COMPARATIVE PROFITABILITY OF MARKETING STORE AND FAT CATTLE IN NORTH-WEST QUEENSLAND

I. H. RAYNER*

Summary

Comparative profitability of store and fat cattle production in the region is examined using herd performance data from recent studies. Under present conditions, there is no income incentive to market stores rather than retain them for fattening. At the higher performance rates resulting from improvements in husbandry, the relative profitability of store production is improved, but not sufficiently to encourage a major change from fattening. .

I. INTRODUCTION

A number of students of the Australian beef industry have argued the need for effective integration of northern breeding and southern -fattening areas. Patterson (1958) predicted "a major southern movement of store cattle from the breeding reservoirs of northern Queensland". Generally, it has been assumed that less developed areas should specialise in the production of store cattle for fattening on more highly improved properties in central, southern and coastal Queensland.

Although fattening of purchased stores may be the most profitable form of land use in developed areas (van Holst Pellekaan and Robinson 1964), the question of the most profitable form of production in less developed areas has received little attention. Whether northern Queensland should, or will, specialise in store production' depends on the comparative technical efficiency of store and fat cattle production within the region and the comparative economic efficiency of the alternatives at current and expected cattle prices.

It has not been possible previously to examine this question because of lack of sufficient reliable data. However, Howard (1966) and Jenkins and Hirst (1966) have now published information on herd performance and mortality in north-west Queensland derived from independent surveys and have demonstrated the economic advantage of changing from present to improved methods. Their data have been used as the basis for a preliminary analysis of the comparative profitability of store and fat cattle marketing from the north-west.

II. ASSUMPTIONS AND BACKGROUND INFORMATION

The number and composition of the marketable stock for herds of the same size (in terms of adult cattle equivalents) were calculated for three ages of marketing, 1 ½, 2½, and 4½ years, and for present and improved conditions. "Present" and "improved" conditions are those described by Howard (1966) as "average" and "improved", and by Jenkins and Hirst (1966) as "existing" and "changed" management practices.

Howard's basic models of herd performance under present and improved conditions were used. They were modified to include the following factors at the rates used by Jenkins and Hirst:—

*Cattle Husbandry Branch, Department of Primary Industries, Brisbane, Queensland.

Culling and spaying of 2.5 % of heifers
Provision of bulls from male calves
Marketing of males at 4½ years

It was assumed that aged cows are culled from only one age group; i.e. at 10½ years under present and 7½ years under improved conditions, and that culled heifers are marketed at the same age as steers.

As all females were used as breeders in Howard's model until culled because of age, inclusion of heifer culling required higher branding rates that those of Howard in order to maintain breeder numbers without increasing the age of final culling.

Production was estimated for herds having a constant grazing requirement equivalent to that of 15,000 adult cattle. Animals over 2½ years of age were taken as adults and the following factors used to convert other classes to adult equivalents:—

Calves (less than ½ year)	: 0.2 adult
Steers and Heifers (½-1½ years)	: 0.5 adult
Steers and Heifers (1½-2½ years)	: 0.8 adult
Bulls (including those less than 2½ years)	: 1.0 adult

Estimates of cattle prices and the costs which vary with age of marketing were then used to derive expected changes in net income for marketing at 2½ and 4½ years as compared with 1½ years of age. Three estimates of cattle prices were used (Table 1).

A-Adapted from Jenkins and Hirst:-These authors reported prices for only four classes of animals-store steers, fat bullocks, fat (cull) cows and spays. For this study it was necessary to particularise within these categories according to age (and presumably related differences in weight and condition) at marketing, while maintaining the same overall price' level and relationship between store and slaughter cattle prices as in Jenkins and Hirst's original scale.

B-From Mt. Isa Market Reports:—These prices were calculated from monthly cattle market reports prepared by the Cattle Husbandry Branch officer of the Department of Primary Industries, Mt. Isa, from October, 1963 to April,

TABLE 1

Cattle Prices

Value per head (Property gate price)

Description		A	B	C
Class	Age years	Adapted from Jenkins & Hirst (1966)	From Mt. Isa Market Reports	Calculated to give equivalent net income from 1½ and 4½ year marketing
		$	$	$
Cull heifers	1½	35	35	35
Spayed heifers	2½	45	48	46.5
Spayed heifers	4½	55	81	68
Cull cows	7½	45	52	48.5
Cull cows	10½	40	41	40.5
Store steers	1½	42	42	42
Store steers	2½	50	55	52.5
Fat bullocks	4½	70	95	82.5

1967. The monthly prices, reported on the basis of delivery on rail at Mt. Isa, were averaged using approximate weightings for volume of transactions. Property gate prices were then calculated by deducting appropriate estimates of transport and marketing costs.

