



Assessing welfare, pain relief and future options

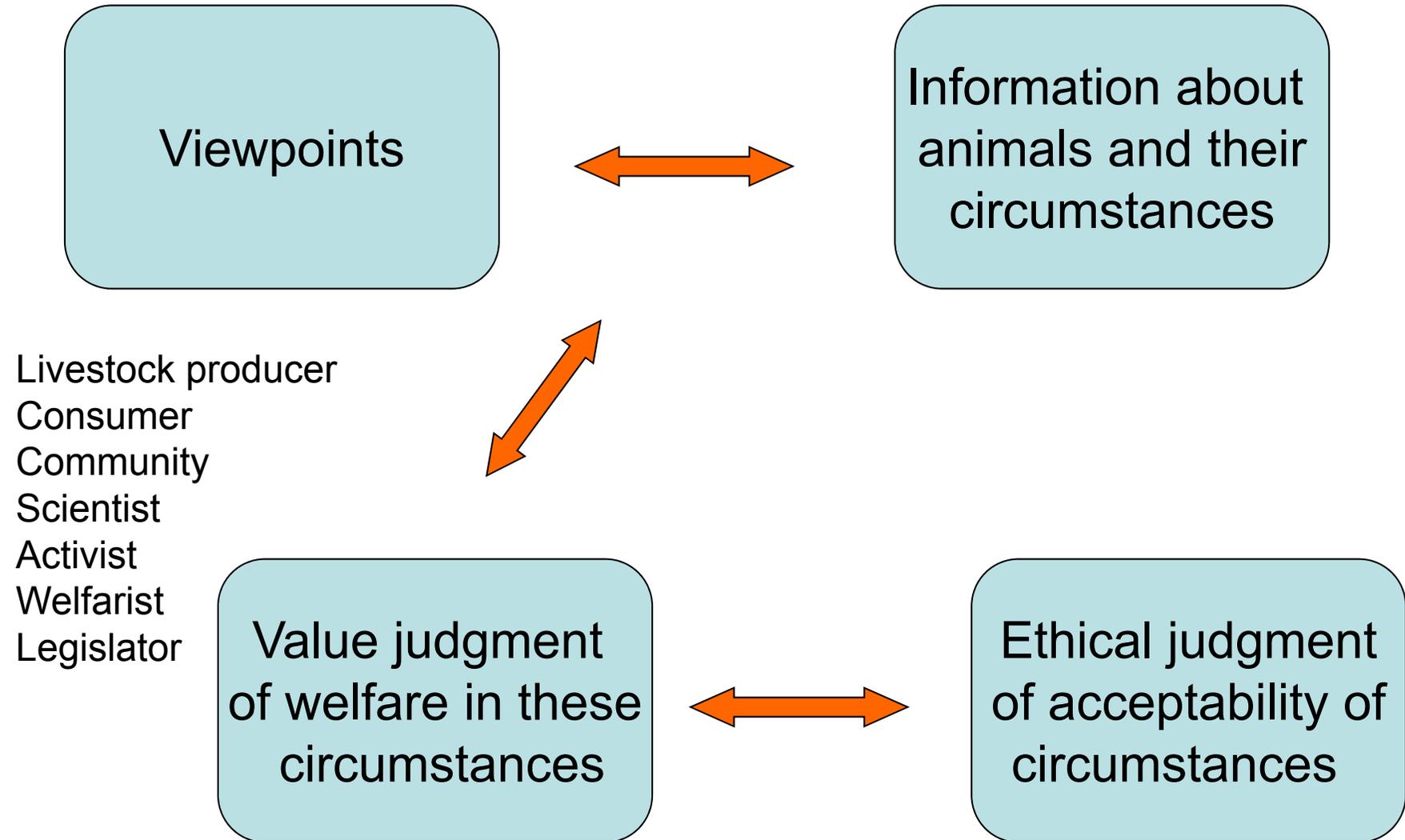
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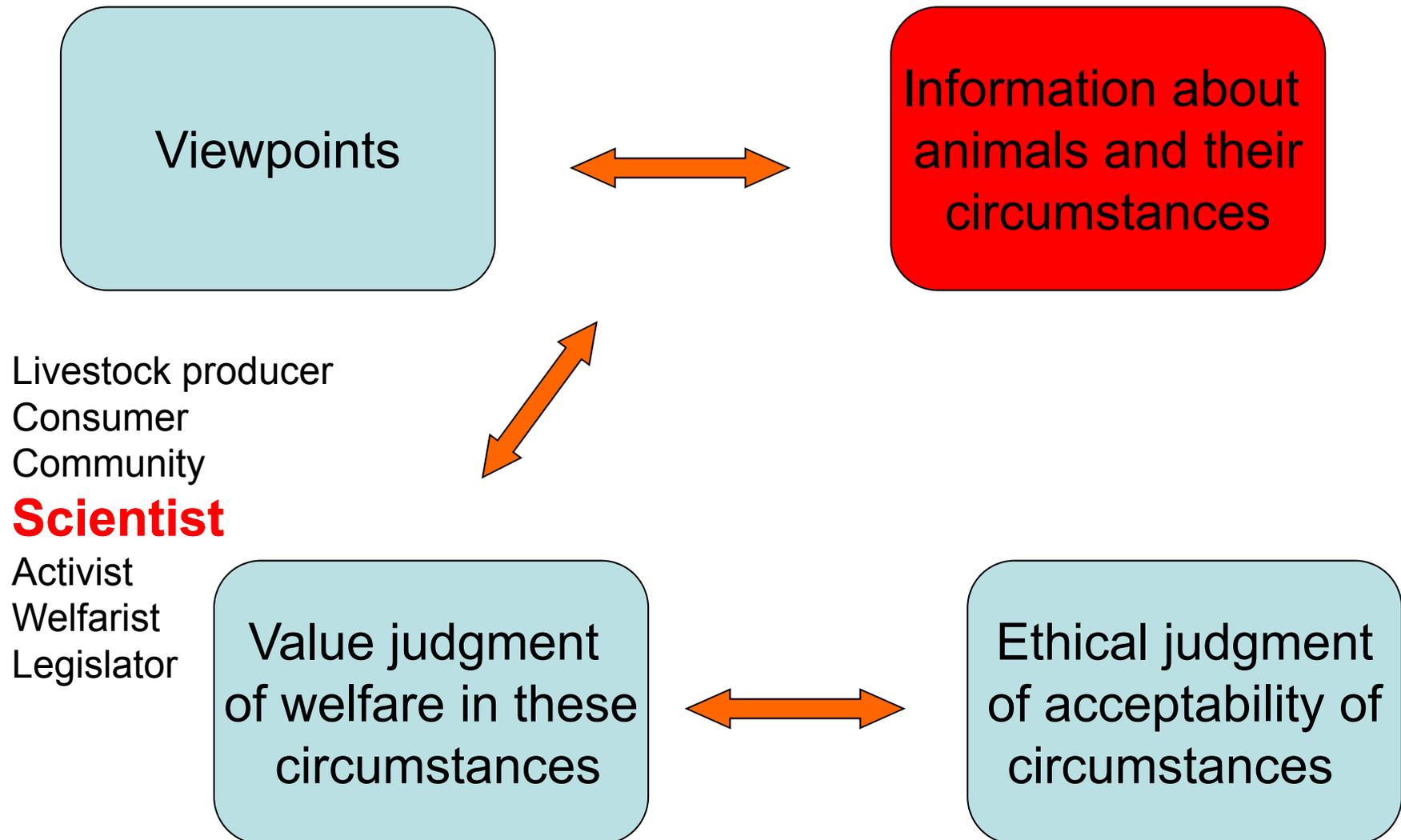
- 1. Welfare assessment***
- 2. Analgesia for mulesing***
- 3. Practical methods***
- 4. Emerging issues***

1. Welfare assessment

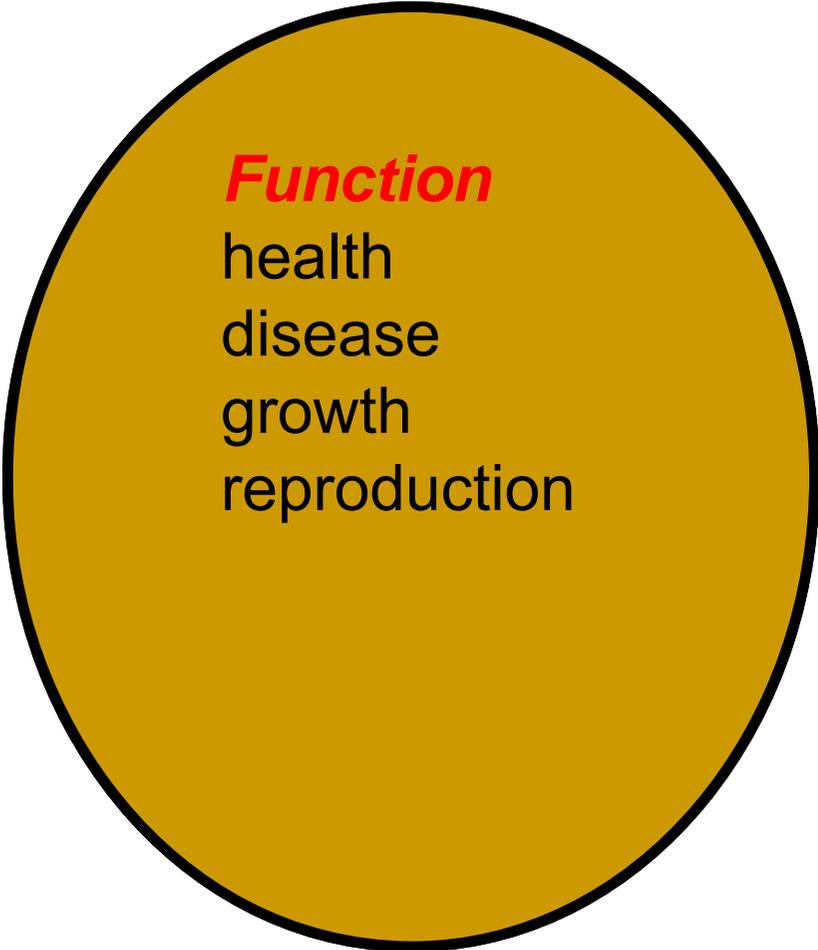
How do we assess animal welfare and ethics?



