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Impact of birth weight and feeding strategies during the growing and finishing period on growth performance, carcass characteristics, and meat quality in pigs

Giuseppe Bee, Claudine Biolley, Bernard Dougoud, and George Guex

SCHWEIZERISCHE VEREINIGUNG FÜR TIERPRODUKTION
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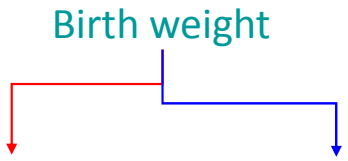
Birth weight and pork quality – reported relationship

(Rehfeldt and Kuhn, 2006)



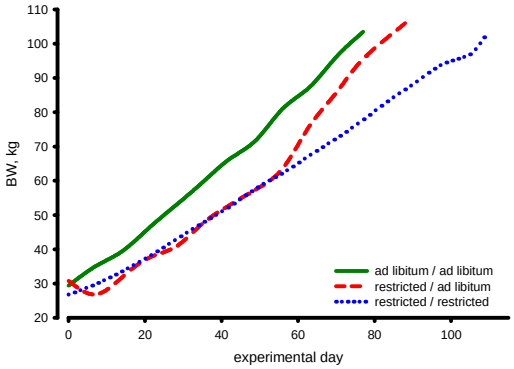
	low (0.9 kg)	high (1.8 kg)
ADWG, kg/d	0.582	0.641
carcass weight, kg	84.2	92.5
lean meat, %	54.8	56.5
omental fat, %	2.78	2.44
Drip loss, %	6.6	4.5
myofiber area, mm^2	3´900	3´200
myofiber number, x1000	900	1´200

Feeding strategy and pork quality - reported relationship

Compensatory growth

Growth performance (Oksbjerg et al. 2001)

- ADWG
- feed intake
- G/F ratio



Meat quality traits (Kristensen et al. 2002)

- Proteolytic capacity
  - Drip loss 
  - Tenderness 

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Objective

Can **compensatory growth** help to overcome the negative impact of low birth weight on **carcass traits** as well as **meat quality traits** such as *drip loss* and *tenderness*?

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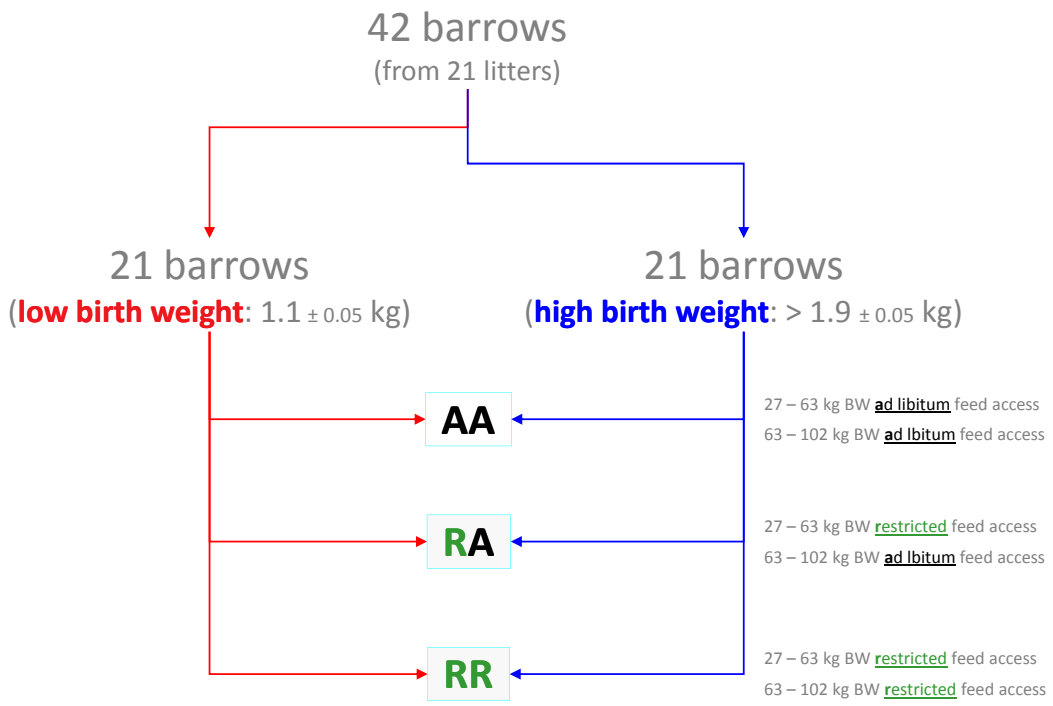
Experimental design