***C-Calculated to give equivalent net income from 1½ and 4½ year marketing under improved** conditions:*—In calculating this set of prices, a relationship between values of different descriptions of cattle similar to that within price sets A and B was maintained. The C price for each description was obtained by adding to the A price a constant fraction of the difference between A and B price. Minor departures in the tabulated values are due to rounding.

Estimation of changes in costs with varying age of marketing was based on the following:—

Paddocks in -addition to those necessary for 1½ year marketing were allowed for the following classes of stock. Under present conditions with 4½ year marketing, a paddock was allowed for 2970 steers aged between 2½ and 4½ years. Under improved conditions with 2½ year marketing, one paddock was allowed for 1970 steers 1% to 2½ years. Under improved conditions at 4½ year marketing, two paddocks were allowed, one for 1565 steers 1½ to 2½ years and one for 3006 steers 2 ½ to 4½ years. One additional stock watering, point costing $12,000 was allowed per paddock. The procedure used by Howard (1966) and Jenkins and Hirst (1966) was followed in calculating annual costs of these facilities.

One dollar per head was charged for dipping, stock assessment levy, plant operations and other costs varying directly on a per head basis.

III. RESULTS

Herd performance rates and numbers of cattle marketed varied considerably with age of marketing (Table 2). With each increase in age of marketing, the herd contains more males and culled females of various ages with a corresponding reduction in percentage of breeders and sales to total herd. As breeders suffer

TABLE 2
Herd Performance Rates and Sales

			Present Conditions			Improved Conditions		
			Age of Marketing (years)					
			1½	2½	4½	1½	2½	4½
Herd mortality		(%)	12.6	11.5	9.8	6.4	6.0	5.3
Losses to brandings		(%)	42.9	44.3	46.0	21.9	23.4	25.1
Breeders to total herd		(%)	54.6	48.4	39.8	42.2	37.2	30.3
Brandings to Breeders—								
(a) of females over 2 years		(%)	53.7	53.7	53.7	—		—
(b) of females over 3 years		(%)	—	—	—	69.3	69.3	69.3
Sales to brandings		(%)	57.1	55.7	54.0	78.1	76.6	74.9
Sales to total herd		(%)	16.8	14.5	11.5	22.8	19.7	15.7
Total Herd Size		(no.)	16870	17064	16655	16896	17091	16659
Sales:								
Cull heifers	1½ yrs.	(no.)	55			57		
Spayed heifers	2½ yrs.	(no.)		45			47	
	4½ yrs.	(no.)			34			35
Cull cows	10½ yrs.	(no.)	669	600	481			
	7½ yrs.	(no.)				1591	1419	1128
Store steers	1½ yrs.	(no.)	2106			2209		
	2½ yrs.	(no.)		1832			1911	
Fat bullocks	4½ yrs.	(no.)			1410			1458

higher mortalities than other grown stock, a smaller proportion of breeders results in lower herd mortality.

The increase with age of marketing in losses to brandings, and slight decline in the proportion of males and culled females in annual sales, results from mortalities over more years in these animals.

Changes in annual costs and net income resulting from marketing at 2½ and 4½ years instead of at 1½ years are set out in Table 3. Cost changes relate mainly to extra facilities and are accordingly greater for improved conditions, where greater segregation has been assumed, than for present conditions.

The net income derived using prices estimated by method A shows virtually no difference between any age of marketing under present conditions but a marked decrease in net income is associated with increasing age of marketing under improved conditions. By contrast, there are increased returns when method B is used for each increase in age at marketing under both present and improved conditions, the increase being more marked under present than under improved conditions.

