


# Farm Animal Project: *HGP trial on a pasture-based backgrounding property*




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## Aim


**“To determine whether hormonal growth promotants are an economically feasible option in a background steer enterprise located in the Riverina.”**




# The Property

- ▶ Location – Riverina
  - ▶ Size – 650Ha
  - ▶ Enterprise– family operated
    - beef backgrounding
    - Horse agistment
  - ▶ Rainfall –  
650mm/year
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# Beef Operation

- Sourced between 8–11 mo (230–300kg)
  - Preference for black cattle
  - Induction program
  - Steers remain on property for 6–8 months or until 520 kgs
  - Aimed at feedlot market
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# Soil and Pasture

- ▶ 340 ha undulating & river flat farming on 'home block'
    - Legume and grass based
    - Cropped; Oats, triticale & lucerne
  - ▶ 330 ha adjacent to the home block
    - less developed grazing pastures
  - ▶ Brown loamy soils
  - ▶ Fertiliser
    - Annual basis or as required
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# Property Map

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# Goals of business

- ▶ Maintain a profitable enterprise **without taking too many risks**
- ▶ Turn off stock at a faster rate and at heavier weights
- ▶ The son
  - Open minded
  - Wants to increase stocking rate
  - Interested in changing to a mixed grazing system
    - Fat lambs




# Hypotheses

- ▶ Null Hypothesis
  - The cattle with HGP will not experience an increased weight gain.
  
- ▶ Alternative Hypothesis
  - The cattle treated with a HGP will gain more weight than the control group.





# Methodology

- ▶ Random allocation of cattle;
    - Control (39)
    - Experimental (35)
  - ▶ Implant HGP
  - ▶ Record current (starting) weight
  - ▶ Recommended 3 week weighing
  - ▶ Weighed on day 1, 21, 40, 68, 82, 104, 117
  - ▶ Record data
  - ▶ Statistical analysis
    - One tailed T-test,
- 

# Results

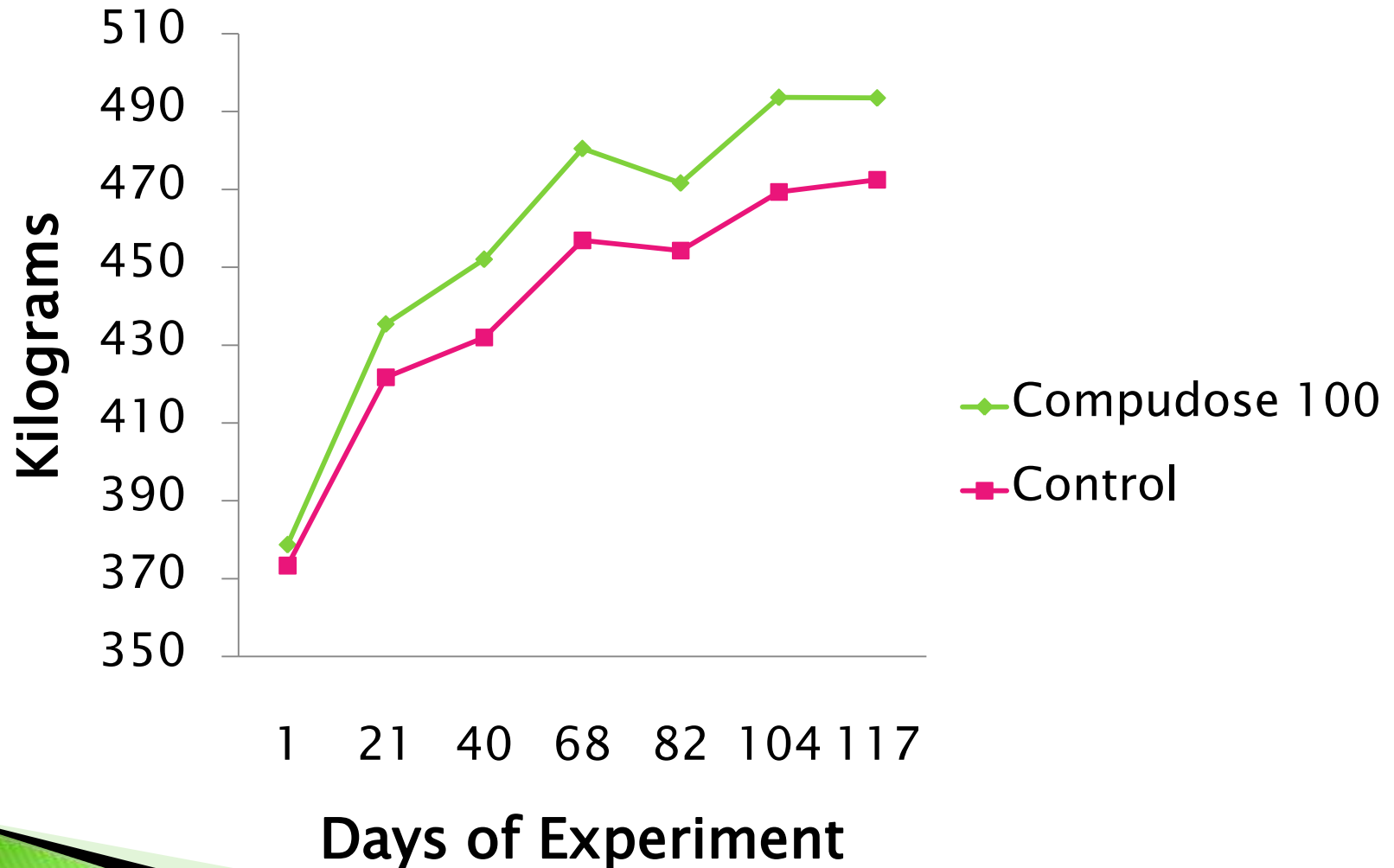
- ▶ 117 day trial
- ▶ HGP mean weight gain 114.8kg/head
- ▶ Control mean weight gain 99.1 kg/head
  - Difference 15.7 kg/head
- ▶ The average daily weight gain:
  - Experimental group: 1 kg/head/day
  - Control group: 0.8kg/head/day

