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**THE USE OF IMPROVED PASTURE FOR A CALF ENTERPRISE AS AN
ADJUNCT OR ALTERNATIVE TO DAIRYING OR VEALER
PRODUCTION IN THE SUB TROPICS**

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INTRODUCTION

The majority of dairy farmers, particularly those supplying whole milk, sell their unwanted calves at a very early age. Those calves kept yarded for two to three weeks, suckling on their mothers twice daily, brought markedly higher prices on the open market and it appeared that a profit could be made from buying these small calves, suckling them on cows for a few weeks and then selling them. The enterprise was started in November 1965. The price differential was sufficient to make it attractive, provided the calves could be kept healthy, and provided the cows did not object to a constantly changing population of calves.

THE FARM AND THE ENVIRONMENT

A disused dairy farm of 90 acres in the Beaudesert area was available to try out this enterprise using A.I.S.† cows that had been culled from our dairy herd for below average production, temperament or recurring mastitis. Most of these cows had already reared a vealer in their previous lactation. Some pasture improvement had been carried out on about half of the land. Five small yards were available for holding the calves—two with cement floors. All were open to sunlight and small areas of shade and shelter were erected in each yard.

The soil varies from a black to a heavy brown earth, with a pH above 6.0 and relatively high in available nutrients, where they have not been excessively exploited. This area carried dense Hoop Pine (*Araucaria cunninghamii*) and vine scrub until it was cleared in the 1890's.

The average annual rainfall for the area is 32 inches but can vary from 17 to 70 inches. The main peak of rainfall is expected in mid-summer, with a subsidiary peak in mid-winter. In general the rainfall can be regarded as very erratic and it can fall at any time of the year. However, it is very unusual to get over three months without an effective fall of rain.

The whole of the area under consideration is subject to frost in winter and temperatures can exceed 100°F in summer.

PASTURE SPECIES

Because of this soil type and climate, a pasture mixture has been evolved to give feed whenever rain falls.

The basic seed mixture and the seeding rate per acre used at present is:

GRASSES	LEGUMES
2 lb Green Panic	2 lb Lucerne
1 lb Nandi Setaria	2 lb Siratro
2 lb Priebe's Prairie	2 lb Glycine javanica
2 lb Wimmera Rye	1 lb Ladino clover
	2 lb mixed medics
	1 lb Clare Sub clover

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The legumes in this mixture are inoculated and the mixture is sown into a well prepared seed bed in late summer or early autumn. Sowing at this time allows the tropical species to establish sufficiently before the first frost to prevent them from being killed and the temperate species will all germinate at this time and give excellent feed right through their first winter.

Grasses

- (i) Green Panic (*Panicum maximum* cv. Petrie) gives good feed throughout the spring, summer and autumn and a reasonable pick in mild winters; it has been found extremely valuable in dry seasons as it responds very quickly even to small falls of rain and grows well in conjunction with lucerne.
- (ii) Nandi Setaria (*Setaria sphacelata* cv. Nandi) gives a heavy body of feed in the warmer months and seeds freely but is not as drought resistant as Green Panic.
- (iii) Priebe's Prairie (*Bromus catharticus* cv. Priebe) is a good late winter and spring grass but is regarded more as an annual regenerating from seed, than as a perennial.
- (iv) Wimmera Rye (*Lolium rigidum*) is used because of its production of high quality feed in the winter and spring and it regenerates readily from seed. Good stands still establish annually in paddocks seeded down six years ago.

Legumes

- (i) Lucerne (*Medicago sativa* cvs. Hunter River, African and Siro-Peruvian) is still regarded as the main component of all pastures because of its year-round production of high quality feed and its drought resistance. Hunter River lucerne is still reasonably strong in seven year old pastures. More recently African and Siro-Peruvian lucerne have been planted in conjunction with Hunter River because of their quick regrowth after grazing. This is particularly noticeable in the cooler months. As the oldest stands of these are only in their third year no estimate can be given of how long they may last.
- (ii) Siratro (*Phaseolus atropurpureus* cv. Siratro) is valuable because of its strong persistence but it only gives good growth in wet summers.
- (iii) *Glycine wightii* cvs. Tinaroo and Cooper. Both these have been used with very good results as they have a longer season of growth than does Siratro and they combine well with this mixed pasture.
- (iv) Ladino Clover (*Trifolium repens* cv. Ladino) gives good feed in the late winter and spring and, provided long periods of moisture stress do not occur, it persists well into the summer.
- (v) Annual Medics (*Medicago truncatula* cvs. Jemalong and Cyprus) and (*M. scutellata* cv. Snail) have become a very valuable part of the pasture mixture over recent years as they provide a heavy body of feed in winter and spring and they all seed freely. They are particularly valuable after a dry summer in that they germinate well on small falls of rain and grow quickly.
- (vi) Subterranean Clover (*Trifolium subterraneum* cv. Clare) has shown some promise in recent years. It gives a heavy body of feed in the spring although it does not always nodulate well after the first year. The amount of feed and the consequent nitrogen fixation in the first year make it worth while including this species.

