



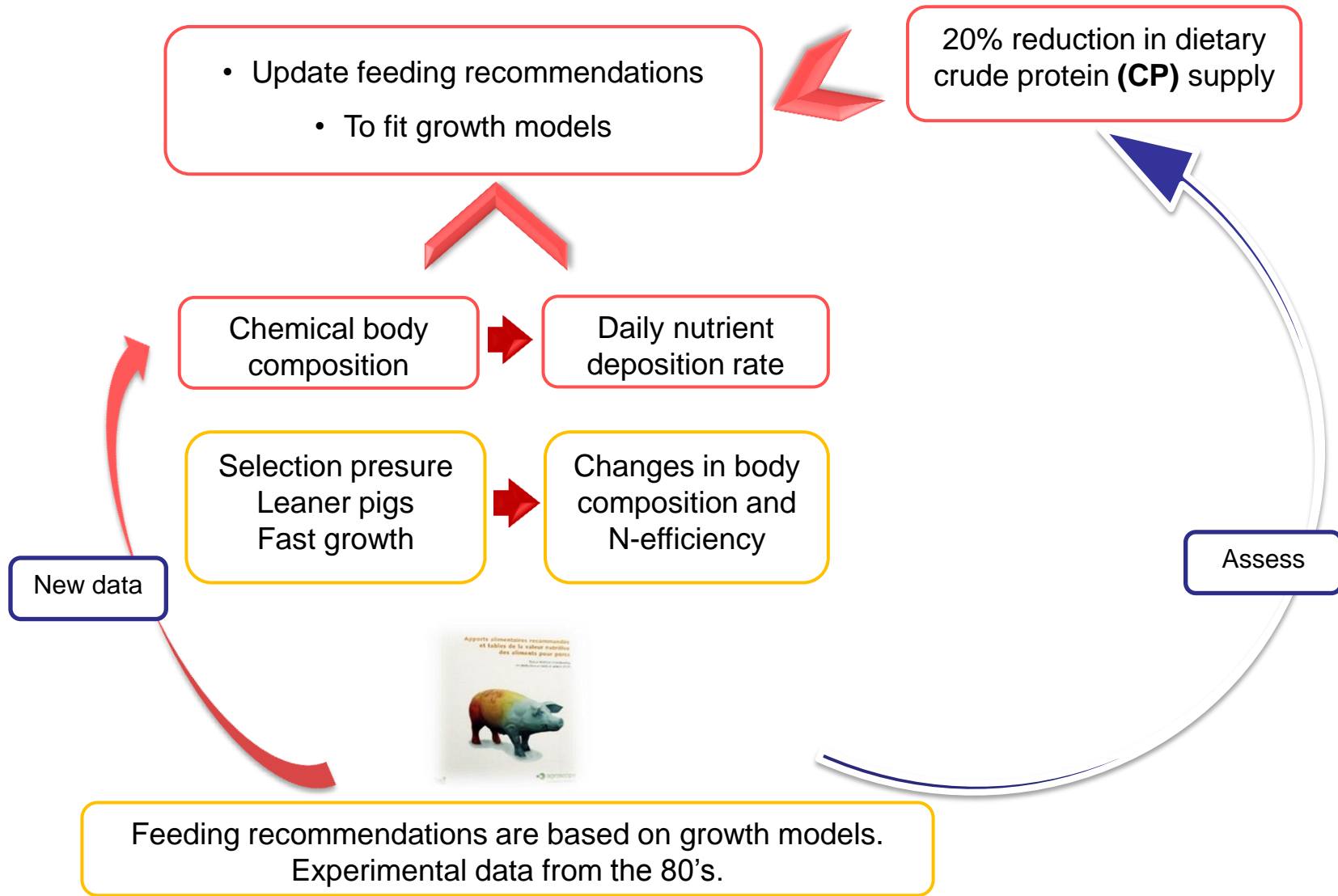
Are the recommendations for dietary protein too high for Swiss Large White pigs?

