"Economic Aspects of Crop Fattening Cattle in Southern and Central Queensland"

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SUMMARY

A study of costs and returns involved in fattening cattle on grazing crops in winter in Southern and Central Queensland on a sample of properties during 1958 and 1959 is reported. Data are presented on the distribution of farms in relation to the various components of costs of cropping, and in relation to the productivity of crops in terms of liveweight gain and estimated meat production per acre.

In all, except five out of 41 cases studied in the two years, crop fattening resulted in additional net income.

INTRODUCTION

Growth rate of cattle on unimproved pastures at a number of centres in Queensland has been described by Seddon and Mulhearn (1939), Alexander and Chester (1957), Shelton (1956), Mawson (1956) and Sutherland (1959). At all centres cattle failed to make liveweight gains for a variable period in winter. Measures which improve cattle growth rate in winter are, therefore, likely to result in greater returns to beef producers than those which improve performance at other times of the year.

Grazing on annual crops in the winter is a method commonly adopted in Southern Queensland to improve the level of nutrition of cattle at this time of year. Investigations were carried out jointly by the Bureau of Agricultural Economics and Department of Agriculture and Stock, in 1958 and 1959, to obtain data on costs and returns in crop fattening of beef cattle on a number of properties.

SURVEY METHOD

During the winter of 1958, survey results were obtained from 18 co-operating graziers who were regarded as being representative of a wide range of conditions. In 1959, the sample was extended to include the more marginal winter fattening areas of Central Queensland and a total of 23 properties were studied, including 11 out of the original sample. These were located in the Central Highlands, the Rockhampton District, the North and South Burnett and the Eastern and Western Downs.

Representative groups of cattle were weighed over the winter fattening period. This gave a measure of the productivity of the crop in terms of meat gain per acre. The farm operators recorded details of costs and labour involved in the venture.

A partial budget approach was adopted to measure the profitability of the crop fattening enterprise over and above that obtained from grazing natural pasture. The gain in value of the cattle, while fattening, was calculated as arising partially from the value of the meat produced by the crop, and partially from the margin between buying and selling prices per 100 lb. of the store carcass*. The

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* Gross Profit $= Q_1 (P_2-P_1) + P_2(Q_2-Q_1)$ where P_1 is price per lb. dressed weight of store animals; P_2 is price per lb. dressed weight of fat animals; Q_1 is the dressed weight of store animals in lb., and Q_2 is the dressed weight of the fat animals in lb.

factors influencing meat production and those affecting price were then appraised critically, as separate studies.

The additional net income was the residual left from the gross return after meeting the cost of fuel, oil, grease, repairs, the imputed labour costs, the overhead charges of depreciation and interest, and an estimate of income lost from grazing of pasture replaced by crop. Labour was charged at ruling district rates for the actual hours worked. Cash costs were costed as paid, although some imputation of seed cost was necessary where this was grown on the farm.

To provide a basis for comparison, all cost and income items for each property were converted to a per acre basis.

SURVEY RESULTS

The results calculated for 1958 and 1959 have been aggregated in this analysis to indicate the range of experience. In all tables, data for properties in the Rockhampton and Central Highlands district are grouped under the heading Central Queensland, and those for other properties under Southern Queensland.

Crops Used: Oats is by far the commonest crop used to provide grazing for cattle in winter, and in 1958 it was used on 14 out of 18 properties and in 1959 on all 23 properties, It was most commonly used as the sole winter crop but in some cases it was grazed in conjunction with such crops as barley, lucerne, wheat, rape and prairie grass. Of the properties not using oats. two used barley, one used wheat and one a ratoon crop of sorghum. The areas of crop sown varied from below 50 to 500 acres. However, on 26 out of 41 properties the acreage was within the range 50 to 150 acres. On most properties the area of crop sown for winter grazing represented only portion of the total crop area on the property.

Costs: The costs to be charged against the crop fattening enterprise were considered in four components :-

(1) Cash costs incurred for purchase of seed and fertiliser, and on items such as fuel, oil and other machinery running expenses.

(2) Costs of labour which included not only labour hired specifically for cropping but also labour of the owner, his family, or permanent employees costed at ruling rates for the time engaged on the enterprise.

(3) Depreciation and interest on plant, machinery, and additional improvements, attributable to the crop fattening enterprise.

(4) Loss of grazing income, which is an estimaate of the income which could have been obtained from grazing on the pre-existing pasture.

Table I presents figures for each of the above components of cost and of total costs, in frequency distribution form. (See Table 1 on next page).

High cropping costs were generally associated with awkward paddock layouts, inefficient machinery or insufficient tractor work to spread the fixed overhead costs.

Additional costs incurred on some properties included costs of supplementary feed used or costs of harvesting grain from the grazed crop. Allowance has been made for these costs in calculation of net income for the enterprise, on the properties concerned.

Meat Production Per Acre: The data collected on liveweight gain of cattle grazed on crop were used to give an estimate of production of carcass beef per acre. In most cases the carcass weight of a sample or of all cattle were obtained on slaughter, thus giving a figure for final dressing percentage. Initial dressing percentage was estimated by subjective judgment.