How do we assess animal welfare and ethics?



Some conceptual frameworks



Function

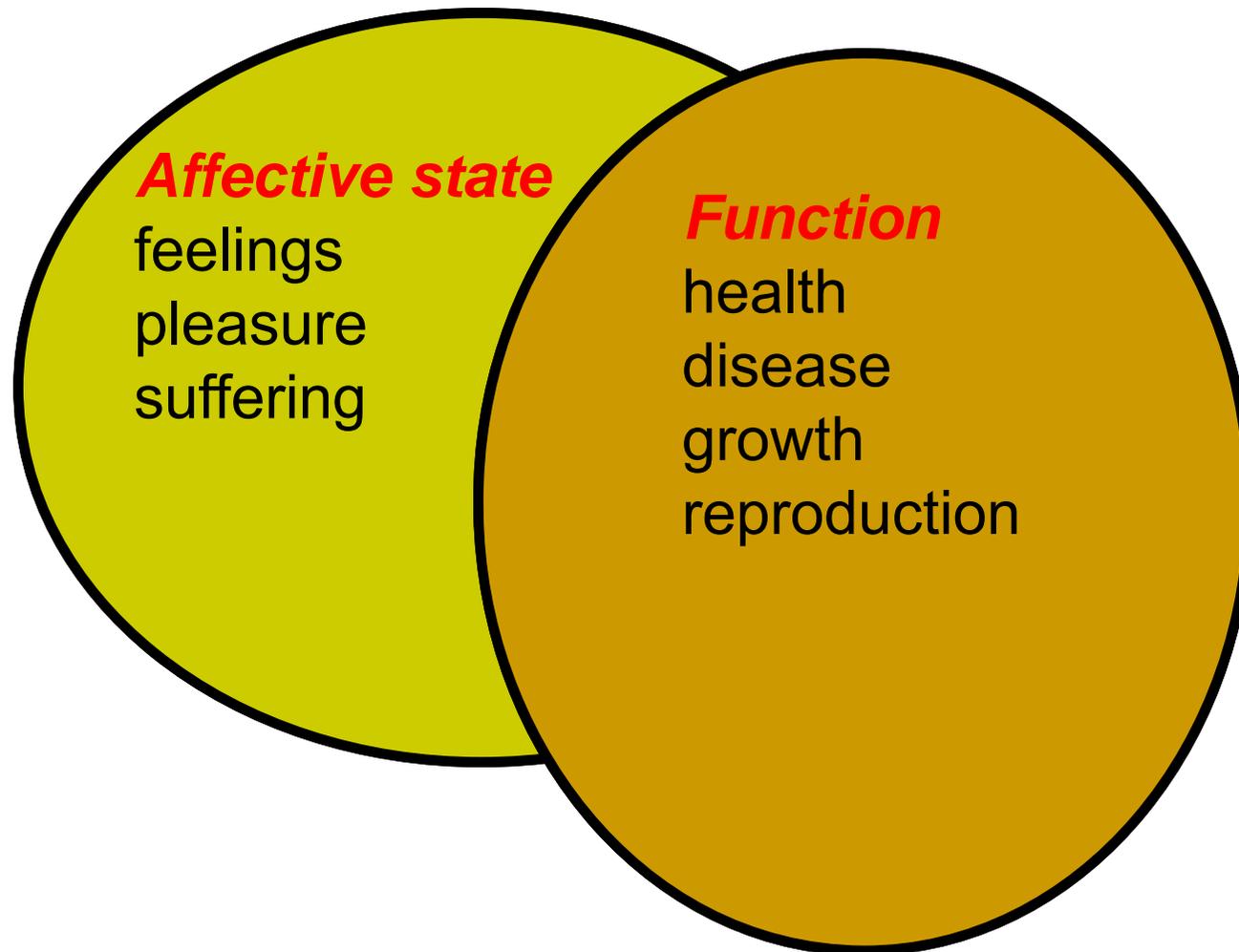
health

disease

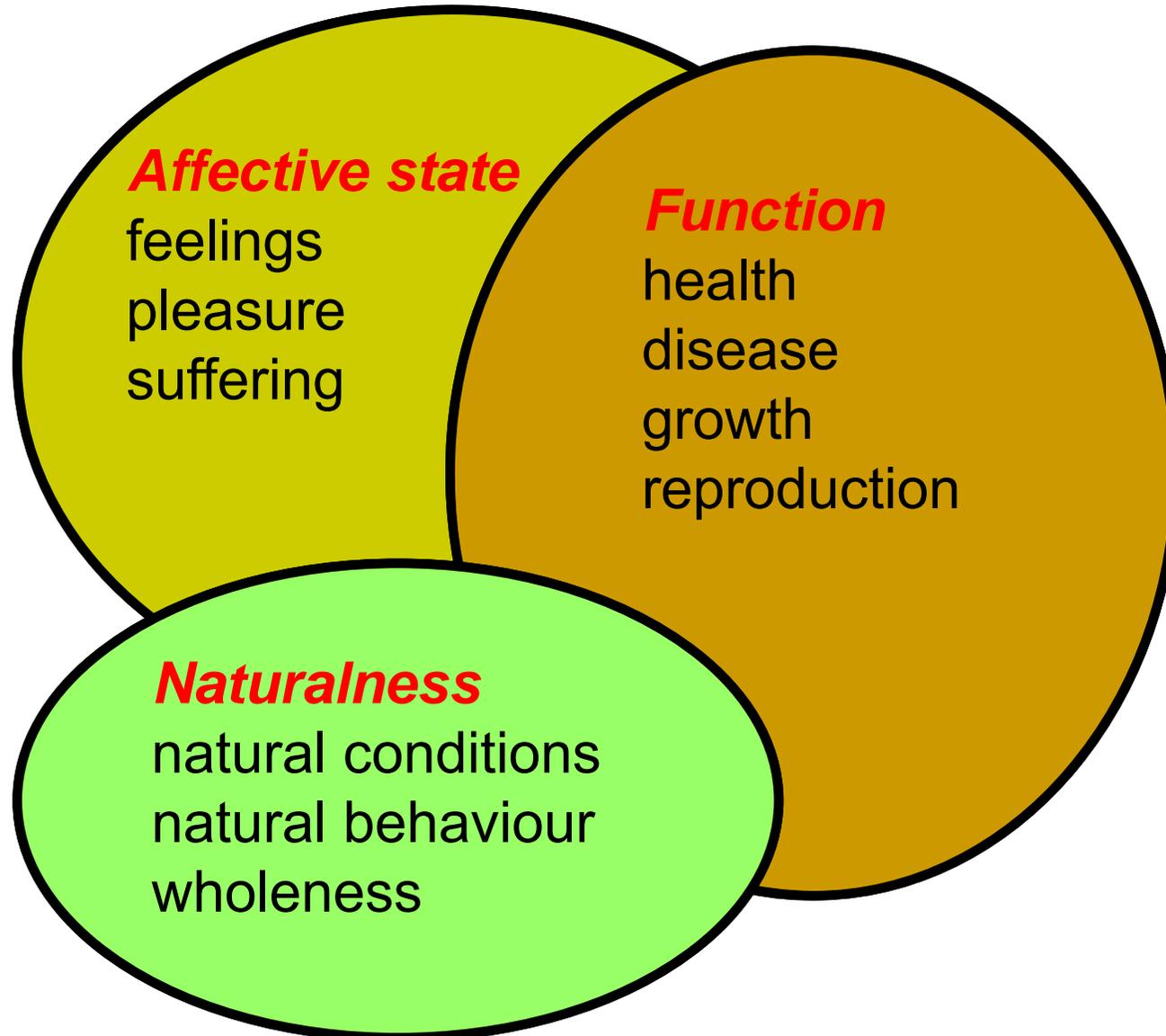
growth

reproduction

Some conceptual frameworks



Some conceptual frameworks



Measures

- Physiology

- Cortisol

- B-endorphin

- Rectal temperature

- Haptoglobin

- Haematology

- Growth rate



Stress and pain



Systemic host defence



Integrated impact

- Behaviours

- Pain related behaviours (differ for type of pain)

- Postures (ethogram – disturbed by pain)

What's missing

Assessment is typically focussed on the anticipated impact of the procedure under assessment

Nonetheless further measures could be informative

- Affective state
- Chronic stress and chronic pain
- Fitness (robustness) measures

Changing biological understanding of regulation of

- Physiology
 - Behaviour
 - Immune Function
- } Allostasis

Interpreting results

- General agreement on need for a basket of measures
- Measurement methodologies accurate
- Combining and weighting measures more subjective
 - Behaviour and physiology
- General descriptor

