Mulga Lands – Factsheet 2: Safe carrying capacity, weaner management, pregnancy testing and vaccinations to improve drought resilience

The Queensland Department of Primary Industries (DPI) evaluated the economic implications from reducing the stocking rate to a long-term safe carrying capacity. A second strategy also evaluated stocking to the safe carrying capacity along with weaner management, pregnancy testing and vaccinations. These strategies are compared to the representative property and herd outlined in 'Mulga Lands – Factsheet 1'.

Key finding
Implementing safe carrying capacity, weaner management, pregnancy testing and vaccinations slightly increased profitability.

Management changes and assumptions

Safe carrying capacity was implemented by selling a proportion of each class of females in the first year (and additional steers in the second year) to reduce grazing pressure from 600 to 500 adult equivalents (-17%).

Steers were weaned at 6 months of age but still sold at 12 months. Weaning activities were implemented twice a year with weaners fed hay post-weaning for $5/head. Additional labour for post-weaning activities was costed at $1,000/year. Pregnancy tests were $5/cow and vaccinations $1/hd for botulism, $1.28/hd for leptospirosis (except yearling heifers at $2.20/hd), $12/bull for vibriosis and $1.50/calf for clostridial diseases. Management costs of $5,000/year accounted for increased workload and skill requirements.

Impact on production

The table (right) compares a range of production traits before and after five years of implementation. Stocking to the safe carrying capacity was assumed to decrease breeder and weaner steer mortality rates and increase conception rates of mature breeders, weaning rate, breeder weights and the proportion of females sold. Also including weaner management, pregnancy testing and vaccinations was assumed to further improve the same traits. Cull cow sale weights were 60 kg lower due to improved reproduction efficiency allowing more cows to be culled on performance at weaning triggering sales of lighter cows. Steer sale weights were 15 kg lighter due to earlier weaning.

Production traits	No change*	Safe stocking (after 5 years)	Safe stocking, weaning, preg testing & vaccines (after 5 years)
Weaning rate	47.5%	49.2%	57.3%
Female mortality rates	12.5%	10%	6%
Weaner steer mortality	4%	3%	2.5%
Average breeder weights	400 kg	410 kg	420 kg
Cull cow sale weights	450 kg	450 kg	390 kg
Steer sale weights	220 kg	220 kg	205 kg
% of females sold	31%	36%	43%

** The representative property as outlined in 'Mulga Lands – Factsheet 1'.*

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The table (right) compares production, sales, costs and gross margin results for the representative property before the strategies were implemented and 30 years after. Implementing a safe carrying capacity decreased the number of cattle carried, mated and sold and reduced sales revenue and the herd gross margin.

By including weaner management, pregnancy testing and vaccinations, the number of calves weaned and cattle sold increased producing the highest sales revenue and gross margin.

Productivity and profitability indicators	No change*	Safe stocking	Safe stocking, weaning, preg testing & vaccines
	First year	After 30 years	After 30 years
Adult equivalents	600	500	500
Total cattle carried	752	615	625
Total breeders mated	458	369	370
Calves weaned	218	182	212
Cows and heifers sold	46	49	79
Steers sold	104	88	103
Average female price	$712	$727	$646
Average steer price	$452	$452	$418
Net cattle sales	$79,859	$75,514	$94,059
Variable costs	$6,726	$5,454	$10,492
Herd gross margin	$73,132	$70,060	$83,567

** The representative property as outlined in 'Mulga Lands – Factsheet 1'.*

Were the changes profitable?

An investment analysis was undertaken evaluating the changes in cash flow that occurred over 30 years. It was assumed that no upfront investment was needed to implement either strategy. The table below outlines the annualised net present value (NPV), rate of return, payback period and peak deficit for the two strategies.

While the safe carrying capacity strategy decreased the herd gross margin, this was more than offset by the revenue derived from the initial sale of cattle (~$60,000). Over 30 years, the safe carrying capacity strategy increased profitability each year by $520 (annualised net present value) relative to the starting representative property (no change). No cash flow deficit occurred.

The safe carrying capacity strategy plus weaner management, pregnancy testing and vaccinations increased profitability each year by $173 relative to the starting representative property (no change).

Management strategy	NPV ($/yr)	Rate of return	Payback period	Peak deficit (year of)
1. Stocking to safe carrying capacity (strategy 1)	$520	n/c	n/a	n/a
2. Strategy 1 *plus* weaning, preg testing and vaccinations	$173	n/c	n/a	n/a

n/c: not calculable. n/a: not applicable.

Please note, these results are dependent on the assumptions used in the analysis. Producers must consider their own circumstances before implementing any changes.

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This project is jointly funded through the Australian Government's Future Drought Fund and the Queensland Government's Drought and Climate Adaptation Program.

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