up by the use of purebred bulls. Less cross-breeding is in evidence now than has been the case in the past. Guernseys have been crossed with Jerseys in order to build up the frame of the latter, but this cross appears to be losing popularity. Some Guernsey x A.I.S. crossing has been done and the first-cross appears to be above the average as a producer. The second generation is often disappointing and generally the policy of grading-up is accepted and practised. A number of commercial herds are headed by sires purchased in other parts of Queensland, but local breeders have supplied the bulk of the sires.

Calf-raising Methods.

Milk and pasture provide the basic foods for calves. The quantity and type of milk depend on the particular type of dairying.

Farmers supplying cream only usually allow calves some whole-milk up to the age of three weeks to one month and then feed on all skim-milk. Some allow the calves access to molasses and others add watered molasses to the milk. Grazing areas are sometimes too small for the number of calves which are being reared, with the result that calves often suffer from internal parasites. In other instances the calves have the run of the farm after they reach the age of two months. The provision of proper grazing areas for calves to permit grazing on the rotational system is worthy of more widespread adoption.

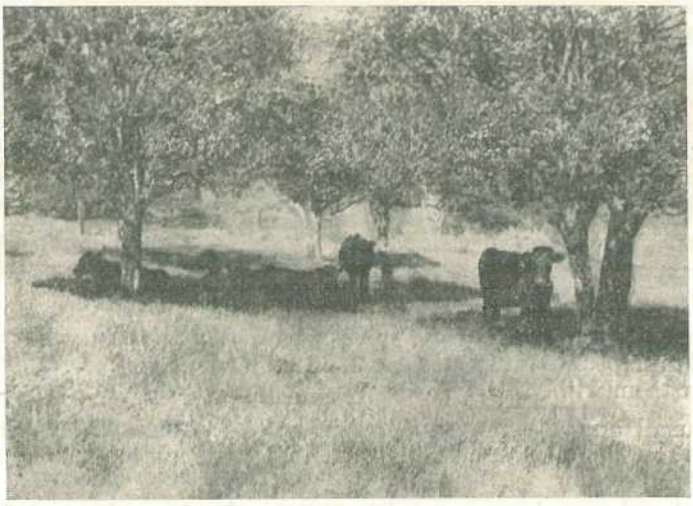


Plate 9.
A Well-shaded Calf Paddock in the Moreqatta District.

Wholemilk suppliers usually send only the morning's milk and separate the afternoon's supply. Some retain sufficient of the skim-milk from the afternoon to feed the calves next morning. Others feed their calves on skim-milk in the afternoon only when no separating is done in the morning. In all cases, wholemilk suppliers tend to give calves some wholemilk up to the age of two months, by which time they have had a good start. Calf meals are not used to a great extent, but are likely to become more popular.

Care of calves after weaning is often unsatisfactory and the period from weaning to the advent of the summer storms is a critical one. Too often calves which have consumed gallons of valuable wholemilk are put away in a back paddock after weaning and fail to maintain their growth rate. This results either in undersized cows (if they freshen at the normal age of 2-2¼ years) or else a delay in producing the first calf. This could be obviated in most cases by feed of better quality or a little supplementary feed at the critical age.

Most farmers retain only sufficient heifer calves for their own herd replacement and the remainder are sold as vealers at a couple of weeks of age. A recent check has shown that heifer calves comprise 28% of the total calves sold for veal. Stud-breeders usually rear all heifer calves, for which there is a ready sale.

Very few farmers adopt the practice of dehorning calves despite its obvious advantages.

WEEDS.

Because of the favourable climatic and soil conditions, many aggressive weeds occur on farms in the district.

The main weeds of pastures are lantana, wild tree tobacco, bracken fern, wild raspberry, inkweed, arsenic bush, blady grass, mat grasses, sour grass and Parramatta grass.

Cultivation weeds include wild hop, stinking roger, crowfoot grass, couch grass, star burr, purple top, blue top, cobbler's pegs, wild radish, wild turnip and Mexican poppy. Land which is taken out of cultivation and put down to pasture often becomes infested with crowfoot grass, Mossman burr, blue top, stinking roger, common sida, wild radish, wild turnip and Mexican poppy.

Pastures newly sown on burnt scrub land usually have to compete with lantana, wild tree tobacco, wild raspberry, inkweed and arsenic bush, and control measures should be adopted. Established pastures become weed-infested mainly because of declining soil fertility and overgrazing. Mat and sour grasses are spreading in the Millaa Millaa area in particular, while in the northern portion blady grass and Parramatta grass are common pasture weeds.

Wild turnip and wild radish can be troublesome in winter-growing grazing crops such as wheat, oats and barley (which are grown to a slight extent in the district), not only as competitors of the crop but also as milk and cream tainters. On cultivated farms, stinking roger may cause a weed taint which is difficult to remove.

The main poisonous plants encountered in the area are bracken fern, lantana, balloon cotton bush, red-headed cotton bush, poison peach, zamia palm, arsenic bush and Johnson grass. Young cattle (often calves on the bucket), hungry stock and stock new to a property are most likely to suffer from plant poisoning.

FARM WATER SUPPLY.

At the southern end of the area, water from the network of streams is the source of the farm supply and is obtained by hydraulic ram where the layout is suitable. Where a ram cannot be operated efficiently, recourse is made to pumping. Pumps powered by a motor engine are the most numerous, followed by windmills and finally electrically-driven units.

In the Tolga-Kairi area to the north, suitable streams are not available to many farms and the necessary water has to be obtained by means of a bore and windmill. Very little water is available at depths less than 100 feet and often it is necessary to go much deeper in order to get a good supply.

STUD-BREEDING ACTIVITIES.

During the war, registrations of stud cattle were discontinued by some stud-breeders and in some instances men are members of a breed society without actually being engaged in stud-breeding. There are 27 stud-breeders still operating, most of them on a restricted scale. There are 12 A.I.S., 11 Jersey, three Guernsey and one Ayrshire studs. There is a fair demand for sires from local dairymen, but few stud-breeders are prepared to rear bull calves without having definite orders for them.

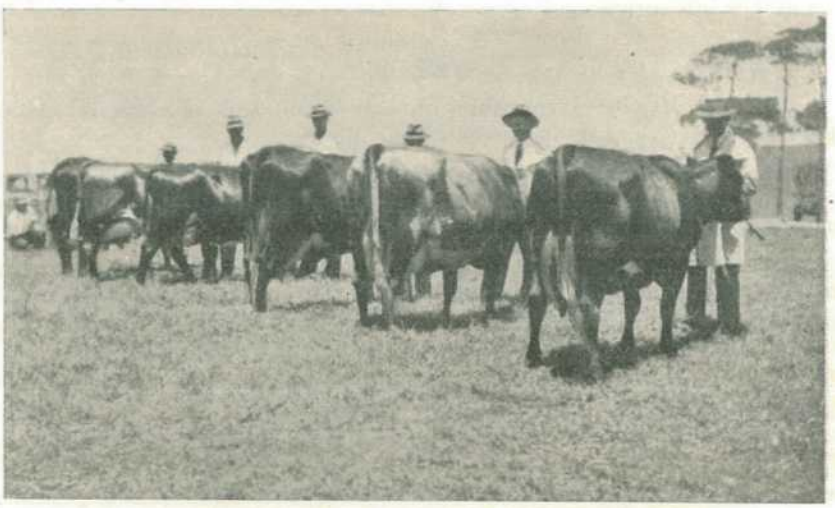


Plate 10.
Cows Lined Up for Judging at the Millaa Millaa Show.

Every active stud is headed by a bull from southern Queensland or New South Wales, and blood-lines of well-known families are found in all breeds. In many cases neither effort nor money has been spared in obtaining high-class cattle, and there are now some very good stud cattle in the district.

Stud-breeding policy generally is to breed from one line of cattle with an occasional outcross. No intensive line-breeding is being deliberately followed yet.

HERD RECORDING UNITS.

Four herd recording units of 18-20 herds each operated in the district during 1952 under the Department's herd recording scheme. The average production of herds in three units for the year ended September 30, 1951, was as follows:—

Unit.	Average Milk Yield.	Average Butterfat Test.	Average Butterfat Yield.	Length of Lactation Period.
	lb.	%	lb.	days
Millaa Millaa	4,112	4·5	186	226
Malanda No. 1	4,493	4·3	195	222
Malanda No. 2	5,279	3·9	208	211

PRESENT TRENDS.

During the past few years there has been a reduction in the number of dairymen in the area. However, in some cases two farms have been amalgamated, with the result that loss in production has not been marked. There are some dairying properties which are now used for grazing beef cattle, but it is considered unlikely that this trend will continue. In fact, it would not be surprising if dairying were resumed on most of these areas.

There is an increasing demand for wholemilk, and with the improved transport facilities which are being provided it is likely that considerable expansion of wholemilk production will occur. The installation of dairy refrigerators on farms, which is steadily proceeding, will enable more farmers to send their total supply as wholemilk.

Increasing thought is being given to fodder conservation in order to maintain production over the period of the year when pastures are generally inadequate. The irrigation of pastures is one avenue which may be expanded where conditions are favourable. Lucerne is being grown by more farmers each season.

There is little doubt that the area generally is well suited to dairying, but it has to be recognised that more fodder conservation is essential if the industry and the district are to continue in a prosperous condition.

The areas suitable for dairying are fairly closely settled and there is not much scope for further subdivision of holdings. Much of the area is held in freehold tenure; the remainder, apart from State forests, is held under various forms of Crown leases.

Cottage Cheese.

Prepared by Officers of the Division of Dairying.

EARLY attempts to manufacture cottage cheese in Queensland were along lines laid down by standard text books on the subject from overseas countries, but the resultant product was unsuitable for the trade. This necessitated lengthy experiments before a suitable article was produced, and a number of wide variations from the usual methods were brought forward.

Experimental work was originally carried out at the Pittsworth Cheese Factory by Mr. R. Duncan, and to him goes the credit of producing an article suitable for the particular trade for which it was manufactured. It was found that the process of manufacture could vary from day to day, and to extremes unknown in normal cheddar cheese manufacture. The individual skill of the operator is of prime importance, and he must know the exact procedure to adopt to produce the type of cheese required. This knowledge can only be gained from experience and from a careful study of the effects of varying temperatures and acidities on the body, texture, and flavour of the cheese.

The following is an account of the process of cottage cheesemaking at present being employed in Queensland.