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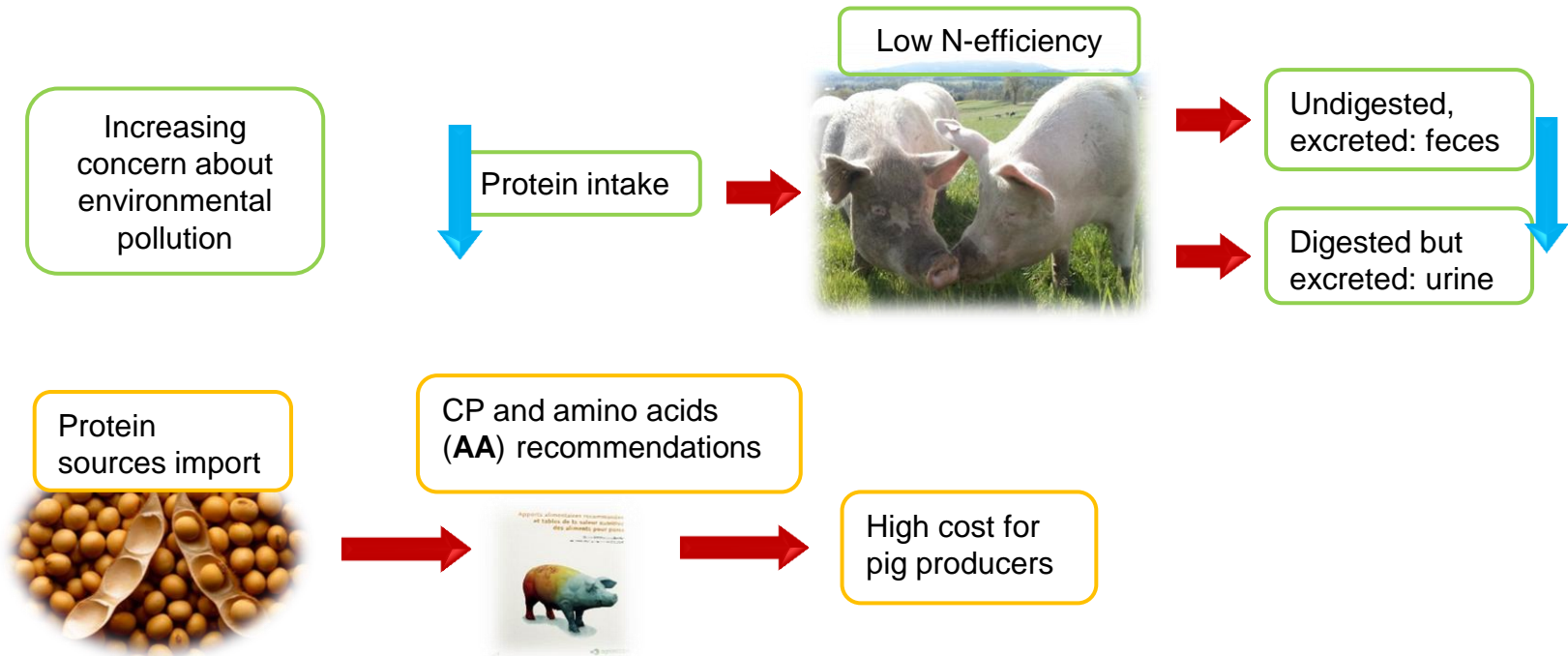
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Introduction



Introduction



Objective: To assess the changes in **performance** and **chemical body deposition rates** in **castrates, entire males** and **female pigs** fed two levels of **dietary crude protein** and **EAA** by using the **serial** slaughter technique.



Material and methods

56 Barrows 56 females and 56 entire males



Diets

Control-diet (C)¹: optimized to cover 100% of the CP and AA requirements based on the current Swiss feeding recommendations for swine.