# Results

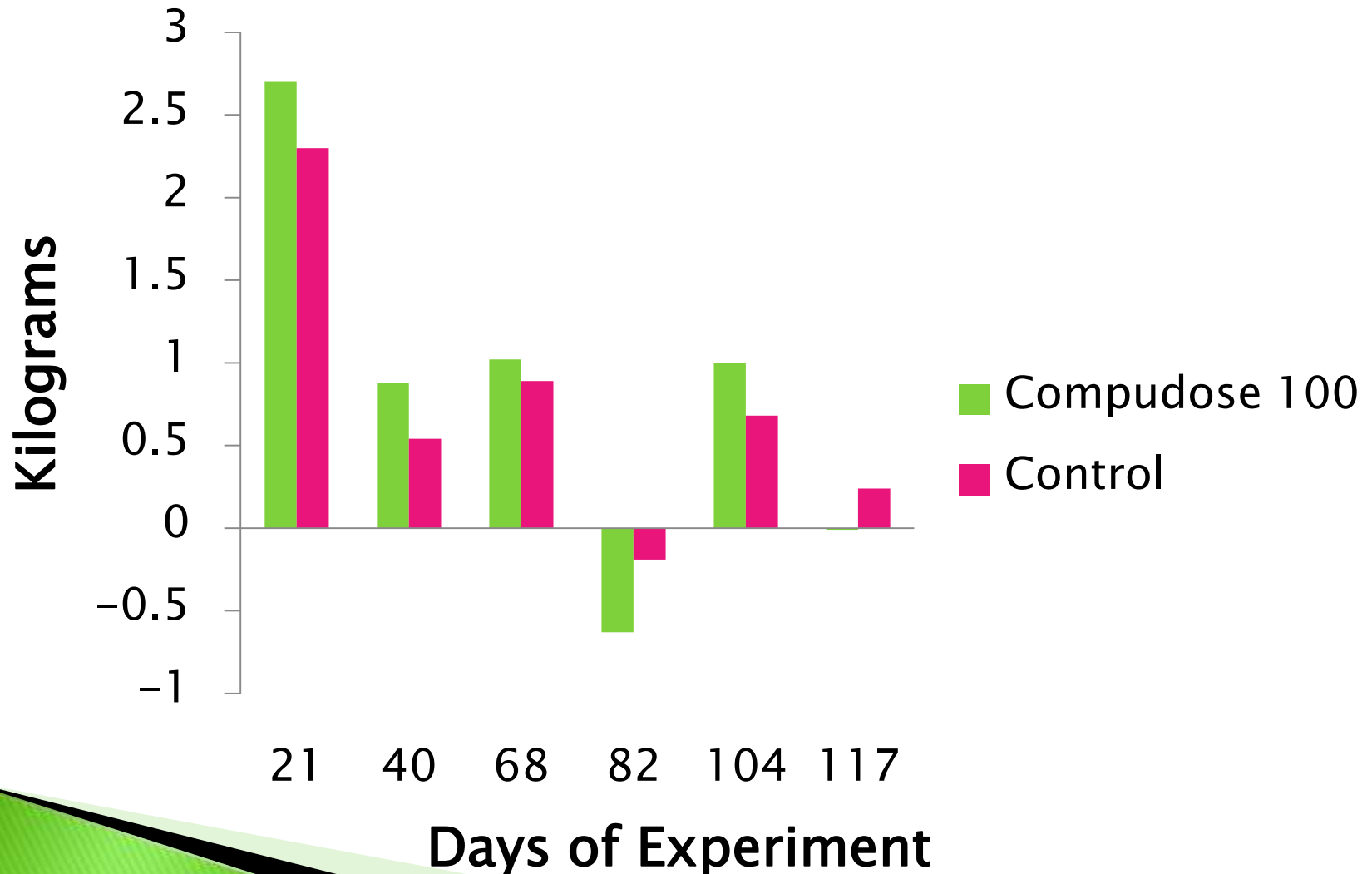
Day	1	21	40	68	82	104	117
Control mean (kg)	373.4 *	421.7	432.0	457.0	454.3	469.4	472.5
HGP mean (kg)	378.7 *	435.3	452.1	480.5	471.6	493.7	493.5
T Test	0.232137 *	0.016221	0.001261	0.00057	0.001404	0.000679	0.000478