COTTAGE CHEESE AS MADE IN QUEENSLAND.

Cottage cheese is made from pasteurised skim-milk. The usual practice is to pasteurise the wholemilk at a temperature of 156-160°F. as it is received (high temperature-short time (H.T.S.T.) pasteurisation) and then cool to 98-100°F. prior to separation. The separated milk is run straight into the making vat at a temperature of 94-96°F., at which it is maintained during the ripening period.

Ripening.

The percentage of starter culture required depends on the initial acidity of the skim-milk, the ripening temperatures used, and the time of the year; it varies from 5% to 15%. The starter is added to the vat; the milk is stirred for a few minutes, then covered and allowed to ripen. In from 4 to 6 hours from the time the starter is added the milk should have coagulated and show an acidity of from ·75% to ·85%. If the temperature has not dropped too low, the curd should be ready to work at this stage. At some times of the year and under certain weather conditions it is necessary to use a higher temperature during ripening in order to obtain the desired firmness of the curd at the time of coagulation.

Cutting or Breaking the Curd.

The usual practice in Queensland is to break up the coagulum by hand, as it is held that the loss of curd in the whey is too great when the curd is cut with ordinary curd knives. However, if knives are used with the blades or wires set ¾ in. apart (twice the normal distance apart), a much more even size of curd particle is obtained than when hand-breaking is employed, and losses are not great. The curd is gently stirred by hand after breaking or cutting, as mechanical agitators are too severe and cause the curd to become too firm and harsh, as well as increasing the loss of curd in the whey.

Cooking.

The batch is slowly heated (or cooked) at the rate of ·5°F. per minute, increasing the temperature to 104°F. or higher. The temperature and period of time depend on: (*a*) the rate of acid development during ripening; (*b*) the acidity at the time of breaking; and (*c*) the body and texture of the curd. The faster the rate of acid development and the higher the acidity at the time of breaking, the higher the temperature employed and the quicker it is raised. If the body of the curd is inclined to be weak, then a longer cooking time will be employed. The body and texture of the cheese must be closely checked at this stage, the best method for doing this being to place a handful of curd in cold water, this bringing about rapid cooling and giving an indication of what the resultant cheese will be like. If the batch is ready to whey off, the curd will be firm without being tough and will crumble readily in the hands, and the curd particles will not have soft centres.

Wheying-off.

The whole of the curd is drawn back to the top end of the vat and allowed to settle. This can best be done with curd rakes and draining boards, and care must be taken not to break up the curd lumps and so increase losses in the whey. As wheying-off is progressing, drains are made in the centre and sides of the curd to speed up the process. The whey at this stage should be clear and show an acidity of from ·60% to ·70%, depending on the acidity of the bulk at the time of breaking of the curd. The curd is then allowed to drain for 5-10 minutes until most of the whey has escaped.

Cooling.

When the curd has reached the desired stage of firmness at wheying-off, the temperature of the curd is still within a few degrees of the cooking temperature. If the curd is allowed to remain at this temperature for any great length of time it will result in too much firming-up of the cheese. For this reason, cooling should be carried out as soon as possible after the bulk of the whey has escaped from the curd particles. The cheese is spread evenly over the bottom of the vat and cold water allowed to run through the vat. After a few minutes, the draining tap is shut and cold water added to the vat until the curd is completely covered. The curd is left in this water for 10-20 minutes, after which the water is drained off. The temperature of the water should be as low as possible.

Salting.

When draining is completed the cheese is salted at the rate of 10-20 oz. per 100 lb. of cheese. A soft curd requires more salt than a firm curd, while the tastes of consumers have also to be considered. The salt is spread evenly over the cheese, the cheese being then packed into suitable containers for transport to the consumers. It is advisable to hold the containers (usually cans) in a refrigerated room until the cheese is consumed, as low temperatures retard bacterial development and deterioration of quality.

Yield.

The yield of cheese is usually 130-140 lb. per 100 gallons of skim-milk treated.

General Remarks.

Cottage cheese has a higher moisture content than ordinary hard types of cheese, and for this reason even more care than usual must be taken to see that all equipment used is thoroughly cleaned and sterilized.

In addition to this, the following rules must be observed:—

(1) Carefully control the H.T.S.T. pasteurising temperature to the limits of 156-160°F. With all of the equipment in a clean and sterile condition, the destruction of bacteria at this temperature will be quite satisfactory, while temperatures in excess of 160°F. are likely to cause difficulty in obtaining a firm curd during manufacture.

(2) It is imperative to use a pure starter culture to give clean acid development. A contaminated starter culture will result in unclean and "off" flavours in the resultant product.

(3) The quality of the water used for cooling the curd must be beyond question. Contaminated water supplies may cause offensive flavours in the cheese.

COMMON DEFECTS IN COTTAGE CHEESE.

(1) *Weak and Mushy Body.*—This is due to too high a moisture content in the cottage cheese brought about by the following:—(*a*) cooking at too low a temperature; (*b*) cooking too rapidly after cutting or breaking the curd; this hardens the outsides of the curd particles and seals the moisture in.

(2) *Dry, Harsh Body.*—The following are the chief causes of this defect:—(*a*) too high a cooking temperature, which results in too much moisture being driven out of the curd and the curd being firmed-up too much; (*b*) too long a cooking period, which gives the same result as in (*a*); (*c*) excessive, or too vigorous, stirring of the curd.

(3) *Sour, Overacid Flavour.*—This is usually allied with weak and mushy body and is exaggerated by the following:—(*a*) too rapid ripening (too much starter) or too high an acidity at breaking or cutting; (*b*) not allowing the whey to drain completely from the curd at wheying-off; (*c*) cooling water added to curd too soon, which firms the curd particles and prevents the complete escape of the whey.

Although cottage cheese is not in general use in Australia as a foodstuff, there is some demand for it in certain localities. Its manufacture serves a very useful purpose in as much as the cream is available for manufacture into butter and the skim milk is utilised for cottage cheese, thus giving the factory a worthwhile return. This kind of cheese is used as a savoury. It blends well with salads, but can also be served as a sweet in conjunction with stewed fruits, &c., and provides a valuable source of readily available proteins. It does not possess what is regarded as normal cheese flavour but has a pleasant, clean, acidic flavour.

Modern Milking Methods.

W. C. T. MAJOR, Dairy Technologist, Division of Dairying.

IN recent years research workers have revealed the intricate physiological mechanisms of the secretion and let-down of milk. A simple outline of these findings, and their application to the art of milking, should help farmers to understand modern milking methods.

Structure of the Udder.

The udder of the cow consists of four separate quarters. The diagram in Plate 1 will assist an understanding of its structure.

Each quarter of the udder contains:—

1. *Teat.*—The teat is closed at its lower end by a *sphincter muscle,* which prevents milk flowing from the udder, and restricts the entry into the udder of foreign bodies, including bacteria. The teat surrounds the *teat cistern* and communicates with the exterior via the *streak canal.*

2. *Milk Cistern.*—This is a small reservoir within the udder. It opens into the teat cistern.

3. *Milk Ducts.*—The milk ducts permeate the tissue of the udder. They open into the milk cistern.

4. *Alveoli.*—These are tiny, cell-lined sacs at the apex of the ducts. The transformation from blood plasma to milk occurs within the cells lining the alveoli.

5. *Blood Vessels, Muscles, Nerves.*—The tissue of the udder and teats is well supplied with blood vessels, muscles and nerves.

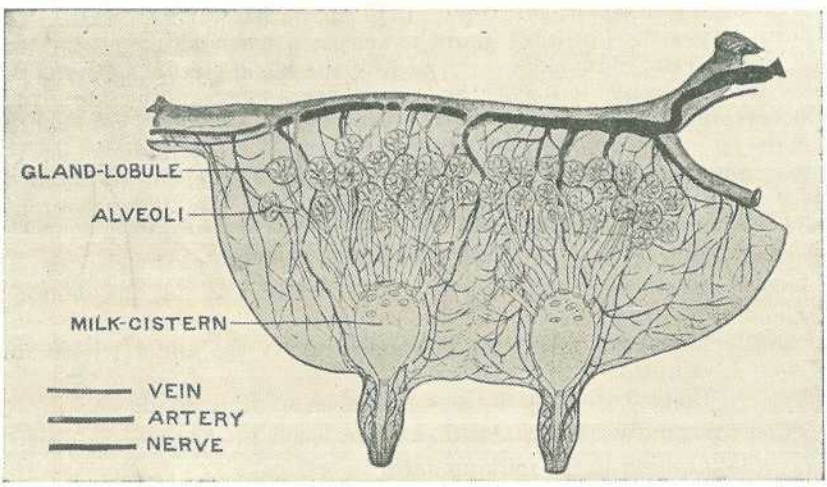


Plate 1.

Diagram of Section Through the Udder.

Secretion of Milk.

Substances digested from the cow's food supply are conveyed to the udder by the blood stream. Selected substances pass into the cells lining the alveoli, and are there manufactured into milk. This milk is secreted into the space within the alveoli. Milk first collects in the alveoli and then passes down the ducts into the udder and teat cisterns.

Not many years ago it was widely believed that milk secretion only occurred during milking. It has now been demonstrated that it takes place over a much longer period. The rate of secretion is influenced by the pressure developed within the udder. During milking the pressure within the udder falls and secretion commences. It continues until sufficient pressure develops within the udder to stop secretion. In normal, well-fed cows approximately eight hours elapse from the commencement of secretion until the rate of secretion commences to decrease considerably. However, it may be 14 hours before secretion apparently ceases—unless milk is removed from the udder during this interval.

Because of the influence of pressure on the rate of secretion, it is possible to increase the yield of heavy-producing cows by milking them three times a day. This increase may be as large as 15% of the twice-a-day yield when the cows are fed to the limit of their capacity. Regularly spaced milking intervals will also increase yields, irrespective of whether the cows are milked twice or three times per day. Milking at regular intervals is also desirable to obtain milk of uniform composition and particularly to avoid low-fat milk at certain seasons of the year with some breeds of heavy-milking dairy cattle.

Milk Let-Down.

Milk let-down, unlike secretion, is not a continuous process, but only occurs as the result of stimulation. The sucking of her calf is the strongest milk let-down stimulus a cow can receive. In normal milking this stimulus is best provided by adequately washing the cow's teats and udder with warm water (120°F.).