Growth performance, carcass characteristics, and meat quality

Growth performance

- ADWG
- Feed intake
- Gain to feed ratio

Carcass measurements

- Percentage lean tissue
- Percentage subcutaneous fat

Meat quality traits

LM and dark portion of the semitendinosus (STD)

- Color
- Drip loss (24 and 48 h)
- Shear force

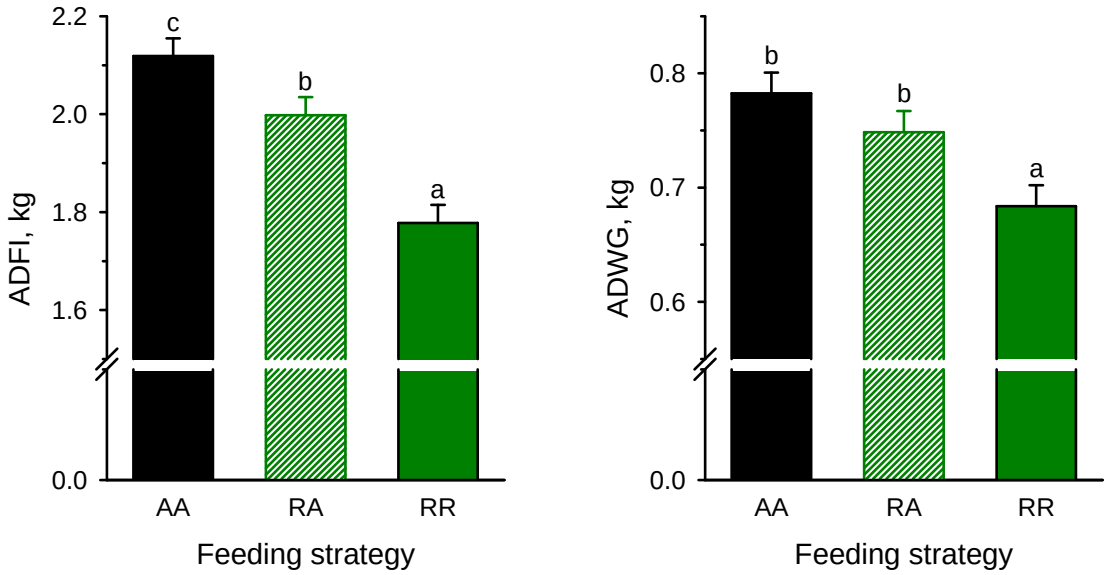
Protein analysis

LM and dark portion of the semitendinosus (STD)

- μ- and m-calpain activity
  - (30 min and 24 h postmortem determined by casein-zymography)
- Degradation of titin
  - (30 min, 24, 48, and 48 h postmortem determined by SDS-PAGE)
- Degradation of talin
  - (30 min, 24, 48, and 48 h postmortem determined by SDS-PAGE and Western Blot)

