

Feed efficiency components at fattening in rabbit lines selected for different objectives

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INTRODUCTION



REPRODUCTIVE TRAITS



CROSSBRED FEMALES

X



GROWTH RATE

INDIRECT SELECTION OF FEED EFFICIENCY



RABBIT MEAT

How efficient are these lines?

INTRODUCTION

Feed efficiency important for sustainability in livestock:

→ environmental impact

→ economical reasons

feeding represents 40 – 60% of production costs in rabbits

INTRODUCTION

Animals use energy for

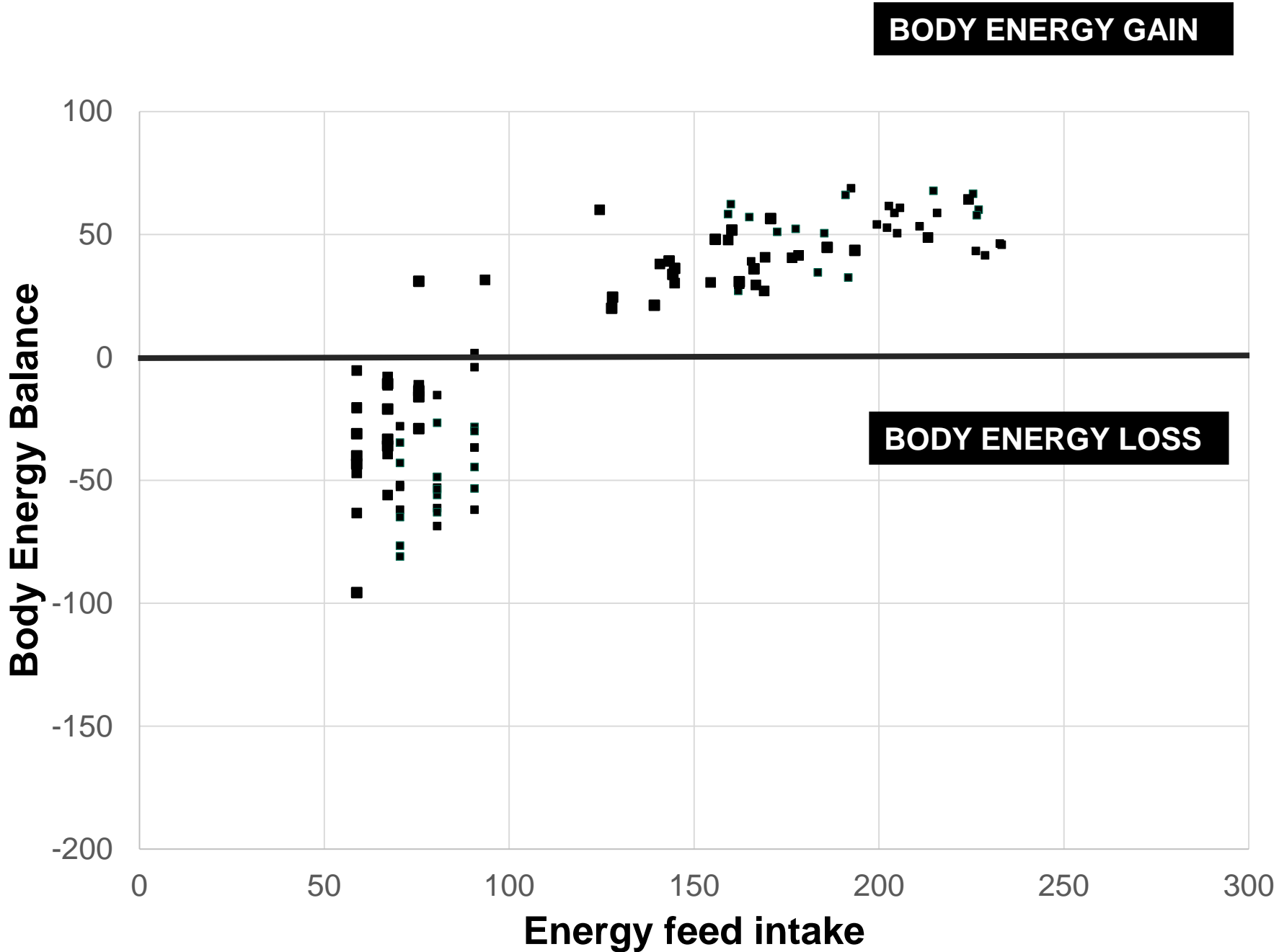
growth

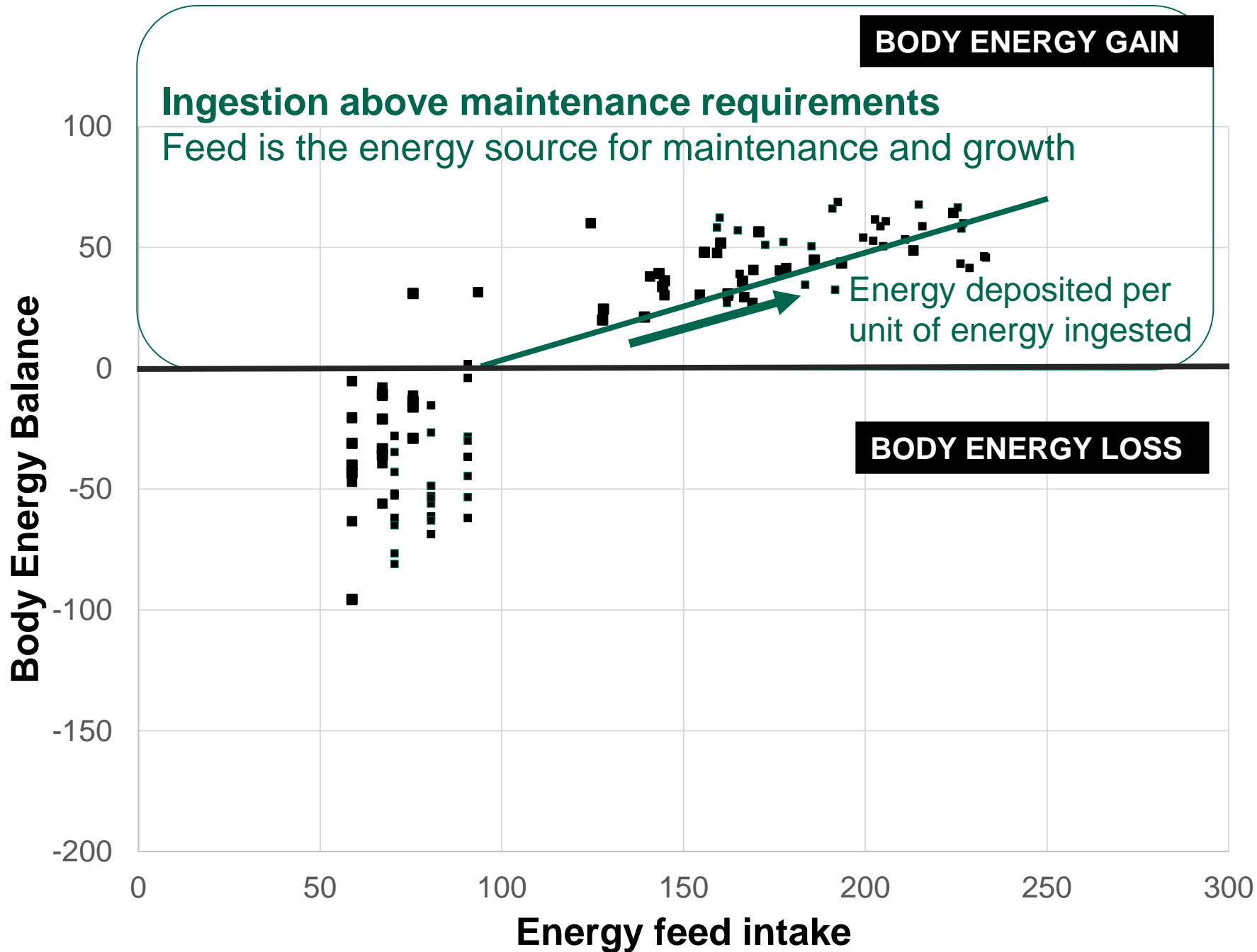


maintenance

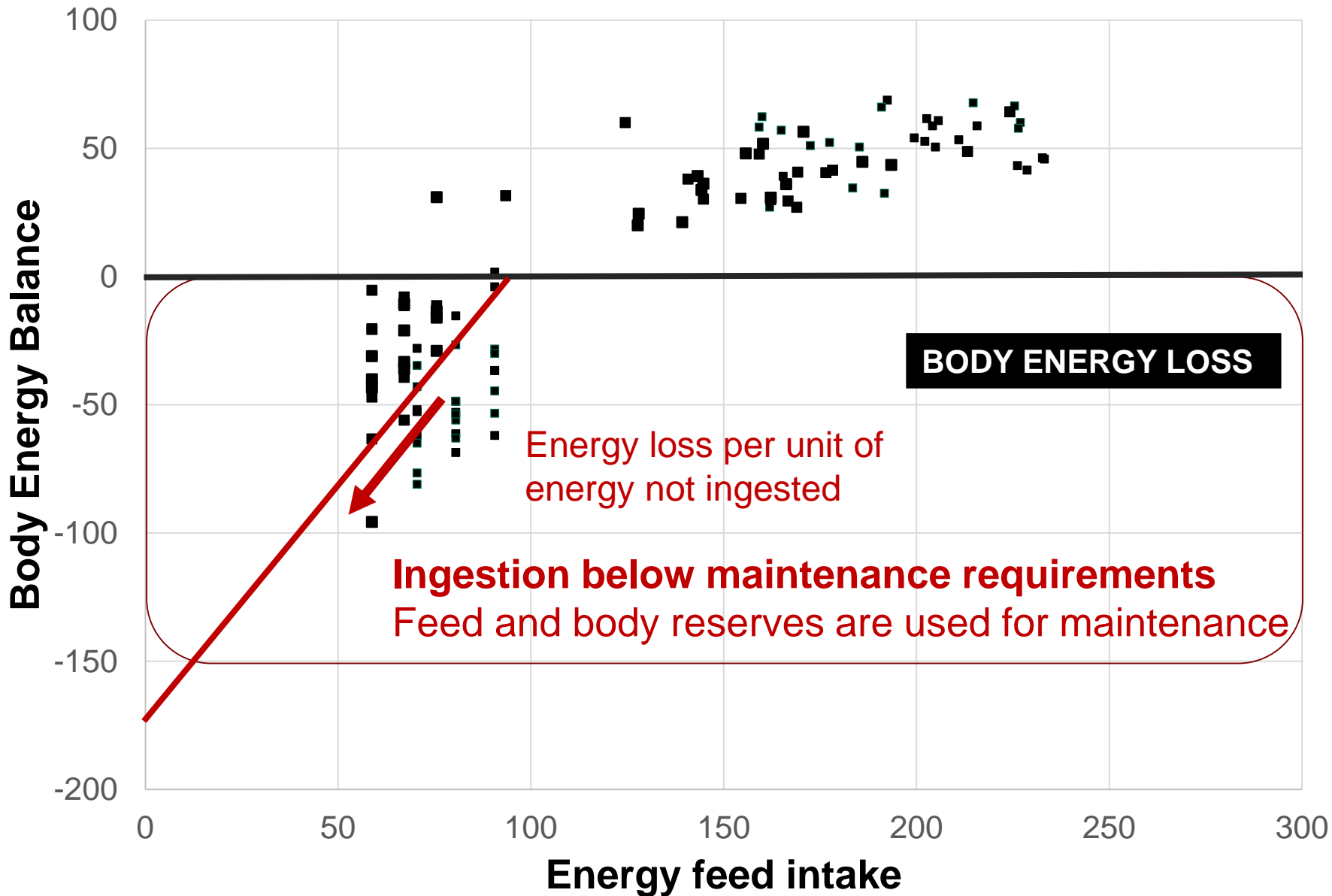


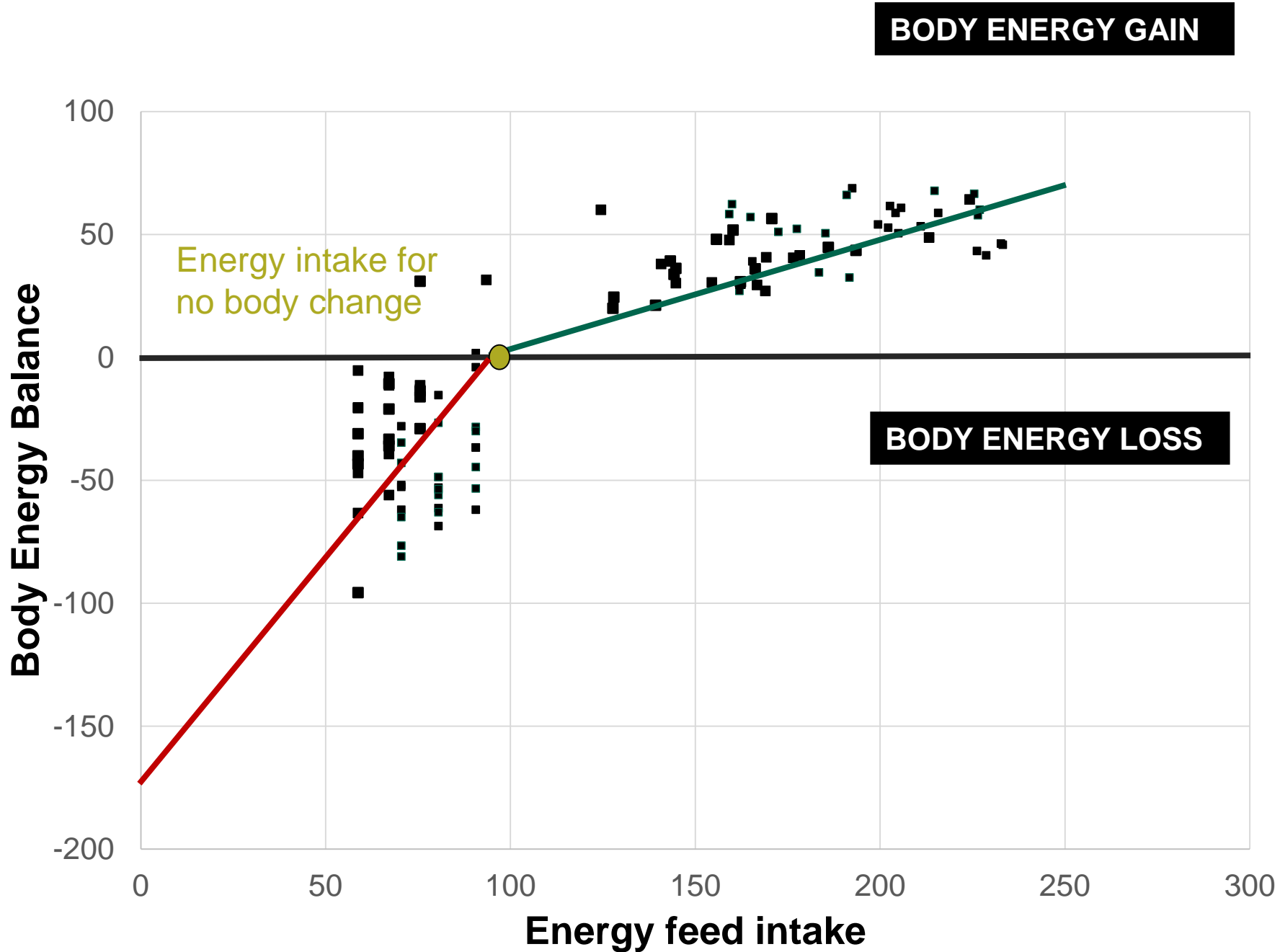
How we know how they use feed for maintenance and growth?

