

Myoglobin and Iron in Lamb Meat

...the influence of lamb growth

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Why is lamb growth important?



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Meat Quality Traits

Myoglobin Ξ Meat colour

Myoglobin increases with age (Pethick *et al*, 2005)



Iron Ξ Nutrition

Source = 10%

Good Source = 25%



Australian Government
National Health and
Medical Research Council

N H M R C

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Does growth affect meat quality?

Hot carcass weight

Myoglobin  1.56 mg/g tissue (20kg)
(Kelman *et al*, 2014)

Iron  0.23 mg/100g (27kg)
(Pannier *et al*, 2014)

- Lamb growth is linear
- Varies with age

Hypothesis

Myoglobin  with lamb growth

Iron  with lamb growth

- The association between lamb growth and myoglobin and iron will vary during different periods of growth (Gardner *et al*, 2007)

Investigation

Information Nucleus Flock

- Eight sites
- 2007 – 2011
- Maternal, Merino and Terminal sires



Investigation

Lamb weights

- Birth
- 100 days (weaning)
- 150 days (post weaning)



Investigation

Myoglobin and Iron

- Myoglobin (n=8,987)
- Iron (n=8,434)



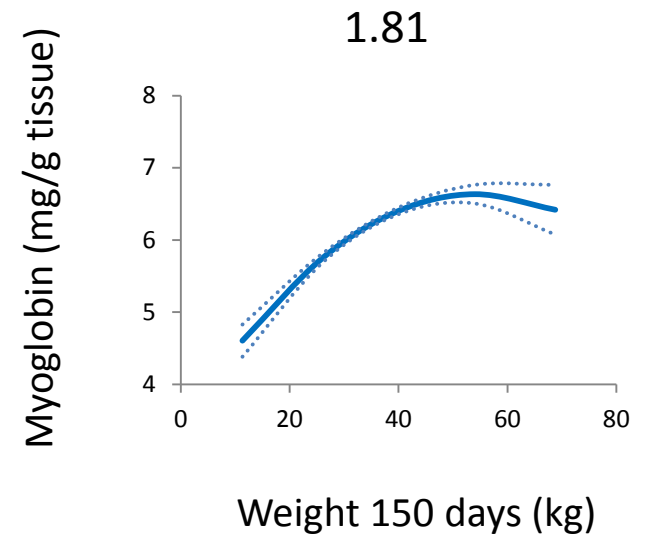
Investigation

Statistical Analysis: Linear Mixed Effects Model

- Fixed:** Site, Year, Birth type-rear type, Dam age, Sire type, Sex, Dam breed (Sire type), Kill group (Site*Year)
- Random:** Sire, Dam*Year
- Covariates:** **Birth weight or Weight at 100 or Weight at 150**

