

Selection for reduced PFAT decreases Isocitrate Dehydrogenase activity

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Session 44: Milk and meat product quality



Outline

- Importance of muscle aerobicity
- Australian Sheep Industry breeding objectives
- Description of Information Nucleus Flock
- The impact of selection for leanness using breeding values on muscle aerobicity

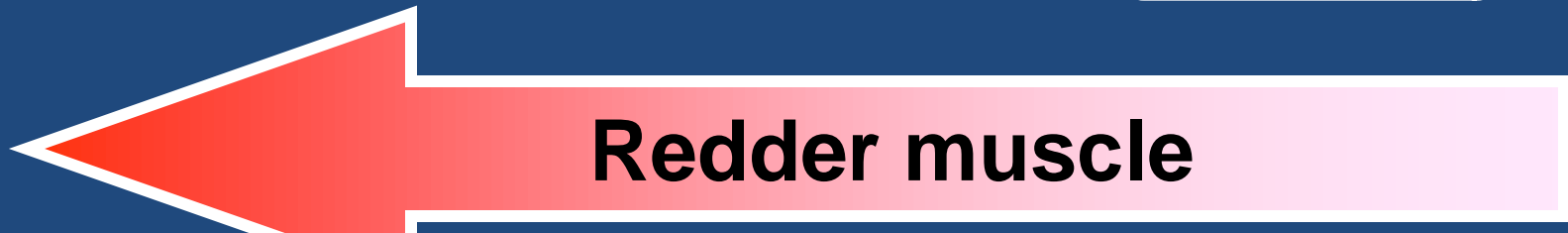


Importance of Muscle Aerobicity

Consumer Satisfaction

- Keeping red meat red!