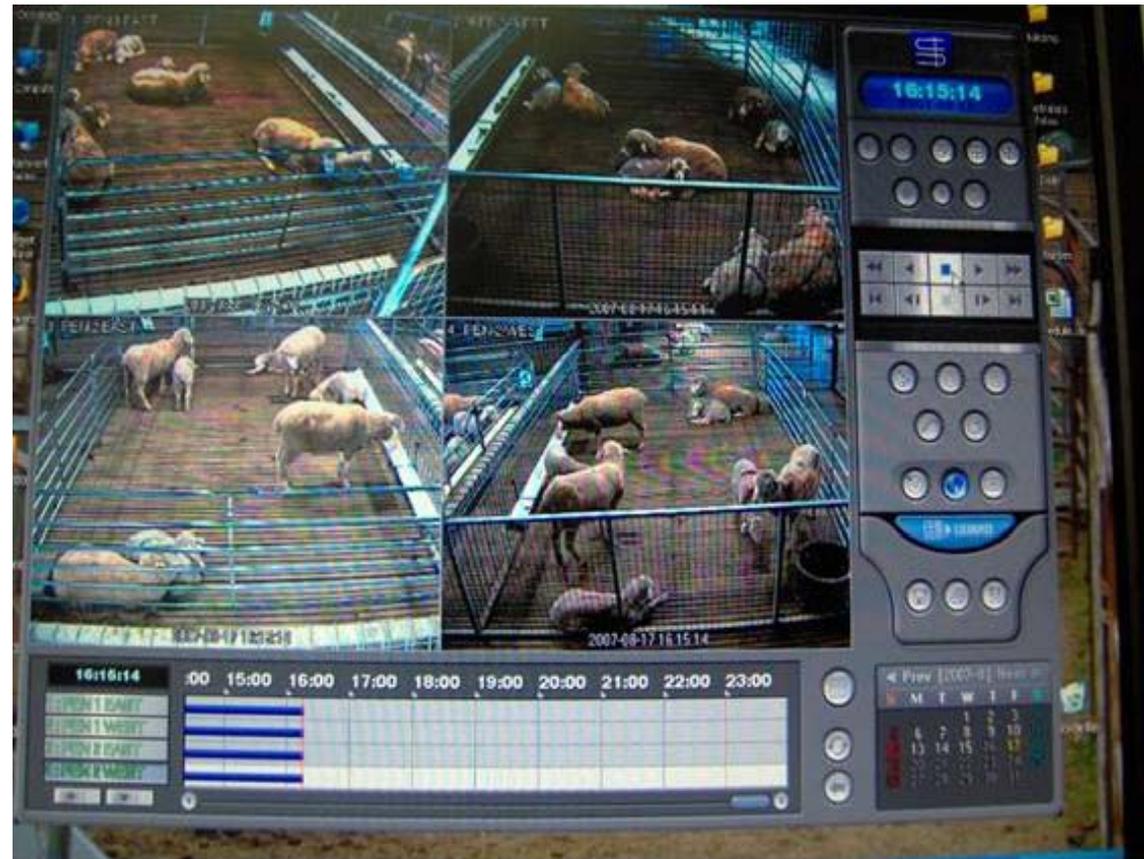


Welfare impact

2. Analgesia for mulesing

Analgesics

- **NSAIDs**
 - Carprofen
 - Ketoprofen
 - Meloxicam
 - Flunixin
 - Tolfenamic acid
- **Local anaesthetic**
 - Epidural
 - Topical
- **Opiate**
 - Buprenorphine
- **A₂ adrenergic agonist**
 - xylazine

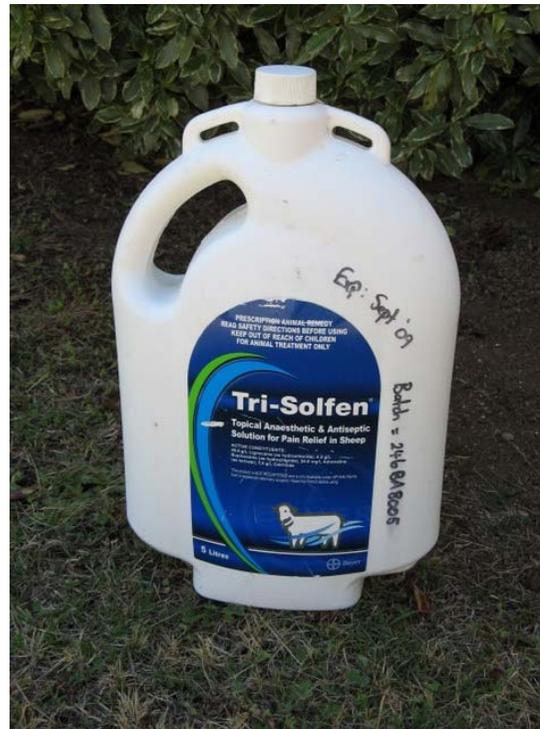


Analgesics

NSAIDs

- Not currently registered in EU or Australia for use in sheep

Tri-Solfen



Veterinary NSAIDs

NSAID	Dog	Cat	Horse	Pig	Cattle	Sheep
Aspirin	✓		✓			
Carprofen	✓	✓	✓			
Ketoprofen	✓	✓	✓		✓	
Tolfenamic acid	✓	✓	✓	✓	✓	
Flunixin	✓		✓	✓	✓	
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Mulesing study

8 lambs per group, 5 – 6 weeks old

Treatments:

1. Control

- Placed in mulesing cradle

2. Mules + saline injection

3. Mules + Tri-Solfen

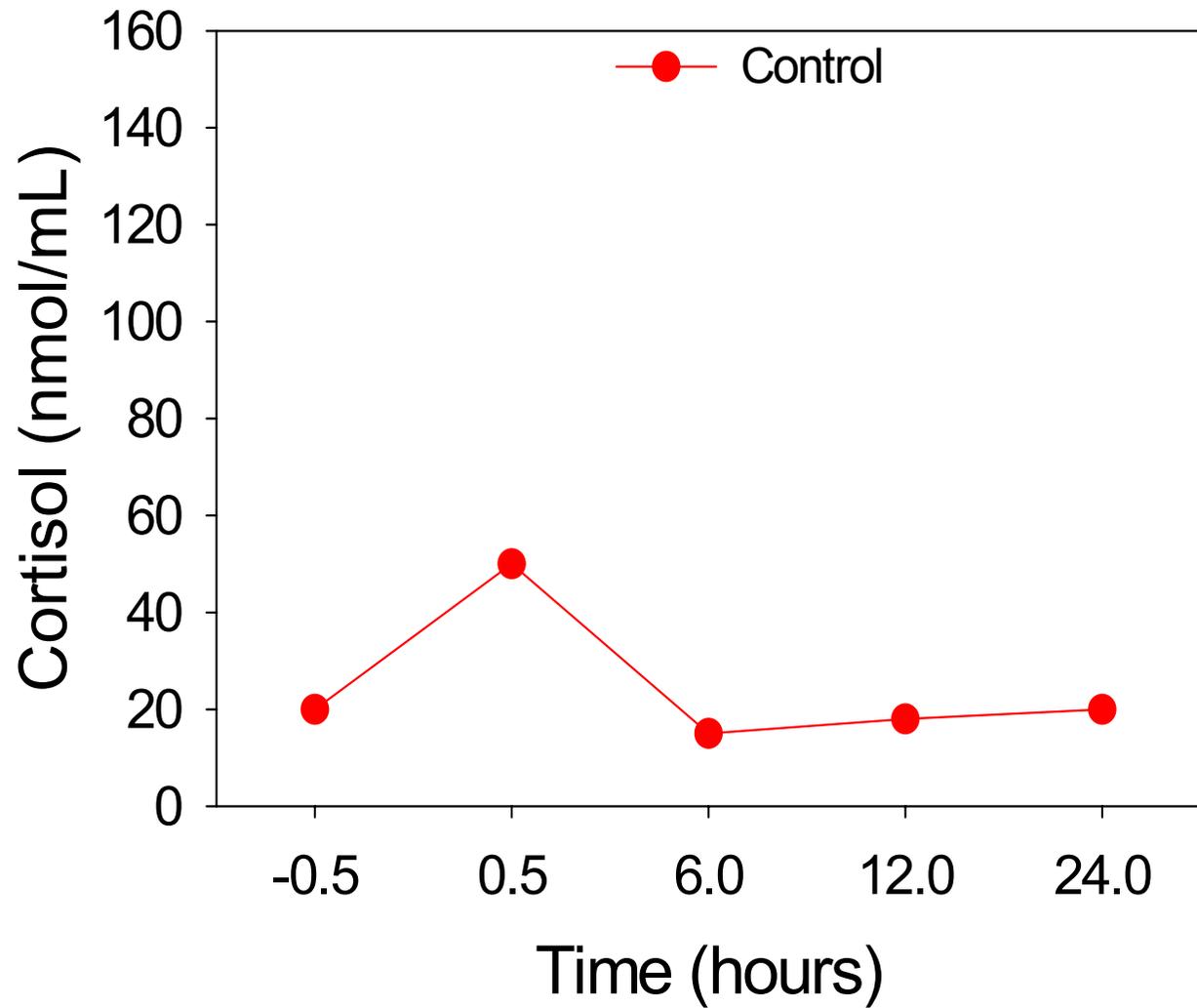
- 8 - 10 mL Tri-Solfen at manufacturer's recommended dose rate