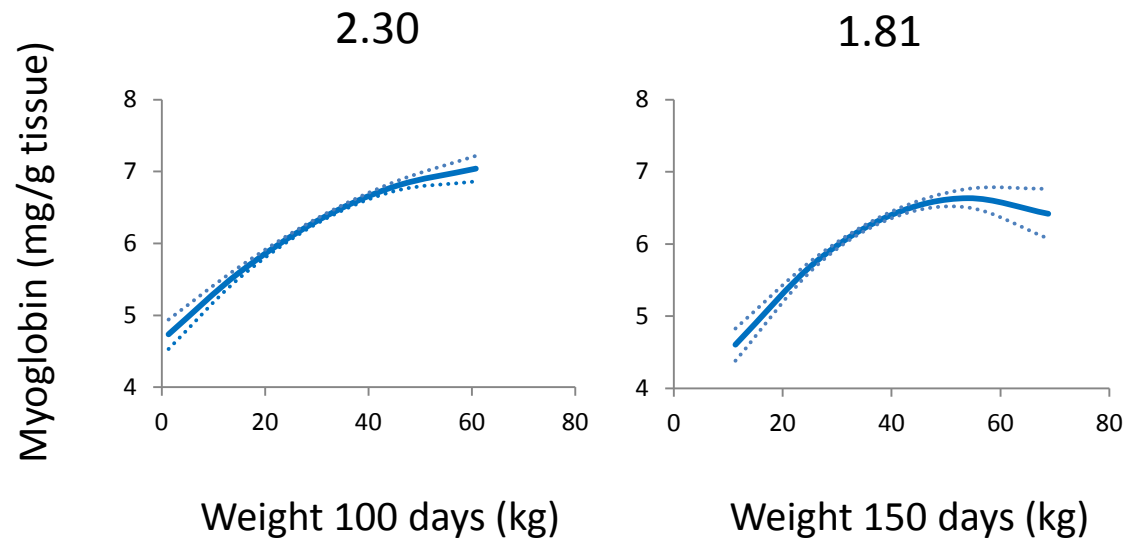
Results

Myoglobin



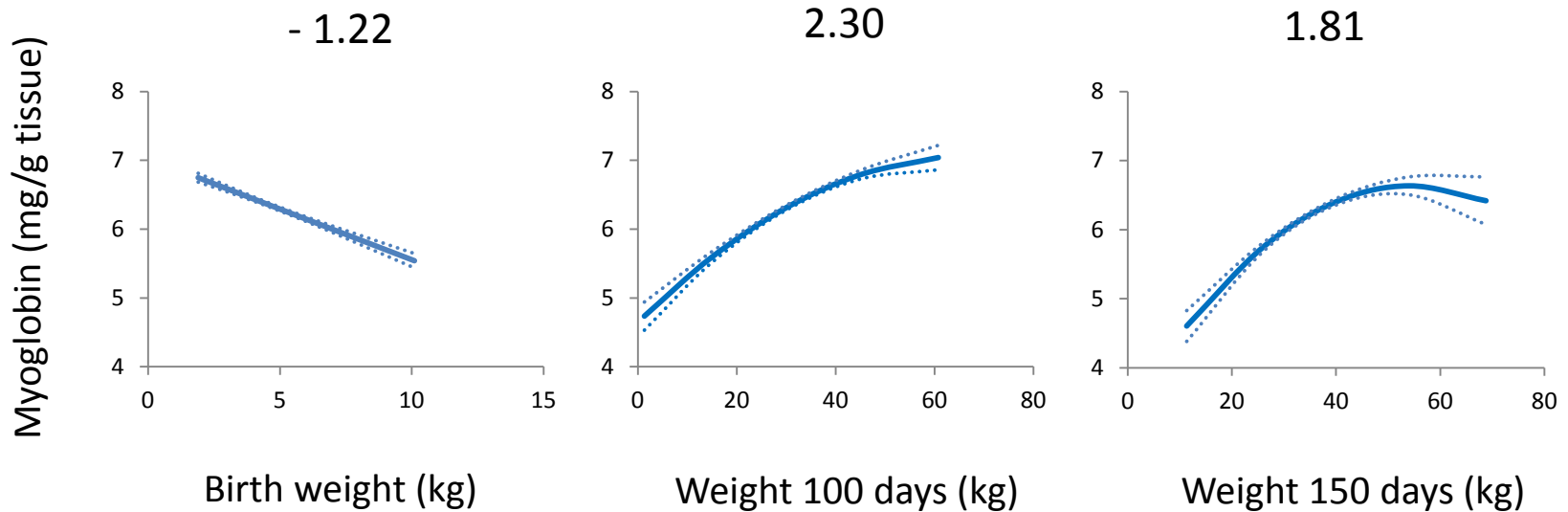
Results

Myoglobin



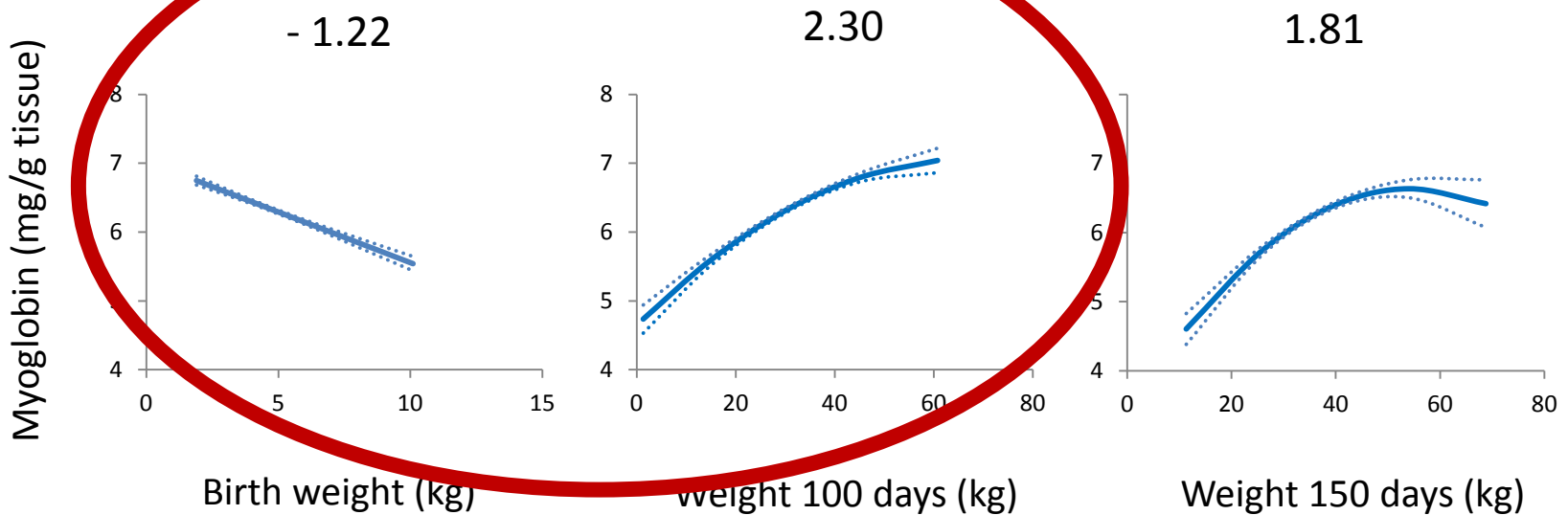
Results

Myoglobin



Results

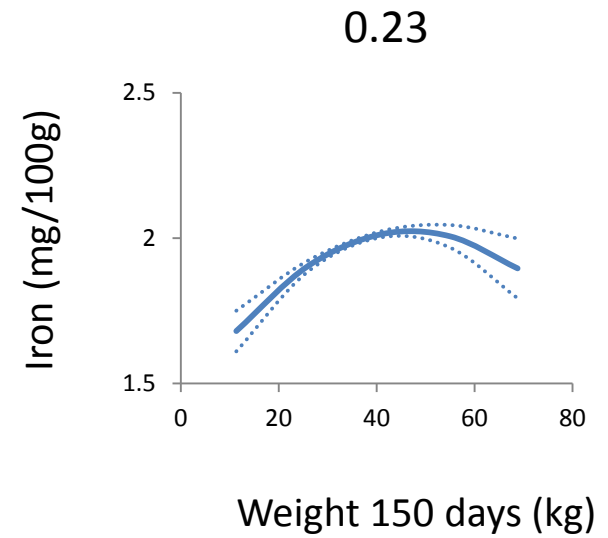
Myoglobin