- Iron and Zinc
- Differentiates red from white

Iron is associated with aerobicity

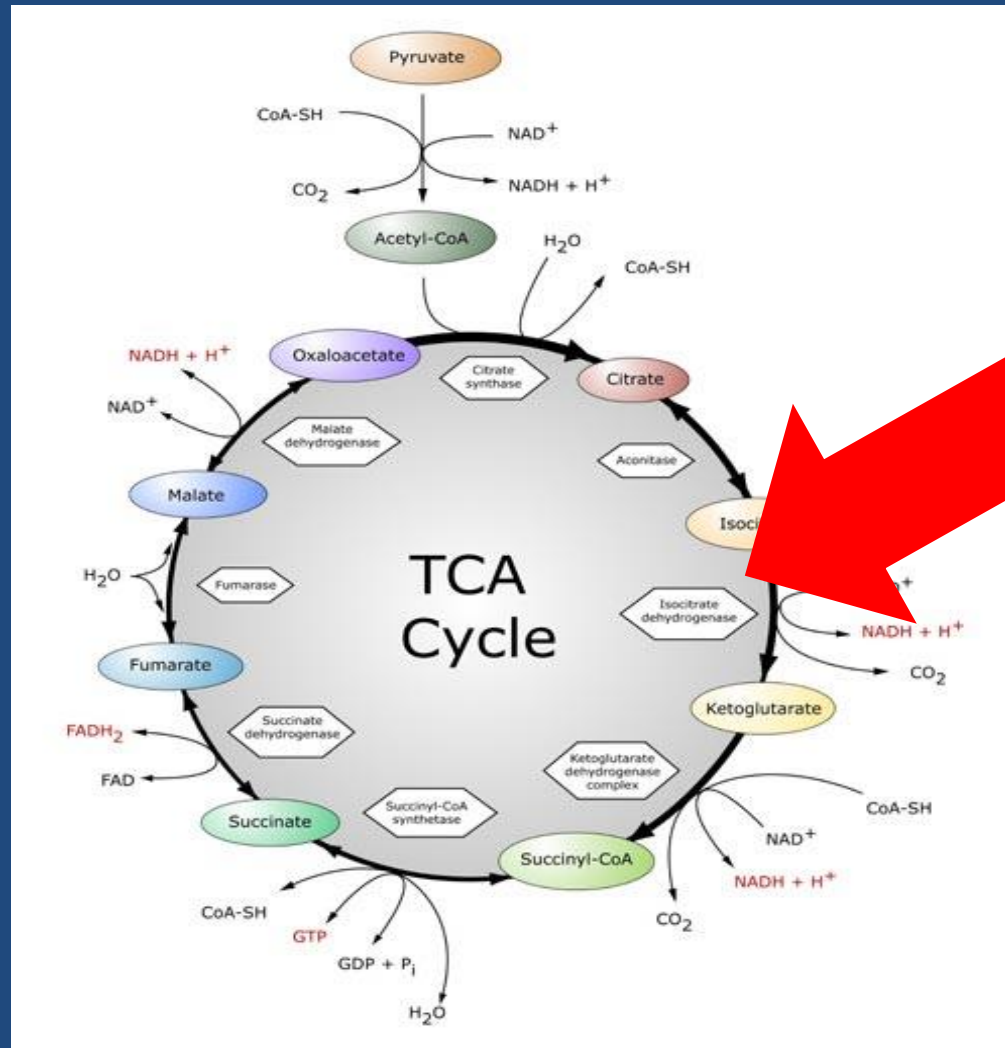


Oxidative
Fibre types

Gardner *et al.* (2006)

Glycolytic
Fibre types

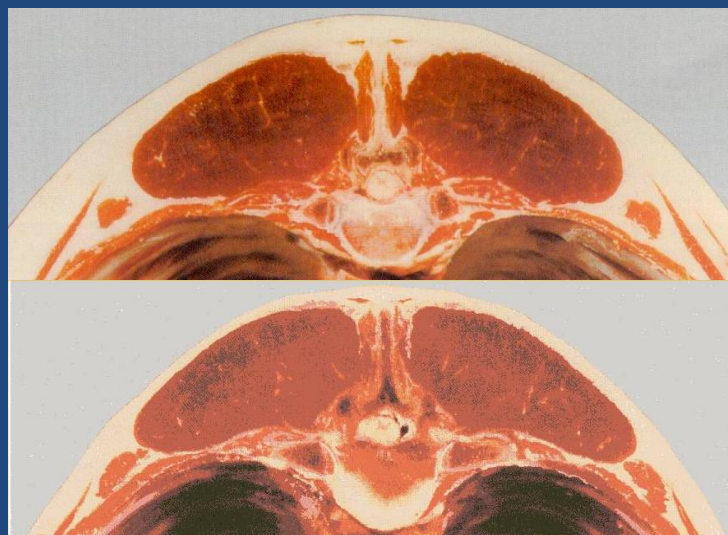
Isocitrate Dehydrogenase



Australian Sheep Breeding Values

PFAT and PEMD

“Leanness and
Muscling”

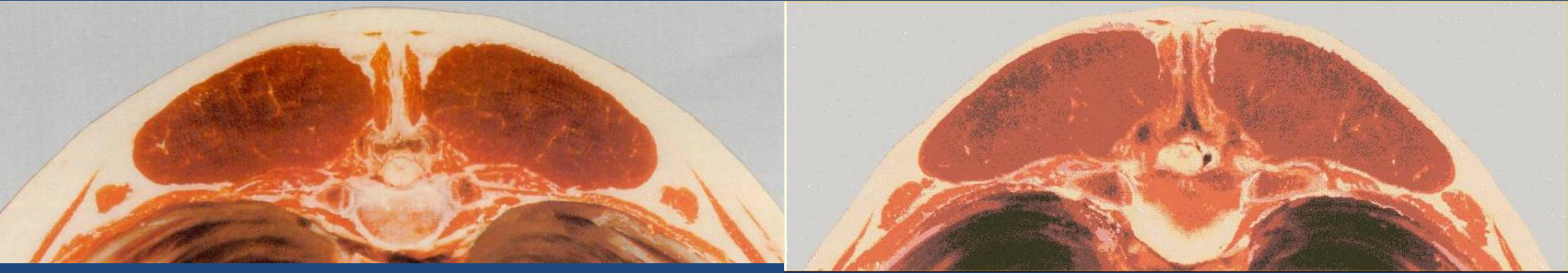


PWWT

“Growth”



Selection for leanness



I

IIA

IIX



Hypothesis



I

IIA

IIX

Less ICDH activity?