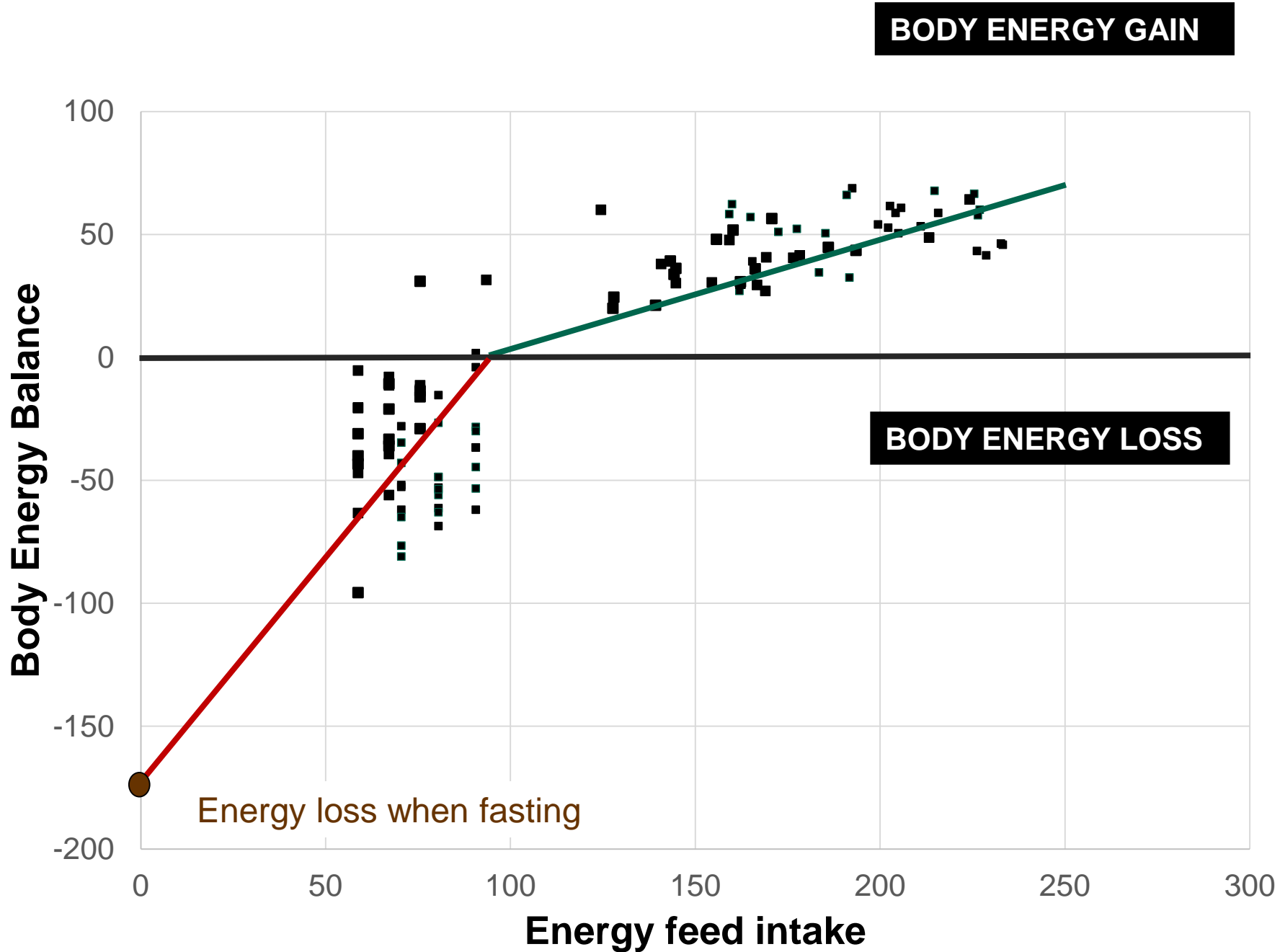




BODY ENERGY GAIN







OBJECTIVE

Analyse and compare the feed efficiency for maintenance and growth in two lines of rabbit selected for growth rate and litter size

METHODOLOGY



Line Caldes

Selected for growth rate from 30 to 62 days of age since 1983

14 males, 14 females

Growth ♂

Growth ♀



Line Prat

Selected for litter size at weaning since 1992

14 males, 13 females

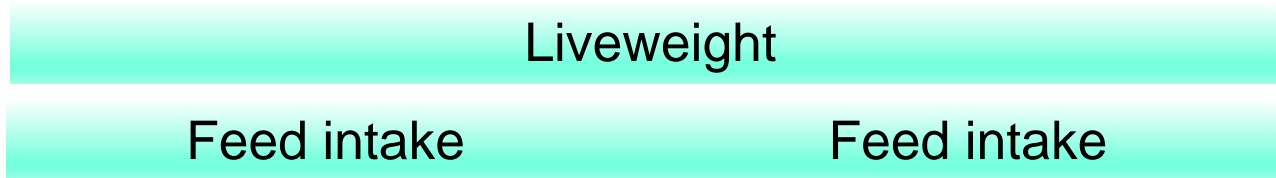
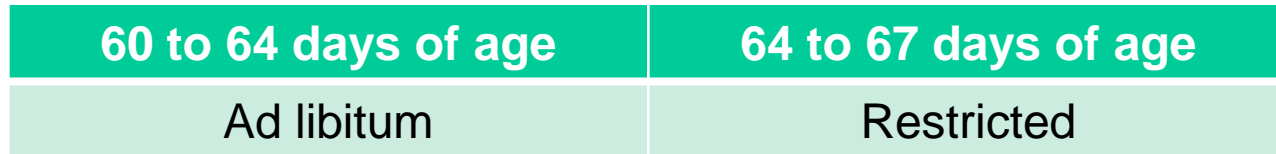
Litter size ♂