GRAZING MANAGEMENT

Of the 90 acres used by this enterprise, 65 acres are under improved pasture of various ages and composition, 21 of which are sown to the mixture listed above. The remaining area consists of 10 acres of lucerne, used for grazing and hay and 15 acres of *Paspalum dilatatum* and naturalized white clover. The whole area is divided into 9 paddocks and is rotationally grazed. There is no set interval between grazings, and hay is made in periods when a surplus exists. Paddocks planted to the pasture mixture listed above are locked up for four to six weeks in the late spring to allow the temperate grasses and legumes to seed down heavily. This period also allows lucerne to reach full maturity which appears to help to maintain it in the stand. The tropical grasses and legumes also get a chance to grow to a reasonable height as winter species are usually grazed much lower than the tropics. In April the tropical species are heavily grazed so that full use is made of the feed before it is spoilt by frost. This also allows light to get through to the soil and this in turn means a good germination of the temperate species once rain falls. Nitrogenous fertilizers can be used to advantage at this stage to get a quick response from Wimmera Ryegrass. Ryegrass managed in this way does away with the need for oats for winter grazing.

Approximately 10 acres of new pasture is being sown each year and, after the remainder of the cultivable land is sown next year, some of the older pastures will be resown. These older pastures are at present used for grazing in prolonged periods of wet weather and while younger pastures are shut up for seeding. There are 44 acres of these older pastures on old cultivation land. They consist of scattered lucerne and siratro with some paspalum and Rhodes grass (*Chloris gayana*). They were planted in 1963.

Carrying capacity

The carrying capacity has only been a beast to 2.25 acres over the last three years which have been marred by drought. In its present state of improvement I feel sure that these 90 acres can now successfully carry 50 cows without the need for any supplementary feed, except for the hay made from the area. Molasses was fed in 1969.

FERTILIZERS

Four cwt of Mo Super 12 is applied before the last ploughing of land being prepared for pasture or lucerne. Top dressing requirements have not been worked out at this stage because foliar analysis has shown the phosphate levels in both legumes and grasses to be adequate even in a five year old pasture on land that has never received any fertilizer. Old cultivation land that had been cropped for up to fifty years has lost much of its initial fertility and structure and top dressing with both phosphate and potash has been found necessary.

Nitrogen is used at the rate of 30 to 50 lb of N per acre, to assist the establishment of pasture on old cultivation land. Some paddocks are top dressed with up to 50 lb of N per acre in the autumn to get early growth, particularly from Wimmera Ryegrass.

CALF MANAGEMENT

The bull calves from our own dairy, together with calves purchased from neighbours and through the local sale yards, are brought into the enterprise at about one week of age. No difficulty has been found in getting calves to suck the cows, as most start at the first feed and only rare exceptions are not sucking within 24 hours of coming into the yards. It has been found necessary to always put individual cows in the same pen throughout their lactation and where necessary, move calves from

one pen to another to make the best use of the milk available. By doing this and where possible seeing that any one calf does not go to the same cow each feed, we have prevented the cows from becoming upset when calves are sold and new calves substituted for them. In three years only one cow has been found impossible to handle this way, although several others have been culled at the end of their lactation because of their temperament. It is necessary for someone to settle each pen when the cows are let in and to see that each calf obtains its fair share of the milk available. The time involved to feed a pen of ten to fifteen calves is approximately ten minutes, except where a large number of new calves has just been introduced. Much depends on the skill and temperament of the person in charge. Calves are kept in the yards from four to eight weeks, with an average of five weeks.