Method

Information Nucleus Flock



7 Sites



93 Key Sires

Sire

Terminal

Maternal

Merino

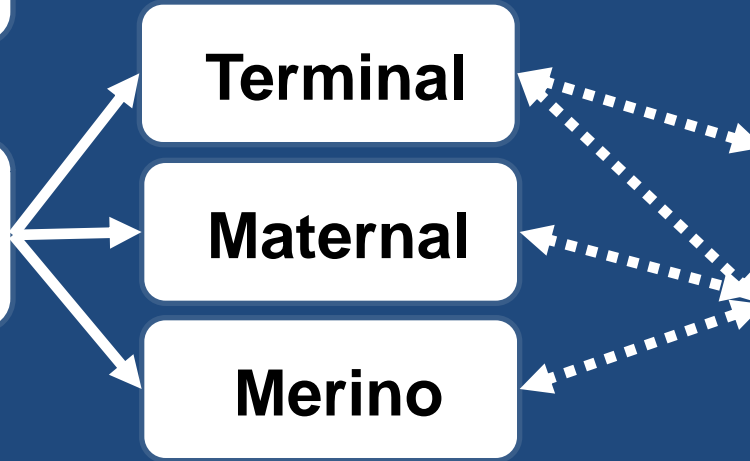
Dam

Maternal

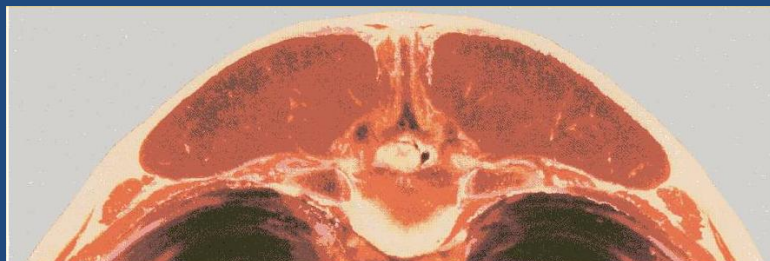
Merino

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Progeny Produced in 2007



ICDH Sample Collection