Stimulation of the nerve endings in the cow's teat causes an impulse to be transmitted to the pituitary gland at the base of the brain. This impulse causes the pituitary gland to release a hormone (oxytocin) into the blood stream. Oxytocin is carried by the blood stream to the udder, where it causes contraction of the muscle fibres surrounding the alveoli, thus developing additional pressure within the udder. It takes about 45 seconds from the stimulation of the teats until milk let-down occurs. Active muscular contraction persists for approximately six minutes. The bulk of the milk within the udder is held in the spongy secreting tissue and is most difficult to remove unless the tiny muscles permeating the tissue squeeze it out. It is therefore important to:—

(1) Commence milking one minute after washing the teats and udder.

(2) Milk fast enough to effectively empty the udder within four minutes.

Plate 2 illustrates the mechanism of milk let-down.

Cows normally associate with milking such actions as—

(1) Coming to the milking shed.

(2) The normal sounds of the shed.

(3) The milking routine.

In so doing cows develop a conditioned reflex, or habit, which stimulates milk let-down. Thus, cows with unwashed teats and udders can be trained to let down their milk. However, let-down due to habit alone is neither as definite nor as persistent as let-down due to habit supplemented by a warm udder wash. Correct stimulation permits more milk to be removed from the udder. It also permits milk to be removed more quickly.

Cows are susceptible to stimulation by hormones other than oxytocin and some have an important bearing on milking. For instance, fear, anger and frustration cause the suprarenal glands to secrete adrenalin into the blood stream. Adrenalin prevents contraction of the muscle fibres within the udder and so inhibits milk let-down by counteracting the effect of oxytocin. Therefore, handle cows quietly. Never excite them.

Thus, for complete milking, it is necessary to have:—

(1) A complete absence of counter stimuli, such as fear, anger, frustration and excitement.

(2) A definite udder and teat stimulation—preferably by a warm wash.

(3) Rapid removal of milk from the udder while the let-down stimulation still strongly persists.

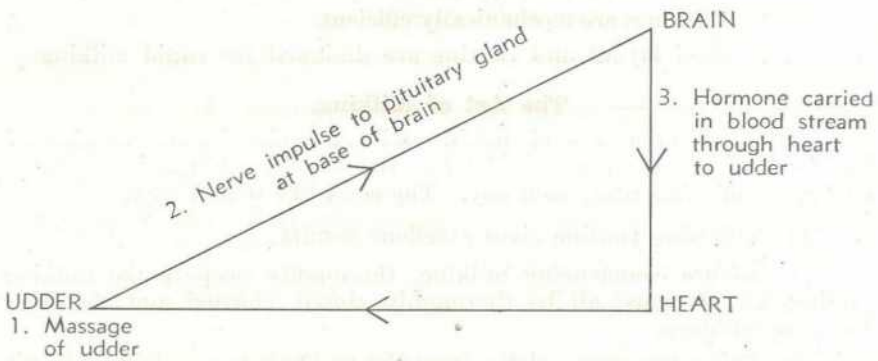


Plate 2.

Diagram of the Mechanisation of Milk Let-Down.

Hand-Milking.

During hand-milking the upper portion of the teat cistern is closed by the pressure of the hand. As the hand closes, the milk so trapped in the teat cistern is forced to issue from the teat. The pressure developed within the udder by secretion and muscular contraction causes milk to flow into the teat cistern as soon as the hand releases the teat. Hand-milking results in an intermittent flow of milk from two teats at a time.

Few milkers have either the ability or the endurance to consistently remove milk from cows quickly enough to completely empty the udder before the effect of the let-down stimulation has markedly decreased. With hand-milking, the milker is the limiting factor in milk removal—not the cow.

Machine-Milking.

Milk is removed from the cow by suction during machine-milking. There is sufficient difference in pressure between the interior of the milking-machine cups and the interior of the udder to permit an almost continuous flow of milk from each teat.

The effect of squeeze-and-release induced by the pulsator is to massage the teat in order to maintain blood circulation in the teat and so avoid congestion and discomfort. Unless the squeeze interval is

long enough to retard milk flow (as may occur with slack, soft inflations), the rate of squeeze to release has little effect on the rate of milking. The effective flow of air through the milking machine influences the rate of milking more than any other factor—provided the machine is otherwise operating efficiently. Effective air flow is influenced by—

(1) Capacity and efficiency of the vacuum pump.

(2) Leaking joints, flaps and poorly seated pulsators.

(3) Sensitivity of the relief valve.

(4) Cleanliness of the air admission hole.

Provided that milking machines are in good mechanical condition, the cow, rather than the machine, is the limiting factor in the rate of machine-milking. Thus, for efficient machine-milking, it is important that—

(1) Cows are properly prepared.

(2) Machines are mechanically efficient.

(3) Shed layout and routine are designed for rapid milking.

The Art of Milking.

Cows are creatures of habit, and regularity in the routine of milking and feeding pays dividends. Do the same things, in the same order, at the same time, each day. The cows like it that way.

The following routine gives excellent results:—

(1) Before commencing milking, thoroughly prepare the milking equipment. It must all be thoroughly rinsed, cleaned and sterilized between milkings.

(2) Bring the cows quietly from the paddock to the dairy. Don't use savage dogs, whips or other harsh treatment. Well-trained cows do not require to be driven to the dairy.

(3) Milk the cows at regular intervals. This will increase production, and help to overcome low-fat problems which some milk suppliers experience during certain seasons of the year.

(4) At the yards provide drinking water, shade and protection from prevailing winds.

(5) Provide yards of adequate size to comfortably hold the cows. Dehorning makes cows quieter and reduces distress—especially of heifers.

(6) Train the cows to pass quietly through the yards and shed. This means more milk and less labour. Gentle handling, rapid milking, and feeding after milking will assist training. The well-trained cow regards milking as a pleasure. She comes into the bail of her own accord. She does not foul the bail. Cleaning problems are simplified and the dust menace is reduced.

(7) As the cows come into the shed they are bailed-up and legroped where necessary. Both operations can be dispensed with when the cows are well-trained. This not only reduces labour, but also simplifies milk-quality problems by avoiding potent sources of contamination.

(8) Wash the hands thoroughly before commencing to milk the herd and rinse them before milking each cow.

(9) When the cow comes into the bail, thoroughly wash and dry her teats and udder, using warm water and a clean cloth. It is an advantage to use a hypochlorite disinfectant in the water. As the disinfectant action of hypochlorites is rapidly destroyed by organic matter, it is necessary to renew the solution during milking. Teats must be thoroughly dried—otherwise a drop forms on the sphincter muscle, thus localising contamination at the very spot where it is least desirable.

(10) As soon as washing and drying are complete, take a few squirts from each teat into a strip cup. Examine for abnormalities. If abnormal, the cow should be held back until last and hand-milked.

(11) Place the cups on the cow's teats one minute after commencing to wash her teats and udder. This is important for rapid milking.

(12) As milk is removed from the udder there is a tendency for the cups to creep upwards on the teats. This closes off the teat cistern from the udder cistern and stops the removal of milk from the udder. It also causes the delicate inner lining of the cistern to rub on itself. This may result in an injury which permits bacteria to enter and cause mastitis.

When the cups creep—gently pull them down.

(13) As soon as active milk flow ceases (as indicated by the sight glass and the appearance and feel of the udder), *bear down gently on the cups.* Frequently milk flow becomes active again for a short time. Remove the cups as soon as this flow slows down. Never leave the cups on a cow after a free flow of milk has ceased. Leaving the cups on too long trains the cow to develop sluggish milking habits, which will decrease her yield and increase the cost of milking.

(14) After milking each cow, dip the cups in clean water and then in strong chlorinated water. This is particularly important where mastitis is troublesome. Never knowingly place cups on any quarter affected with mastitis.

(15) Then place the cups on the next freshly prepared cow. This routine is carried on until all of the cows have been milked.

(16) Start the separator at such a stage during milking that separation is almost completed when the last cow is finished milking. Separate to a fat content of not less than 34% in winter and 38% in summer. This has an important influence on cream quality as well as transport costs. Do not separate cream to contain more than 42% fat—very-high-fat creams mean high fat losses.

(17) As soon as practicable after milking, rinse the milking machine and all utensils with clean water. Then proceed with cleaning and sterilization.

(18) Clean up the manure, sweep and hose the shed floors and leave everything clean, neat and tidy for the subsequent milking.

(19) After milking feed the cows in clean, detached feeding stalls. The amount and nature of their supplementary feed depend on—

(*a*) Productive capacity of the cow.

(*b*) Nature and amount of the feed available in the paddock.

(*c*) Relative prices of feed and dairy produce.

Machine-Stripping.

The majority of cows can be trained to milk out completely in 3 to 4 minutes and to maintain production without hand stripping.

The advantages of machine-stripping are—

1. A very definite labour saving.
2. Faster milking; that is, more cows can be milked in a given time.
3. Milking becomes more attractive to labour.

Machine-stripping causes no loss of production and drying-off is not accelerated. It has also been claimed that machine-stripping leads to improved milk quality and lowered incidence of mastitis.

Cows must be trained to machine-stripping methods. This training involves:—

1. Adherence to the modern milking methods already outlined. Cows must be efficiently milked before machine-stripping is attempted.

2. Remove the cups 4 minutes after milking has commenced (or earlier if free flow ceases). Hand strip to determine the amount of strippings.

3. For several milkings remove the cups as soon as free flow of milk ceases. Bear down on cups for a few seconds before removal. *Do not hand strip.*

4. Then determine the amount of stripping recovered. It will be found that some cows have not milked out completely. These cows require further training. Treat them as follows:—

   (*a*) Very thoroughly wash and massage the teats and udder before milking is commenced.

   (*b*) Massage the udder gently during the last 2 minutes of milking.

   (*c*) Gently bear down on the cups during the last minute.

5. Check the effect of this treatment on the amount of milk remaining in the udder by hand stripping at weekly intervals. As soon as practicable progressively reduce the amount of udder massage and the duration of bearing down on the cups.

By these methods more than 80% of the herd can be trained to machine stripping. The remaining, apparently untrainable, cows are a problem. It is for the farmer to decide, on economic grounds, whether they are to be retained in the herd and milked last, or replaced by trainable heifers. Frequently, aged cows will only fully respond to training at the commencement of a lactation. A few cows require re-education at the commencement of each lactation.

Summary.

Modern milking methods involve—

(1) Correct stimulation of the cow.
(2) Gentle handling and correct training of the cow.
(3) Efficient milking machines.
(4) Shed and yards designed to permit rapid milking.
(5) No hand-stripping.