- ▶ Significance level:  $P < 0.05$  or 5%
- ▶ Reject the Null hypothesis

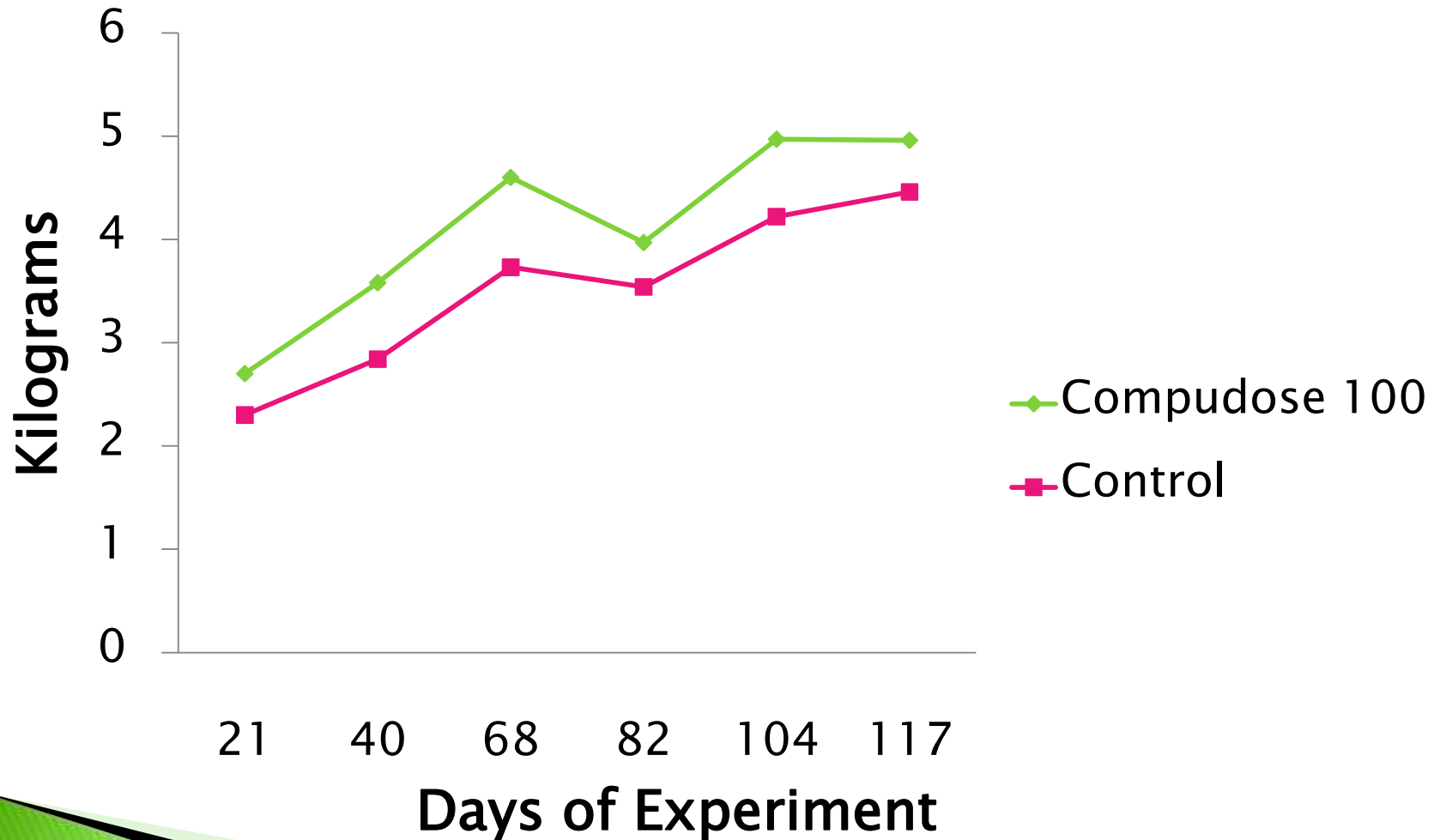
# Mean Weight gain (kg)