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Statistical Model

Fixed Effects

Site

Kill group within Site

Sex

Birth-Type Rear-Type

Age of Dam

Sire Type

Dam Breed within Sire Type

Random Effects

Sire

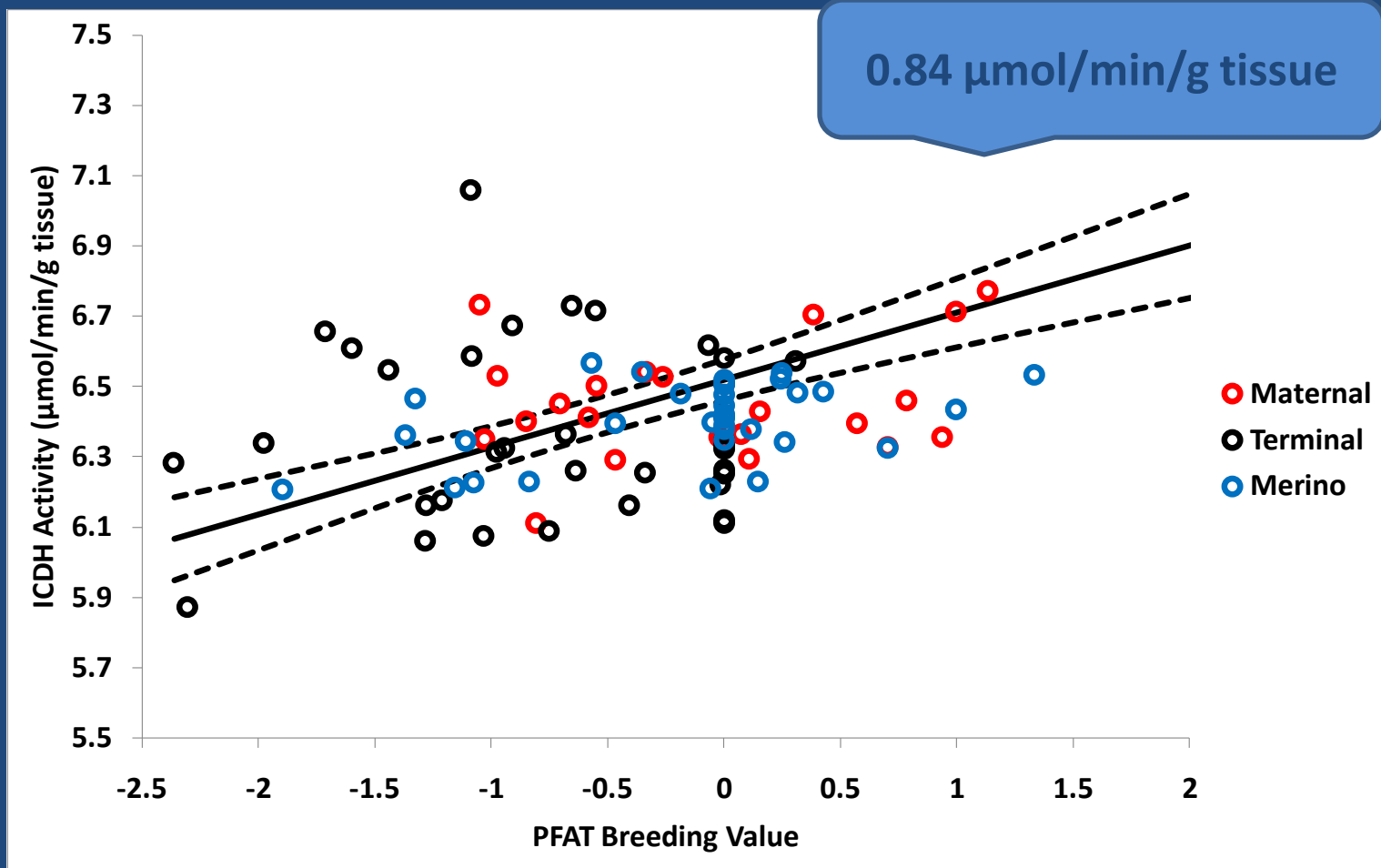
Dam

Covariate

PFAT breeding value