Low-protein-diet (LP)²: optimized to contain 80% CP and Lysine, Methionine + Cysteine, Threonine and Tryptophan based on the current Swiss feeding recommendations for swine.

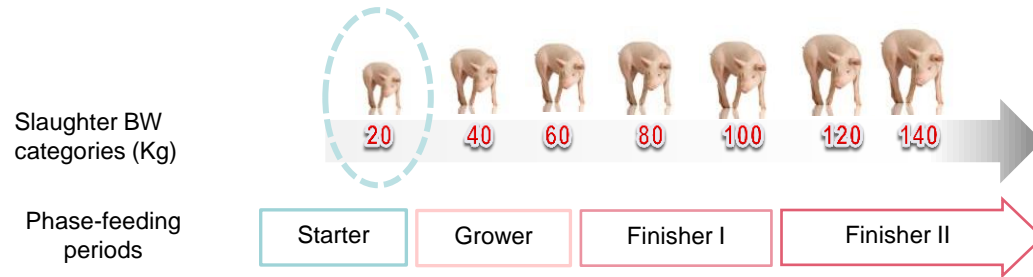
Dietary treatments	Grower diet		Finisher diet I		Finisher diet II	
	C	LP	C	LP	C	LP
Dry matter	88.59	88.12	88.41	88.5	87.46	
Ash	4.38	4.07	4.03	3.8	3.36	
Fat	2.78	2.73	2.7	2.54	2.95	
Gross energy	16.3	16	16.3	16.1	16.1	
CP	16.34	13.38	13.81	11.36	12.56	
Lysine	0.96	0.76	0.77	0.61	0.69	
Methionine	0.32	0.23	0.24	0.18	0.21	
Cysteine	0.29	0.26	0.27	0.23	0.24	0.22
Threonine	0.73	0.57	0.59	0.48	0.51	0.36
Tryptophan	0.23	0.18	0.18	0.15	0.16	0.13

Swiss feeding recommendations add **5%** more of **CP** and **EAA** for entire males compared to castrates and females

Analysed composition (% or MJ/kg as fed basis) of the control and low protein grower, finisher I and finisher II diets for castrates and female pigs



Material and methods



- Pigs were fed *ad libitum*
- Individual feed intake and weekly weight were recorded

Average daily gain (ADG)