DISEASE

- (i) *Scours*. The main disease problem is that of bacterial scours. Over 50% of all calves coming into the yards scour at some stage and this is usually towards the end of their first week. Treatment with sulphadruugs and antibiotics has been effective in most cases, but some scours have been very hard to clear up. Kaolin is used together with raw eggs to prevent excessive dehydration and to give some readily digestible food to bad cases.
- (ii) *Leptospirosis*. In warm wet periods leptospirosis has been troublesome but provided it is noticed quickly, streptomycin injections are very effective.
- (iii) *Nasal Catarrah*. A disease thought to be nasal catarrah, has killed a couple of calves each year. It only affects a small percentage of calves but is usually fatal.

Although disease, in particular scours, has had a marked effect on weight gains, the mortality rate has been very low for a young animal enterprise. In 1966/67 it was 3½% in 1967/68, 4% and in 1968/69, 2%.

BREED COMPARISONS

For the year 1st July, 1968 to 30th June, 1969 records have been kept in conjunction with Mr. E. L. B. Haskew of the Cattle Husbandry Branch of the Department of Primary Industries. Portable scales were installed by the department and each calf is weighed and ear tagged on entering the yards and weighed out again when sold. Check weighings of a sample of the calves are made weekly.

All calves have been grouped for breed in the following way:

- (i) A.I.S.; (ii) Friesian and Friesian cross; (iii) Hereford and Hereford cross;
- (iv) Calves showing any Brahman characteristics.

These groups have been further divided according to sex. All cows calving in the enterprise are mated to Brahman bulls and their calves run with them until they are sold at approximately five weeks of age. During this period the cow is also going into one of the yards for her surplus milk to be utilized. The mother-reared Brahman Cross calves have been grouped separately.

Table 1 shows the comparison between breeds and sex on weight gains and monetary returns from this enterprise.

METHODS OF SELLING

Calves have been sold by three different methods:

- (i) *Auction*. By far the majority have been sold though auction sale yards. Although this method is subject to quite large fluctuations in price it has proved quite satisfactory. At certain times of the year there is an extra demand and premium prices are paid for calves in a particular weight range. By anticipating these demands, which have a general pattern, extra profit can be made. If light

TABLE 1
A breed and sex comparison on weight gains of calves and monetary returns

Breed and Sex	Number	Average weight gain per calf (lb)	Average weight gain per week (lb)	Average net return per calf (\$)	Average net return per week (\$)
A.I.S. Heifers	22	55.5	9.3	10.70	1.79
A.I.S. Bulls	63	53	9.5	9.58	1.72
Friesian Heifers	11	42.8	7.9	10.50	1.92
Friesian Bulls	102	49.3	9.2	10.09	1.88
Hereford Heifers	31	42.2	8.65	7.90	1.62
Hereford Bulls	15	40.6	8.23	8.42	1.71
Brahman X Heifers	42	58.9	9.6	12.40	1.98
Brahman X Bulls	35	48.8	9.3	9.75	1.85
Mother-reared Brahman X Heifers	24	77.7	13.3	13.80	2.38
Mother-reared Brahman X Bulls	9	90.4	15.95	14.78	2.54

and heavy calves are selling at a higher price per pound than medium calves, the latter are bought and sold as heavy calves rather than buy light ones and turn them off at the medium stage.

- (ii) *On Dressed Weight.* In General, meat works tend to pay less on a dressed weight basis than they do at auction sales. Even though the 5% commission is saved using this method, it is seldom advantageous.

In 1967-68 a contract was made with a local butcher to supply him with heavy fat calves at 33c per pound and this proved to be most satisfactory. Unfortunately, with adverse seasonal conditions, we were unable to maintain a supply of suitable calves and lost this market.

- (iii) *Contract Rearing.* In 1968-69 we contracted to supply 160 calves, suitable for beef production, to a grazier who wished to rear his own stores. These were sold on the basis of purchase price plus \$2.00 per week that we held them. These calves were given free access to troughs of cracked barley and meat meal and to racks of good quality lucerne hay so that their rumens would be sufficiently developed to be weaned straight on to dry feed. To be satisfactory for this next stage of rearing it was found that calves had to be six weeks old and over 140 lbs liveweight when delivered.

ECONOMICS

Deaths, opening and closing values and the value of calves born on the enterprise have been taken into account in table 2, which gives a summary of this enterprise in terms of costs and returns.