Liveweight gain per acre is a function of (1) duration of grazing provided by the crop; (2) average number of beasts carried per acre, and (3) rate of liveweight gain of cattle carried on crop.

Table III presents data on liveweight gain per acre and estimated meat production per acre.

Gross Returns per Acre: Gross returns per acre from grazing are dependent on two factors — the value of meat produced per acre and the change in value of the initial carcass beef in the animals over the fattening period.

Data on the experience on survey properties in relation to gross returns from grazing and the two components of these returns are shown in Table IV.

In some cases there was income from harvesting of grain either before, or after grazing. This income is not included in gross returns from grazing given in Table IV. but is included in the net additional income levels per farm from the crop fattening enterprise (Table V).

TABLE I

Distribution of Farms by Costs Per Acre of Crop for Grazing.

Range of Costs (£ Per Acre)	NUMBER OF FARMS WITH COSTS IN SPECIFIED RANGES																	
	1. Cash Costs		2. Labour		3. Overhead		4. Total Crop Production Cost (1 + 2 + 3)		5. Loss of Grazing Income		6. Total Additional Cost (4 + 5)	
	Cent. Q'ld.	Sth. Q'ld.	Cent. Q'ld.	Sth. Q'ld.	Cent. Q'ld.	Sth. Q'ld.	Cent. Q'ld.	Sth. Q'ld.	Cent. Q'ld.	Sth. Q'ld.	Cent. Q'ld.	Sth. Q'ld.
Less than 1	3	6	6	25	3	4	—	—	3	5	—	—
1.0 to 1.9	3	22	1	8	3	25	1	1	3	14	—	—
2.0 to 2.9	—	5	—	1	1	4	3	8	1	9	2	—
3.0 to 3.9	1	1	—	—	—	—	1	12	—	5	1	—
4.0 to 4.9	—	—	—	—	—	1	2	8	—	1	2	8
5.0 to 5.9	—	—	—	—	—	—	—	3	—	1	—	15
6.0 to 6.9	—	—	—	—	—	—	—	1	—	—	2	7
7.0 to 7.9	—	—	—	—	—	—	—	—	—	—	—	1
8.0 to 8.9	—	—	—	—	—	—	—	1	—	—	—	1
9.0 to 9.9	—	—	—	—	—	—	—	—	—	—	—	—
10.0 to 10.9	—	—	—	—	—	—	—	—	—	—	—	2

TABLE II.

Production Data on Survey Farms

Liveweight Gain Per Beast Per Day (lb.)	No. of Farms Cent. Q'ld.	Sth. Q'ld.	Duration of Crop (Days)	No. of Farms Cent. Q'ld.	Sth. Q'ld.	Beasts Fattened Per Acre	No. of Farms Cent. Q'ld.	Sth. Q'ld.
Nil	1	—	Nil	1	—	Nil	1	
0.51—1.00	1	2	Less than 30	—	1	Less than 0.5	1	—
1.01—1.50	1	7	31—60	2	—	0.5—0.74	2	5
1.51—2.00	1	11	61—90	—	3	0.75—0.99	2	3
2.01—2.50	—	7	91—120	2	9	1.00—1.24	1	9
2.51—3.00	2	3	121—150	1	7	1.25—1.49	—	8
3.01—3.50	—	3	151—180	—	7	1.50—1.74	—	6
			181—210	1	4	1.75—1.99	—	1
N.A.	1	1	211—240	—	3	2.00—2.24	—	1
						2.25—2.49	—	—
						2.49—2.74	—	1

TABLE III.

Liveweight and Meat Gains Per Acre on Survey Farms

Liveweight Gain Per Acre (lb.)	No. of Farms Cent. Q'ld.	Sth. Q'ld.	Estimated Meat Production Per Acre	No. of Farms Cent. Q'ld.	Sth. Qld.
0	1	—	—	1	—
1— 50	1	1	1— 50	3	1
51—100	2	2	51—100	1	7
101—150	1	8	101—150	—	12
151—200	—	9	151—200	1	4
201—250	1	4	201—250	—	7
251—300	—	5	251—300	—	2
301—350	—	2			
351—400	—	2	N.A.	1	1
N.A.	1	1			

N.A. = Not assessed.

TABLE IV.

Distribution of Farms by Gross Grazing Income Per Acre of Crop.

Value of Meat Produced (£ Per Acre)	No. of Farms Cent. Q'ld.	No. of Farms Sth. Q'ld.	Appreciation in Value of Beef (£ Per Acre)	No. of Farms Cent. Q'ld.	No. of Farms Sth. Q'ld.	Gross Grazing Return (£/Acre)	No. of Farms Cent. Q'ld.	No. of Farms Sth. Q'ld.
Nil	1	—	Negative	3	4	0 — 4.9	3	2
1.0— 4.9	3	1	0 —1.9	2	10	5.0— 9.9	2	8
5.0— 9.9	1	13	2.0—3.9	—	6	10.0—14.9	2	9
10.0—14.9	1	9	4.0—5.9	—	4	15.0—19.9	—	5
15.0—19.9	—	5	6.0—7.9	1	4	20.0—24.9	—	3
20.0—24.9	—	5	8.0—9.9	—	1	25.0—29.9	—	5
			Over 10.0	—	4	30.0—34.9	—	1
						35.0—39.9	—	1
N.A.	1	1	N.A.	1	1			

TABLE V.