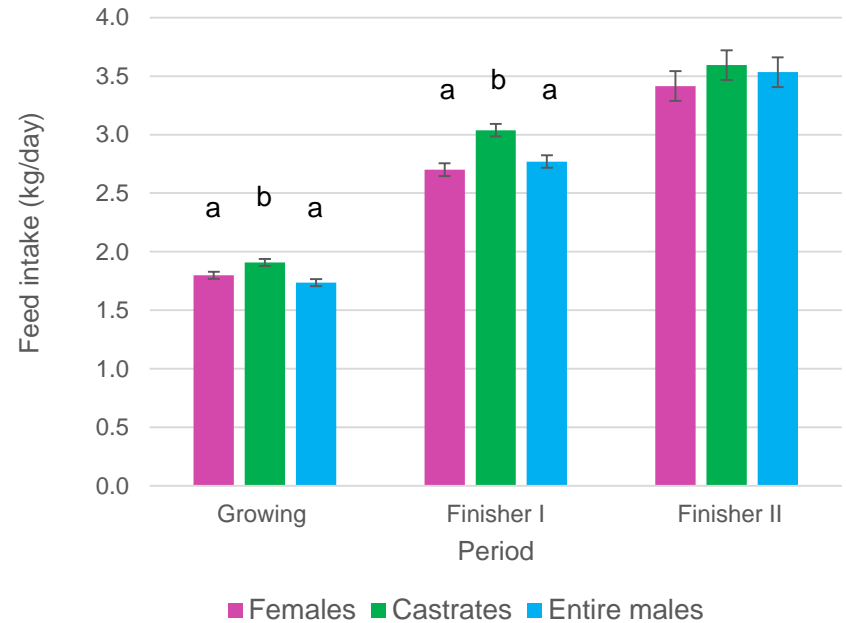
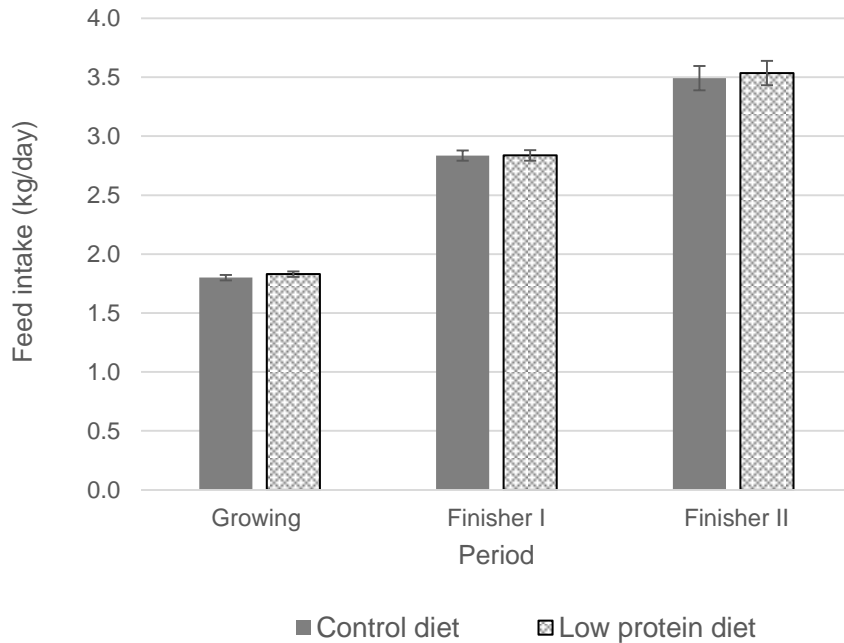
$$\text{Energy efficiency} = \frac{\text{Body weight gain (g)}}{\text{Digestible energy intake (MJ)}}$$

Each pig was divided in 5 fractions:





Feed intake (kg/day)



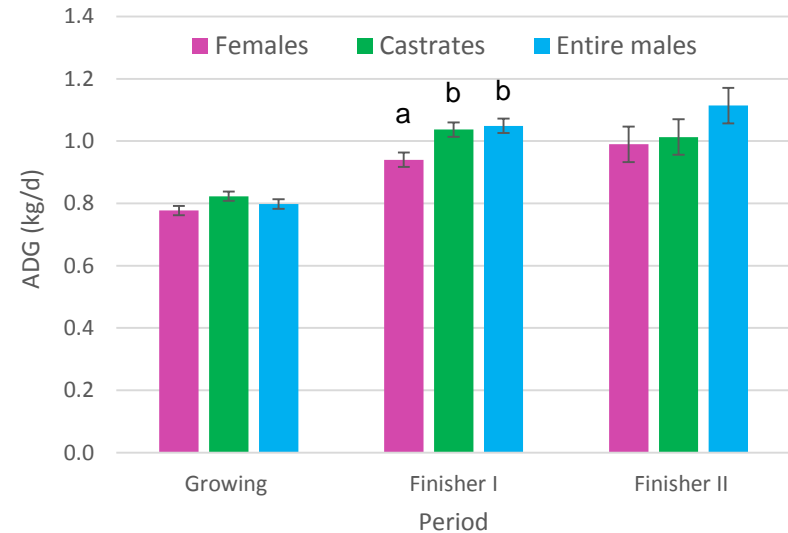
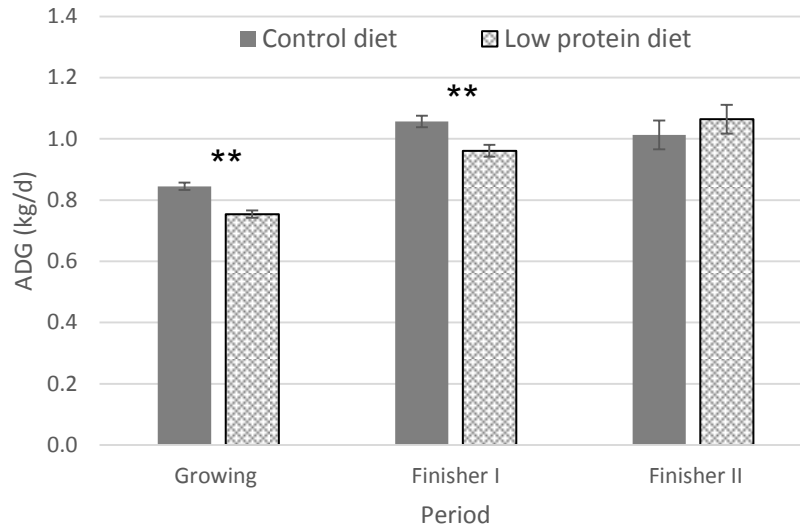
Effect of **dietary protein and EAA supply** and **sex** on feed intake in the grower, finisher I and finisher II period (LSM \pm SE). ^{a,b} LSM without a common superscript differ (P < 0.05).