*Hot carcass weight association 1.56 mg/g tissue

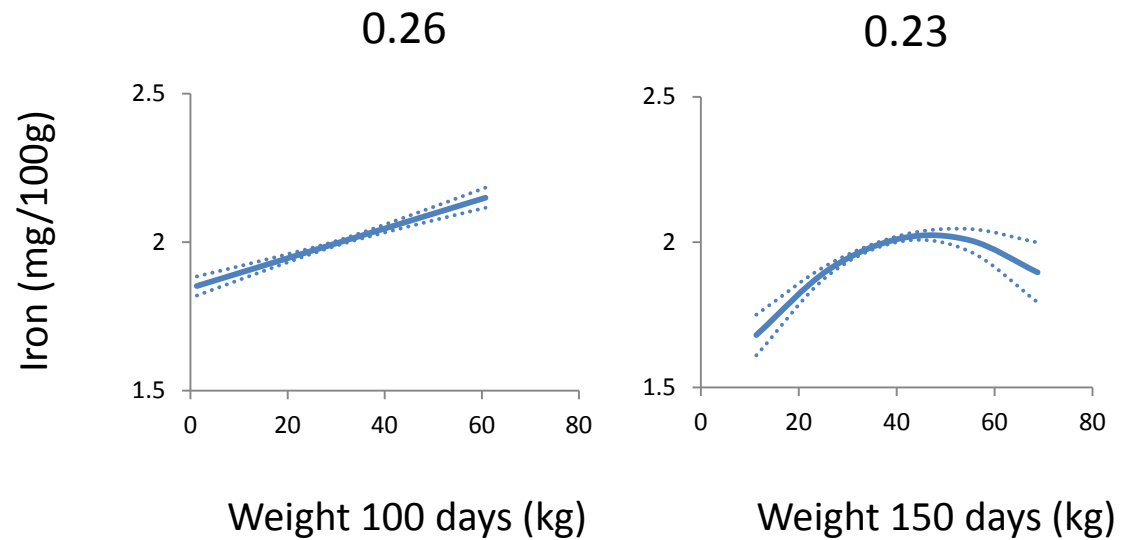
Results

Iron



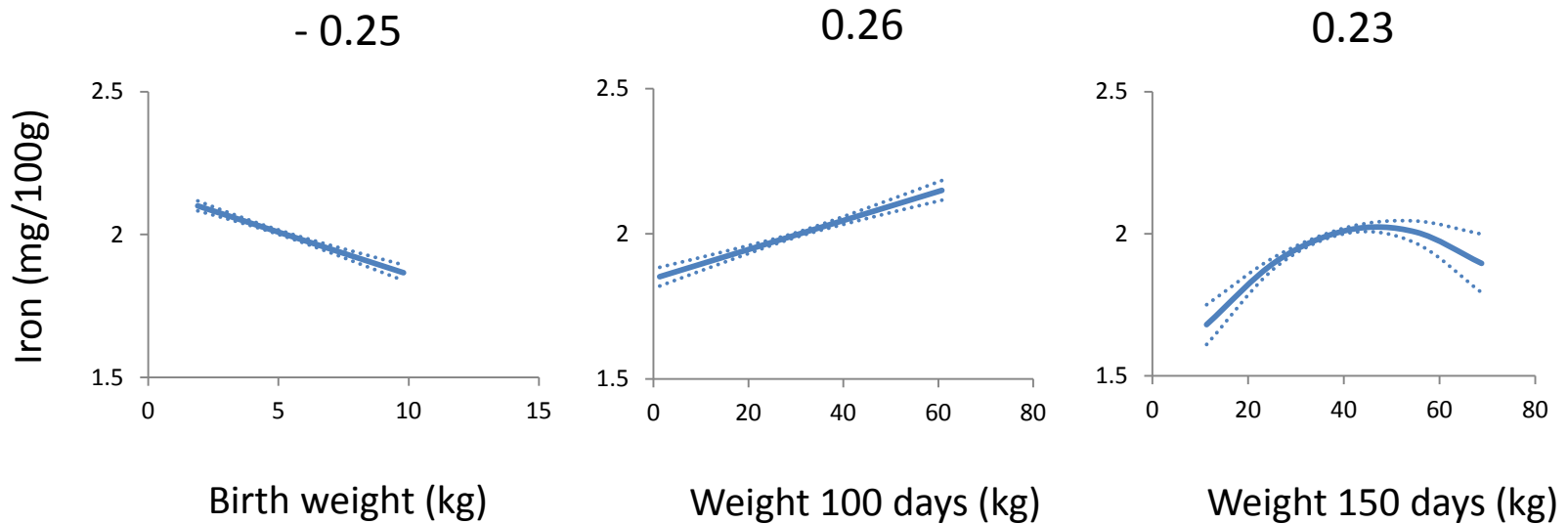
Results

Iron



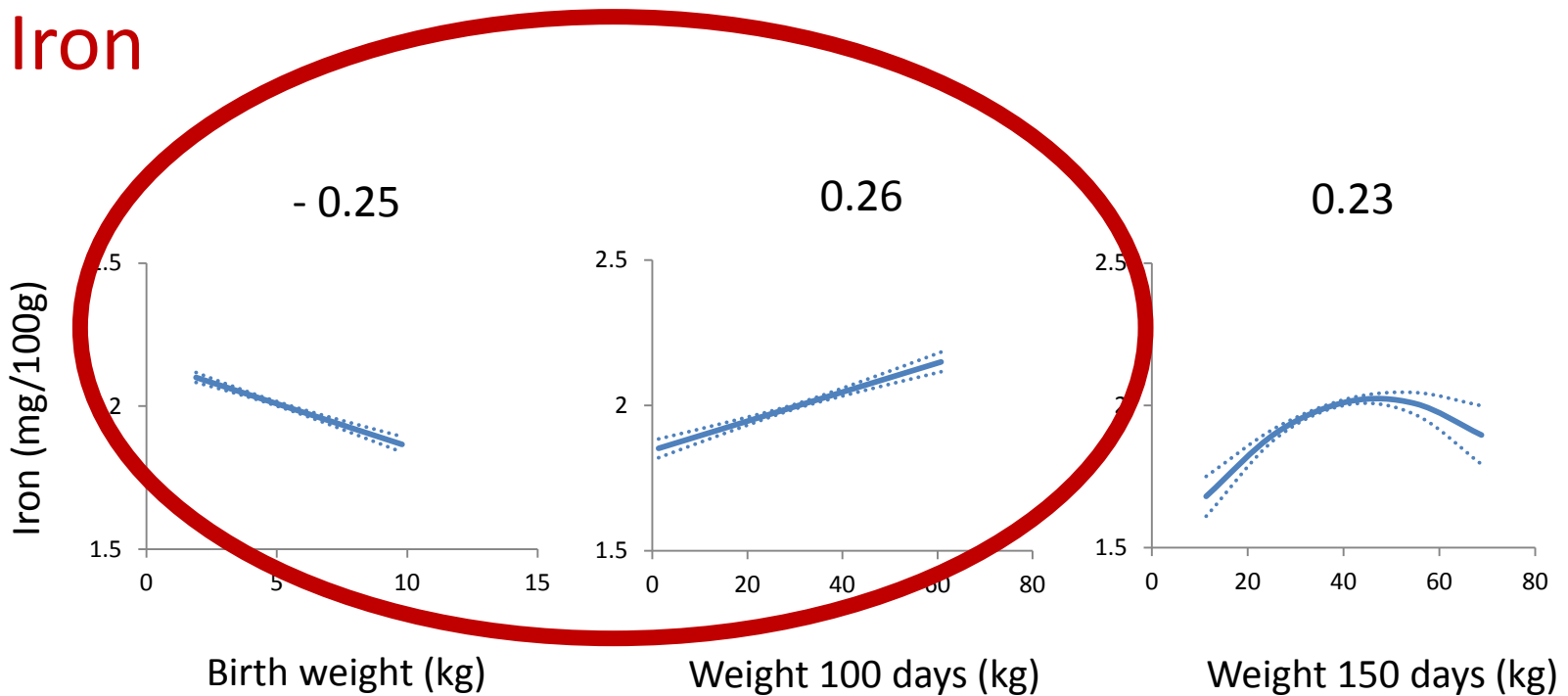
Results

Iron



Results

Iron