Litter size ♀

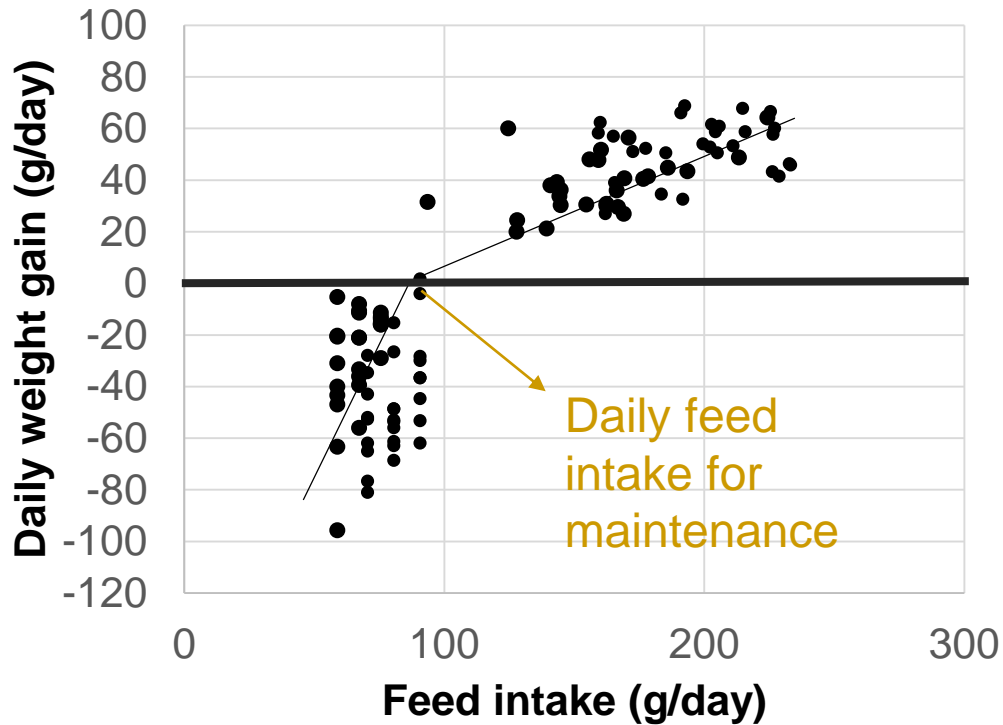
METHODOLOGY

Estimation of theoretical maintenance needs ($430 \text{ KJ kg}^{-0.75} \text{ day}^{-1}$) per line and sex