4. Mules + Carprofen

- 4 mg/kg s.c. 90 min before mulesing

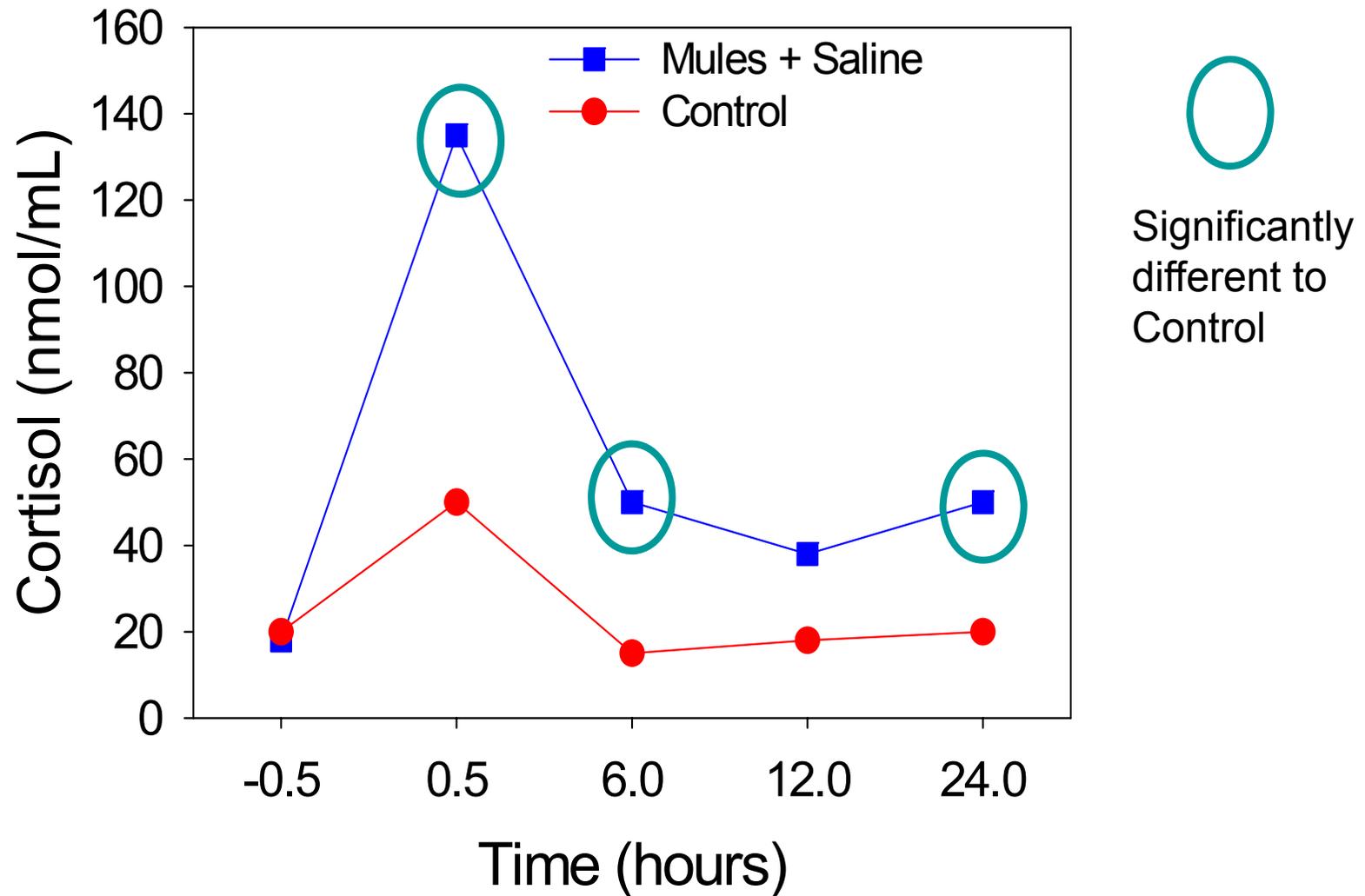
5. Mules + Carprofen + Tri-Solfen

Cortisol

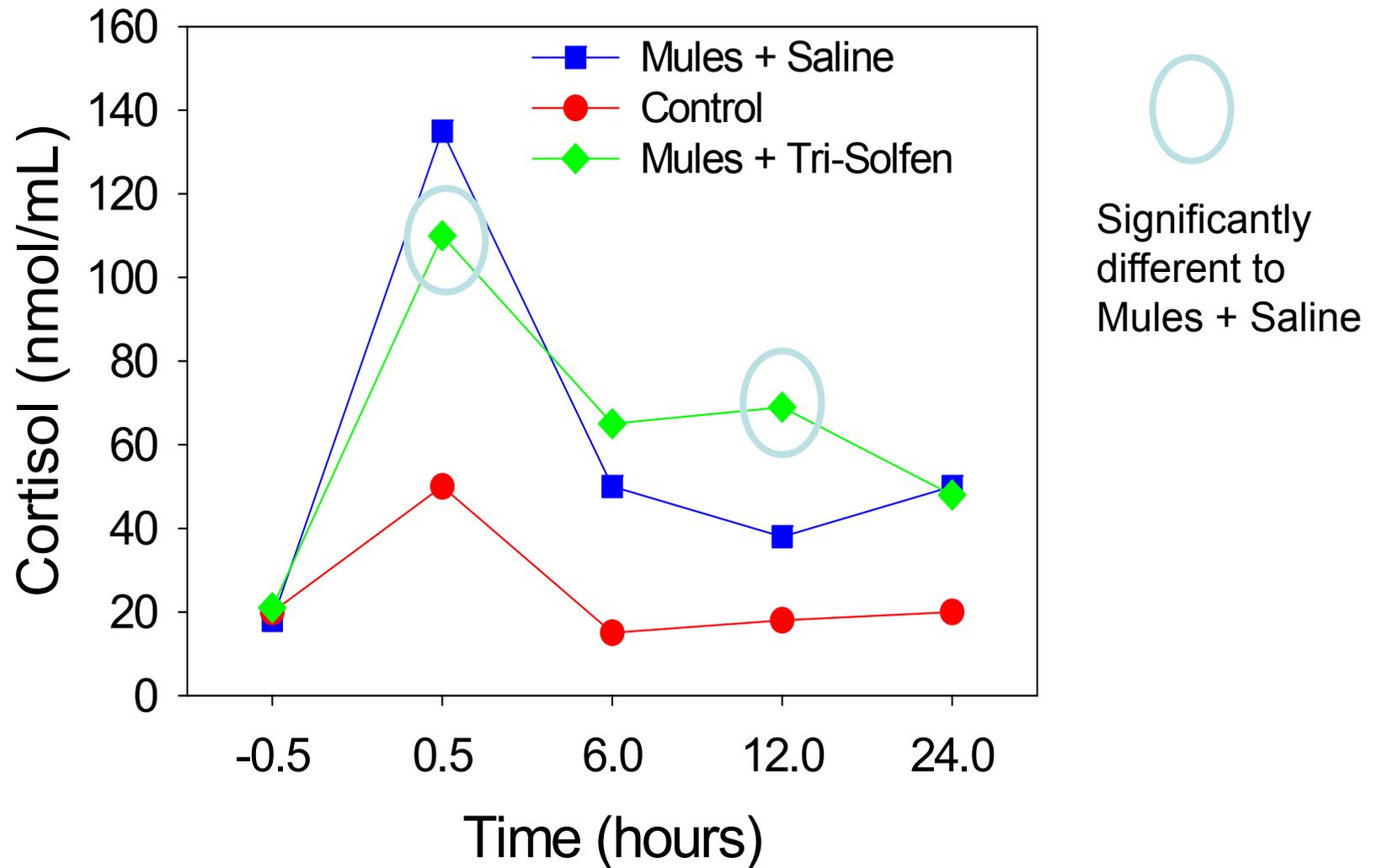


Paull et al 2007 *Aust Vet J* 85:98