Growth performance – ADFI & ADWG

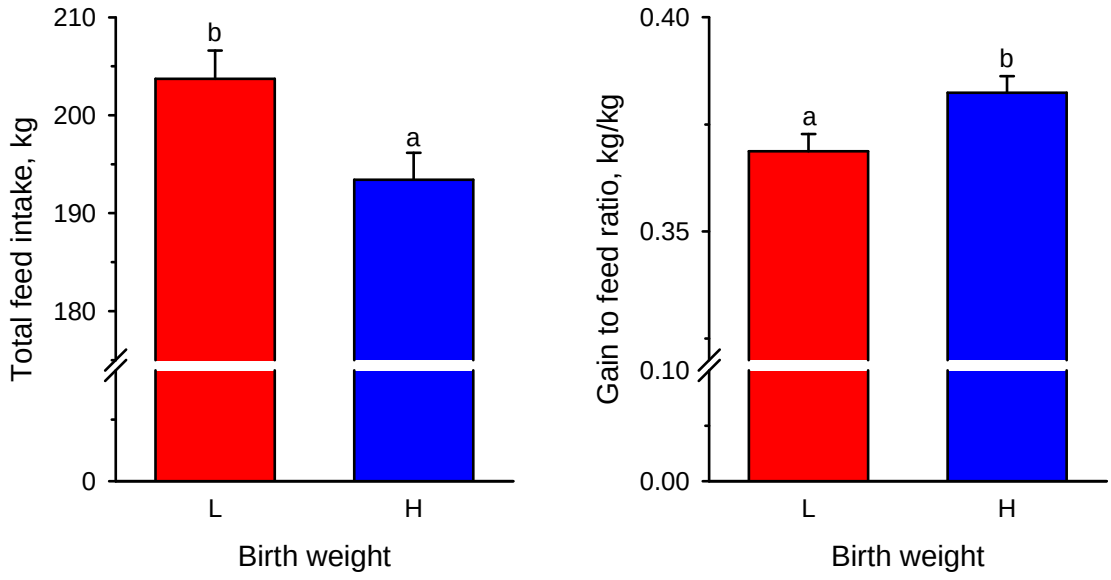
effect of feeding strategy



Within a graph, bars that do not have common letters differ ($P < 0.05$)

Growth performance – total feed intake & G/F ratio

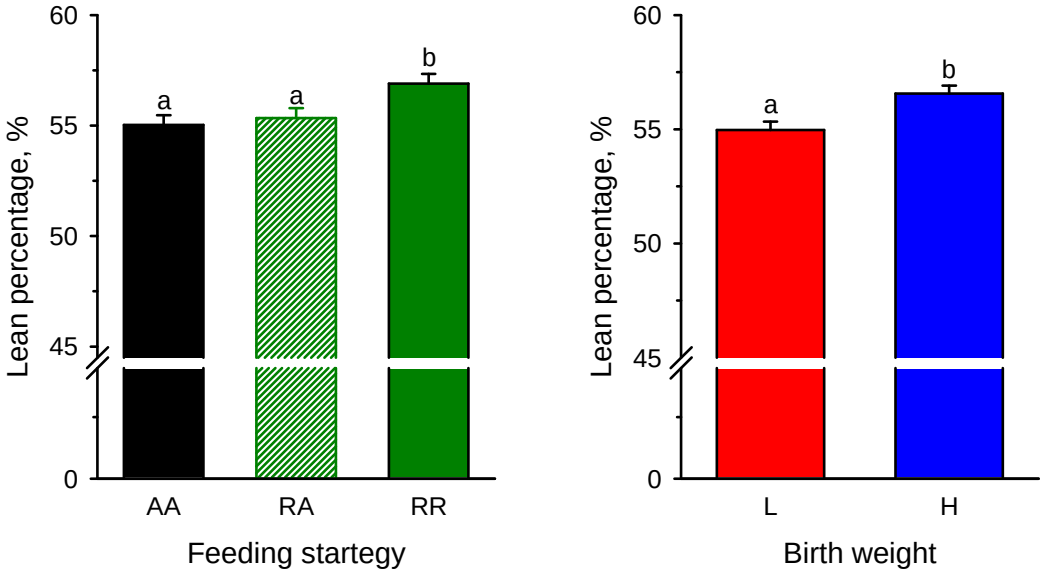
effect of birth weight



Within a graph, bars that do not have common letters differ ($P < 0.05$)

Carcass measurements – lean percentage

effect of feeding strategy & birth weight



Within a graph, bars that do not have common letters differ ($P < 0.05$)

