

**Saltbush (*Atriplex spp.*):  
a natural source of vitamin E that can  
improve the colour stability of lamb meat**

Chelsea Fancote



***Supervised by:***

Dr Phil Vercoe  
Dr Ian Williams

Dr Hayley Norman  
Dr Kelly Pearce



# Australian farming systems

## Mediterranean climate

- long, dry summers

## Salinity

- threat to agriculture

## Saltbush

- revegetation
- green fodder
- **Vitamin E**



# The importance of meat colour

Freshness and quality → decision to purchase



Oxymyoglobin → Metmyoglobin

An industry issue

Anti-oxidants improve colour stability

– Vitamin E

# Availability of vitamin E for grazing livestock

---

## Vitamin E content (mg/kg DM)

---

Green pastures	50 - 200	← Winter/Spring only
Dry pastures	2 - 15	← Summer/autumn
Grain	5 - 10	
<b>Saltbush</b>	<b>140</b>	

---



# Availability of vitamin E for grazing livestock

## Saltbush:

- ✓ source of green feed in summer
- ✓ high in vitamin E
- ✗ moderate levels of digestible energy
- ✗ high salt (25%)



# Experimental design

## 'Backgrounding' phase

- 64 days
  - Saltbush
  - Control

## 'Finishing' phase

- 38 days
  - Low vitamin E ration

## Slaughter



# Hypotheses

Backgrounding lambs on saltbush before finishing would:

1. **Increase the concentration of vitamin E** in muscle tissue (LL)
2. **Improve the colour stability** of the LL during retail display



# Methodology

- Vitamin E ( $\alpha$ -tocopherol) concentration
- Colour stability  $\rightarrow$  oxy:met
  - 5 days aged
  - Simulated retail display
  - 96 hours



0 hours



48 hours



96 hours



# Vitamin E concentration of feed

---

## Vitamin E content (mg/kg DM)

---

<i>Atriplex spp.</i>	138 ± 6.4
Understorey pasture species	2.2 ± 0.4
Barley grain	1.5 ± 0.2
Finishing pellet	12.5 ± 1.6

---

# Muscle vitamin E

---

LL muscle vitamin E concentration  
(mg/kg)

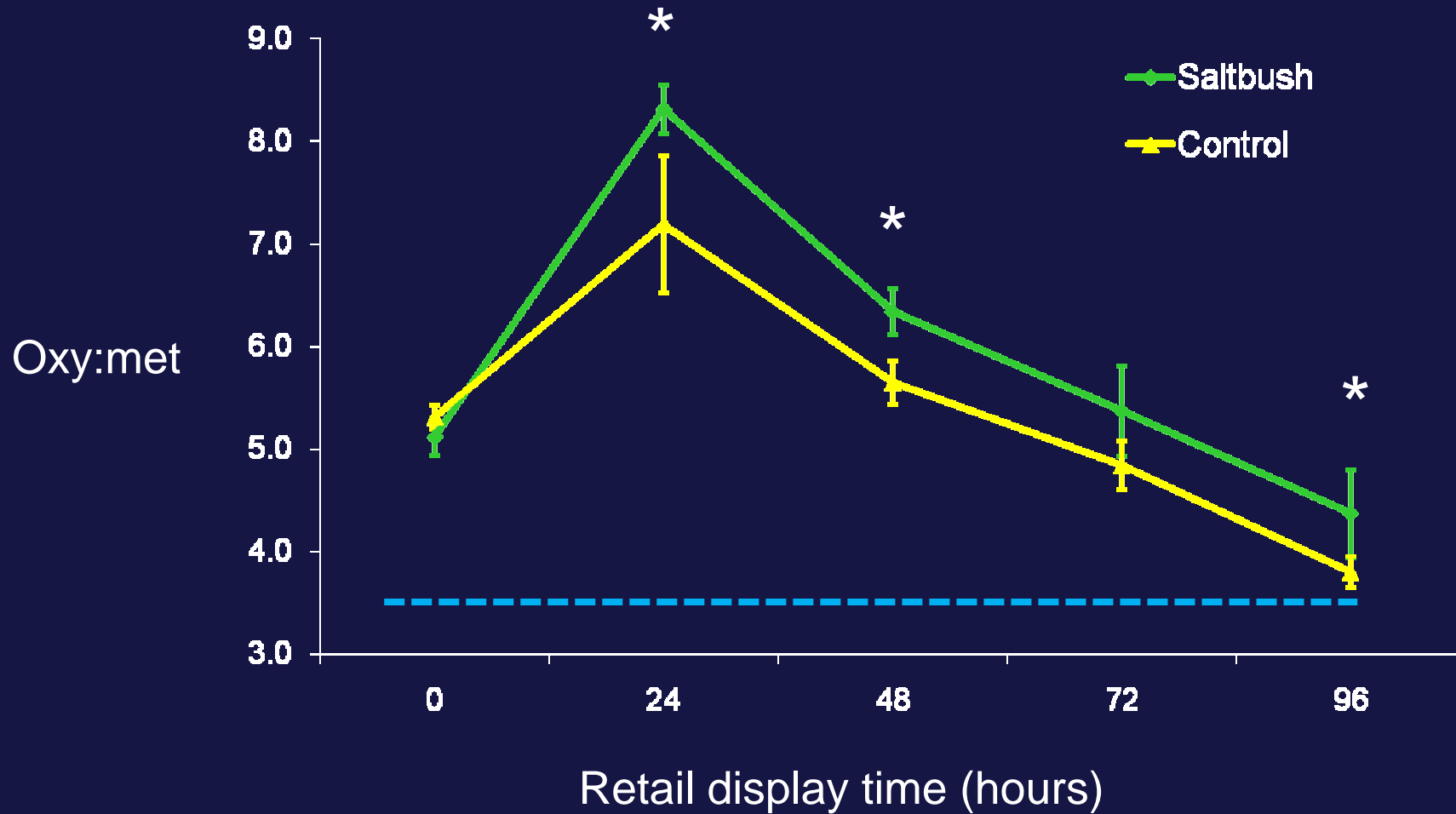
---

Control  $0.8 \pm 0.08^a$

**Saltbush**  **$1.6 \pm 0.10^b$**

---

# Colour stability



# Summary of results



## Grazing saltbush can:

- Provide a good source of vitamin E
- Increase the concentration of vitamin E in meat
- Improve the colour stability of meat during retail display

# Opportunities for application of results

- Meat colour = very important
- An industry issue
- Utilize existing saltbush to naturally enhance vitamin E levels in meat and improve colour stability