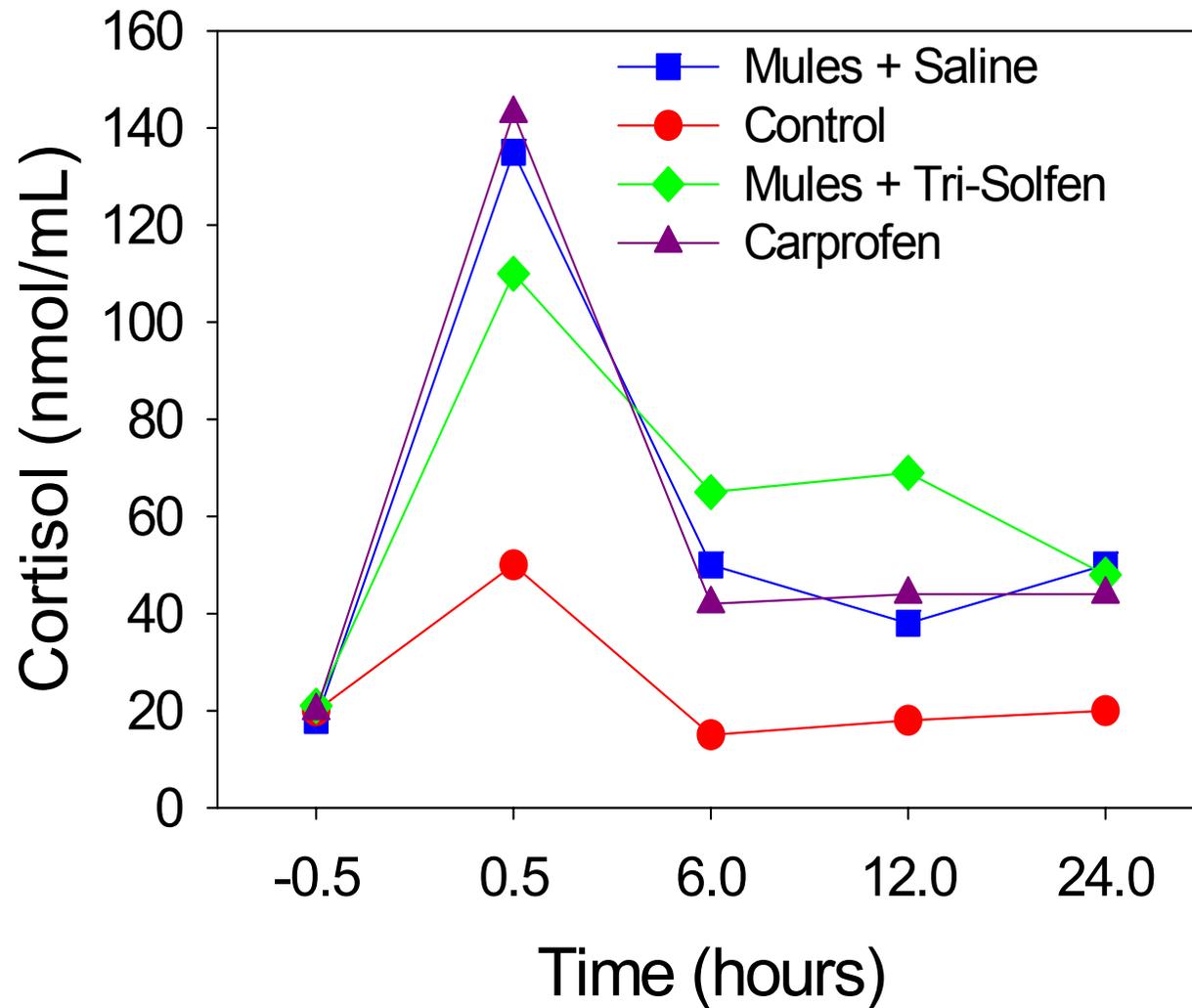
Cortisol



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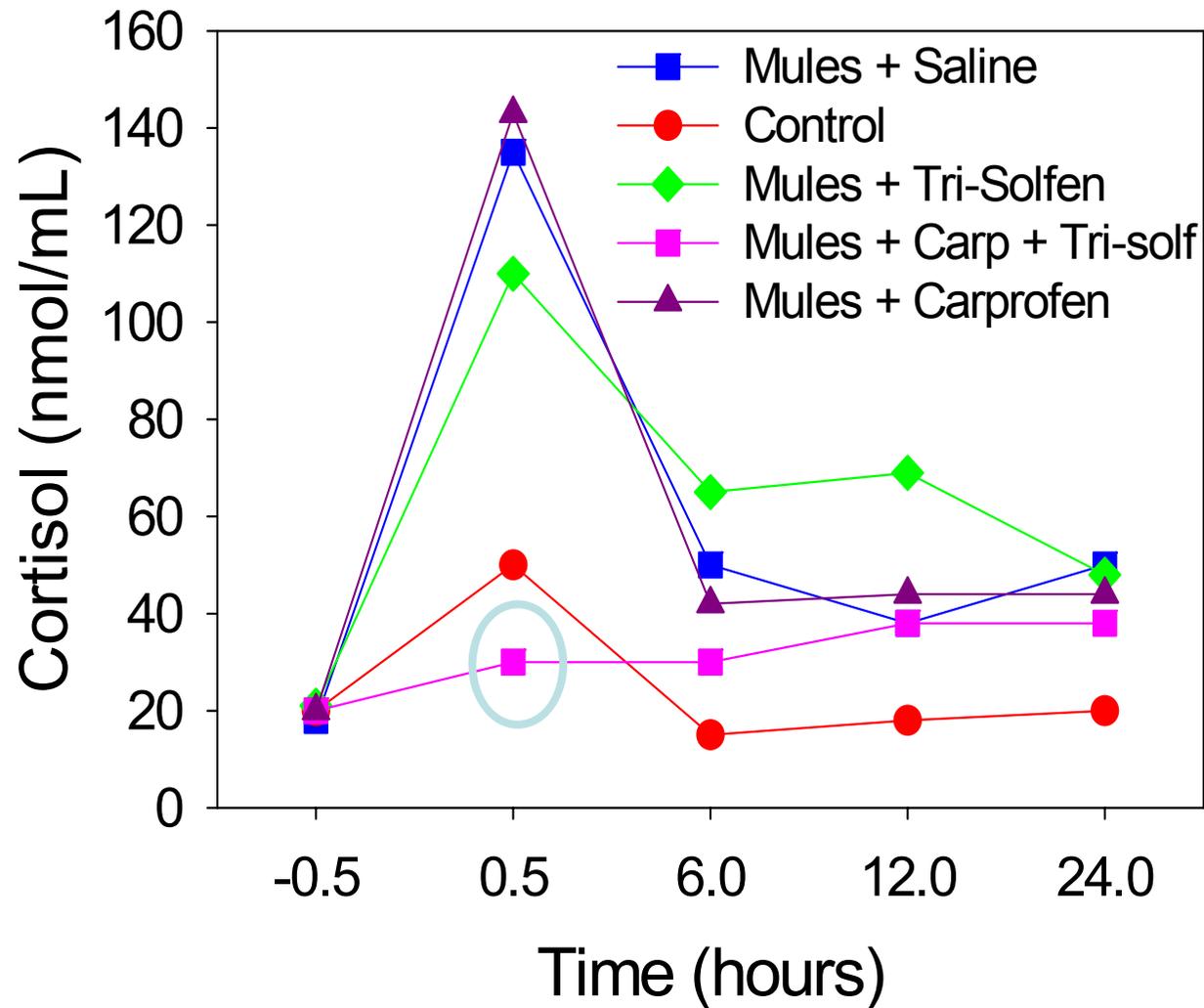


Cortisol



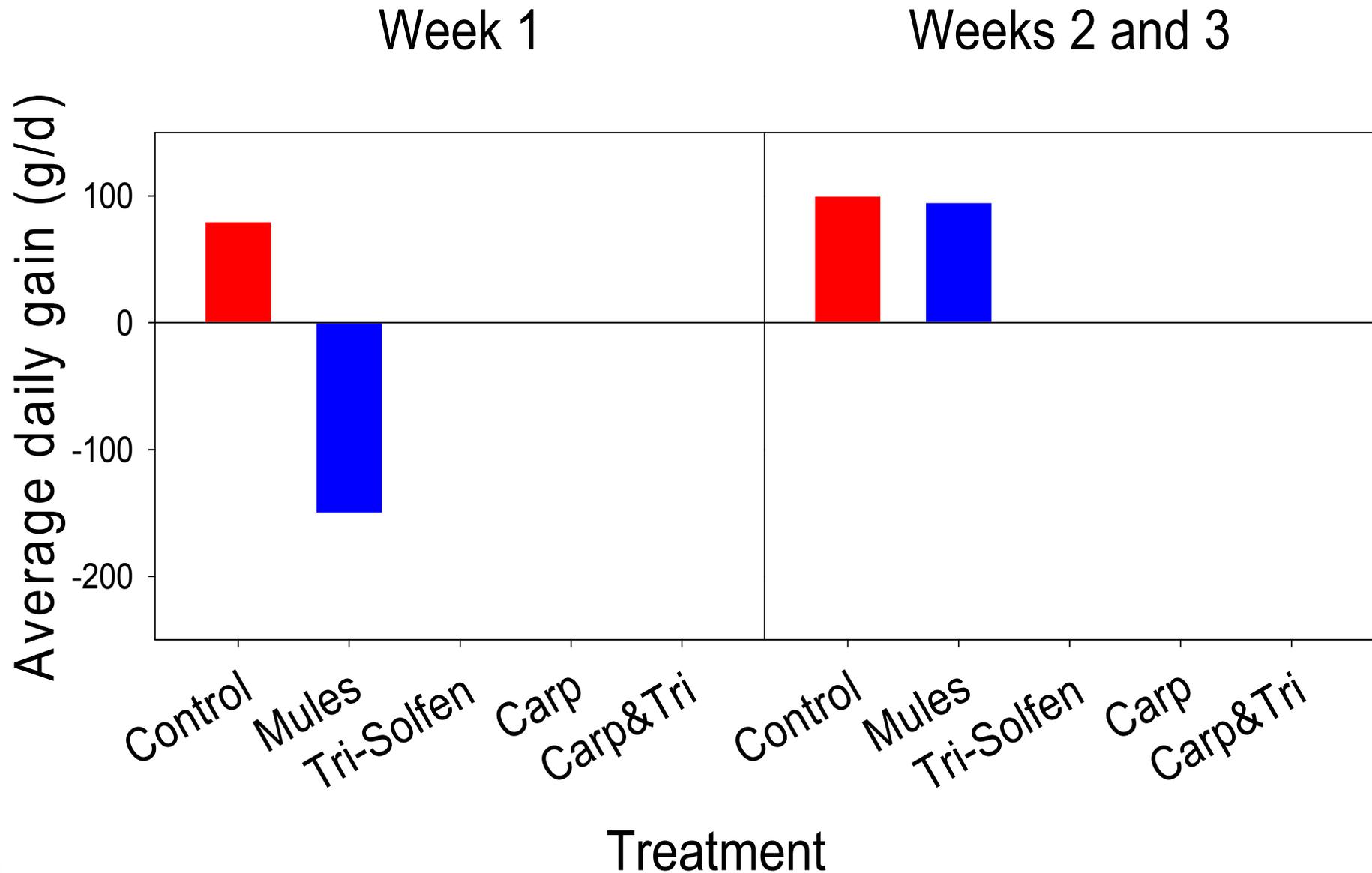
Significantly different to Mules + Saline