Distribution of Farm by Net Additional Income Per Acre of Crop*

Additional Net Income Per Acre of Crop (£)	No. OF FARMS Central Q'ld.	Southern Q'ld.
Negative	2	3
0 to 3.9	3	5
4.0 to 7.9	—	9
8.0 to 11.9	1	5
12.0 to 15.9	—	4
16.0 to 19.9	—	2
20.0 and Over	1	6

The price relationship important to crop fatteners and the statistical techniques used in the analyses of seasonal beef price movements have been outlined by Collins and Kinsman (1959). This analysis shows that the producer who fattens cattle in the winter is usually able to take advantage of a seasonal price rise to the extent of some 10-15% over the winter period, which is not available to producers fattening cattle on native pastures in the summer. The existence of the seasonal price rise acts as an insurance against a falling market trend. The. analyses may be extended to give a prediction in any year that even should the trend in the market turn moderately downward, prices in the July-November period will be as high as those which reigned in the preceding autumn-early winter period.

DISCUSSION

The data obtained over two years provide information on the magnitude of the components of costs and returns which may be expected under a fairly wide range of conditions. They provide a basis on which the individual producer may form a budget for a projected crop fattening enterprise. The data can also be used for the owner of a property of given size and resources to determine the optimum extent to which resources should be devoted to crop fattening.

Of the five instances in which the additional costs were not covered by the additional returns, one was due to crop failure, another to very low crop productivity, two to a lower selling price than buying price per 100lb., and the other to heavy costs incurred in supplementary feeding. It was only in 1959 that net losses were recorded. In 1958 seasonal conditions were generally more favourable for winter crops and the rise of beef prices over the crop fattening season was greater than usual, due to an upward price trend.

The properties in Central Queensland showed much lower net returns generally than the properties in Southern Queensland. This was due almost entirely to lower productivity of crop. Of the two properties in Central Queensland which showed high net returns, one showed relatively high production per acre, while the profit of the other was due largely to net grain income from sorghum. The climate of Central Queensland is less favourable for growing of winter crops than Southern Queensland as rainfall in winter has much lower reliability. It may be that, in this area, crops other than the conventional winter grazing crops will prove more suitable.

* Including any grain harvested from portion of crop (11 properties) and after taking account of supplementary feeding or irrigation costs (5 properties).

On the properties in the survey the class of cattle fattened, varied; some used cows and calves, others used weaners, and others used older bullocks up to 3 years of age. Satisfactory results were obtained with all classes of cattle, and it is not possible from this survey to draw any conclusions as to the relative efficiency of different classes of animals in utilisation of crop. While the younger, lighter animals would be expected to make greater gains of liveweight and of meat per acre crop, older cattle may be favoursd where it is expected that appreciation in value of beef will be a major component of gross profit. As food requirements vary as the 0.75 power of body weight, the total amount of liveweight of cattle which can be carried on crop will increase, as the size of the animals used, increases. The initial price of stores of different classes, the expected demand for different classes of cattle for slaughter and the relative costs of transporting and marketing, all influence the decision the fattener has to make in regard to choice of cattle.

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DISCUSSION

Dr. P. J. Skerman (Qld.) commented that the lack of reliable rainfall could often be overcome by storing water in the soil. A planting rain is most important. Both summer and winter crops are desirable so that if the winter crop should fail, it is possible to use the summer crop. He suggested that cattle should be brought onto the crop in a forward condition.

Answer.-The condition of the cattle used is dependent on market conditions. Backward cattle may be desirable if the market needs cattle with little finish. The cropping experience of cattle fatteners played an important part.

B. Truscott (N.S.W.) asked for the reasons for the wide variation in the net returns from different properties.

Answer.—

1. The quantity and quality of the crop.
2. The skill in the use of the crop especially in grazing optimum stocking rates with rotational grazing.

Sir Henry Abel Smith (Governor, Qld.) .—Is it possible to produce prime fat cattle from crops and pasture in Southern Queensland?

Answer.-It was possible to produce animals of 1,000 lbs. liveweight at about 18 months on crops and pastures. Animals with carcases highly suited to the local trade could be produced on crops and pasture.

H. J. Lee (S.A.) considered that it is important to know the dressing-out percentage of the store cattle going onto the crop in order to estimate the actual meat increment from such an experiment.

Answer.—This information is desirable but difficult to obtain under commercial conditions. Such experiments can only be carried out in terms of liveweight gains and profits.

Dr. G. I. Alexander (Qld.) considered that ideally, two controls would be needed, one group of store cattle for slaughter at the beginning of the period, and one group on natural pasture and experience suggests that this latter group would lose an average of about. 100 lbs. liveweight.