



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



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Effect of soybean reduction and crude protein restriction on the performance of fattening pigs

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Introduction



Nutritional strategies to enhance the sustainability of pig diets.

Reducing the protein content in the diet by balancing it with synthetic amino acids

Replacing soybean meal with more sustainable raw materials





Aim of the trial

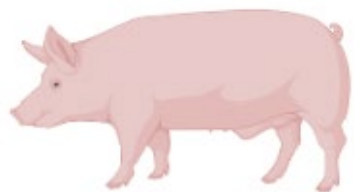
- Testing diets based on the partial replacement of soybean meal (SBM) with local (national and/or EU) protein sources for use in the finishing phase of heavy pigs, in compliance with the PDO regulations for Parma ham, to evaluate their effects on growth performance and the organoleptic and technological quality of the meat.



Dietary treatment:

1920 pigs

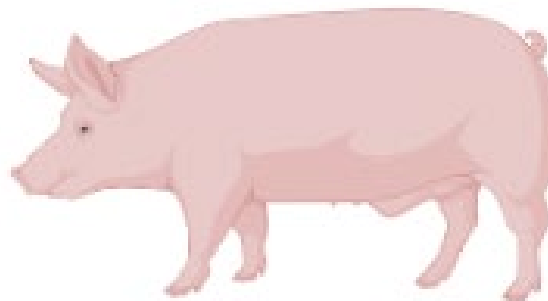
Phase 1:
Day 0-28



CO	TRT
CP 13.9%	CP 13.7%

↓ 31% SBM

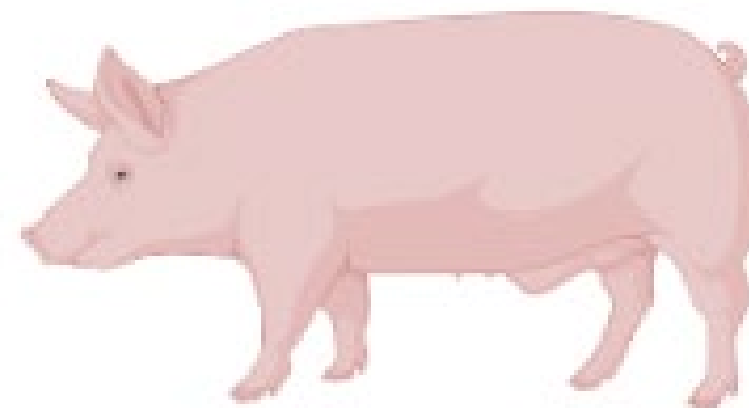
Phase 2:
Day 29-94



CO	TRT
CP 13.1%	CP 13.2%

↓ 68% SBM

Phase 3:
Day 95-184

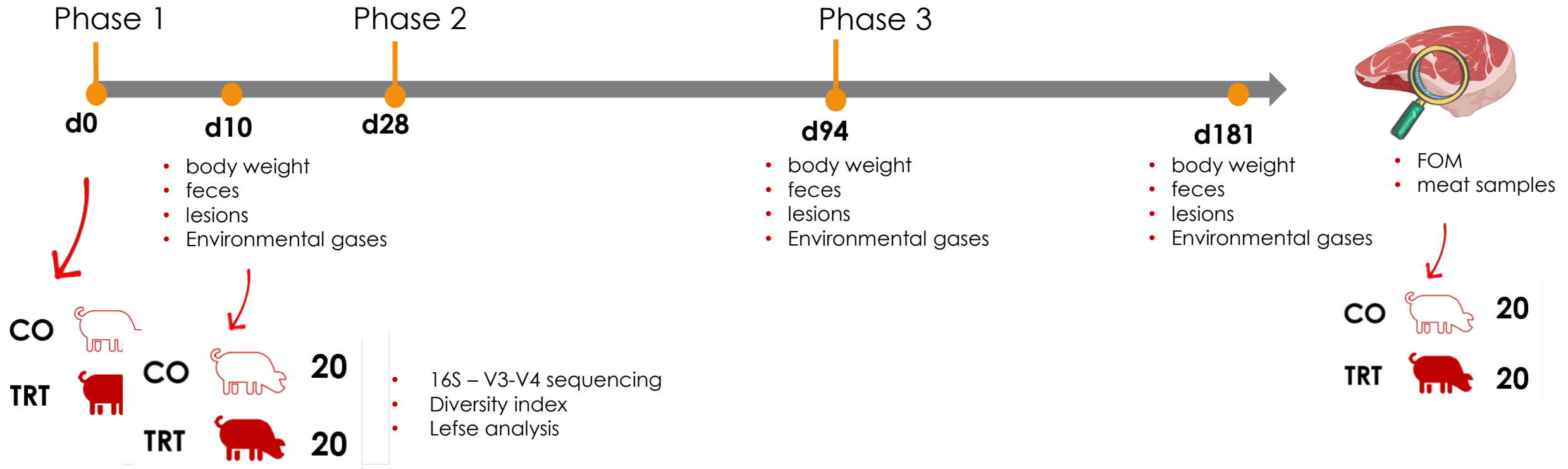


CO	TRT
CP 12.5%	CP 11.3%

↓ 69% SBM
↓ 10% CP

TRT = ↓ SBM ↑ sunflower
pea

Experimental design



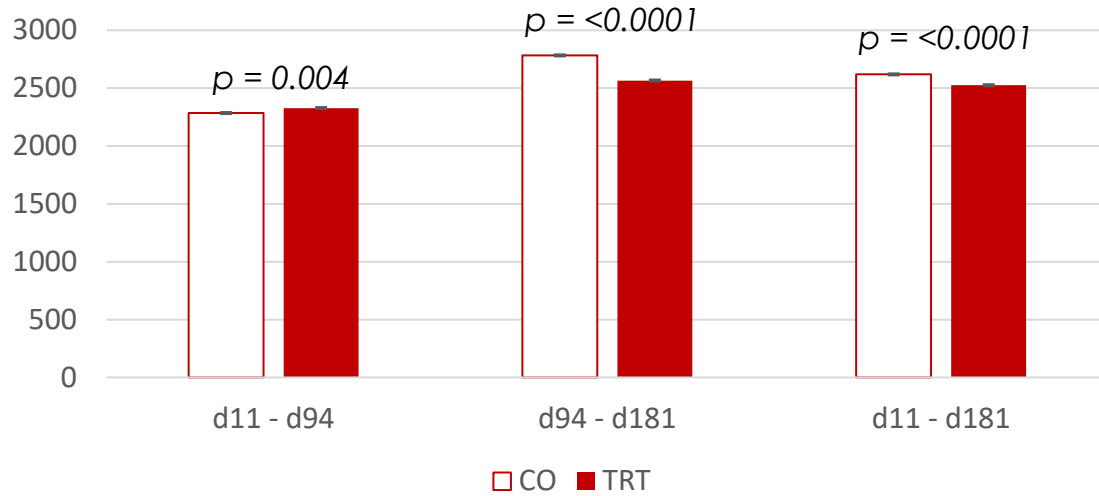
- During the trial, behavioural, injury and environmental gas measurements were repeated monthly.



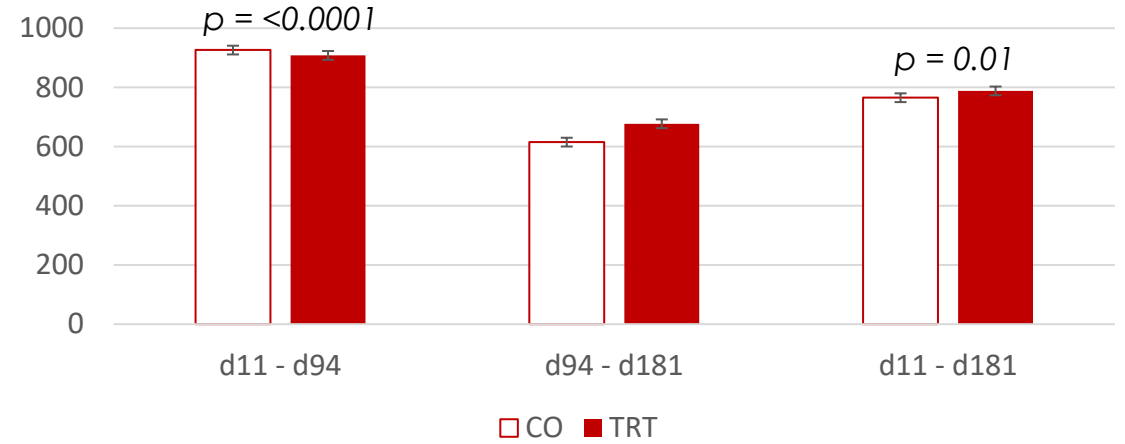
Results - performance

- The weight of the animals showed no significant differences between CO and TRT in any of the surveys.