TABLE 2
Summary of calf rearing enterprise in terms of costs and returns

Detail	1966-1967	1967-1968	1968-1969
No. of calves bought and average price	493 @ \$11.50	350 @ \$10.60	393 @ \$11.50
No. of calves sold and average net price	493 @ \$20.20	350 @ \$24.30	393 @ \$21.60
Average net return per calf	\$8.70	\$13.70	\$10.10
Average net return per calf per week	\$1.93	\$ 2.28	\$ 2.00
Gross margin of net sales over purchases	\$4287	\$4823	\$3959

Because of the severe drought conditions in 1969 the enterprise was virtually closed in May and June, when only 22 calves were sold for the two month period compared with an average of 34 calves per month for the rest of the year.

I have taken an average year as one with a margin of net sales over purchases of \$4400. Expenses in each year have been very similar except that extra supplementary feed was used in 1969. However, I consider that the hay baled on the enterprise will cover all supplementary feed requirements so I have allowed \$250 for hay making which would cover the contract cost for making 1000 bales of hay per year.

The enterprise is taken as being owner operated and the total time taken on an enterprise of this size would be 25 hours per week. No allowance is made for any machinery, as a single unit of this size would not warrant the capital expenditure, so all pasture work and top dressing is put in at a contract rate. If it was being run in conjunction with other enterprises on the property these costs could be considerably reduced.

No allowance has been made for the replacement of cows because the boner price for cull cows is at present sufficient to cover this.

Expenditure

Drugs	\$ 160
Dipping	\$ 40
Calf Cartage	\$ 150
Prepare, fertilize and plant 10 ac. pasture	\$ 300
Top Dressing	\$ 100
Hay making	\$ 250
Administration	\$ 50
Repairs and miscellaneous	\$ 100
TOTAL	\$1150

This, when deducted from the margin of sales over purchases (\$4400), gives a net farm income of \$3250.

Capital Invested

90 ac. land @ \$100/acre	\$ 9000
40 cows @ \$100	\$ 4000
1 bull @ \$200	\$ 200
50 calves @ \$12	\$ 600
Working Capital	\$ 200
TOTAL	\$14000

If we allow 7½% for return to capital equalling \$1050 it still leaves \$2200 for labour and return to management.

Twenty five hours work a week could be costed at \$1.20 per hour totalling \$1560 leaving \$640 for return to management or a total of 12% return to capital.

ALTERNATIVE ENTERPRISES

Dairying

Returns from dairy farms with a similar capital investment, allowing for the extra that would be spent on the buildings and equipment necessary for dairying, have been compiled under the "Farm Management Accounting Scheme" by P. F.

Clift and W. Moorhouse for the year 1966-67. The average return to capital in these dairying areas was:

South Burnett	6%
Dayboro (Brisbane Milk Supply)	5%
Lockyer	0%
Booval	0%
Boonah	9%

Using these for a comparison the 12% return to capital shown by this enterprise should be quite attractive in these areas.

Vealer Production

Vealers were reared on this land prior to the 1965 drought and this area could now carry 30 mothers each with a single vealer. Value of 30 vealers sold @ \$80 = \$2400.

Cost would be the same as for the calf enterprise except for a reduction in the amounts for drugs and cartage giving a total farm cost of \$900. This leaves a net farm income of \$1500. Capital invested would be reduced by the value of 10 cows and fifty calves equalling \$1600, giving a capital value of \$12400.

The labour for a vealer enterprise would only be \$260 per year leaving \$1240 for return to capital and management, or a total of 10% return to capital.

VERSATILITY

If necessary, this enterprise could easily be closed at short notice without much loss because selected calves could be fostered out to individual cows for vealer production or all of the calves could be sold and the majority of the cows re-introduced into the dairy herd. The introduction of some virulent disease into the yards would be the most likely reason forcing a closure but this now appears unlikely after purchasing calves for over three years without running into serious disease problems.

CONCLUSION

Because of the difficulty in obtaining a sufficient number of suitable calves at an economical price at certain times of the year it appears that problems would soon arise if many farmers in any one district decided to undertake this form of calf rearing on a large scale.

However, on a small scale it would be a profitable side line for dairy farmers using mainly their own unwanted calves, as it does not require much time and could make use of good cows that have to be culled for reasons such as recurring mastitis. Like dairying it requires someone to be present twice every day except for a short break if seasonal calving was practised. Using seasonal calving would give the yards a short spell each year which should reduce the number of disease organisms present.

Carefully managed this type of enterprise can be a profitable way of using improved pastures, but I feel it is unlikely that it will be widely practised on a large scale because of supply and marketing problems.