Cortisol

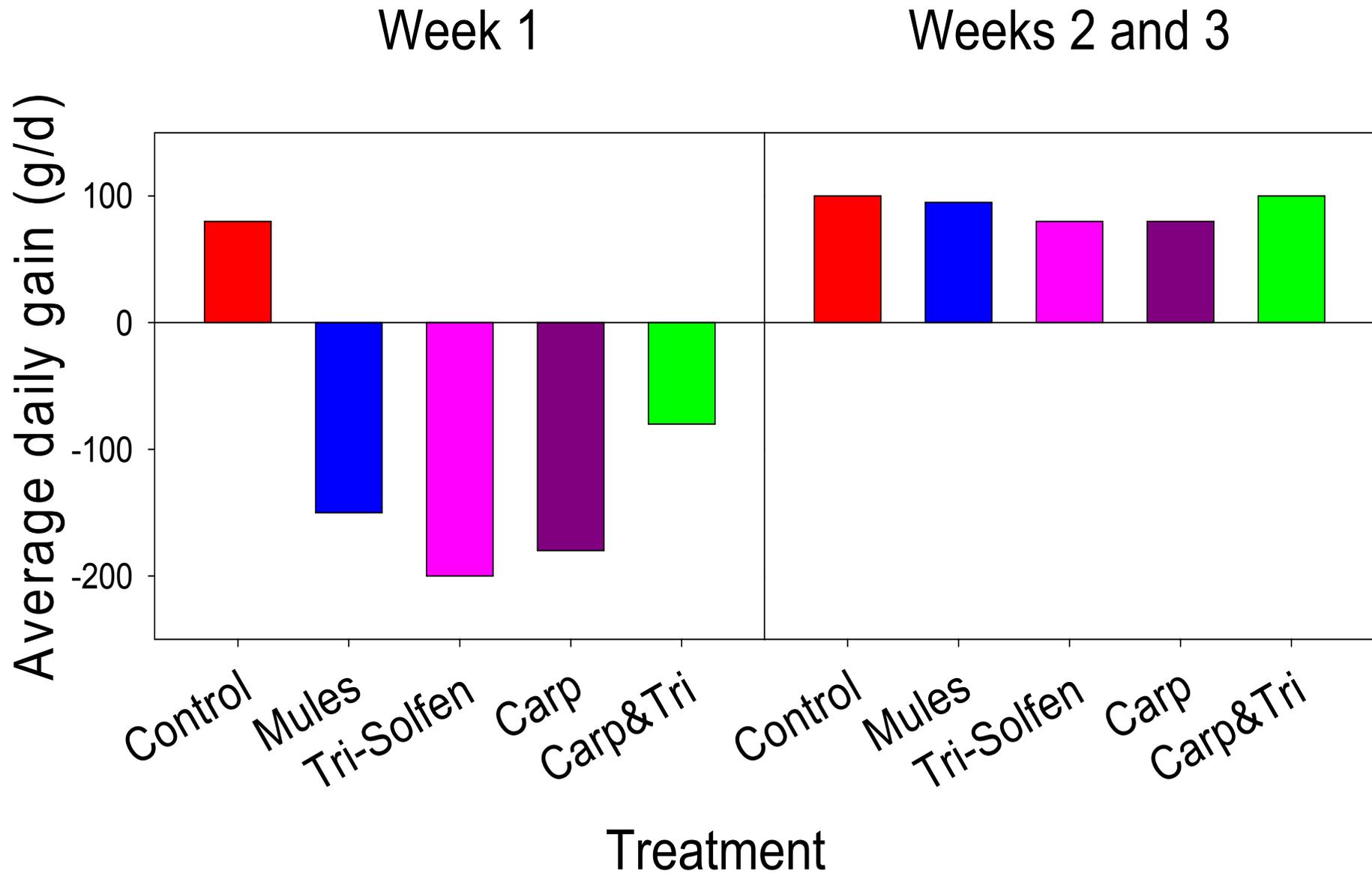


○
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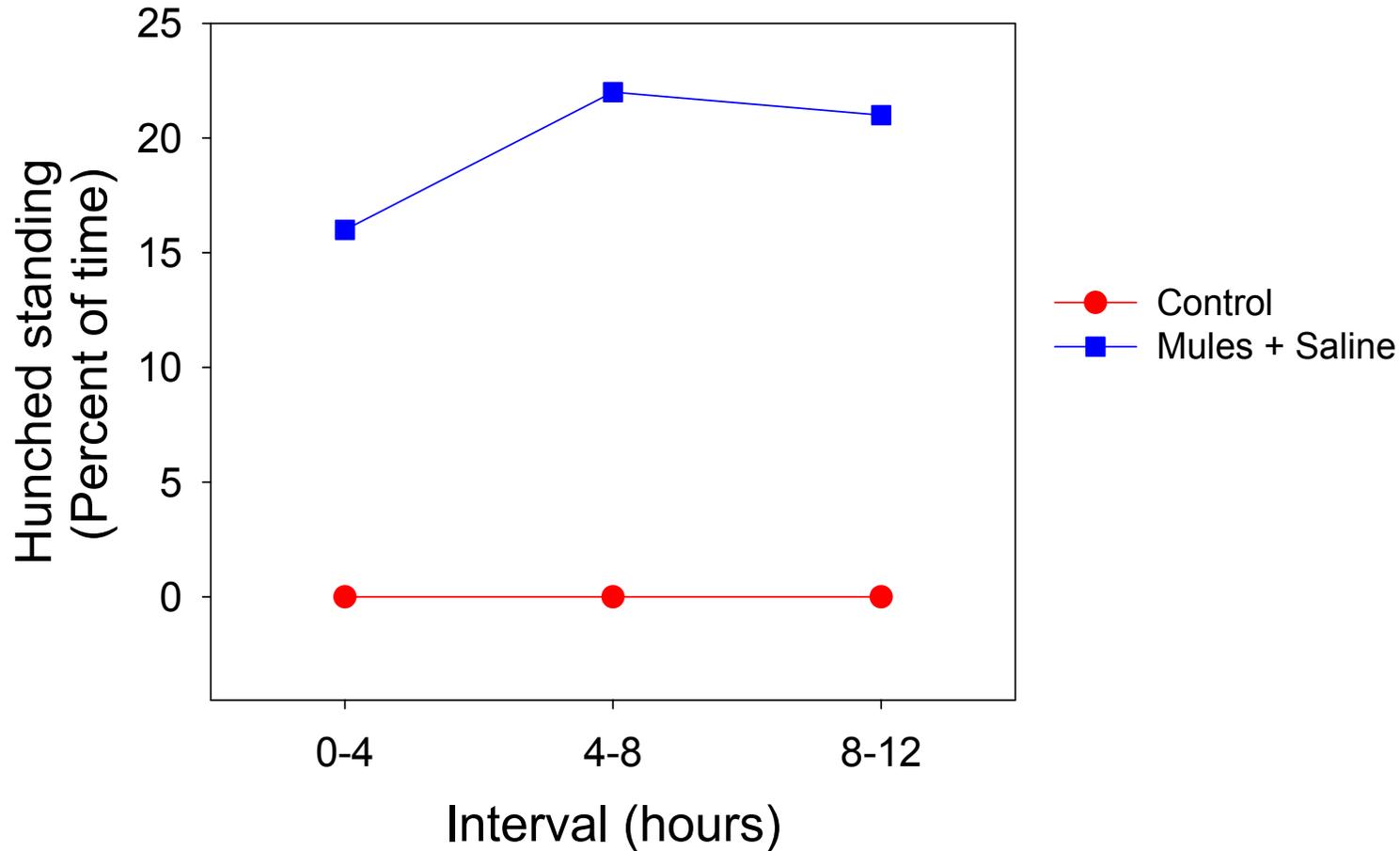
Average daily gain