# Difference in ADG of over the trial period



# Cumulative ADG of over the trial period



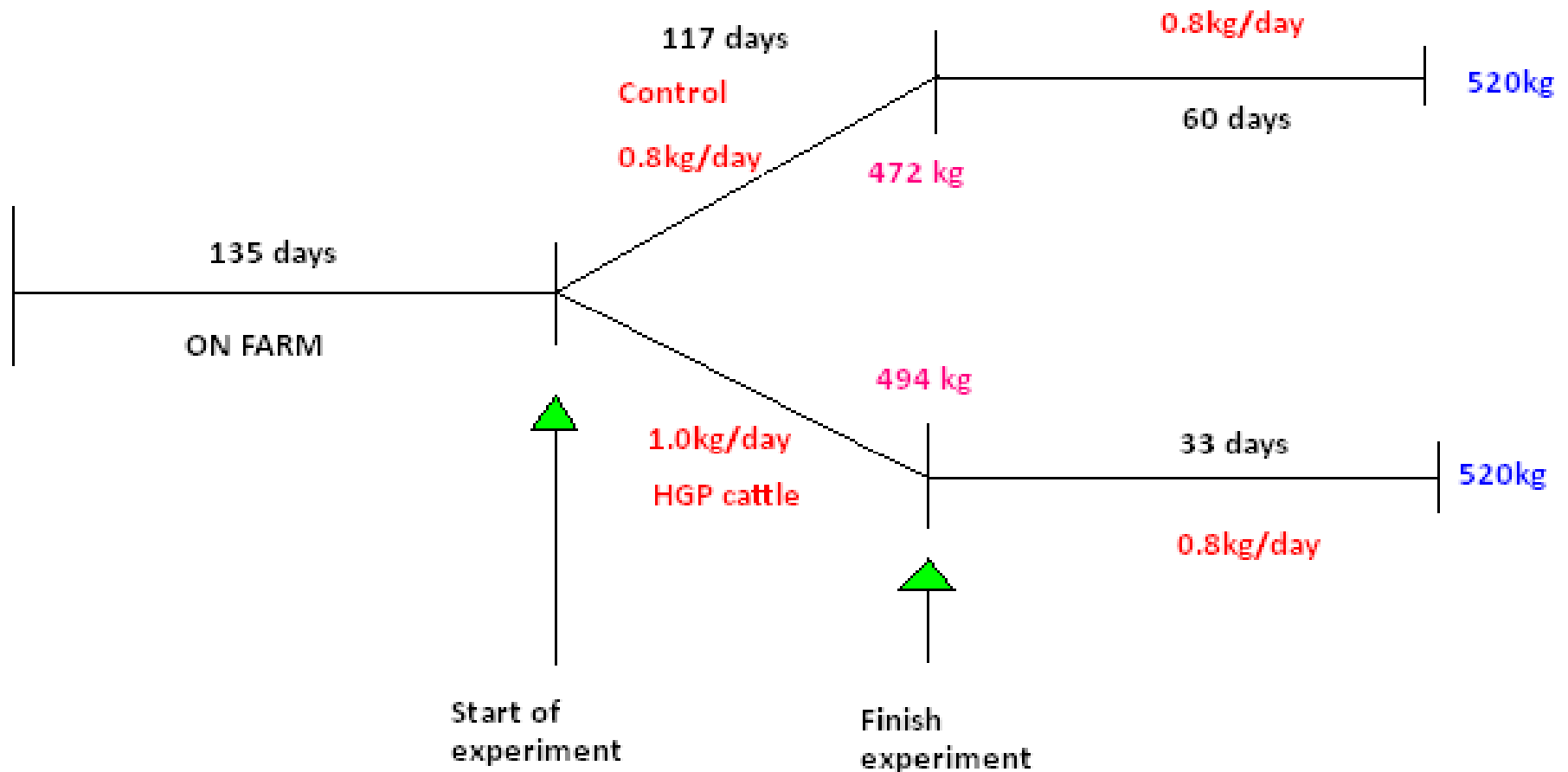
# Recommendations from trial

- ▶ Employ Hormonal Growth Promotants (Compudose 100) in cattle to achieve higher average daily gains
  - Profit achieved will depend on how/when cattle are sold
  - 3 feasible options with varied profit returns

*\* Different markets were not explored in this trial*



# Assumptions



# Option 1

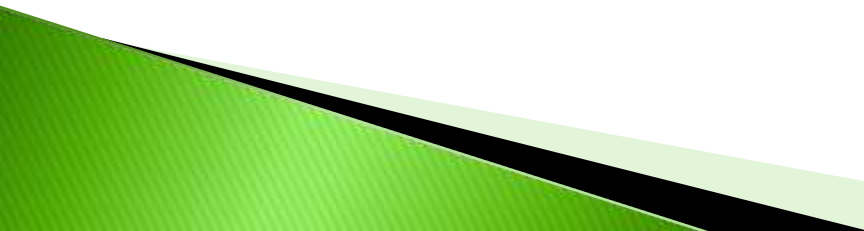
- ▶ The first option involves selling cattle after a certain amount of time e.g. 100 days.
- ▶ **Benefit is related purely to the difference in ADG (kg/beef).**

## Compudose 100

Location	Duration (days)	Starting weight (kg)	Average daily gain (kg)		Weight gain average (kg)	Economic advantage per head	Return on investment *
			Control	Compudose			
Ladysmith	117	376 kg	0.84	0.98	21.02 kg	\$43.97	2377%

(Based on live weight price of \$2.09/kg for feeder steers and average retail price of Compudose100 (\$1.85) (Elders- Wagga Wagga))

# Option 2

- ▶ Selling cattle when they reach 520kg.
  - ▶ The benefit is associated with HGP cattle being turned off quicker than non-treated cattle.
  - ▶ The economic advantage is only achieved when the pasture is utilised by restocking.
  - ▶ Profit = \$43.30
  - ▶ Return on Investment = 2440%
- 


# Option 3

- ▶ Selling the cattle at 520kg,
- ▶ Economic advantage is related to the utilisation of pasture that is 'saved'
  - Eg. cutting and selling the lucerne hay.