Remember:

Slow milking makes a cow a "stripper."
Rapid milking makes a cow a "milker."

Pure-Bred Dairy Cattle Production Recording.

Report for the Year 1951-52.

S. E. PEGG, Chief Adviser, Herd Recording Section.

THE 1951-52 season was very unfavourable for dairying. Over the greater part of the State little or no rain fell between March 1951 and February 1952; thus most of the State was in the throes of a drought for nine months of the season. Under these conditions it could only be expected that the number of cows recorded would be lower than in previous years and that the average production of cows which completed lactations would also be much lower. The drought caused many breeders to withdraw their herds from the scheme, and every credit must be given to those who continued to record throughout the year. The production records of the various animals must therefore be related to the adverse nature of the season in which the productions were recorded.

During the year 112 herds were submitted for recording, compared with 135 herds during 1950-51. This decrease in the number of herds can be attributed to seasonal conditions, which also caused 46 herds to be withdrawn.

Table 1 shows the number of herds of the various breeds recorded.

TABLE 1.

NUMBERS OF HERDS RECORDED.

Breed.	1950–51.	1951–52.
A.I.S.	52	39
Ayrshire	9	10
Friesian	3	2
Guernsey	13	9
Jersey	57	52
Dairy Shorthorn	1	—
Total	135	112

The total number of cows submitted for recording in 1951-52 was 1,177, compared with 1,320 in the preceding year. Cows which passed the required age-production standards numbered 377 (32.0%) compared with 615 (46.0%) in 1950-51; 508 cows failed and 292 were withdrawn. The particulars are given by breed in Table 2.

In Table 3, information is set out, for each year from 1942-43 to 1951-52, on the number of cows which passed, failed or were withdrawn.

The average production of all cows which completed lactations during the year was 5,571 lb. milk and 259 lb. butterfat; the average butterfat percentage was 4·65.

Table 4 gives the average production of cows which completed lactations of 273 days or less for each year since 1946-47.

Table 5 gives the average production for the various age-groups in each breed.

TABLE 2.

SUMMARY OF COWS WHICH PASSED, FAILED OR WERE WITHDRAWN, 1950-51 AND 1951-52.

Breed.		Total.		Passed.		Failed.		Withdrawn.	
		1950–51.	1951–52.	1950–51.	1951–52.	1950–51.	1951–52.	1950–51.	1951–52.
A.I.S.	No.	471	407	196	118	221	181	54	108
	%	—	—	41·6	29·0	46·9	44·5	11·5	26·5
Ayrshire	No.	69	79	29	29	29	30	11	20
	%	—	—	42·0	36·7	42·0	38·0	15·9	25·3
Friesian	No.	26	18	9	7	9	9	8	2
	%	—	—	34·5	38·9	34·5	50·0	30·9	11·1
Guernsey	No.	129	78	64	24	47	46	18	8
	%	—	—	49·6	30·8	36·4	58·9	14·0	10·3
Jersey	No.	621	595	317	199	228	242	76	154
	%	—	—	51·0	33·4	36·7	40·7	12·2	25·0
Dairy Shorthorn ..	No.	4	—	—	—	4	—	—	—
	%	—	—	—	—	100	—	—	—
Total	No.	1,320	1,177	615	377	538	508	167	292
	%	—	—	46·6	32·0	40·8	43·2	12·6	24·8

TABLE 3.

SUMMARY OF COWS WHICH PASSED, FAILED OR WERE WITHDRAWN, 1942–43 TO 1951–52.

Year.	Passed.	Failed.	Withdrawn.	Total.
1942–43	249	60	..	..
1943–44	199	74	..	..
1944–45	278	112	60	450
1945–46	363	113	92	568
1946–47	366	80	262	708
1947–48	421	200	263	884
1948–49	759	305	363	1,427
1949–50	680	384	257	1,321
1950–51	615	538	167	1,320
1951–52	377	508	292	1,177

TABLE 4.

AVERAGE PRODUCTION OF COWS WHICH COMPLETED LACTATIONS, 1946–47 TO 1951–52.

Year.	No. of Cows.	Average Production.		
		Milk.	Test.	Butterfat.
		Lb.	%	Lb.
1946–47	446	6,580	4·95	326
1947–48	621	6,981	4·67	326
1948–49	1,064	6,783	4·76	323
1949–50	1,064	6,608	4·69	310
1950–51	1,153	5,917	4·58	271
1951–52	885	5,571	4·65	259

TABLE 5.

BREED PRODUCTION AVERAGES FOR REGISTERED HERD BOOK STOCK WHICH COMPLETED LACTATION RECORDS OF 273 DAYS OR LESS DURING THE YEAR ENDING 30TH JUNE, 1952.

Breed.		J.2.	S.2.	J.3.	S.3.	J.4.	S.4.	Mature.	All Ages.
A.I.S.	No. of Cows	113	56	28	17	15	12	58	299
	Milk (lb.)	5,551	5,755	6,473	6,409	6,776	5,423	7,891	6,229
	Butterfat (lb.)	224	233	262	254	285	204	317	251
	Test (%)	4·0	4·0	4·0	4·0	4·3	3·8	4·0	4·0
Ayrshire	No. of Cows	22	13	4	3	2	4	11	50
	Milk (lb.)	5,814	6,794	6,587	7,271	7,140	7,817	5,912	6,356
	Butterfat (lb.)	243	290	259	288	323	326	247	266
	Test (%)	4·2	4·3	3·9	4·0	4·5	4·2	4·2	4·2
Friesian	No. of Cows	5	2	3	2	..	..	4	16
	Milk (lb.)	6,219	8,086	7,272	7,271	..	..	6,789	6,294
	Butterfat (lb.)	214	290	280	283	..	..	301	267
	Test (%)	3·4	3·6	3·9	3·9	..	..	4·4	3·9
Guernsey	No. of Cows	21	5	5	4	9	4	22	70
	Milk (lb.)	4,739	4,804	6,207	6,646	6,944	6,538	5,669	5,637
	Butterfat (lb.)	231	224	298	319	301	286	214	262
	Test (%)	4·9	4·7	4·8	4·8	4·3	4·4	4·5	4·7
Jersey	No. of Cows	172	53	46	36	17	23	94	441
	Milk (lb.)	4,351	4,816	5,012	5,089	4,906	5,927	5,961	4,983
	Butterfat (lb.)	227	251	265	267	271	303	319	262
	Test (%)	5·3	5·2	5·3	5·3	5·5	5·1	5·4	5·3

All ages and all breeds :—No. of Cows, 885 ; Milk, 5,571 lb. ; Butterfat, 259 lb. ; Test, 4·6%.

TABLE 6.

COWS WHICH HAVE PRODUCED BUTTERFAT EQUIVALENT TO 1,000 LB. COMMERCIAL BUTTER IN ONE LACTATION.

Name of Cow.	Owner.	Breed.	Date of Calving.	Age.	Days in Lactation.	Milk.	Test.	Butterfat.	Estimated Commercial Butter.
				Y. M.		Lb.	%	Lb.	Lb.
Fairvale Laurel 2nd	W. Henschell	A.I.S.	14–9–49	6 3	365	28,884	3·6	1,062	1,295
Charmer 2nd of City View	M. Lawrence	A.I.S.	1920	6 3	365	21,304	4·5	949	1,167
Gem May	W. Bishop	Jersey	11–10–46	9 9	365	15,065	6·1	924	1,127
Alfa Vale Model 4th	W. H. Thompson	A.I.S.	3–7–41	9 0	365	19,151	4·8	922	1,124
Alfa Vale Model 2nd	W. H. Thompson	A.I.S.	1–6–40	10 9	328	18,530	4·9	904	1,102
Evelyn of Sunnyview	J. Phillips	A.I.S.	18–8–33	6 11	273	22,575	4·0	904	1,102
Alfa Vale Nellie 4th	W. H. Thompson	A.I.S.	12–4–39	6 4	365	23,889	3·7	890	1,085
Alfa Vale Pansy	W. H. Thompson	A.I.S.	2–8–42	4 11	365	19,824	4·5	887	1,082
Alfa Vale Gem 4th	W. H. Thompson	A.I.S.	26–7–37	5 0	365	21,325	4·1	884	1,078
Alfa Vale Laura	W. H. Thompson	A.I.S.	4–7–39	5 8	365	23,158	3·7	858	1,046
Alfa Vale Model 4th	W. H. Thompson	A.I.S.	3–4–40	7 10	365	19,106	4·4	847	1,033
Alfa Vale Model 29th	W. H. Thompson	A.I.S.	8–5–48	3 5	349	17,635	4·8	847	1,033
Valera Sheila	Sullivan Bros.	A.I.S.	13–3–38	7 4	365	16,239	5·2	847	1,033
Penrhos Pansy	A. Sandilands	A.I.S.	25–5–35	7 3	273	17,603	4·7	844	1,029
Alfa Vale Model 3rd	W. H. Thompson	A.I.S.	12–8–36	6 1	365	18,734	4·4	835	1,018
College Princess Pontiac	Hickey and Sons	Friesian	3–5–32	7 10	365	24,027	3·4	830	1,012
Kilburnie Ethel 3rd	Macfarlane Bros.	A.I.S.	5–7–33	7 11	365	18,108	4·6	829	1,011
Blossom of Penrhos	A. Sandilands	A.I.S.	10–8–31	6 5	365	18,933	4·3	824	1,005

New Production Records.

During the year there was one new 273-days production record established. This was for the Ayrshire breed in the Senior 2 age-group; it is all the more meritorious because of the adverse seasonal conditions prevailing. The new record was established by "Auchen Eden Trixie 2nd," (Plate 1) who produced 10,680 lb. milk yielding 511 lb. butterfat; the average butterfat content of her milk was 4·8%. This animal was bred by Mr. J. N. Scott, "Auchen Eden," Camp Mountain, and was sired by "Oatlands Duke." The dam is "Auchen Eden Thistle." Her lactation was continued to 365 days and in this period she produced 12,986 lb. milk and 635 lb. butterfat. This is also a record production for an Ayrshire Senior 2-year-old over a 365-day period. The previous 273-days lactation record of an Ayrshire cow was 9,683 lb. milk and 415 lb. butterfat, established in 1950 by "Crescent Farm Monnie," owned by Mr. N. J. Mann, Broxburn.