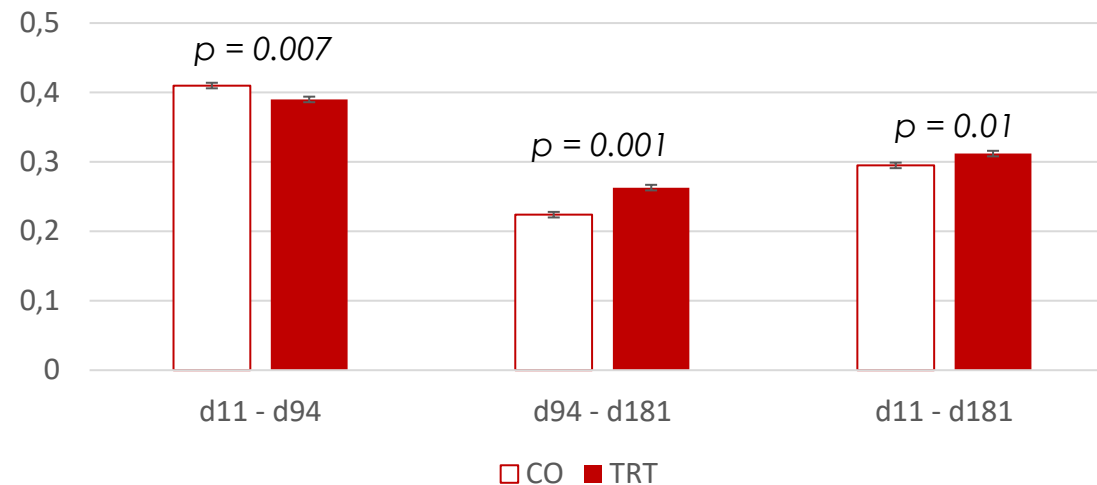
Feed Intake (g/day)