IV. DISCUSSION AND CONCLUSIONS

In calculating production, assumptions favouring early age of marketing were used, i.e., Howard's basic models were used rather than 'those of Jenkins and Hirst because of the former's lower female and higher male mortality rates, but the branding rates used were higher than those of Howard. However, the calculated herd performance rates are consistent with Howard's, and Jenkins and Hirst's estimates. Howard's estimates for 3½ year marketing are intermediate between the values in this analysis for 2½ and 4½ year marketing for both present and improved conditions. Similarly, Jenkins and Hirst's estimates for store production, with marketing of mixed 1½ and 2½ year ages, generally fall between the 1 ½ and 2½ year estimates of this study. Some minor discrepancies are due to different definitions, for example of breeders.

The disagreement between A and B cattle price estimates may be attributed to higher prices for slaughter cattle during the latter part of the period 1963 to 1967, while Jenkins and Hirst's values were derived for 1963 to 1965 only.

Higher slaughter cattle prices have resulted from long term influences, such as an increasing demand for beef in *world trade, and some temporary factors, such as drought in eastern Australia. Accordingly the B prices, which are intermediate between previous lower and recent higher values, should be a satisfactory indicator of the future cattle market. However, as with most market predictions, they are still subject to some uncertainty.

TABLE 3

*Changes in Costs and Income**

		Present Conditions		Improved Conditions	
		Age of Marketing (years)			
		2½	4½	2½	4½
Annual Costs—fencing and stock water supply	($)	—	3154	2497	5499
cattle handling and management	($)	194	—215	195	—237
Total	($)	194	2939	2692	5262
Net Income —A. Prices	($)	294	—266	—7540	—16885
B. Prices	($)	9520	35680	952	17234
C. Prices	($)	4907	17707	—3294	175†

*Resulting from marketing at 2½ and 4½ years compared with marketing at 1½ years of age.

†Departure from zero, i.e. equivalent income, due to rounding of cattle values (Table 1).

The C set of prices (Table 1) allows an alternative approach to this problem of price uncertainty. It can be used in two ways —

(a) The set of prices can be scrutinised by persons with specialised knowledge of the cattle industry and cattle market to check whether it agrees with their expectation of future overall and relative prices.

(b) It can give a measure of the difference between store and fat cattle prices, above which there will be an incentive to retain cattle for fattening. A smaller margin between store and fat cattle prices could encourage north-western producers to market younger animals as stores.

It is apparent that producers obtaining average herd performance under present conditions have no profit incentive to market store cattle even at the most conservative estimate of the margin between store and fat cattle prices. The increase in prices of slaughter cattle during the last two years has resulted in a substantial profit advantage for fat cattle production.

The conclusion that store selling has been less profitable than the retention of steers for fattening is consistent with the past behaviour of producers in the region. Howard estimates that 60% of cattle from the area are sold for slaughter. With the estimates of composition of sales used above, this represents 57% of the industry in the region engaged in breeding and fattening. If allowance is made for store producing properties under common ownership with fattening properties in other areas, it is apparent that most independently operated properties are producing fat cattle.

At the improved levels of breeding herd performance resulting from property development and husbandry improvements, as envisaged by Howard and Jenkins and Hirst, fat cattle production remains the most profitable alternative at prices which give due weight to recent increases. Even if these prices are not maintained, margins between store and fat cattle values greater than those required for equivalent returns seem likely to continue, so that a major change to store marketing cannot be expected.

These conclusions are consistent with those reached by Sutherland (personal communication) in comparing different ages of marketing from forest country in eastern Queensland. He found that the selling of young cattle was not advantageous at low (60%) branding rates, but there was a definite incentive for younger marketing at high (80%) fertility levels. A similar reversal in relative profitability to favour younger marketing could be expected in the north-west if breeder productivity was further improved.

V. ACKNOWLEDGMENTS

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VI. REFERENCES

HOWARD, K. F. (1966). *Qd. agric. J. 92:* 132.

JENKINS, E. L., and HIRST, G. G. (1966). Q. Rev. *agric. Econ.* **19:** 134.

PATTERSON, R. A. (1958). Q. *Rev. agric. Econ.* **11:** 163.

VAN HOLST PELLEKAAN, J. W., and ROBINSON, VALERIE J. *(1964). Q. Rev. agric. Econ.* 17: 154.