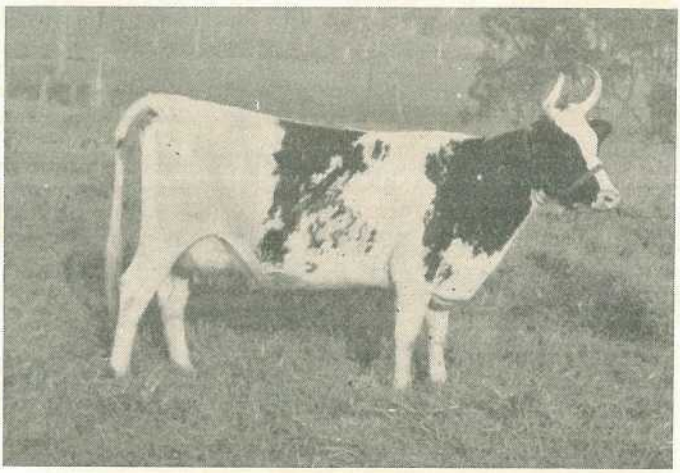


Plate 1.

"Auchen Eden Trixie 2nd," owned by Mr. J. N. Scott, "Auchen Eden," Camp Mountain. This animal established a new production record for the Ayrshire Senior 2-year-old age-group. Her production was 10,680 lb. milk and 511 lb. butterfat. The average butterfat content was 4.8%.

Highest Production during the Year.

The highest production recorded during the year was of the A.I.S. cow "Fairvale Laurel 2nd" (Plate 2) (owned by Mr. W. Henschell), who produced 16,095 lb. milk and 645 lb. butterfat; her average test was 4·0%. In the previous lactation this animal produced 23,094 lb. milk and 853 lb. butterfat in 273 days, and 28,884 lb. milk and 1,062 lb. butterfat in 365 days.

Table 6 lists all cows which have produced at least 820 lb. butterfat (equivalent to 1,000 lb. commercial butter) in a single lactation.

Tables 7 and 8 give the existing individual production records, according to age-groups, of the different breeds of dairy cattle for lactation periods of 273 days and 365 days respectively. Although much more importance is attached to the lifetime production of cows, these records of individual lactation productions are still of great interest.

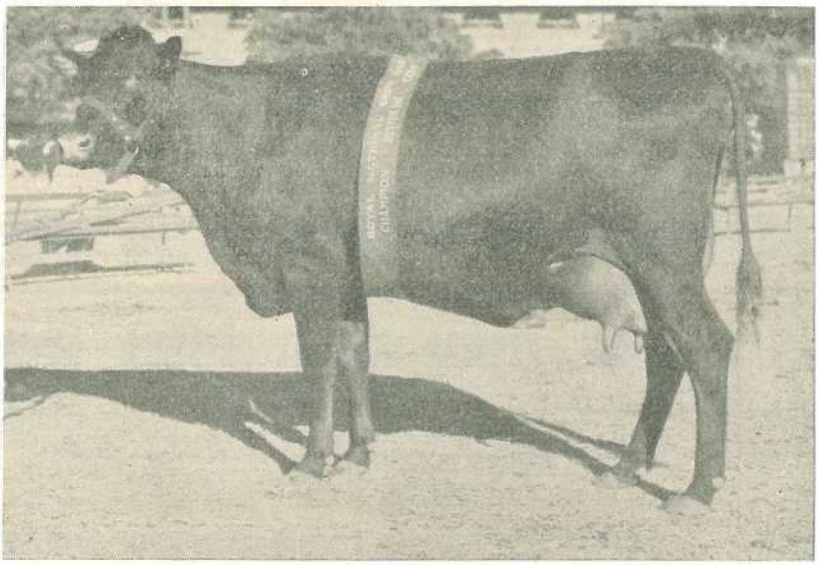


Plate 2.

"Fairvale Laurel 2nd," owned by Mr. W. Henschell, "Yarranvale," Yarranlea, was the highest producing cow for 1951-52. Her production was 16,095 lb. milk and 645 lb. butterfat.

Plate 3.

"Glendalough Cissy," owned by Dr. D. Gordon, 17 Mile Rocks, Brisbane. As a Senior 2-year-old she produced 8,333 lb. milk and 304 lb. butterfat. The average butterfat content was 3.6%.

TABLE 7.

EXISTING PRODUCTION RECORDS FOR 273 DAYS FOR VARIOUS AGE GROUPS IN EACH BREED.

Age.	Cow.	Owner.	Year of Test.	Milk.	Test.	Butterfat.
		A.I.S.		Lb.	%	Lb.
J.2 ..	Diana 17th of Kelston	A. Frank, Boonah	1930	13,604	4·20	572
S.2 ..	Alfa Vale Model 16th	W. H. Thompson, Nanango	1942	12,783	5·00	640
J.3 ..	Alfa Vale Model 29th	W. H. Thompson, Nanango	1949	14,516	4·07	691
S.3 ..	Sunnyview Beauty 6th	J. Phillips, Wondai	1948	16,577	4·42	733
J.4 ..	Alfa Vale Gentle 2nd	W. H. Thompson, Nanango	1936	15,186	4·57	695
S.4 ..	Kyabram Mab	C. W. Black, Kumbia	1940	16,963	4·32	733
Mature..	Sunnyview Evelyn	J. Phillips, Wondai	1933	22,575	4·00	904
		JERSEY.				
J.2 ..	Inverlaw Phyllis	R. J. Crawford, Kingaroy	1940	9,756	5·57	544
S.2 ..	Hamilton White Rose	J. Wilton, Killarney	1934	8,060	6·52	526
J.3 ..	Lyndhurst Mollie	J. B. Keys, Gowrie	1931	11,828	4·83	571
S.3 ..	Oxford Jezebel	E. Burton and Sons, Wanora	1941	10,950	5·88	644
J.4 ..	Oxford Buttercup 4th	E. Burton and Sons, Wanora	1922	11,331	5·93	672
S.4 ..	Trecarne Dairymaid	T. A. Petherick, Lockyer	1940	9,584	7·31	701
Mature..	Brookland Cunning Drop	W. S. Conochie, Sherwood	1948	12,800	5·87	752
		GUERNSEY.				
J.2 ..	Linwood Feather	A. S. Cooke, Maleny	1944	9,183	4·42	406
S.2 ..	Springvale Verla	A. Ruge and Sons, Woowoonga	1950	8,517	5·34	455
J.3 ..	Bangalow Vale Vanity Fair 3rd	W. A. K. Cooke, Maleny	1948	9,664	4·81	465
S.3 ..	Linwood Sister	A. S. Cooke, Maleny	1944	8,992	5·02	452
J.4 ..	Laureldale Vera	W. A. K. Cooke, Maleny	1945	9,599	4·96	476
S.4 ..	Laureldale Vida	W. A. K. Cooke, Maleny	1946	10,313	4·82	498
Mature..	Laureldale Vida	W. A. K. Cooke, Maleny	1948	12,473	4·51	563
		AYRSHIRE.				
J.2 ..	Myola Gem 2nd	J. R. and R. M. Anderson, Yandilla	1937	12,578	3·74	472
S.2 ..	Auchen Eden Trixie 2nd	J. N. Scott, Camp Mountain	1951	10,680	4·78	511
J.3 ..	Myola Lady Tina	J. R. and R. M. Anderson, Yandilla	1937	8,126	4·77	388
S.3 ..	Myola Jollity	J. R. and R. M. Anderson, Yandilla	1936	10,995	4·34	477
J.4 ..	Crescent Farm Joyous	N. J. Mann, Broxburn	1950	10,848	3·79	411
S.4 ..	Myola Lady Jean	J. R. and R. M. Anderson, Yandilla	1938	14,377	4·76	685
Mature..	Fairview Vesta	J. R. and R. M. Anderson, Yandilla	1938	10,856	4·87	529
		FRIESIAN.				
J.2	Ryfield Dairymaid 8th	P. Falt, Cushine	1937	8,139	4,54	370
S.2 ..	St. Athan's Bee	W. Newman, Wyreema	1930	14,143	3·12	442
J.3 ..	St. Athan's Piebe Molly	F. C. Noller, Kumbia	1936	11,813	3·69	436
S.3 ..	Brigalow Gem 2nd	A. O. Stumer, Boonah	1934	9,801	3·76	369
J.4 ..	Tent Hill Princess	W. H. Grams, Gatton	1938	11,366	3·62	412
S.4 ..	Stonybrae Belle	Hickey and Sons Pty. Ltd., Wilston	1930	11,156	3·69	412
Mature..	College Princess Pontiac	Hickey and Sons Pty. Ltd., Wilston	1932	19,315	3·40	657

TABLE 8.

EXISTING PRODUCTION RECORDS FOR 365 DAYS FOR VARIOUS AGE GROUPS IN EACH BREED.

Age.	Cow.	Owner.	Year of Test.	Milk.	Test.	Butterfat.
		A.I.S.		Lb.	%	Lb.
J.2 ..	Diana 17th of Kelston	A. Frank, Boonah	1930	17,430	4·14	721
S.2 ..	Alfa Vale Pansy	W. H. Thompson, Nanango	1940	16,237	4·59	746
J.3 ..	Greyleigh Gem 139th	W. H. Thompson, Nanango	1943	16,825	4·46	751
S.3 ..	Alfa Vale Gem 7th	W. H. Thompson, Nanango	1940	14,649	4·92	721
J.4 ..	Alfa Vale Gentle 2nd	W. H. Thompson, Nanango	1936	17,360	4·71	818
S.4 ..	Alfa Vale Pansy	W. H. Thompson, Nanango	1942	19,824	4·47	887
Mature..	Fairvale Laurel 2nd	W. Henschell, Yarranlea	1951	28,884	3·68	1,062
		JERSEY.				
J.2 ..	Inverlaw Phyllis	R. J. Crawford, Kingaroy	1940	12,472	5·85	730
S.2. ..	Hamilton White Rose	J. Wilton, Killarney	1934	9,812	6·66	654
J.3 ..	Lyndhurst Marella	J. B. Keys, Gowrie	1932	11,225	5·44	611
S.3 ..	Lavender of Calton	E. Burton and Sons, Wanora	1933	15,249	5·07	773
J.4 ..	Does not exceed the record for 273 days					
S.4 ..	Does not exceed the record for 273 days					
Mature..	Gem May	W. Bishop, Kenmore	1947	15,065	6·13	924
		GUERNSEY.				
J.3 ..	Laureldale Pamela	W. A. K. Cooke, Maleny	1948	11,698	4·86	569
		AYRSHIRE.				
S.2 ..	Auchen Eden Trixie 2nd	J. N. Scott, Camp Mountain	1951	12,986	4·9	635
		FRIESIAN.				
S.2 ..	St. Athan's Bee	W. Newman, Wyreema	1930	18,008	3·13	564
Mature..	College Princess Pontiac	Hickey and Sons Pty. Ltd., Wilston	1932	24,027	3·45	830

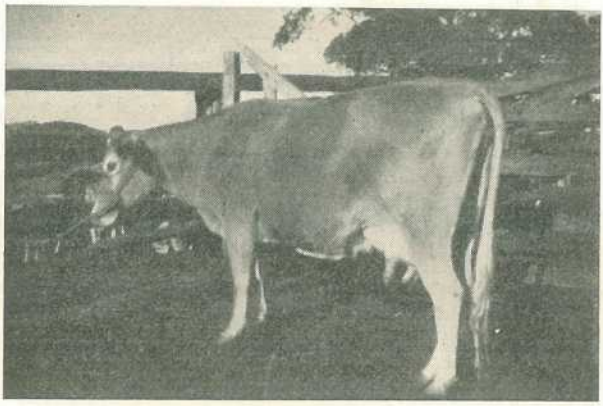


Plate 4.