Average Daily Gain



Gain to Feed

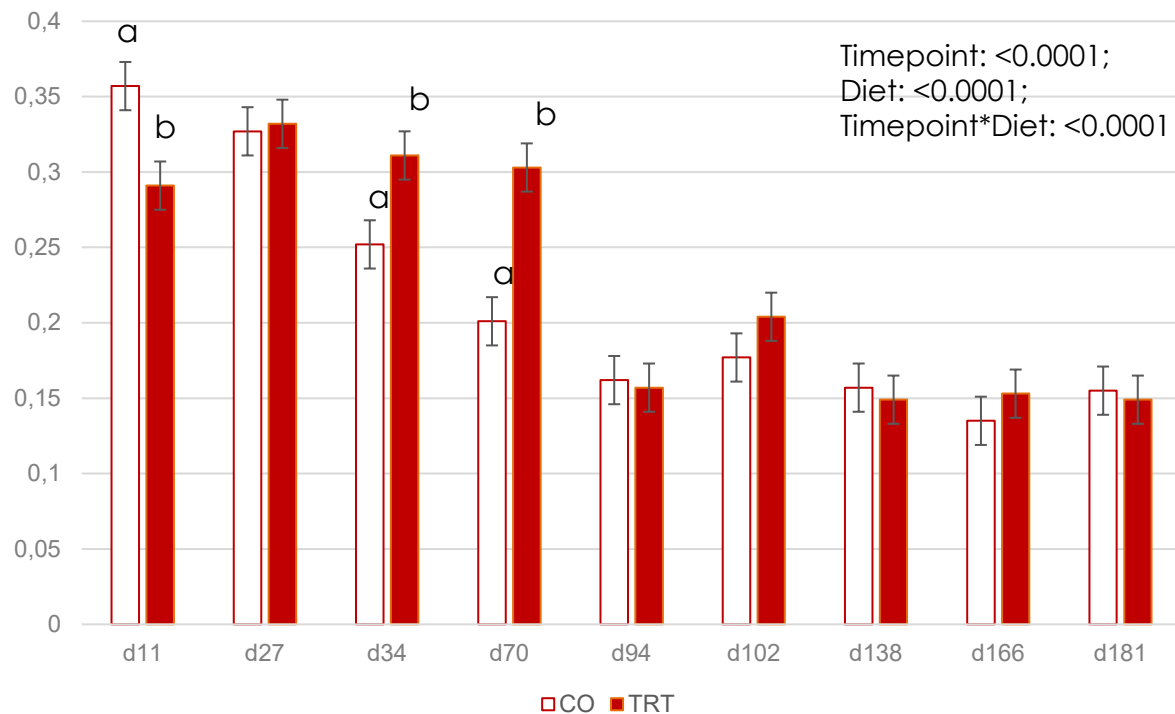


Results – Fecal NH₃

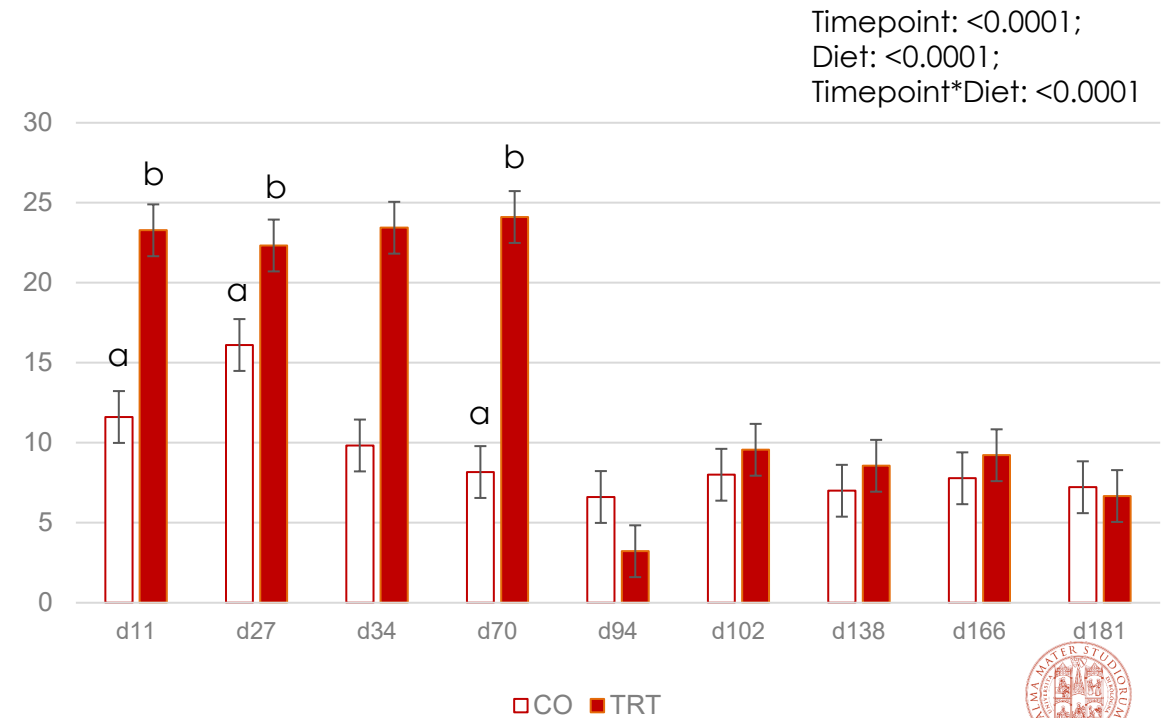
- The use of alternative protein sources did not adversely affect the digestibility or utilisation of the administered protein.