Animals divided in 3 groups restricted at 90, 80, 70% of these requirements



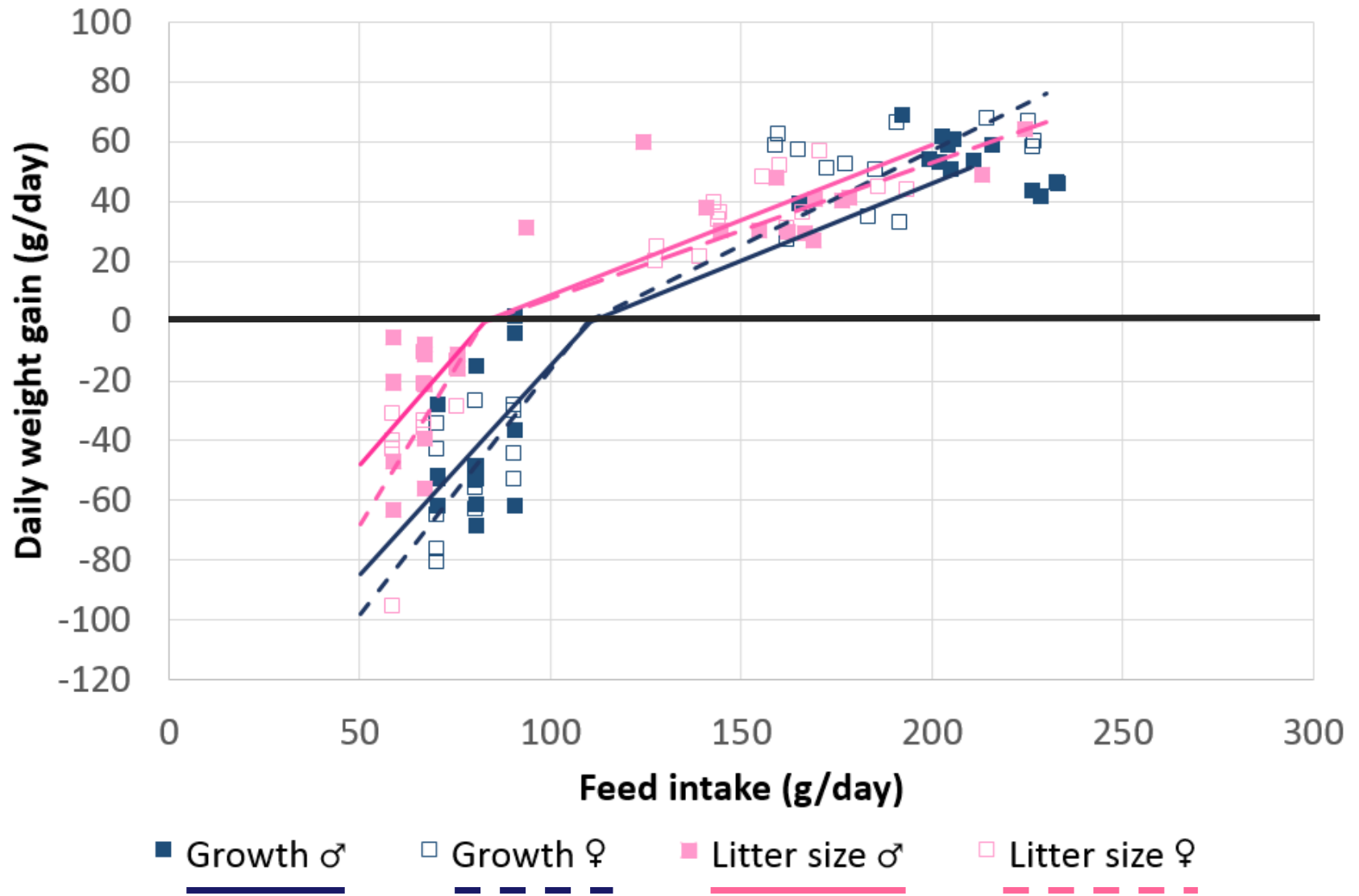
METHODOLOGY



Regression of body weight change against feed intake

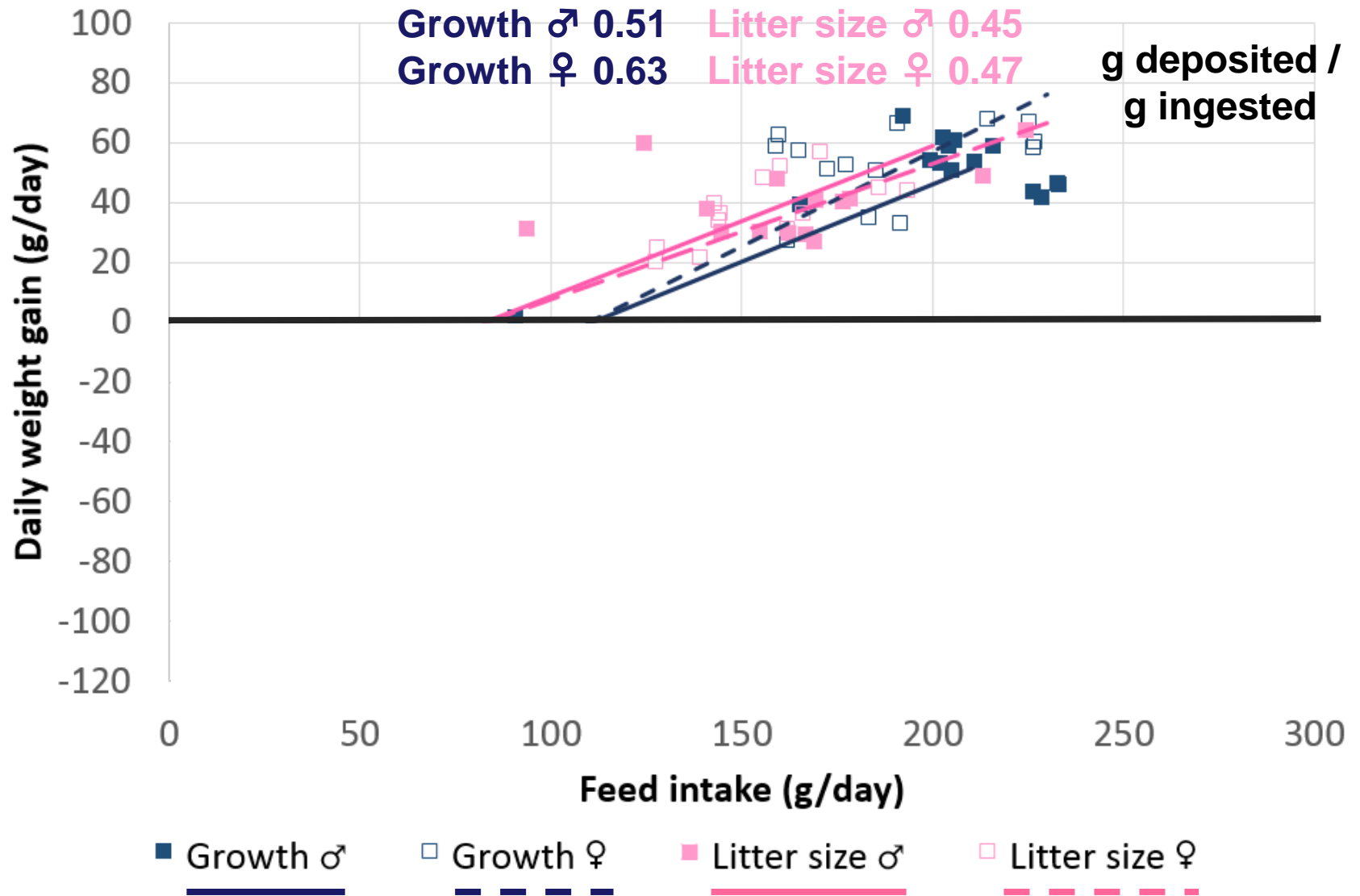
For each line and sex:
Linear spline regression with a knot at $(DFIm, 0)$ with R