"Willowbrae Daffodil," owned by Messrs. Ruge & Sons, "Woowoonga," Biggenden, was the highest producing Guernsey cow. As a Junior 4 she produced 9,421 lb. milk and 439 lb. butterfat. The average butterfat test was 4.7%.

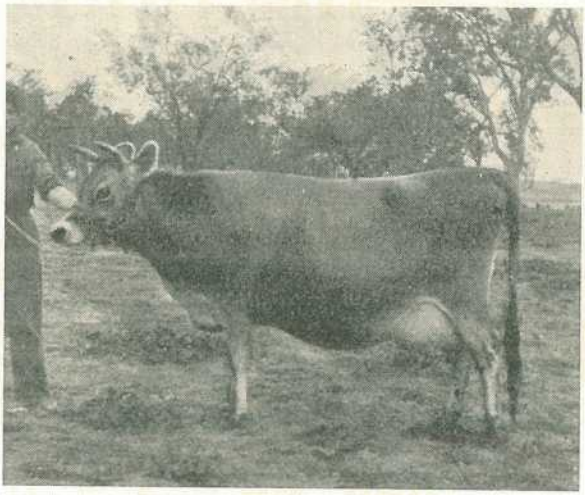


Plate 5.

"Trecarne Chiming 2nd." owned by Mrs. I. L. M. Borchert, "Willowbank," Kingaroy. She produced 9,169 lb. milk and 499 lb. butterfat as a Senior 2-year-old.

Some particulars of the 1951-52 season leaders for each age group in each breed are given in Table 9.

TABLE 9.

CLASS LEADERS IN EACH AGE GROUP FOR BUTTERFAT PRODUCED IN 273 DAYS DURING 1951–52.

Age Class.	Cow.	Owner.	Milk.	Test.	Butter-fat.
			Lb.	%	Lb.
		A.I.S.			
J.2 ..	Yarranvale Gem ..	W. Henschell, Yarranlea	8,138	4·2	344
S.2 ..	Arolla Pet 3rd	J. Crookey, Allora ..	9,249	4·4	404
J.3 ..	St. Andrew's Honeycombe 3rd	M. C. Lester, Glengallan, Warwick	10,695	4·1	442
S.3 ..	St. Andrew's Envy ..	M. C. Lester, Glengallan, Warwick	11,768	3·9	460
J.4 ..	Cedar Valley Rosette ..	J. H. Fogg, Toogoolawah	9,145	3·9	357
S.4 ..	No animal reached the standard				
M ..	Fairvale Laurel 2nd ..	W. Henschell, Yarranlea	16,095	4·0	645
		AYRSHIRE.			
J.2 ..	Holm Park Jaunty ..	L. and N. Norgaard, Nara	7,332	4·8	354
S.2 ..	Auchen Eden Trixie 2nd	J. N. Scott, Camp Mountain	10,680	4·8	511
J.3 ..	Iona Jollity	St. Christopher's Lodge, Brookfield	7,188	4·0	285
S.3 ..	Auchen Eden Thistledown	J. N. Scott, Camp Mountain	7,977	4·5	361
J.4 ..	Auchen Eden Truda ..	J. N. Scott, Camp Mountain	7,199	4·8	348
S.4 ..	Eleresley Flirt	Stimpson Ltd., Loganlea	8,144	4·6	374
M ..	Auchen Eden Thalia ..	J. N. Scott, Camp Mountain.	8,760	4·9	430
		FRIESIAN.			
J.2 ..	Yarrabine Molly's Robe..	C. H. Naumann, Yarraman	7,015	3·6	251
S.2 ..	Glendalough Cissy ..	D. Gordon, Oxley ..	8,333	3·6	304
J.3 ..	Burnbrae Myra Colantha	D. Gordon, Oxley ..	7,988	3·9	313
S.3 ..	Burnbrae Adeline Colantha	D. Gordon, Oxley ..	9,069	3·7	339
J.4 ..	..	..	..	..	..
S.4 ..	..	..	..	..	..
M ..	..	..	..	..	..
		GUERNSEY.			
J.2 ..	Woowoonga Jubilee ..	A. Ruge and Sons, Woowoonga	7,565	4·5	339
S.2 ..	San Jonda Bright Eyes ..	W. H. Doss, Degilbo ..	6,320	5·1	320
J.3 ..	Willowbrae Tossells ..	A. Ruge and Sons, Woowoonga	6,507	5·1	332
S.3 ..	Springvale Verla ..	A. Ruge and Sons, Woowoonga	8,286	4·9	407
J.4 ..	Willowbrae Daffodil ..	A. Ruge and Sons, Woowoonga	9,421	4·7	439
S.4 ..	..	..	..	..	..
M ..	Willowbrae Poppy ..	E. G. Foxton, Maleny ..	8,666	4·6	396
		JERSEY.			
J.2 ..	Glenrandle Gleam Girl ..	P. Kerlin, Killarney ..	6,551	5·7	375
S.2 ..	Trecarne Chiming 2nd ..	Mrs. I. L. M. Borchert, Kingaroy	9,169	5·4	499
J.3 ..	Romsey Lady Fox ..	J. Wilton, Killarney ..	6,616	6·1	401
S.3 ..	Glen Erin Princess 2nd ..	J. S. McCarthy, Greenmount	9,110	4·9	446
J.4 ..	Glenrandle Joan ..	P. Kerlin, Killarney ..	6,122	6·1	374
S.4 ..	Windsor Royal Ruth ..	H. G. Johnson, Gleneagle	8,393	5·4	452
M ..	Glenrandle Verabelle ..	P. Kerlin, Killarney ..	8,798	5·7	499

Withdrawals from Recording.

During the year permission was given to withdraw 292 cows from test. The number and percentage of cows withdrawn for various reasons is given according to breed in Table 10. Most of the withdrawals are due to the whole of the herd having been withdrawn owing to the drought; these amounted to 261 head, or 89·4% of all withdrawals.

TABLE 10.

CAUSES FOR WITHDRAWAL FROM RECORDING AND NUMBER OF COWS WITHDRAWN, ACCORDING TO BREED AND CAUSE.

Cause.	A.I.S.	Ayrshire.	Friesian.	Guernsey.	Jersey.	All Breeds.	Percentage of Withdrawals.
Mastitis	..	..	..	..	1	1	·3
Footrot	1	..	..	..	..	1	·6
Sickness	3	3	1	..	3	10	3·4
Herd Withdrawn..	98	15	..	8	140	261	89·4
Sold	3	..	..	..	4	7	2·4
Died	1	..	1	..	5	7	2·4
Culled	1	..	..	..	1	2	·6
Accident	1	2	..	..	..	3	·9
Totals ..	108	20	2	8	154	292	..

Short Lactation Periods.

During the year, 156, or 17·64%, of the cows which completed their lactation periods were milked for less than 273 days, compared with 16·2% in the previous year. It has been shown from surveys of data from grade herd recording that production is closely linked with the length of lactation. The relatively high proportion of cows with short lactations indicates the necessity for stud breeders to concentrate on strains or families which are capable of milking for a lactation period of at least 273 days.

Table 11 shows the numbers and percentages of cows in each age-group of the respective breeds which milked for lactation periods of less than 273 days.

TABLE 11.

NUMBERS AND PERCENTAGES of COWS IN AGE-GROUPS AND BREEDS WHICH HAD LACTATION PERIODS OF LESS THAN 273 DAYS.

Breed.		J.2.	S.2.	J.3.	S.3.	J.4.	S.4.	Mature.	Total.
A.I.S.	No.	23	15	8	3	6	5	19	79
	%	20·4	26·8	28·6	17·6	40·0	41·7	32·8	26·4
Ayrshire	No.	2	..	..	1	..	..	5	8
	%	9·1	..	..	33·3	..	..	45·5	13·6
Friesian	No.	..	..	..	..	..	..	..	..
	%	..	..	..	..	..	..	..	..
Guernsey	No.	..	1	..	..	..	..	5	6
	%	..	20·0	..	..	..	..	22·7	8·6
Jersey	No.	22	7	5	12	3	4	10	63
	%	12·8	13·2	10·9	33·3	17·6	17·4	10·6	14·3
All Breeds	No.	47	23	13	16	9	9	39	156
	%	14·1	22·1	15·1	25·8	20·9	20·9	20·6	17·6

Further Information.

Details of all cows which completed lactations during the year will be published in subsequent issues of this journal as space permits. A preliminary survey of sires will also appear.

Useful Cattle Feeding Stalls.

J. ARBUCKLE, Adviser in Cattle Husbandry.

THE need for higher production from Queensland's dairy herds has increased the urgency for a greater measure of fodder conservation in order that milking cows may be adequately fed during the drier months of each year. Dairying is similar to any other business enterprise, and increased expenditure on fodder conservation can only be justified when the increased production resulting from the better feeding of the herd is sufficient to pay the cost of storage and feeding-out. It is essential, therefore, that the farmer who has decided to supplement his pastures with conserved roughages make provision for the feeding of these roughages by a smooth-working, labour-saving system.