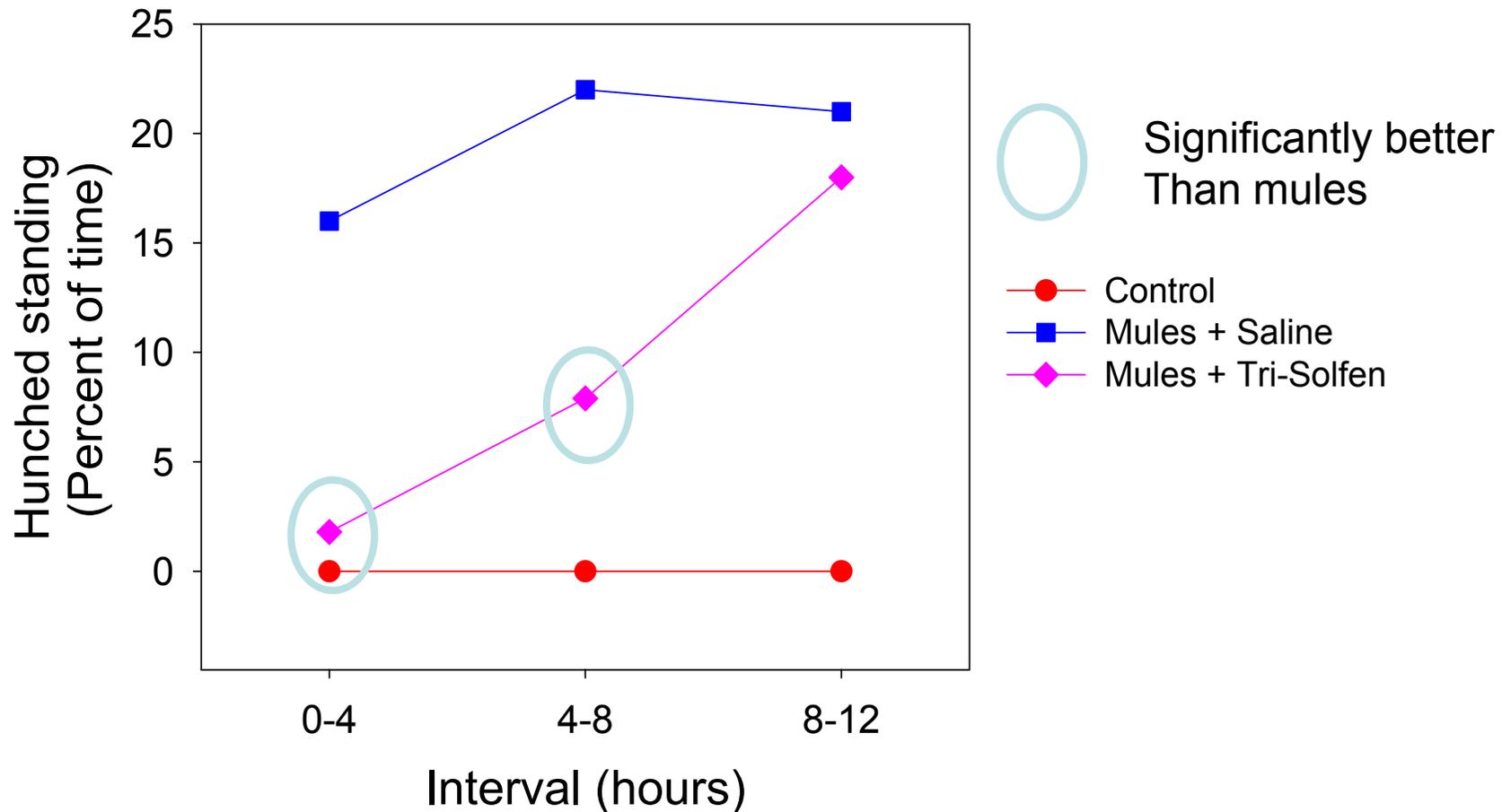
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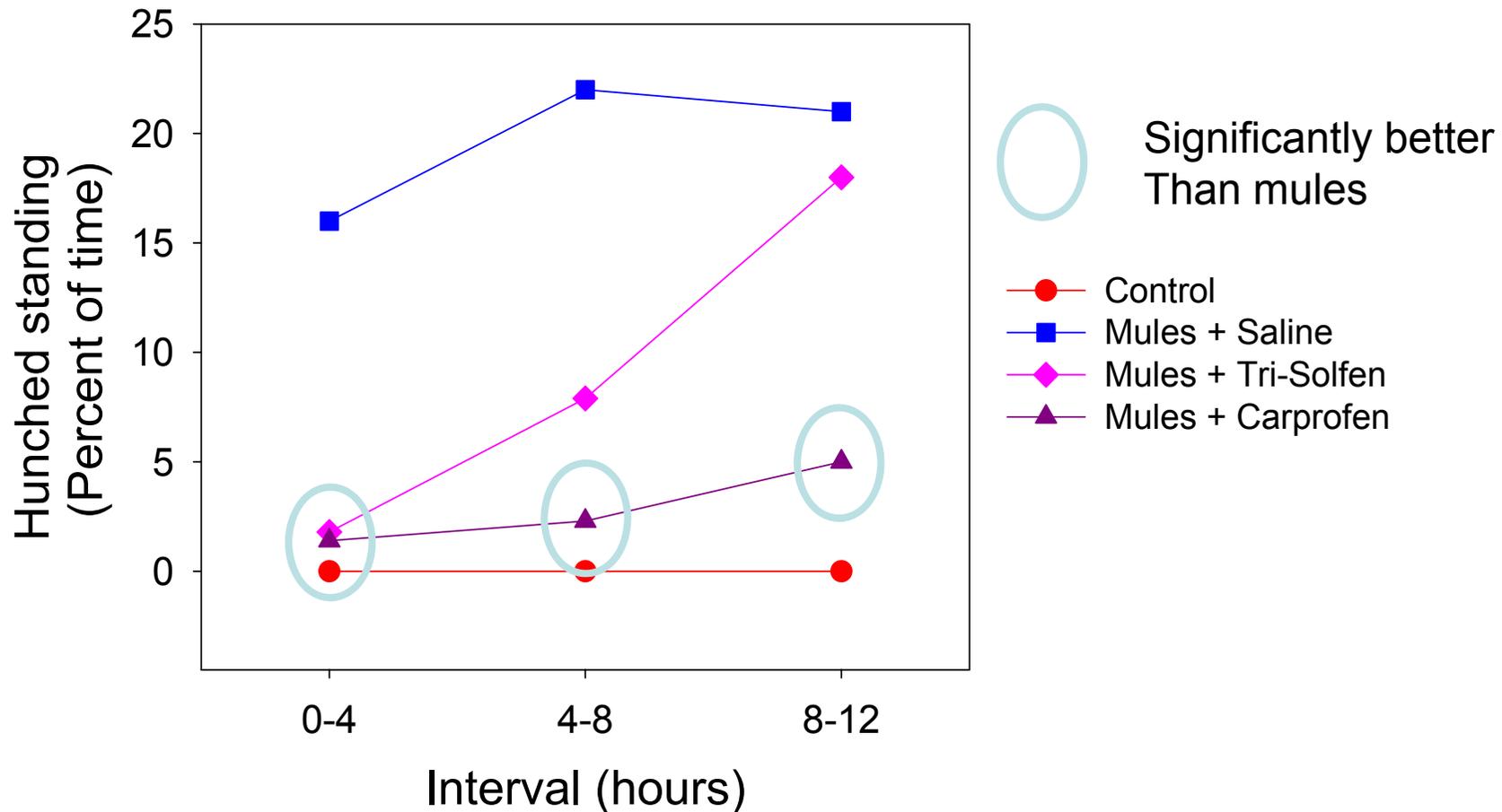
Behaviour – hunched standing