Diet did not influence the feed intake.

Castrates had the greatest feed intakes.



ADG (g/day)



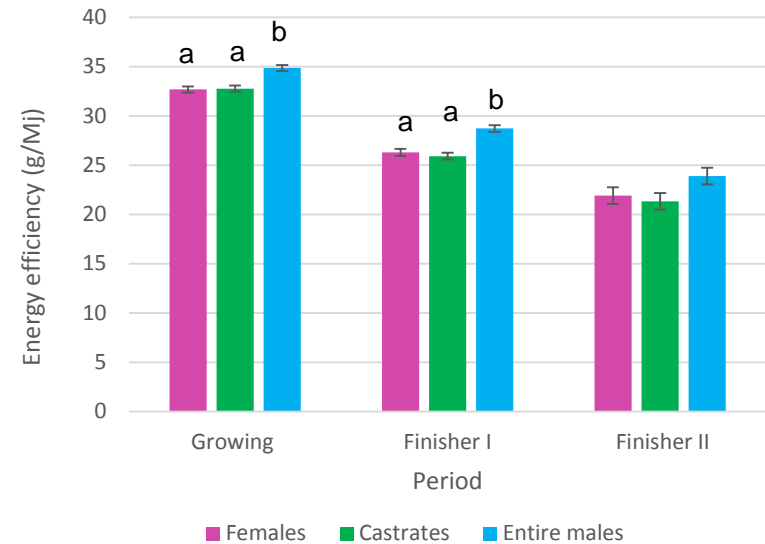
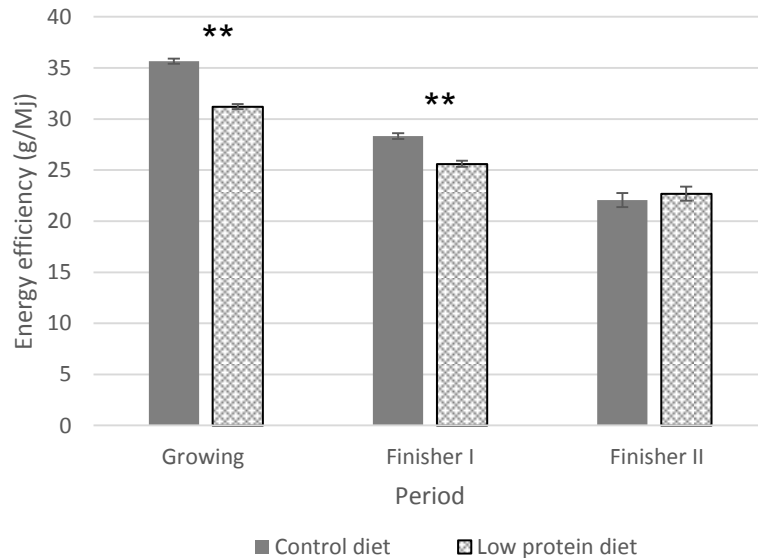
Effect of **dietary protein and EAA supply** and **sex** on average daily gain in the grower, finisher I and finisher II period (LSM \pm SE). * $P < 0.05$ or ** $P < 0.01$ C-diet vs the LP-diet. ^{a,b} LSM without a common superscript differ ($P < 0.05$).