The plans presented in Plates 1-3 are of stalls used successfully by Messrs. H. J. Kraatz and Sons, of Etna Creek, whose courtesy in making the design available for publication is appreciated.

The plan is designed primarily for the feeding of silage from two silos situated at one end of the stalls. The cattle enter the stalls from the end opposite the silos by a 7 ft. laneway behind each set of stalls. Slight modifications of the ground plan will make the scheme equally convenient for the feeding of hay. Alternatively, should only 20 or fewer stalls be required, where hay is being fed the stalls could run along the length of the hayshed and be covered by a lean-to, preferably on the weather side of the shed, as this would add extra protection to the hay from damage by weather.

It is recommended that, where finance is available, the stalls be roofed, preferably with iron. Roofing protects the timber and ensures clean, dry feeding conditions during wet weather.

Concrete flooring, at least of the actual feeding space, is also recommended, but where finance is not available for concrete, cinders and gravel are useful substitutes.

The plan requires a depth of 38 ft. with a length depending on the number of stalls built, which is optional.

The depth is made up of a 7 ft. lane behind each set of stalls to facilitate movement of cattle in and out of the enclosure; two sets of stalls each 9 ft. deep; and a 6 ft. space between the rows of stalls.

A tram track 2 ft. to 2 ft. 6 in. wide is run down the central laneway to carry the fodder waggon. A very slight fall away from the silos makes the task of pushing the loaded waggon considerably easier.

The 7 ft. roadway at the back of the stalls should be enclosed by a post-and-rail fence. The actual stall is formed by 5 x 5 posts at the head and rear of each stall, with three 5 x 2 rails between each stall, the top rail being set 4 ft. from the ground. The distance from centre to centre of the posts is 2 ft. 6 in., giving an overall clearance between posts of 25 in. At the head of the stalls, every fourth post is replaced by a round post 6 in. in diameter in order to allow roof supports to be added.

By means of sliding gates at the rear of the stalls, cattle can be controlled from the central laneway. This is done by pulling the cord at each individual stall to open the gate. As shown in Plate 3, the cord runs from the top of the gate through a pulley attached to the outside top member and down to a bent nail or hook above the feed

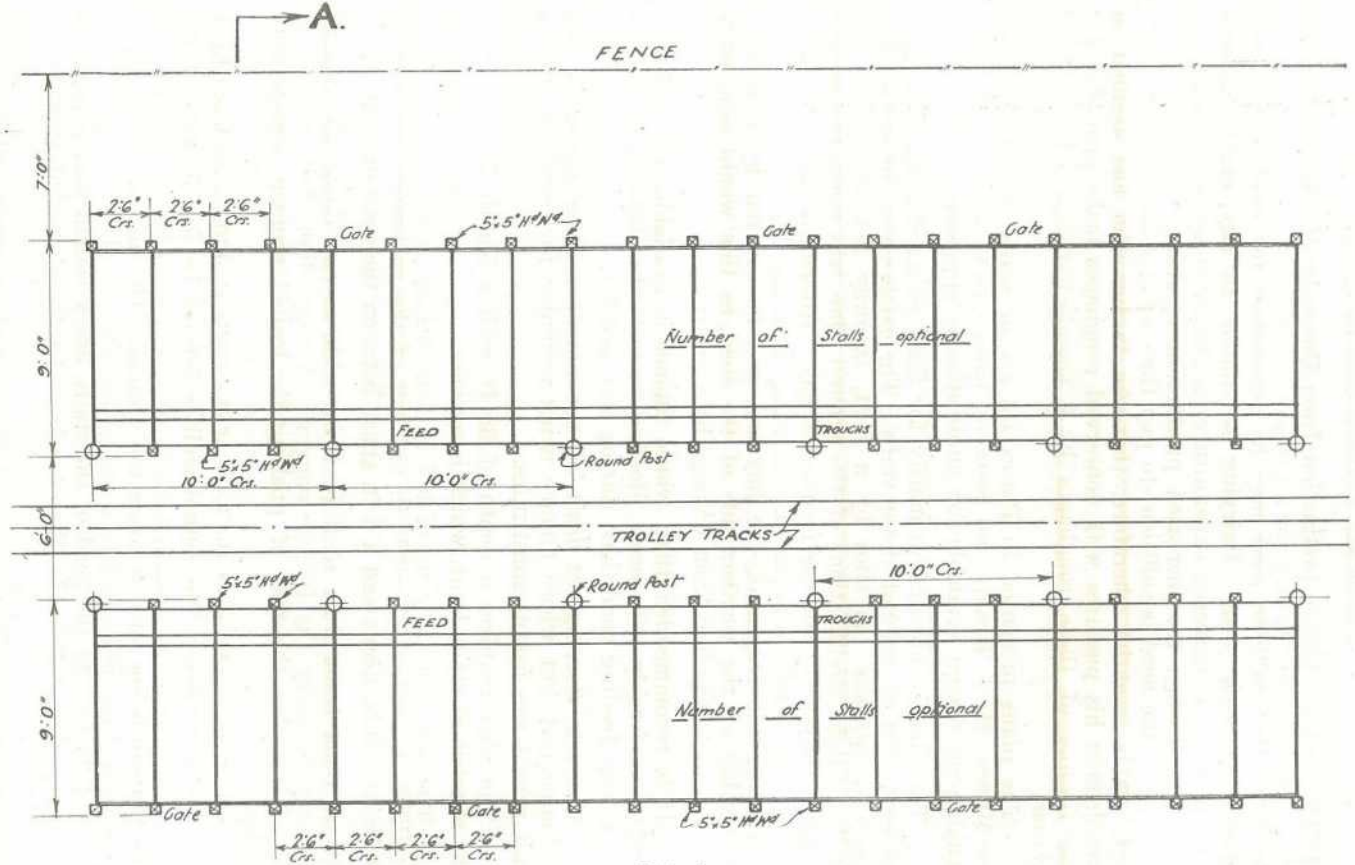


Plate 1.

Plan of Feeding Stalls. The laneway behind one set of stalls is not shown.

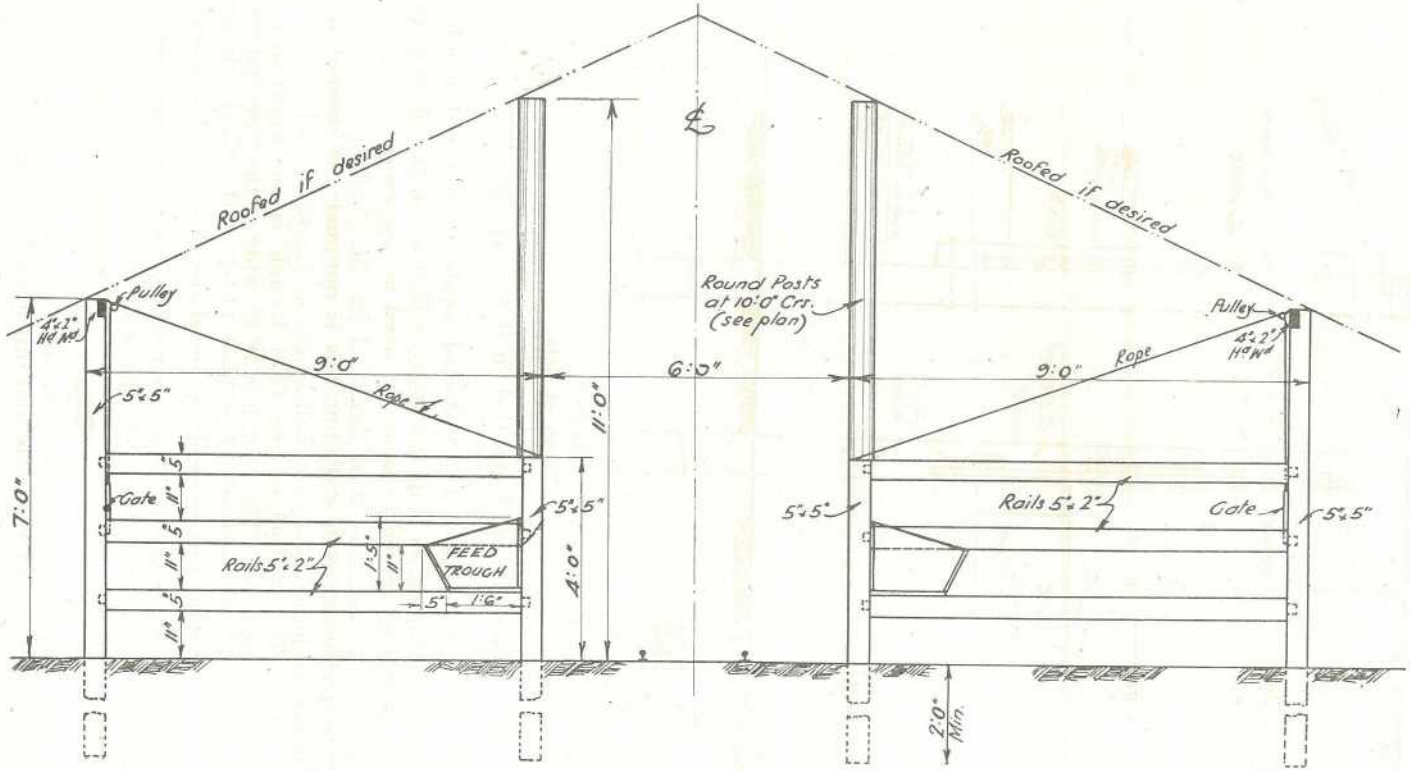


Plate 2.

Sectional View Through Stalls.