Hot carcass weight association 0.23 mg/100g

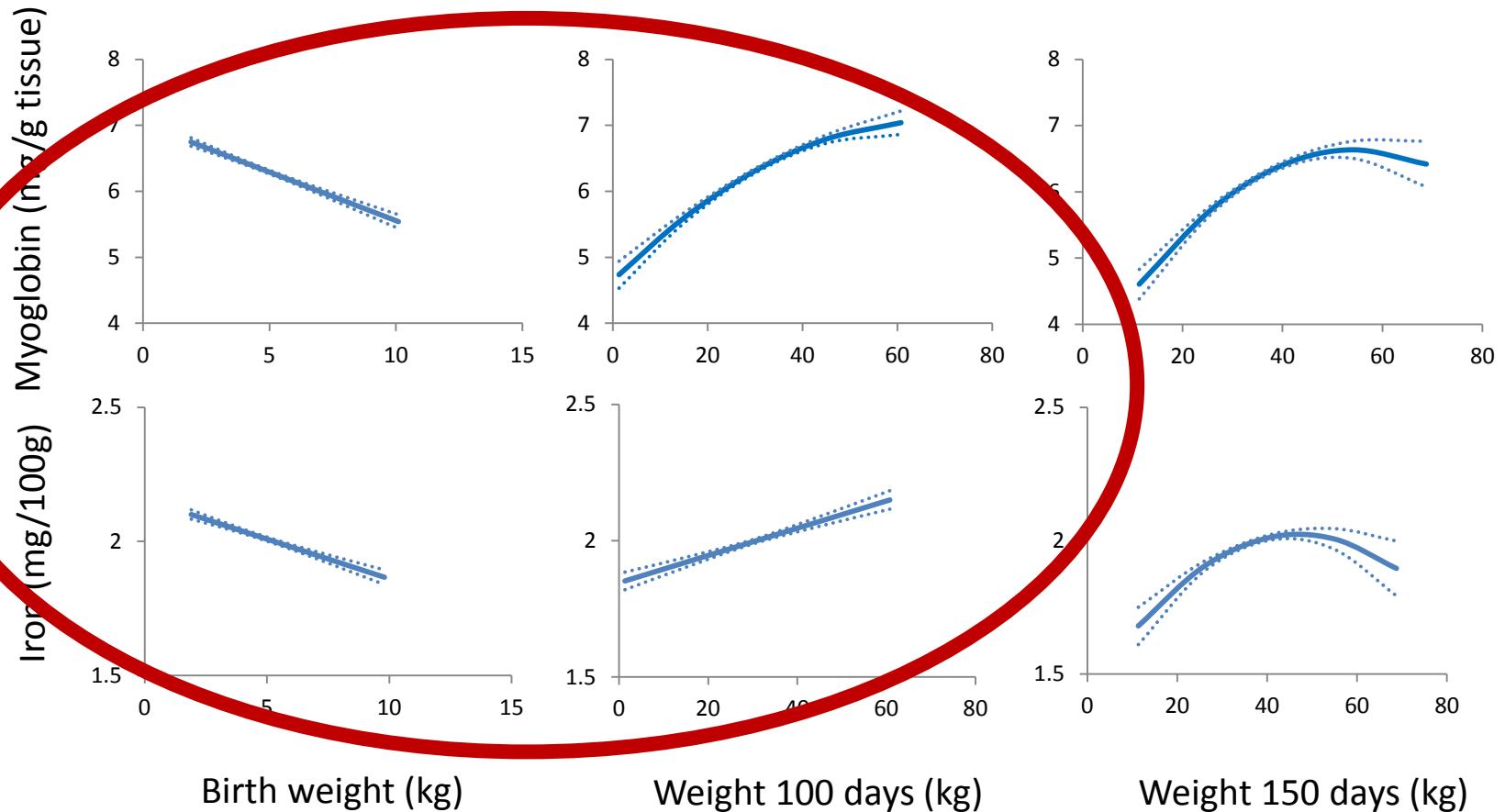
Hypothesis

Myoglobin  with lamb growth ✓
*only after 100 days

Iron  with lamb growth ✓
*only after 100 days

➤ The association between lamb growth and myoglobin and iron will vary during different periods of growth ✓

Birth to weaning



- Possible mechanisms: Time from slaughter and growth impetus
- Myoglobin and Iron can be influenced EARLY

Future Investigations

- Investigation of a greater range of meat traits
- Characterise the change in association between birth and weaning and investigate mechanisms
- Association after 150 days (e.g. 240)

Acknowledgements

➤ EAAP



➤ Sheep Cooperative Research Centre



➤ Murdoch University



Thank you