RESULTS

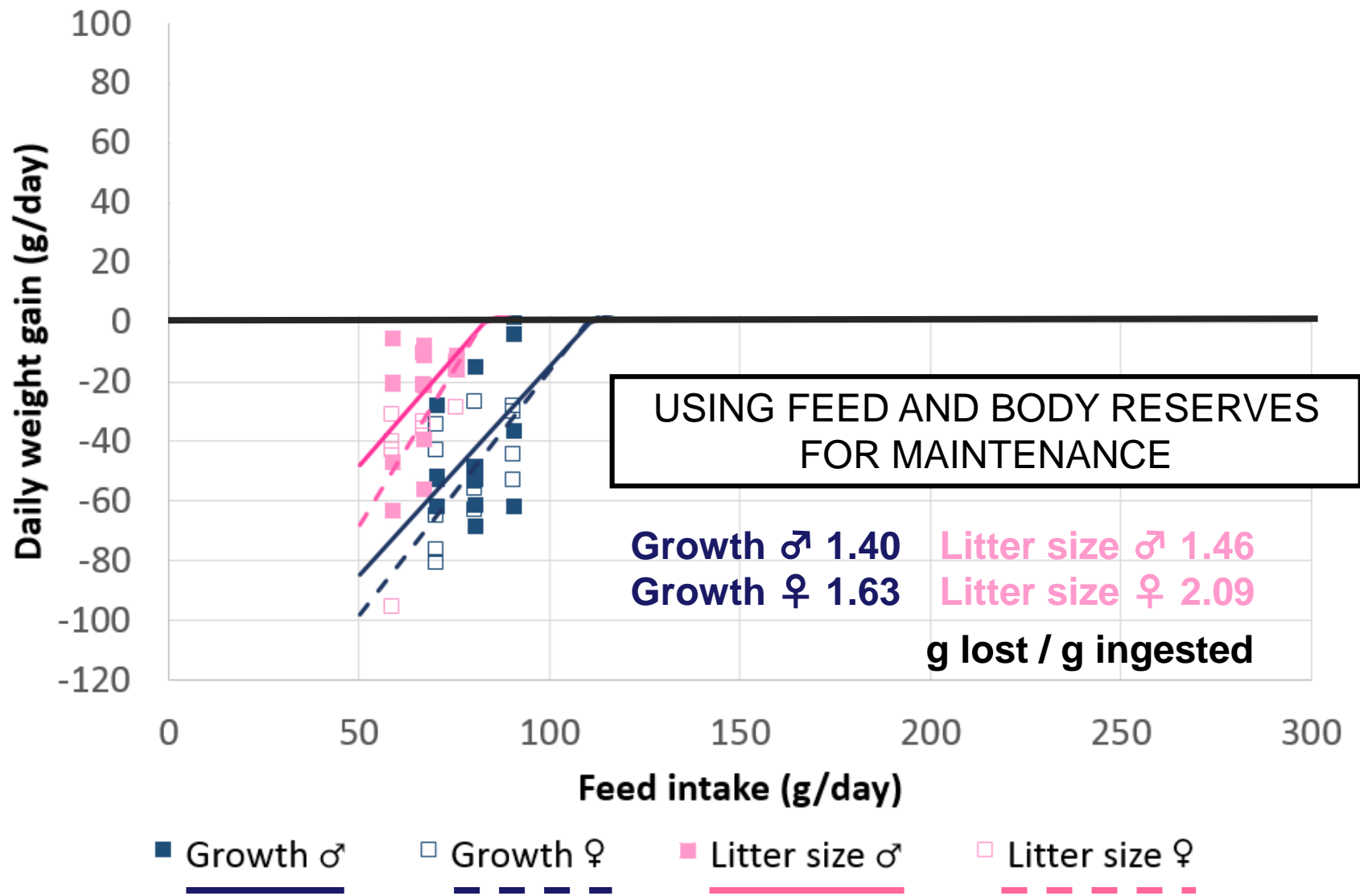


RESULTS

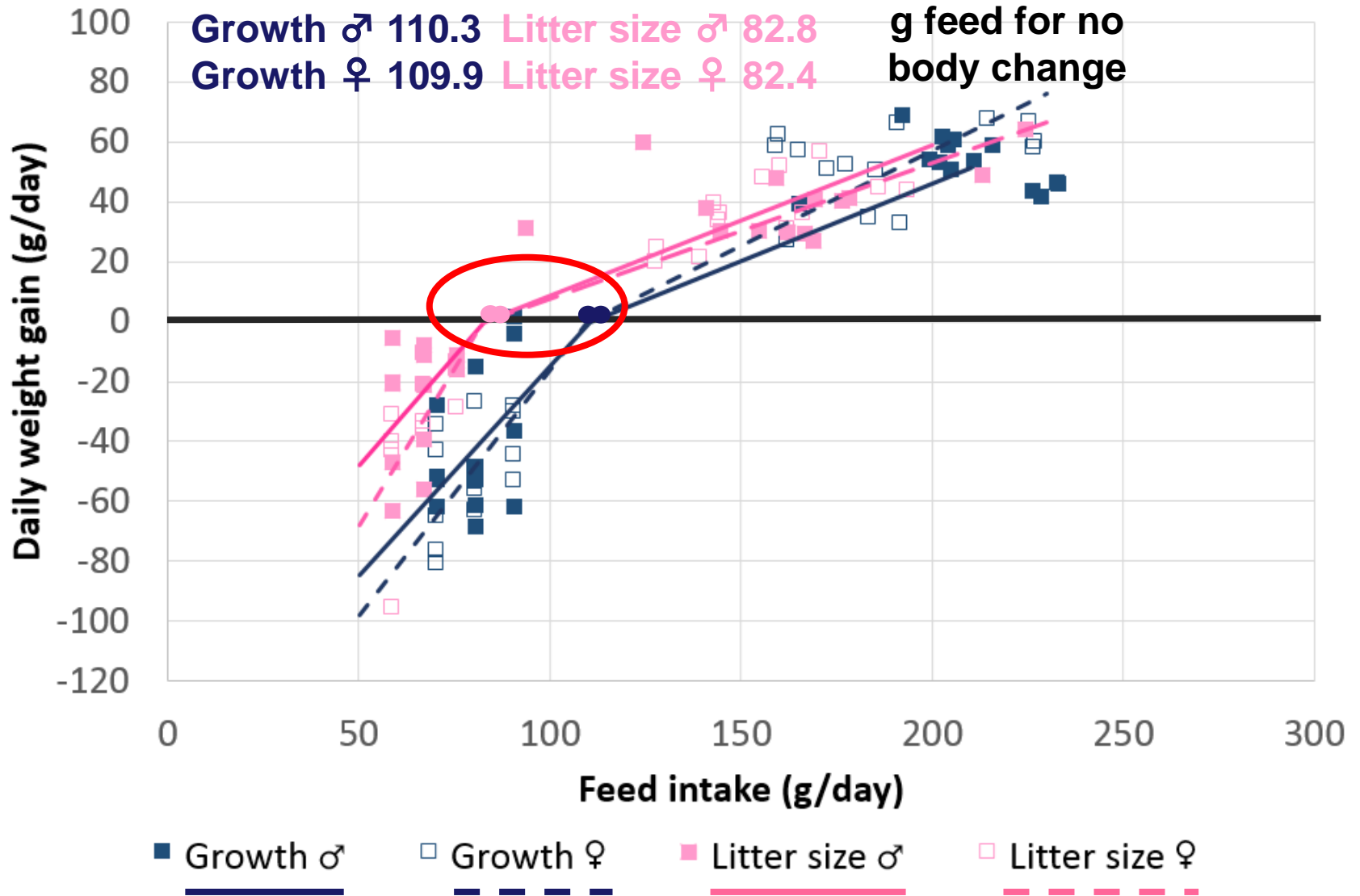
USING FEED FOR MAINTENANCE AND GROWTH



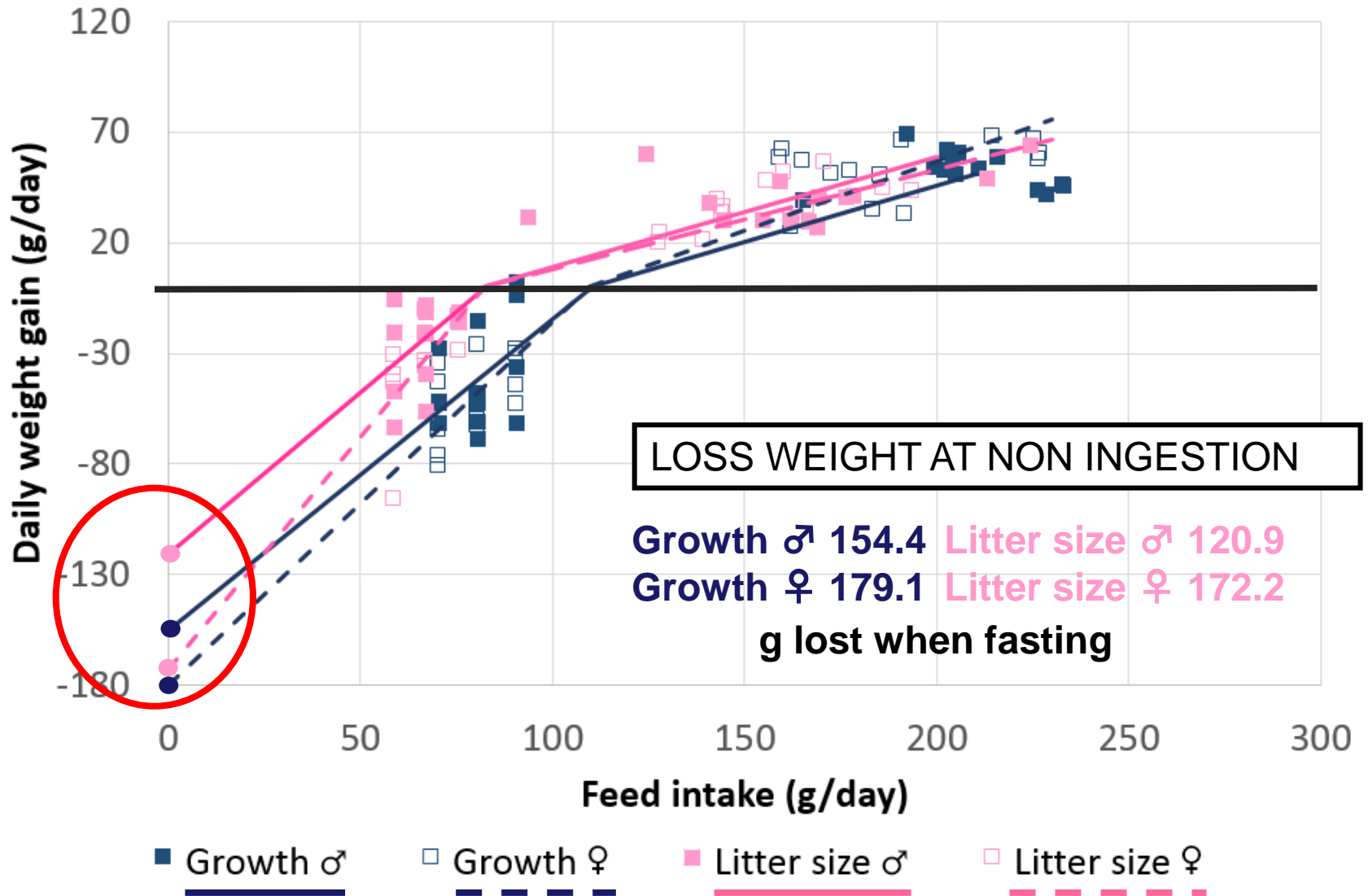
RESULTS



MAINTENANCE REQUIREMENTS



RESULTS



CONCLUSIONS

Line selected for growth rate, compared to line selected for litter size:

- ✓ Seems **more efficient** when ingestion is **above the maintenance levels**
- ✓ Has **lower mobilisation of reserves** when ingestion is **below the maintenance level**

Females have a **higher mobilisation** of reserves than males when ingestion **is below the maintenance level**

FUTURE WORK

- ✓ **Relating energy balance and energy intake** estimated by measuring biometrical impedance and digestibility of the feed
- ✓ Applying this methodology to **three lines of rabbits selected for feed efficiency** with different criteria of selection in the context of the Feed A Gene European Project