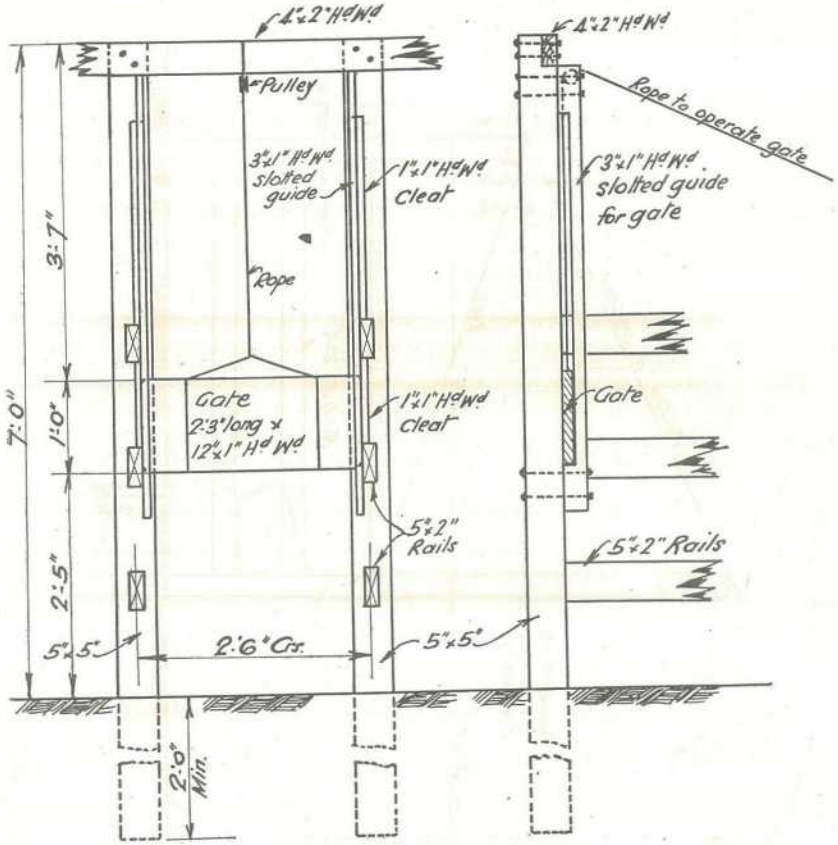


Plate 3.
Details of Gate.

trough. The rope has two loops tied in it to correspond with the two positions of the gate. The gate is placed on the inside of the stalls and held in position by a 3 x 1 slotted guide, with 1 x 1 hardwood cleats down each side to stop side sway. If desired, the sliding gates can be replaced by sword bails at the head of the stall.

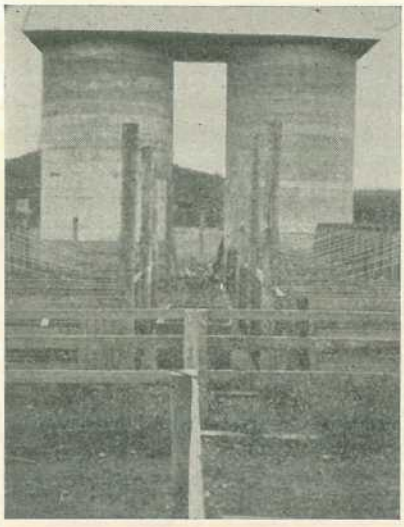
The feed trough has been designed for the feeding of silage or hay; it is divided at each stall, but this is optional. If desired, 4 ft. flat iron can be joined along the full length of the stalls and bent to the desired size. The bottom of the feed trough is set approximately 16 in. from the ground. The trough is 18 in. wide at the base and 25 in. at the top, and it has a depth of at least 11 in. at the front. It is an advantage if troughs can be easily removed for cleaning and repairing.

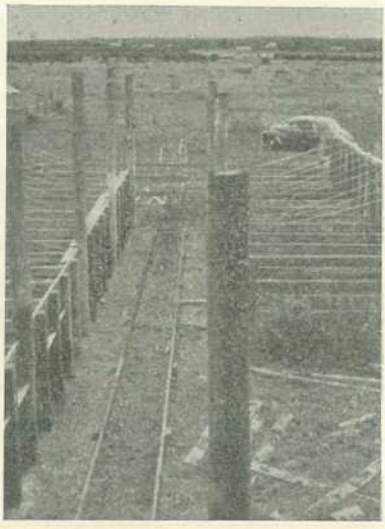
The plan is for sawn timber, but where costs can be decreased materially by using round timber, this may be done.

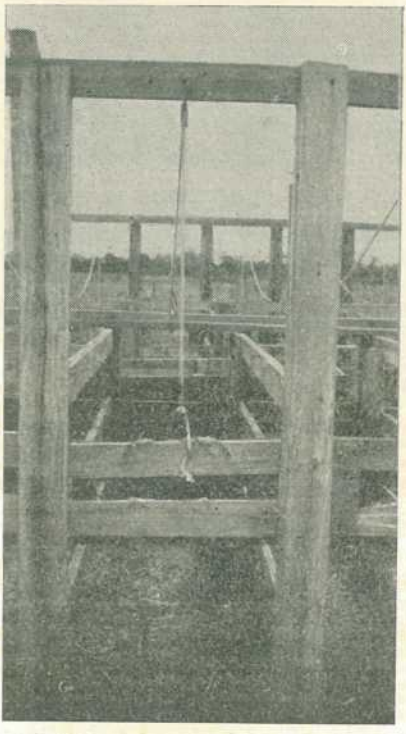
Site.

It is essential that a well-drained site be selected and that drainage be away from the bails and other out-buildings.

The stalls must be conveniently placed to allow ease of working of cows from the bails and surrounding paddocks. They must be placed next to the silo or hayshed and yet not hinder the process of storing silage or hay.







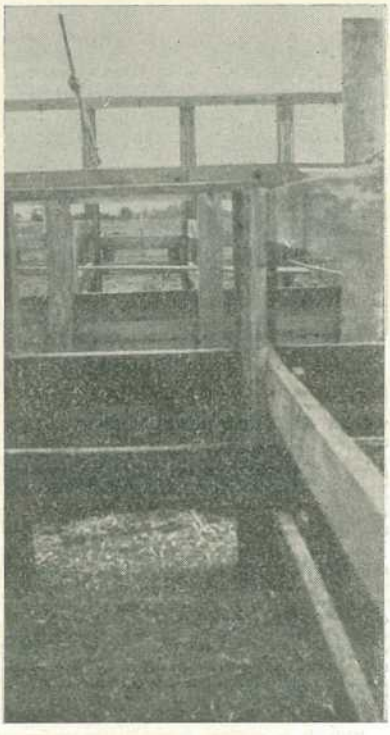
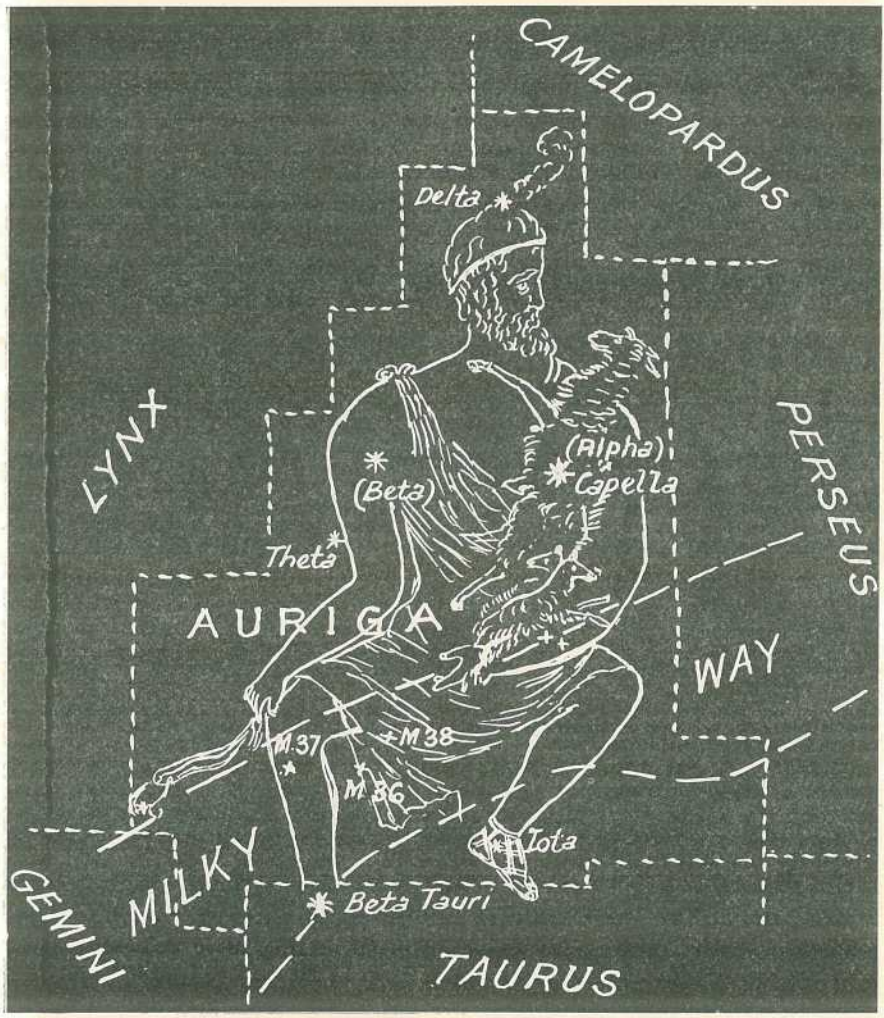


Plate 4.

Views of Stalls, Sliding Gate and Feed Trough.



THE CONSTELLATIONS.

AURIGA (THE CHARIOTEER.)

In mythology, Auriga was a charioteer, but for some unknown reason the ancient constellation figures picture him without a chariot, but holding a goat and three kids with his left arm and with a whip in his right hand.

The brightest star in the group is Capella (Alpha), which is a golden yellow in colour, but Ptolemy (A.D. 150), Al Fagani (10th century) and Riccoli all describe it as red. Possibly it may have changed its colour in comparatively recent times. Capella shows a spectrum similar to that of our sun, though it is much larger, having a mass about 5 times and a diameter about 9 times greater than the sun.

Auriga is situated between Orion and the north pole of the heavens, but in our case the horizon intervenes. The northern portion is just visible from Brisbane but may be seen more clearly from North Queensland. The constellation appears to us as a rough, irregular pentagon, with Alpha (Capella), Beta (Menkalinan), Theta, and Iota at four of the points and Beta Tauri at the apex. Directly north of Beta Tauri and about half-way between Theta and Iota are two fine, loose star clusters in the Milky Way (M36 and M38), while between Beta Tauri and Theta Aurigae is M37, another fine open cluster. Theta is a double with a 3rd and 7th magnitude, separated by 2.9 seconds of arc. Auriga is on the meridian about 8 p.m. towards the end of February.

CAMELOPARDUS.

This is a modern constellation representing the giraffe and is situated between Auriga and the North Pole. It is not visible from southern Queensland, and though it may be seen from extreme North Queensland it is not a spectacular group, the brightest stars being only of 4th magnitude.