REDUCTION OF AGE AT SALE FOR EXPORT CARCASSES: WILL IT AFFECT BEEF PRODUCERS IN TROPICAL REGIONS?

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SUMMARY

A series of computer models of beef cattle herds estimated the effect of live weight, age at sale and weaning rates on gross income from heavy export carcasses.

Increasing live weight at sale from 550 to 700 kg and reducing sale age from 5.5 to 2.5 years had a marked effect on income. Decreasing sale age increased the drought susceptibility of the herd because higher proportions of the herd were lactating cows and yearlings. Increments in gross income from increased weaning rates were greatest at high sale weights and low sale ages.

(Keywords: beef herd simulation, sale age, live weight.)

INTRODUCTION

Beef produced in Queensland often comes from breeding and fattening enterprises producing carcasses between 250 and 375 kg. At sale steers range from 2.5 to 5.5 years of age depending on location, soil fertility, stage of property development and seasonal conditions.

Until recently there was no incentives to reduce age at sale because export processors paid higher prices for heavier carcasses with acceptable fat cover irrespective of age. Now there are indications that reducing age at sale will improve prices. However, any change to age at sale will focus attention on a number of secondary effects, such as live weight at sale, the relative importance of reproductive and survival rates and drought susceptibility of the herd. These effects may have more influence on income than the primary reason for change and should be estimated before altering an established managerial system. Some effects of reducing age at sale in a breeding and fattening herd are examined in this paper.

METHODOLOGY

A series of computer models was constructed to simulate herd structure and gross income under different levels of production, and the logic of which can be inferred from Taylor et al. (1980).

Biological and managerial variables held constant for all models were: (i) herd size at 2500 mixed age cattle because standard adult equivalent factors were thought to be inappropriate over the range of live weight for age and weaning rates studied, (ii) age at first (2 years) and final (10 years) joining, (iii) proportion of bulls (4 %) and their live weight at sale (650 kg), (iv) breeder mortality rates (3 to 6 % depending on age and lactation status), (v) growing cattle mortality rates (2 to 5 % depending on age), (vi) culling for reproductive failure was confined to non-lactating cows and (vii) cast for age cows were fattened after weaning their final calf and sold at a live weight of 400 kg.

Weaning rates and age at sale varied (50, 65 and 80 % and 2.5, 3.5, 4.5 and 5.5 years, respectively) for both steers and cull heifers. Live weights at

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sale were varied from 550 to 700 kg for steers and from 355 to 490 kg for cull heifers. A live weight at sale of 550 kg for steers is achieved over many locations at the sale ages examined while the 700 kg represents the probable genetic potential. The prices for steers, cull heifers, cast for age cows and bulls were inferred from current Rockhampton reports (May–June 1985) and were 95, 85, 78, 100 cents per kg live weight, respectively.

RESULTS AND DISCUSSION

Relationship between drought risk and sale age.

Table 1: The percentage of high drought risk animals in the herd at different weaning rates and sale ages

<table>
<thead>
<tr>
<th>Weaning rate</th>
<th>50% Cows &lt;15 mo.</th>
<th>65% Cows &lt;15 mo.</th>
<th>80% Cows &lt;15 mo.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.5 years</td>
<td>20</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>4.5 years</td>
<td>22</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>3.5 years</td>
<td>25</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td>2.5 years</td>
<td>28</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

† Pregnant and lactating cows.
‡ c. 6 to 15 months of age.

Pregnant and lactating cows and growing cattle from 6 to 15 months of age are drought susceptible groups. The proportion of high risk cows ranges from 19 to 30% as sale age decreases from 5.5 to 2.5 years and weaning rates increase from 50 to 80% (Table 1). The comparable trend for yearling cattle is an increase from 18 to 30%. In a herd of 2500 mixed cattle these increases represent an extra 275 lactating cows and 300 yearling cattle.

The proportion of drought susceptible animals in a herd is economically important to management. In Queensland the frequency of droughts of greater than six months, varies from one each five to six years in the <380 mm to one each seven to eight years in the > 760 mm annual rainfall areas (Alexander 1966). The effect of drought on mortality is higher in extensively managed herds which are usually located in low rainfall areas. In these areas drought mitigation costs are exacerbated by high feed, transport and distribution costs. Thus changes to existing production systems should be interpreted against the risks and costs of drought.

Relationship between weaning rates and sale age

Fig. 1, shows the effect on gross income at four sale ages, four sets of live weights at sale and two weaning rates. In all cases the effect of the 65% weaning rate was median to those of the 50 and 80%. The effect on gross income of increasing weaning rate from 50 to 80% varied from 0% at 5.5 years and 550 kg live weight to 18% at 2.5 years at 550 kg live weight at sale. The comparable figures for 700 kg live weight at sale were 3% and 22% in logical sequence. This indicates there is little incentive to increase weaning rates unless age at sale can be reduced below 3,5 years. By contrast, an increase in live weight at sale of steers from 550 to 700 kg and cull heifers from 385 to 490 kg increases gross income from 19 to 24% across the range of weaning rates, irrespective of age at sale. Increasing live weight is economically and managerially easier to achieve than increasing reproductive rates because returns to investment are received more quickly and less animals are involved.
Fig. 1. The effect of sale liveweight, weaning rate and sale age on estimated gross income ($'000)
Fig. 1. also shows the relationship between age and live weight at sale on gross income. Increasing growth rate so that target live weights can be achieved at younger ages increased gross income by 16, 22 and 25% at 50, 65 and 80% weaning rates, respectively, for each year reduction in sale age. The figure also demonstrates the effects on gross income of increasing both age and live weight at sale. As sale age increases the live weight increment required to equate gross income across various sale ages is reduced. For example, similar gross income can be generated by selling at 2.5 years and 550 kg and selling at 3.5 and 700 kg, whereas selling at 4.5 years and 550 kg produces similar gross income to selling at 5.5 years and 650 kg.

COMMERCIAL IMPLICATIONS

High cost development such as improved pasture, cropping, irrigation is pre-requisite to significantly higher growth and reproductive rates for many herds in central and northern Queensland. Therefore, changes should be planned with regard to investment and managerial constraints.

In the absence of market pressures to reduce age at sale the first logical step could be to increase live weight at sale towards the higher levels examined if they are not already being achieved. This approach will give a similar increase in gross income as each years reduction in age at sale at a given weight, and greater increase than by increasing reproductive rates especially at the lower sale live weights. Increasing live weight at sale is financially and managerially easier to effect because there is a smaller number of animals involved when compared with either of the other two strategies.

During the stage of reducing age at sale, breeder numbers need to be increased to maintain total herd numbers. Concurrently, it is necessary to implement drought mitigation practices to cope with the higher risk associated with increases in numbers of drought susceptible cattle.

When maximum live weight and minimum sale age are obtained, emphasis should be placed on improving weaning rates to increase gross income, because returns to increased weaning rates are low until high live weight at sale and younger sale ages are achieved. In better environments, reproductive rates of more than 75% can be achieved with minimum managerial and financial inputs, however this is not the case in harsher environments in tropical regions.

If the premiums paid for younger 250 to 375 kg carcasses become substantial, cattle bred in the harsh regions may be sent to the more favoured environments for finishing at younger ages. In turn, this would put pressure on industry research to develop commercially viable technology to ensure high reproductive and survival rates in breeding herds in harsher environments.

REFERENCES