Feed efficiency components at fattening in rabbit lines selected for different objectives

THANK YOU

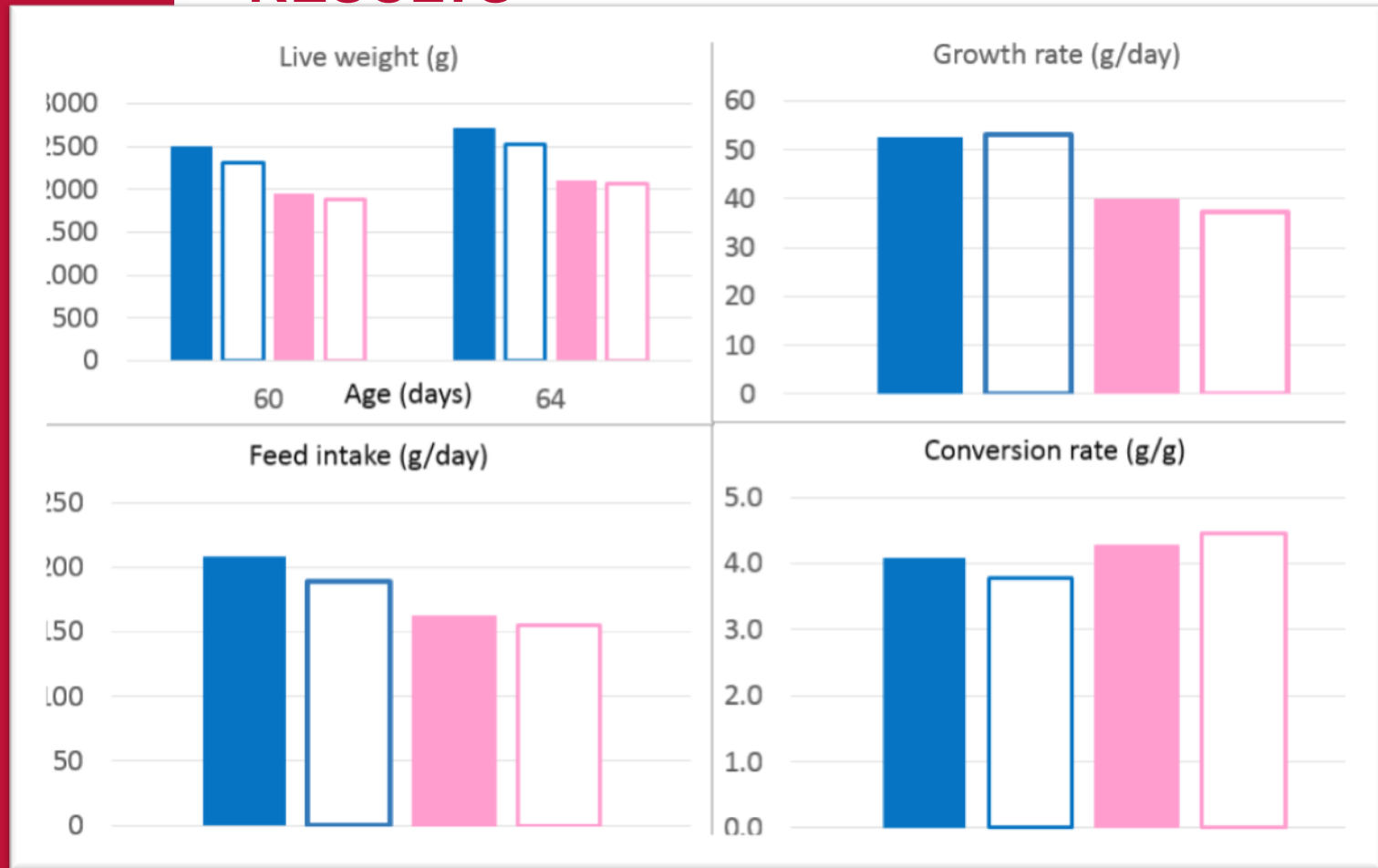
IRTA

RESEARCH & TECHNOLOGY

FOOD & AGRICULTURE

OVER MAINTENANCE REQUIREMENTS

RESULTS



Selected for growth rate:

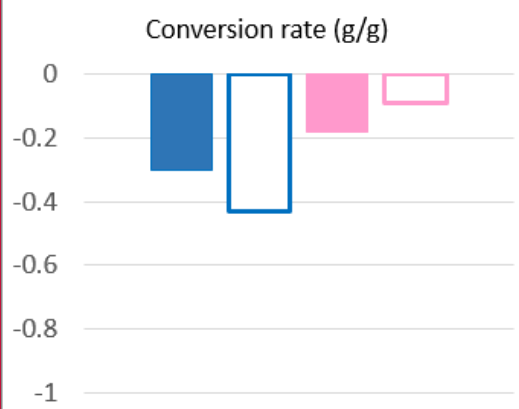
- ✓ Higher live weight, growth rate, feed intake
- ✓ Similar conversion rate