Results

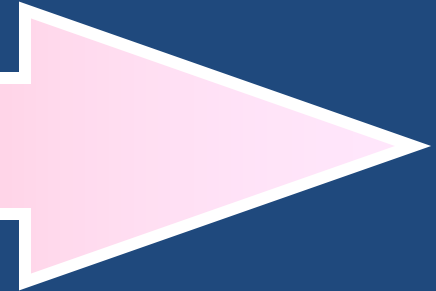
PFAT Breeding Value and ICDH



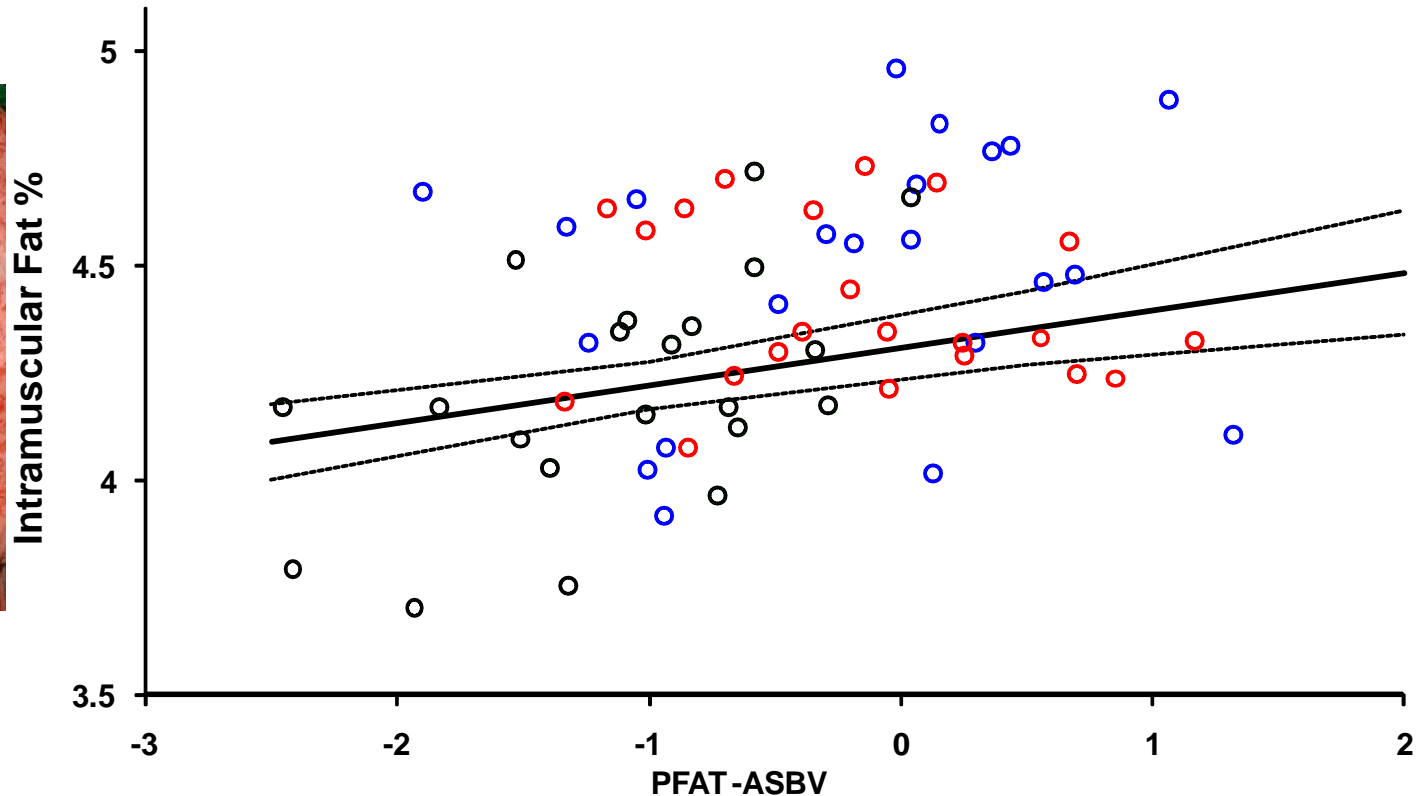
Hypothesis



Less ICDH activity

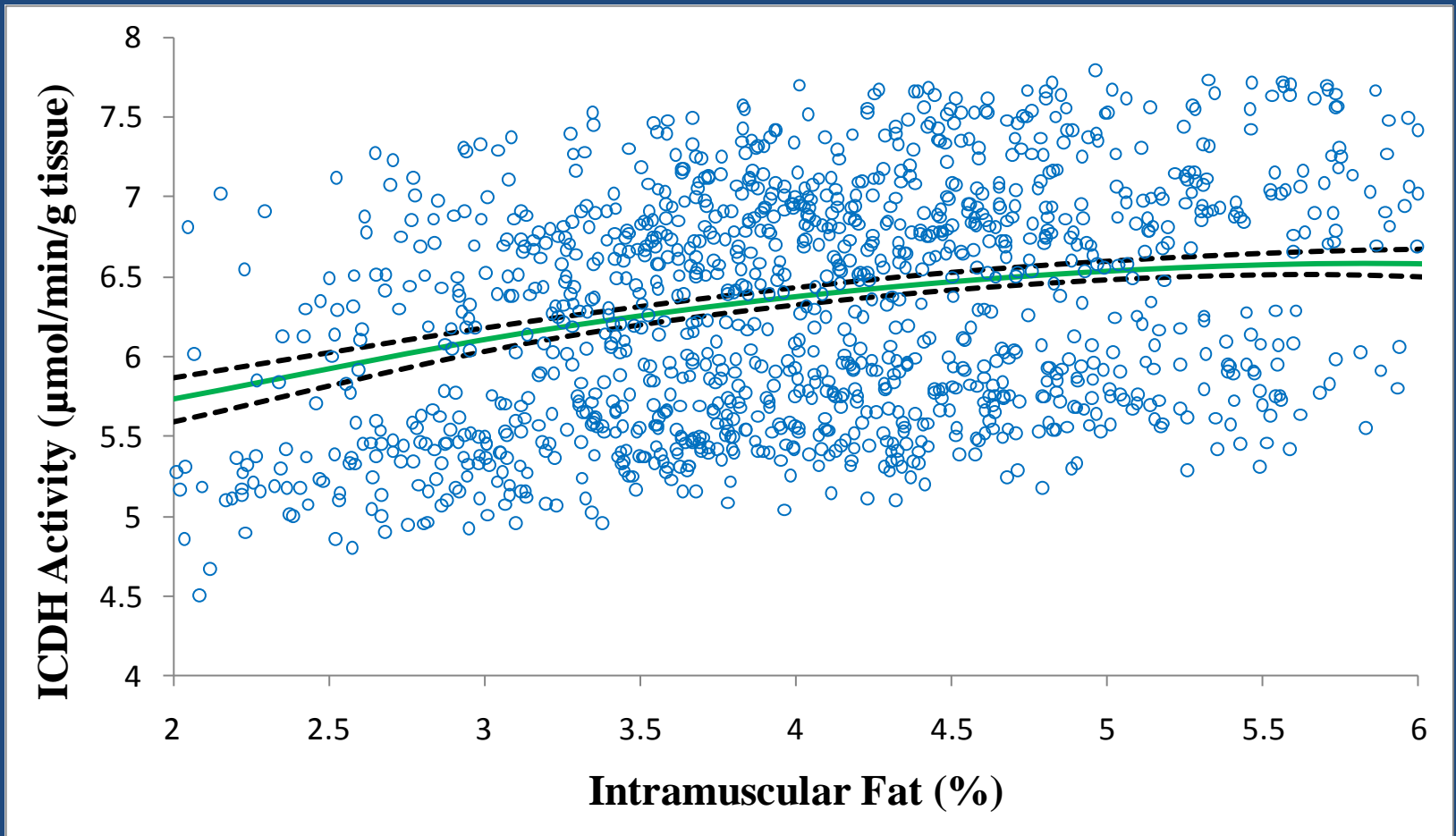


PFAT Breeding Value and IMF

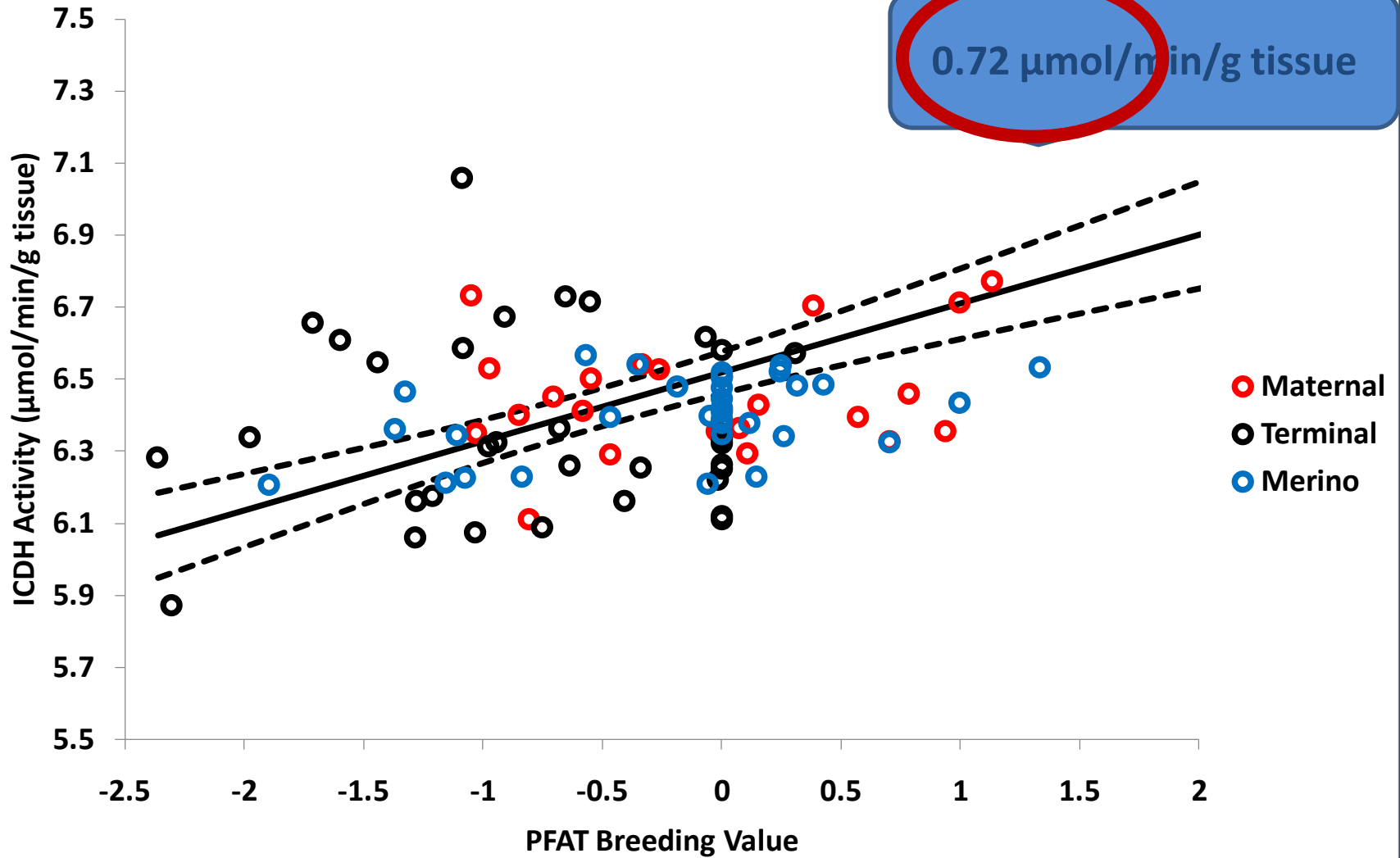


IMF Percentage and ICDH

0.85 $\mu\text{mol}/\text{min}/\text{g}$ tissue



PFAT and IMF



Summary of Results

- Selection for leanness reduced ICDH activity
 - Change in whiter meat?
 - Reduction in iron and zinc levels?
- There is an association between IMF and aerobicity which is not mediated by whole body adiposity