**Profit = \$56.65 – \$62.90**

**Return on Investment = 3162% – 3502%**

# Managerial Recommendations

- ▶ Holistic approach
    - Electronic Records
    - Record keeping
    - Conduct another HGP trial during Winter season
    - Implement a standard weighing protocol
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# Trial Improvements

- ▶ Keeping cattle for the entirety of the trial
- ▶ Consistent weighings
- ▶ Re-calibrating scales
- ▶ Repeat trial at different times of year
  - Repeat trial on different pastures

# Questions?





# Option 1

- ▶ Selling cattle by age/certain time period. Benefit is related purely to the difference in ADG (kg/beef).
- ▶
- ▶ Control = 472 kg x \$2.09  
= \$986.48/hd
- ▶
- ▶ HGP Cattle = 494 kg x \$2.09  
= \$1032.46/hd
- ▶
- ▶ Difference = \$1032.46/hd - \$986.48/hd  
= \$45.98/hd
- ▶
- ▶ Profit = \$45.98/hd - \$1.85 (cost of HGP)  
= \$44.13
- ▶
- ▶ Return on Investment = 2485%

# Option 2

- ▶ Difference in days on pasture due between HGP treated cattle and the control = 27 days
- ▶ Restock the weight gain of those cattle = 27 days  $27 \times 0.8 \text{ kg/day} = \$45.14$
- ▶ Profit =  $\$45.14 - \$1.85$  (cost of HGP)  
= **\$43.30**
- ▶ Return on Investment = **2440%**

# Option 3

Maximum daily dry matter (DM) intake – percentage of liveweight = 2.4%

Control cattle

$$\begin{aligned}\text{DM intake per day} &= 2.4\% \times 472\text{kg} \\ &= 11.328\end{aligned}$$

$$\begin{aligned}\text{Dry matter intake per day} &= 2.4\% \times 520\text{kg} \\ &= 12.48\end{aligned}$$

$$\begin{aligned}\text{Average DM intake per day} &= 11.328 + 12.48 \\ &= 23.808/2 \\ &= 11.904 \\ &= 12 \text{ kg HGP cattle}\end{aligned}$$

$$\begin{aligned}\text{Dry matter intake per day} &= 2.4\% \times 494\text{kg} \\ &= 11.856\end{aligned}$$

$$\begin{aligned}\text{Dry matter intake per day} &= 2.4\% \times 520\text{kg} \\ &= 12.48\end{aligned}$$

# Option 3

$$\begin{aligned}\text{Average dry matter intake} &= 11.856 + 12.48 \\ &= 24.336/2 \\ &= 12 \text{ kg}\end{aligned}$$

$$\begin{aligned}\text{Time saved by selling cattle earlier} &= 27 \text{ days} \\ \text{Amount of pasture consumed during this period} &= 27 \text{ days} \times 12 \text{ kg} \\ \text{Lucerne} & \\ &= 324 \text{ kg Lucerne}\end{aligned}$$

$$\begin{aligned}\text{Lucerne contains 90\% DM and 10\% water} \\ 324 \text{ kg pasture (DM)} &/ 0.9 \\ &= 360 \text{ kg Lucerne}\end{aligned}$$

$$\text{Price Lucerne} = \$325 - \$360 / \text{tonne}$$

$$\begin{aligned}\text{Amount of pasture saved in \$} &= 0.36 \text{ tonne} \times \$325 \\ &= \$117\end{aligned}$$

$$\begin{aligned}\text{Estimated expenses} &= \$117/2 \\ &= \$ 58.50\end{aligned}$$

# Option 3

$$\begin{aligned}\text{Profit} &= \$58.50 - \$1.85 \text{ (cost of HGP)} \\ &= \underline{\$56.65}\end{aligned}$$

$$\begin{aligned}\text{Profit} &= \$64.80 - \$1.85 \text{ (cost of HGP)} \\ &= \underline{\$62.90}\end{aligned}$$

$$\text{Return on Investment} = \underline{3162\%}$$

$$\begin{aligned}\text{Amount of pasture saved in \$} &= 0.36 \text{ tonne} \times \$360 \\ &= \$129\end{aligned}$$

$$\begin{aligned}\text{Estimated expenses} &= \$129/2 \\ &= \$64.80\end{aligned}$$

$$\text{Return on Investment} = \underline{3502\%}$$