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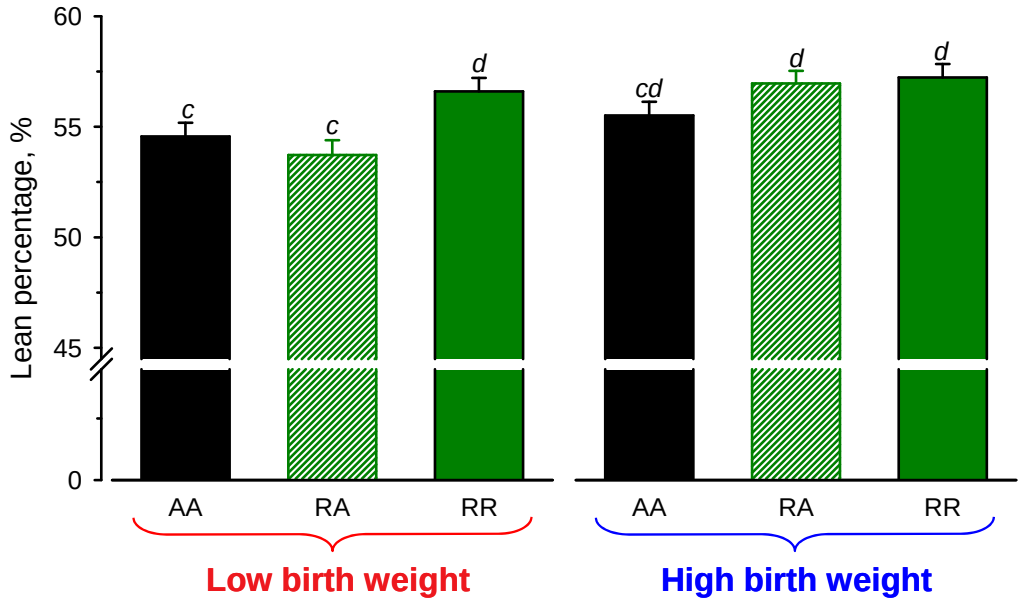
Carcass measurements – lean percentage

feeding strategy x birth weight interaction



Within the graph, bars that do not have common letters differ ($P < 0.10$)

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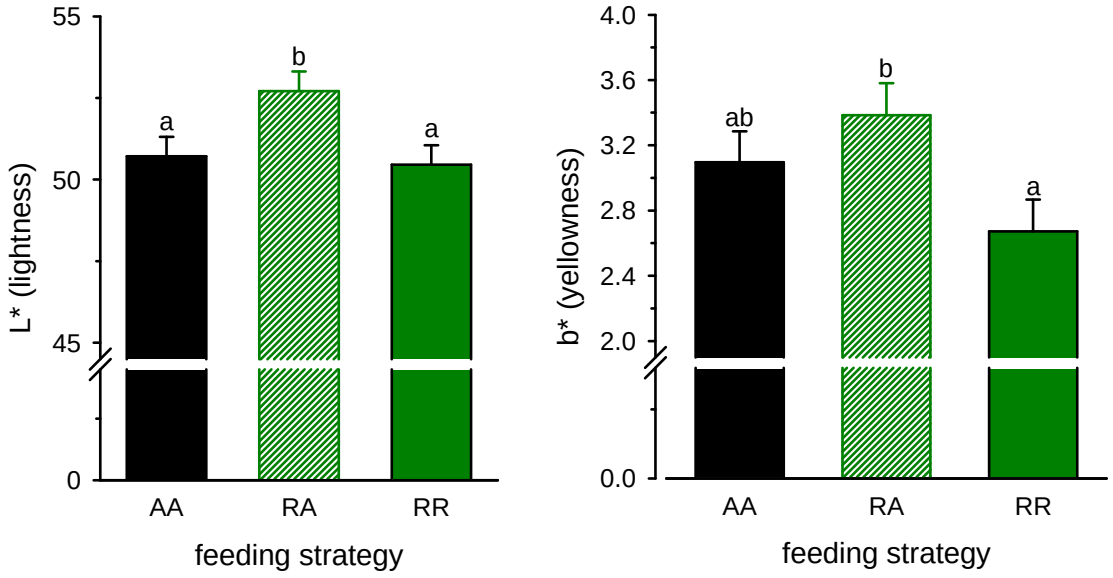
Meat quality – color of the LM