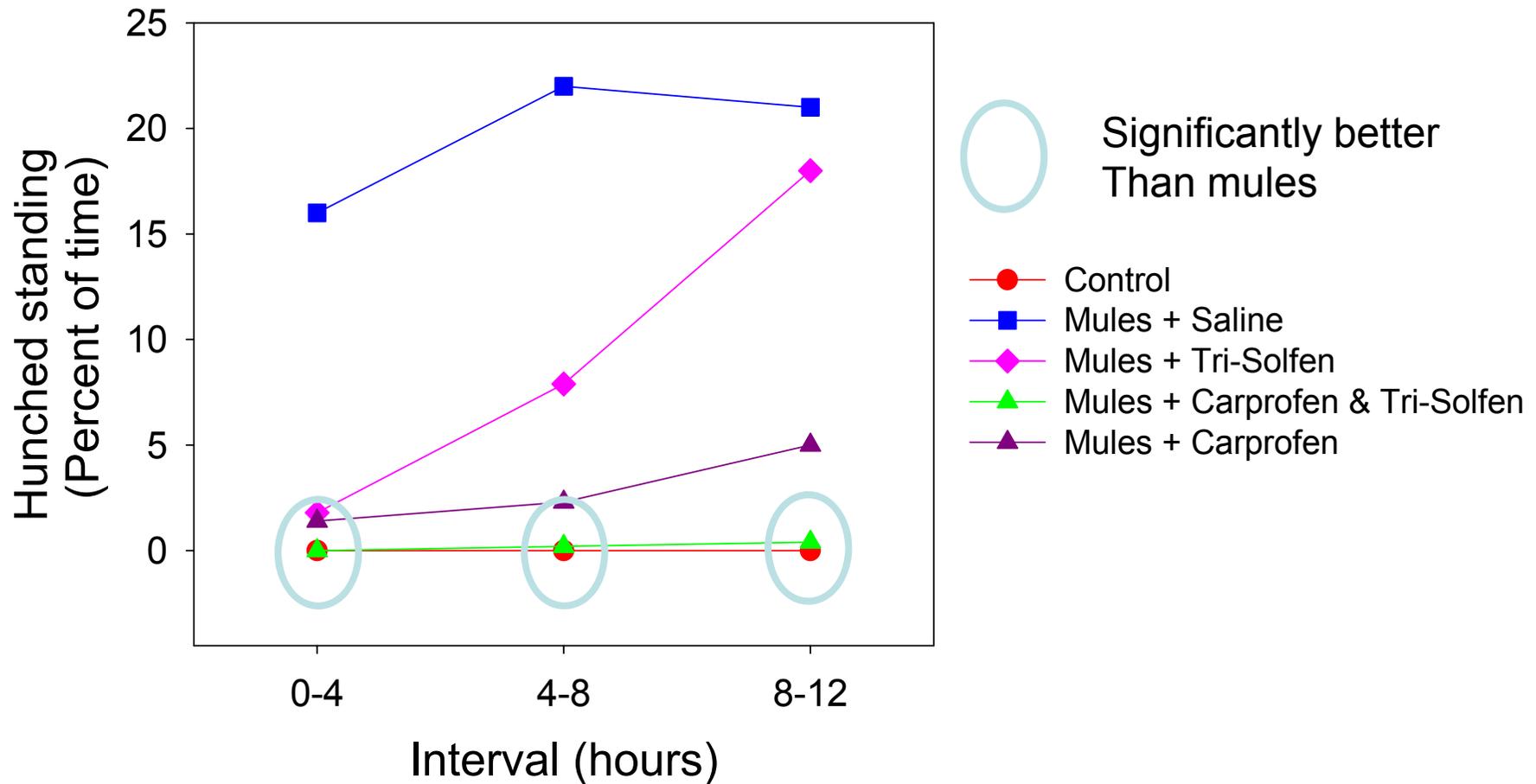
Behaviour – hunched standing



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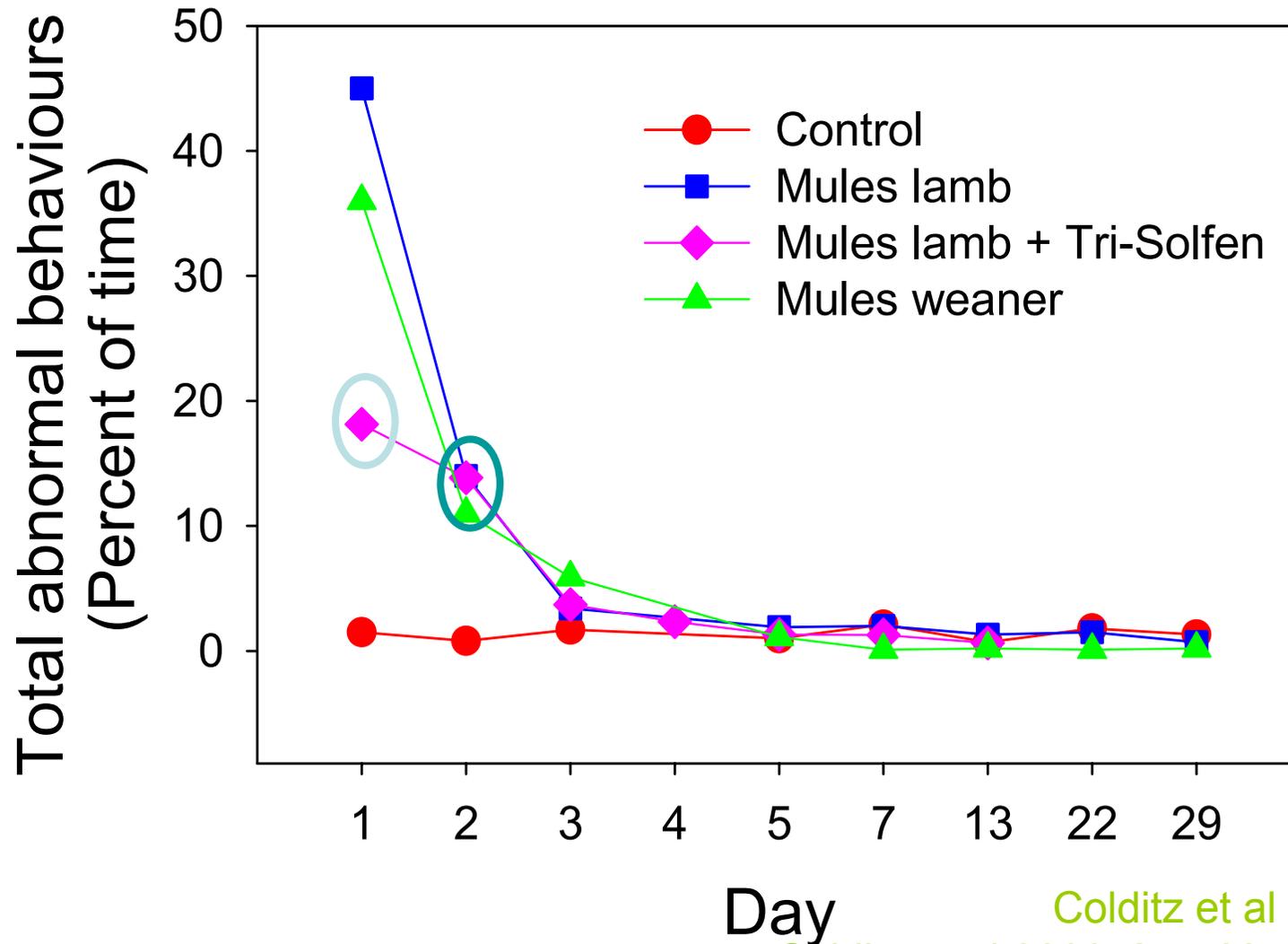


Behaviour – hunched standing



Behaviour – later time points

10-11 lambs per group



Conclusions on analgesics

Tri-Solfen

- Some improvement in acute cortisol response
- Improvement in early pain related behaviours
- Excellent wound anaesthesia ([Lomax et al 2008 Aust Vet J 86:159](#))

Carprofen

- No improvement in acute cortisol response
- Improvement in early pain related behaviours

Tri-Solfen + NSAID (Carprofen)

- Abolishes acute cortisol response to mulesing
- Excellent improvement in pain related behaviours
- Excellent wound anaesthesia

3. Practical methods

Practical issues for NSAIDs

Proof of principle

- not an industry-ready method

Registration

- AWI working with private sector and APVMA
 - registration of NSAIDs
 - registration processes for new sheep products

“Indication”

- Broader application than surgical husbandry procedures
 - Laminitis
 - Acidosis
 - Mastitis
 - Foot rot, etc
- **Need NSAIDs for good veterinary care of sheep**

Route

- Oral
- s.c. / i.m.
- Transdermal (Intervet patent)

Practical issues for NSAIDs

Age of sheep

- Some NSAIDs not recommended for animals < 6 weeks old without close clinical monitoring

Timing

- Time in relation to procedure
- Need for double handling?

Dose

- Dose response studies yet to be done

Safety margin

- Weigh every lamb or dose to heaviest in mob?

Duration of action

Schedule 4 (S4) drugs

Practical issues for NSAIDs

Indicative costs only. Dose rates not yet validated

NSAID	Cost (\$) per 10 kg			
	W'sale	+30%	+70%	+100%
ketoprofen	0.14	0.18	0.24	0.28
tolfenamic acid	0.19	0.24	0.32	0.38
flunixin	0.07	0.09	0.11	0.13
meloxicam	0.82	1.07	1.40	1.65
carprofen	2.00	2.60	3.40	4.00

4. Emerging issues

Welfare concerns

- Painful husbandry procedures
 - e.g. mulesing, castration and tail docking
- Confinement of animals
 - e.g. feedlots
- Problems (especially diseases) caused by the production environment or management system
 - e.g. lamb mortality
- Long distance transport for economic gain
 - e.g. live export

Changing welfare environment

Recently prohibited practices in Australia

- Cosmetic tail or ear docking of domestic pets
- Debarking of dogs
- Tail docking of horses
- Pin firing of horses
- (Tail docking of dairy cows)
 - (new Cattle Standards and Guidelines)

Exemption

- Except for treatment of a veterinary condition

Changing welfare environment

Sheep Standards (must) and Guidelines (should)

Tail docking and castration

- G6.13 **Tail docking** and **castration should be accompanied by pain relief** when practical and cost effective methods become available. Operators should seek advice on current pain relief minimisation strategies

Mulesing

- G7.6 **Mulesing should be accompanied by pain relief** when practical and cost effective methods become available. Operators should seek advice on current pain relief minimisation strategies

Sheep handling

- S5.6 A person **must not trim or grind the teeth** of sheep
- S5.7 A person **must not** alter the anatomy of the prepuce by incising the surrounding skin (**pizzle dropping**) on sheep.

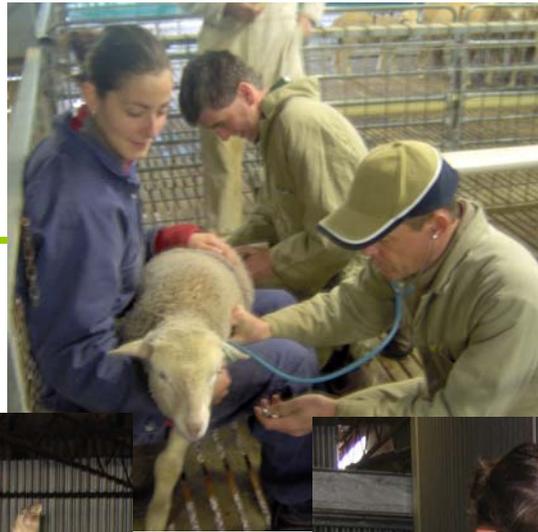
Industry vulnerabilities

Where a practice differs substantially from other countries or other similar species

Where information on welfare impacts and outcomes of the practice are not well documented

International practices

Practice	Australia	Other countries
Sheep: Tail docking	√√√	√
Sheep: Castration	√√√	√√√ (analgesia)
Live export	√√√	√√√



Thank you

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Limited