Clear impact of diet on ADG at growing and finisher I.

Females grew slower than entire males and castrates at finisher I.



Energy efficiency (g/MJ)

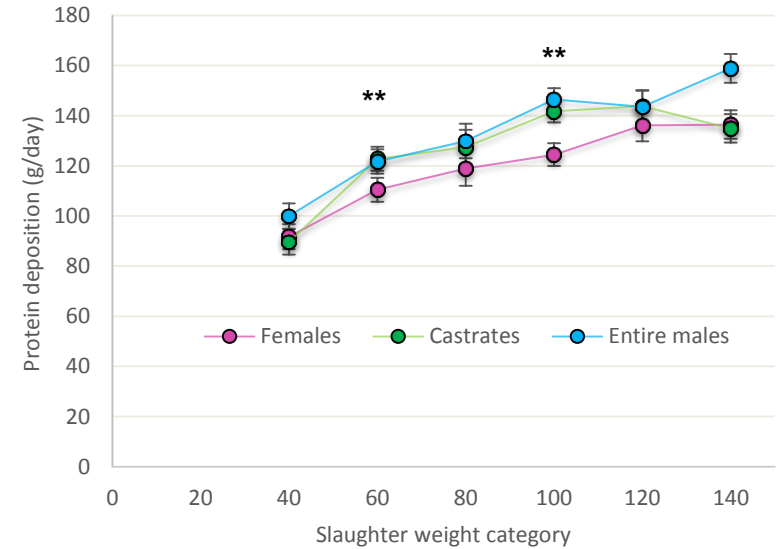
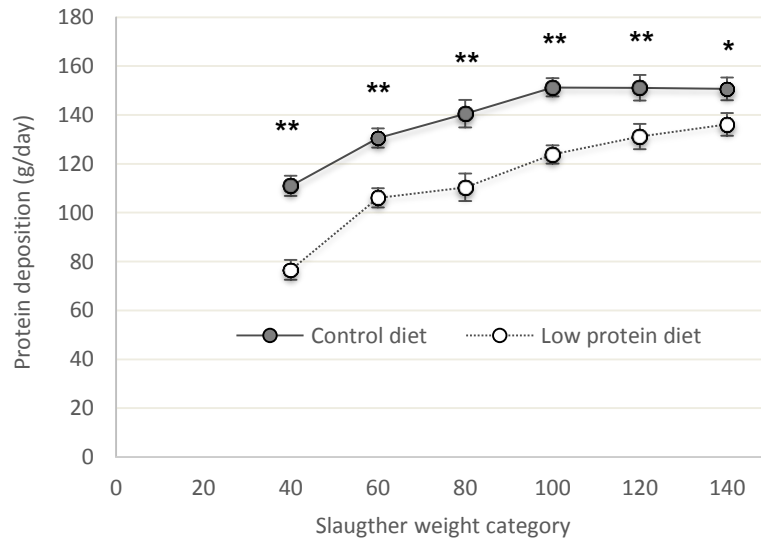


Effect of **dietary protein and EAA supply** and **sex** on energy efficiency in the grower, finisher I and finisher II period (LSM±SE). * $P < 0.05$ or ** $P < 0.01$ C-diet vs the LP-diet. ^{a,b} LSM without a common superscript differ ($P < 0.05$).