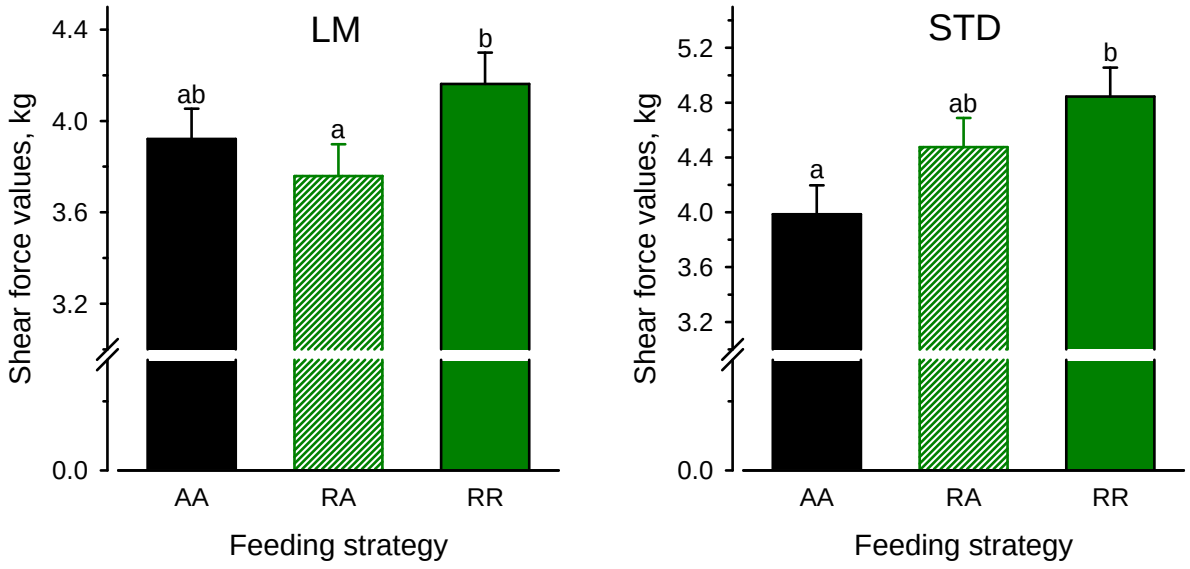
effect of feeding strategy



Within a graph, bars that do not have common letters differ ($P < 0.05$)

Meat quality – shear force values of the LM and STD

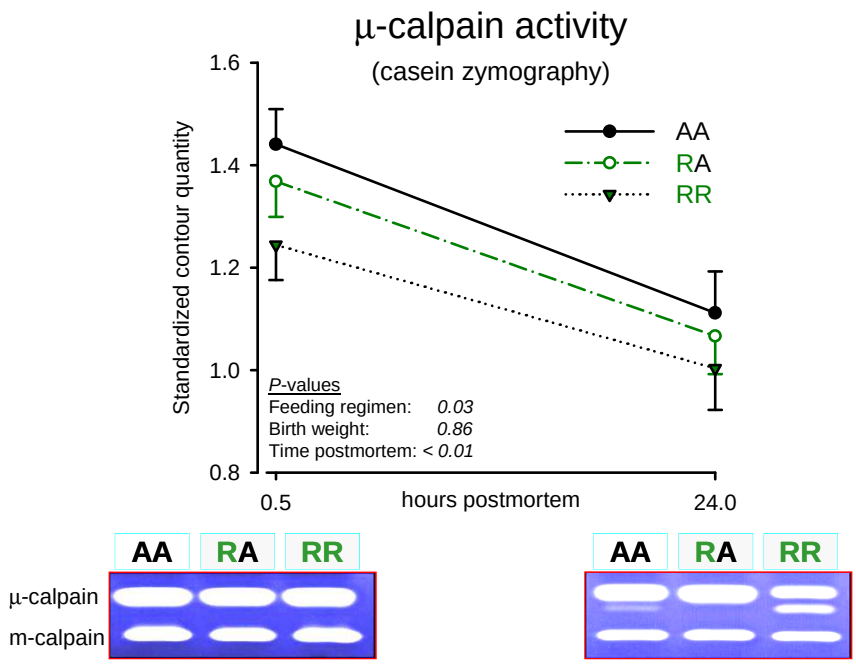
effect of feeding strategy



Within a graph, bars that do not have common letters differ ($P < 0.05$)

μ-calpain activity - in the LM

effect of feeding strategy



Conclusions

Impact of the feeding strategy

- **Compensatory growth**
  - positively affected growth performance
    - less feed and similar growth
  - positively affected meat tenderness
    - increased proteolytic capacity at slaughter

Impact of birth weight

- **Low birth weight was associated with impaired carcass quality**
    - lower lean percentage
    - higher percentage subcutaneous adipose tissue
  - consequence of the **higher feed intake** without increased growth

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Danke für Ihre Aufmerksamkeit

Sind noch Fragen?