■ CM □ CF ■ PM □ PF

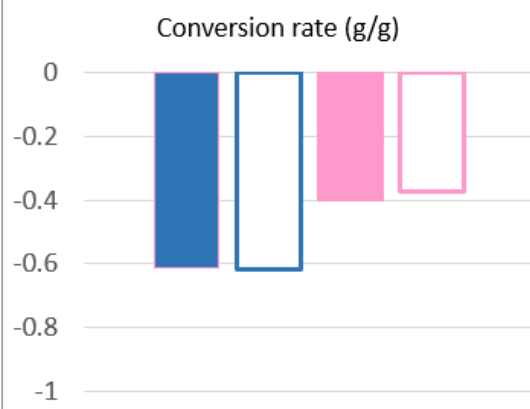
RESULTS

BELOW MAINTENANCE REQUIREMENTS

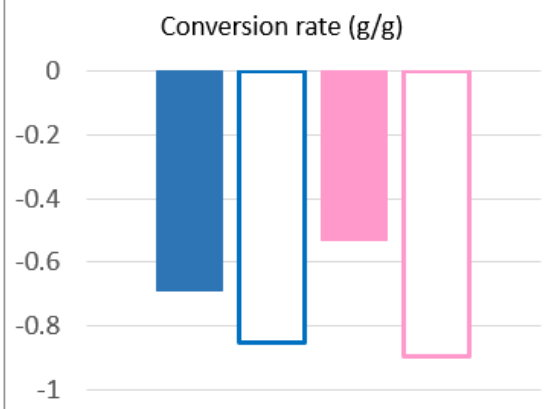
R90



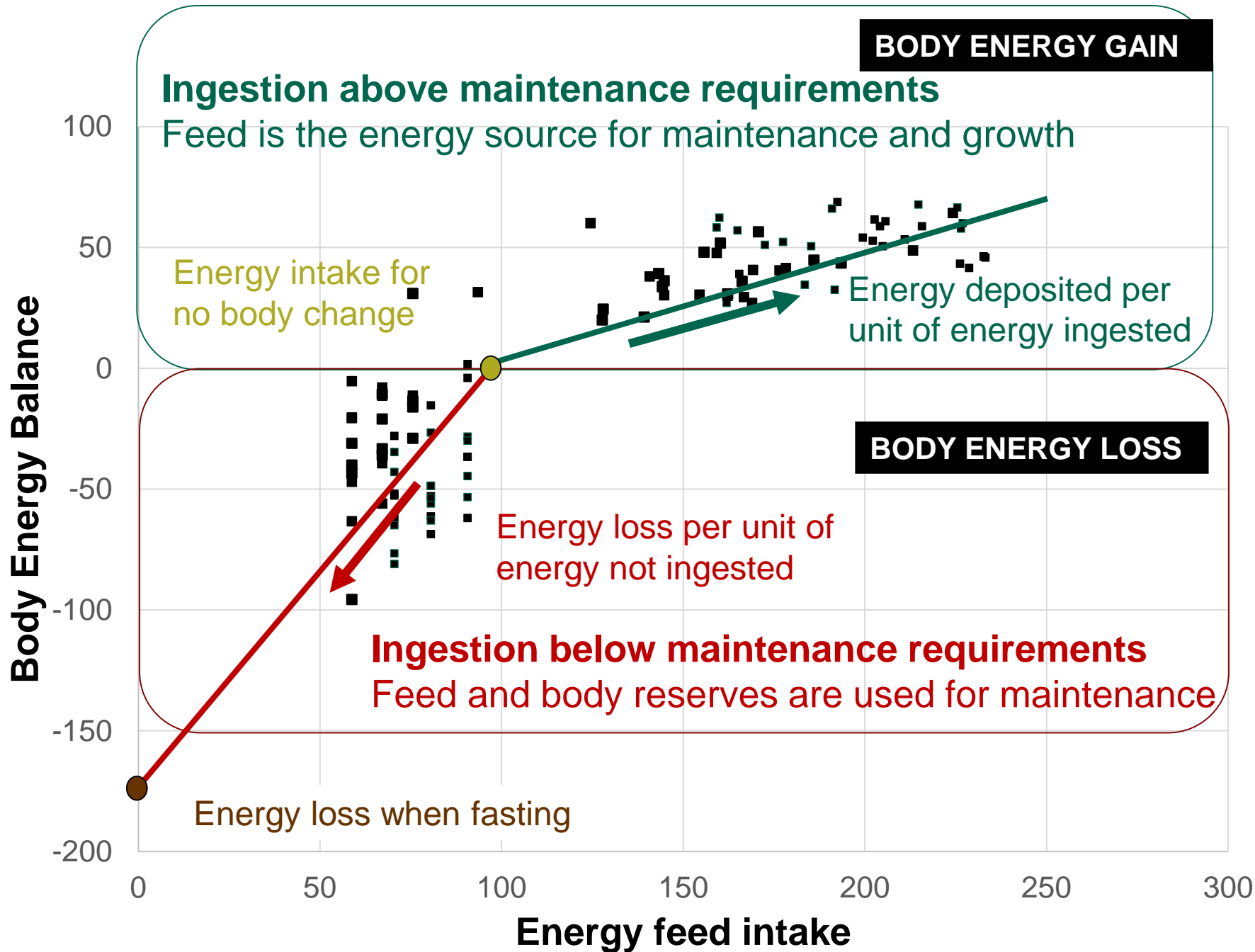
R80



R70



■ CM □ CF ■ PM □ PF



RESULTS

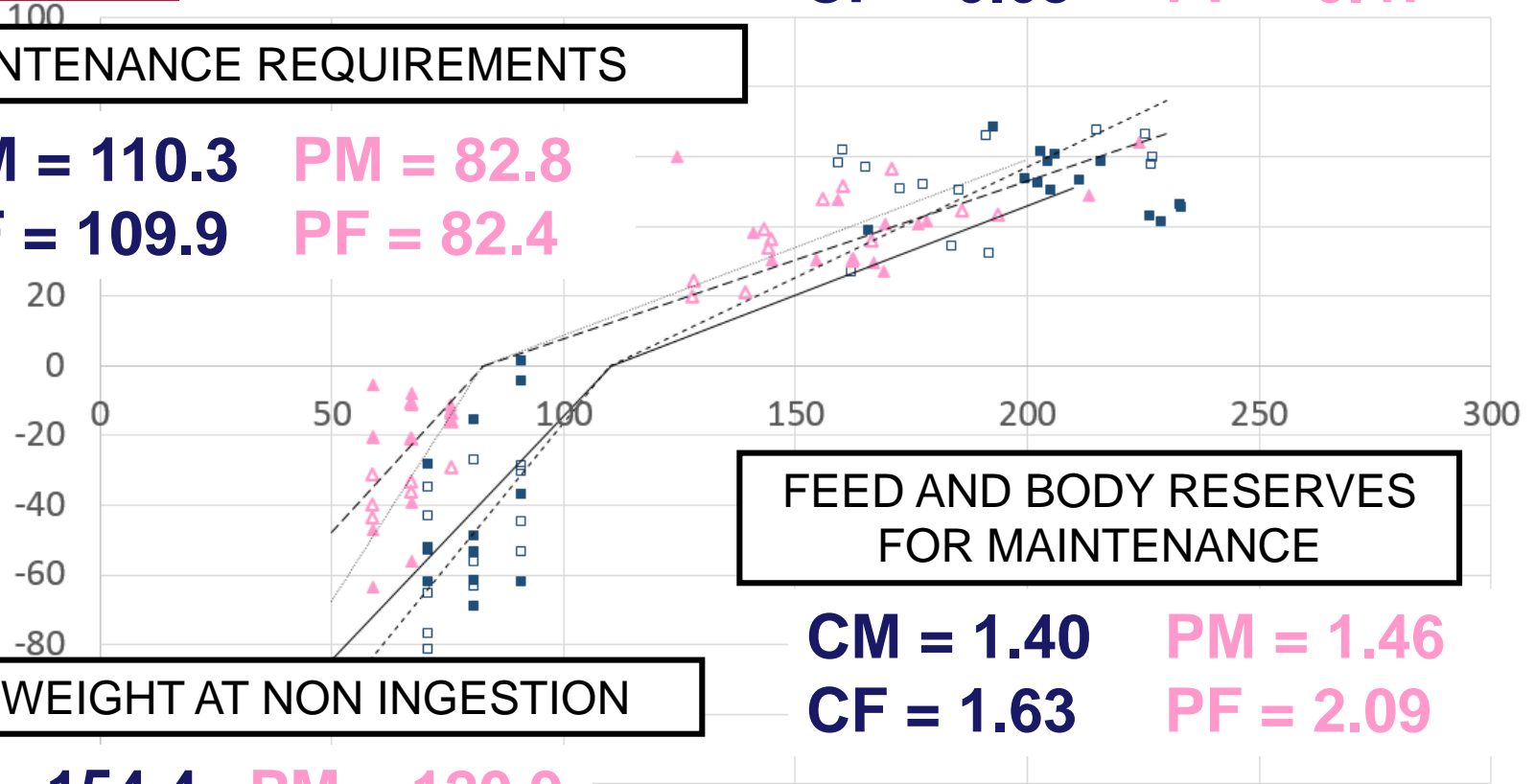
FEED FOR MAINTENANCE AND GROWTH

CM = 0.51 **PM = 0.45**
CF = 0.63 **PF = 0.47**

MAINTENANCE REQUIREMENTS

CM = 110.3 **PM = 82.8**
CF = 109.9 **PF = 82.4**

Daily weight gain (g/



FEED AND BODY RESERVES FOR MAINTENANCE

CM = 1.40 **PM = 1.46**
CF = 1.63 **PF = 2.09**

LOSS WEIGHT AT NON INGESTION

CM = 154.4 **PM = 120.9**
CF = 179.1 **PF = 172.2**

Feed intake (g/day)

▲ PM ▲ PF