C-pigs and entire males displayed the greatest energy efficiencies.



Daily protein deposition

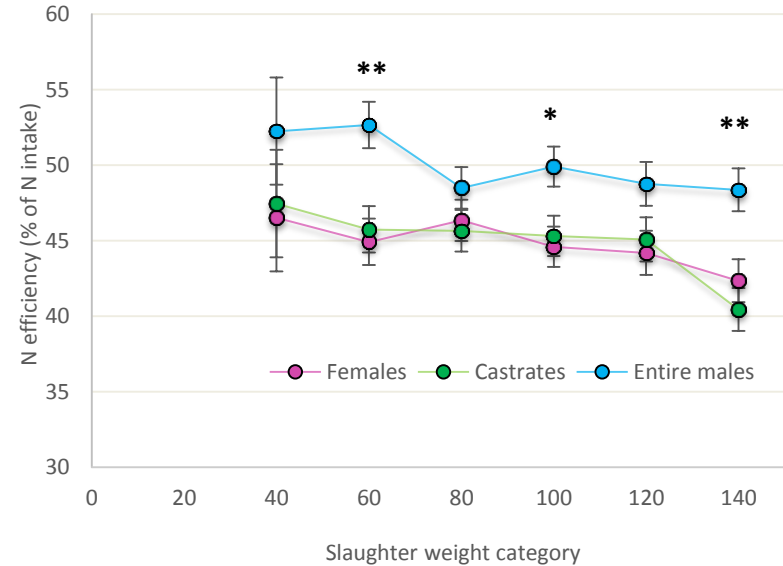
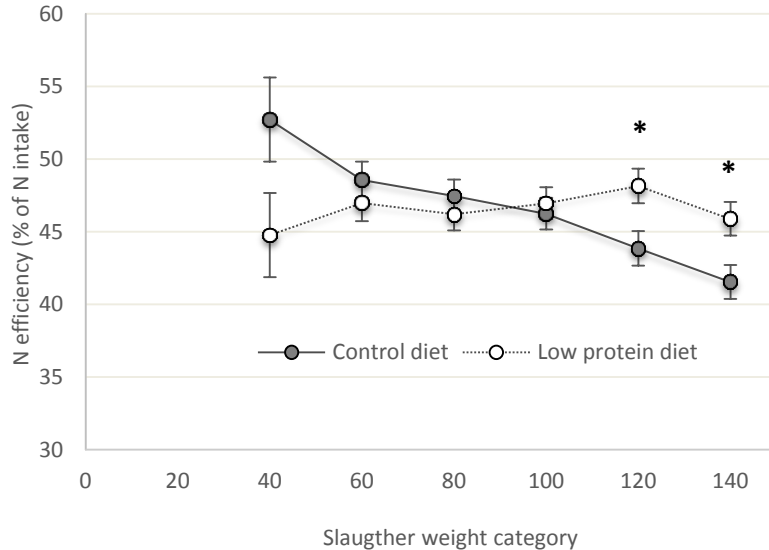


Effect of **dietary protein and EAA supply** and **sex** on daily protein deposition rate determined at the different slaughter body weights (LSM±SE). * $P < 0.05$ or ** $P < 0.01$ vs the control diet.

Daily protein deposition was reduced up to 31% by the LP-diet (40 kg). This difference decreased to 10% at 140 kg.
Daily protein accretion was numerically the lowest in female pigs.



N-efficiency



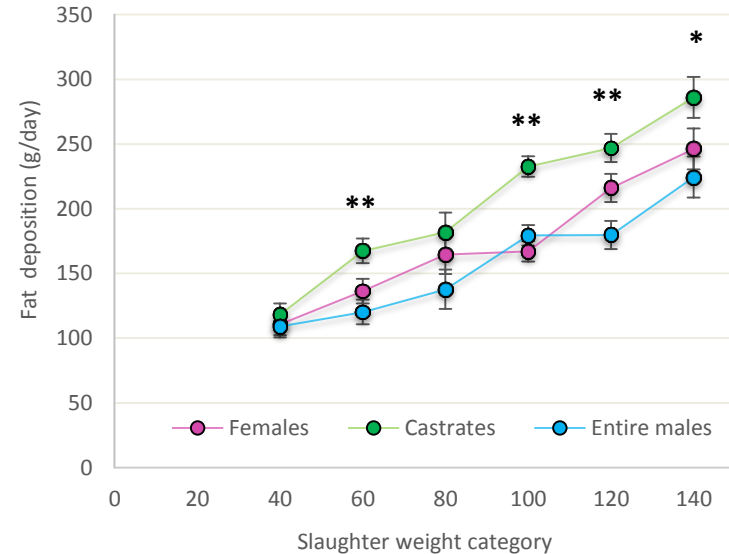
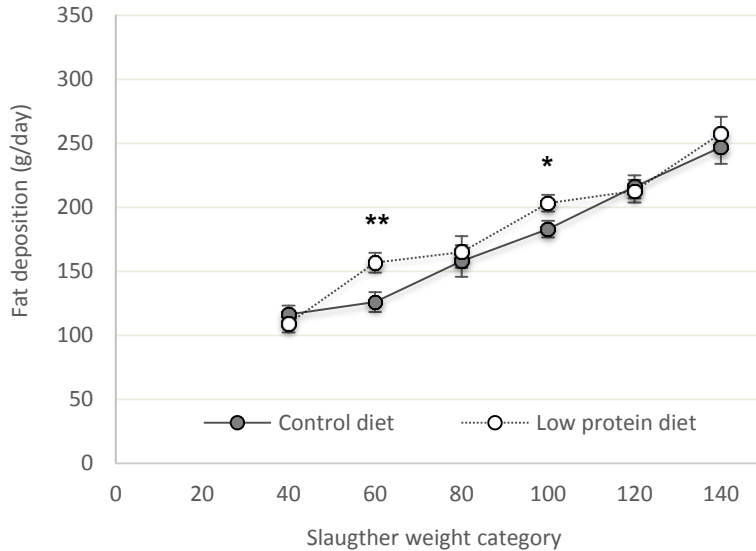
Effect of **dietary protein and EAA supply** and **sex** on daily N-efficiency determined at the different slaughter body weights (LSM±SE). * P < 0.05 or ** P < 0.01 vs the control diet.

LP-pigs had greater N-efficiency at 120 and 140 than C-pigs.

Entire males displayed the greatest N-efficiency.



Daily fat deposition



Effect of **dietary protein and EAA supply** and **sex** on daily fat deposition rate determined at the different slaughter body weights (LSM \pm SE). * $P < 0.05$ or ** $P < 0.01$ vs the control diet.

Fat deposition was affected at 60 and 100 by LP-diet.

Castrates had the greatest daily fat deposition.



Conclusions I

The reduction of protein supply had a negative impact on protein accretion.

Entire males were the most efficient using the dietary energy and protein.

Regardless of dietary treatment, feed intake and daily fat deposition rate were the greatest in castrates.

A reduction of 20% dietary CP and EAA is possible without any major impact in any of the parameters in the finisher II period.

Chemical analyses revealed Ile level in LP-diets was under 70%. This implies a dietary EAA imbalance.



Conclusions II

Difficult to say whether the impact during the growing and finisher I phases is due to restriction of dietary CP or the EAA imbalance.

The impact of a less severe dietary CP restriction (85%), with a balanced AA profile on the growth performance and the body chemical composition of Large White pigs is currently under study for females and castrates.



Thank you for your attention



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