Results – Environmental gases concentration

CO₂ concentration



NH₃ concentration



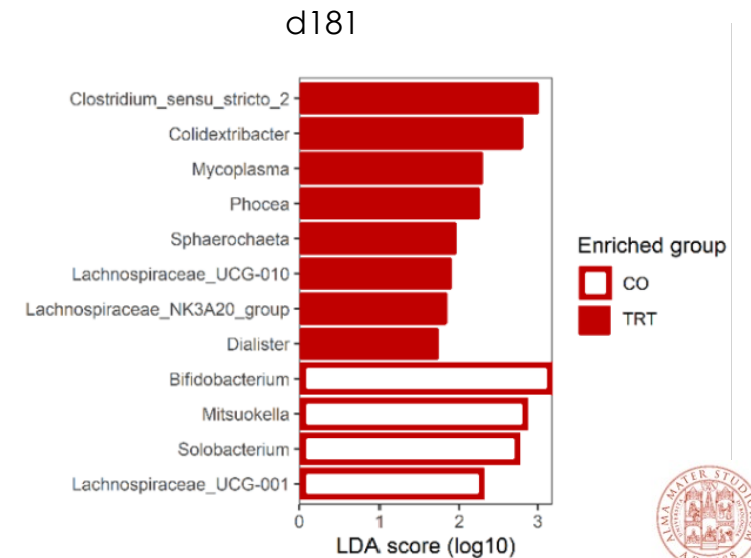
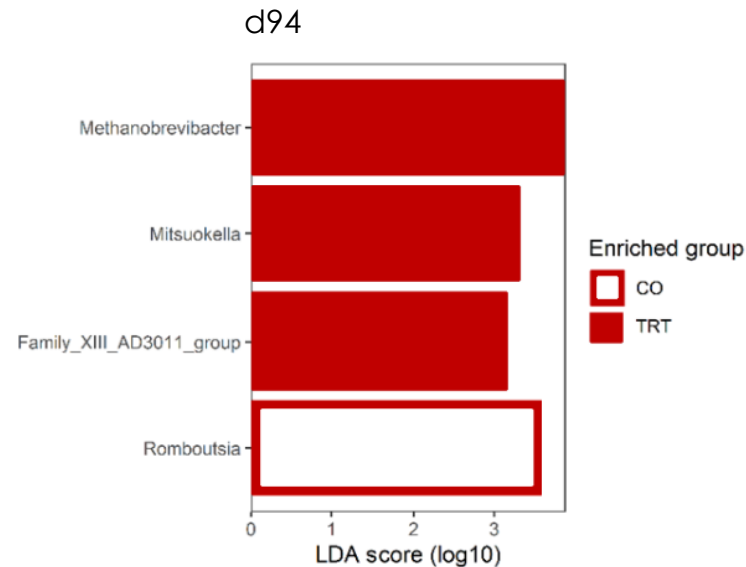
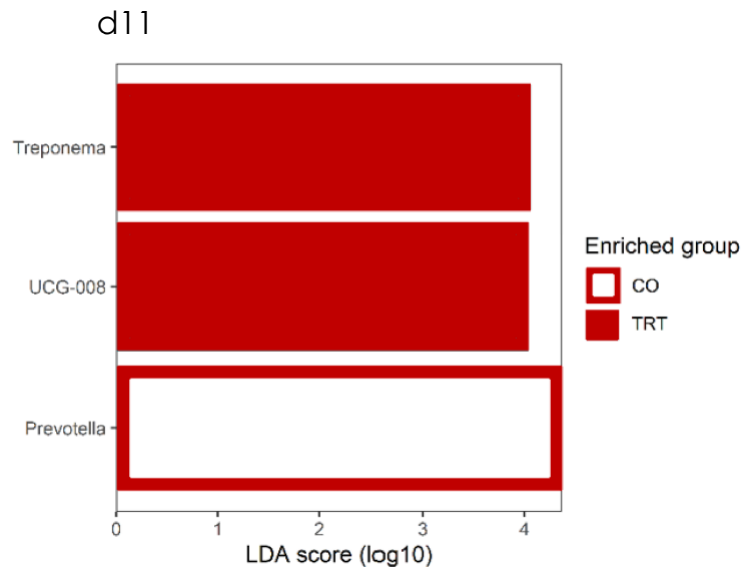
Results – Welfare parameters

Lesions

Behaviour

Results – Gut microbiota

- Changes in diet are one of the first factors influencing the gut microbiota of pigs.
- The effect of diet on microbiota composition was not marked.



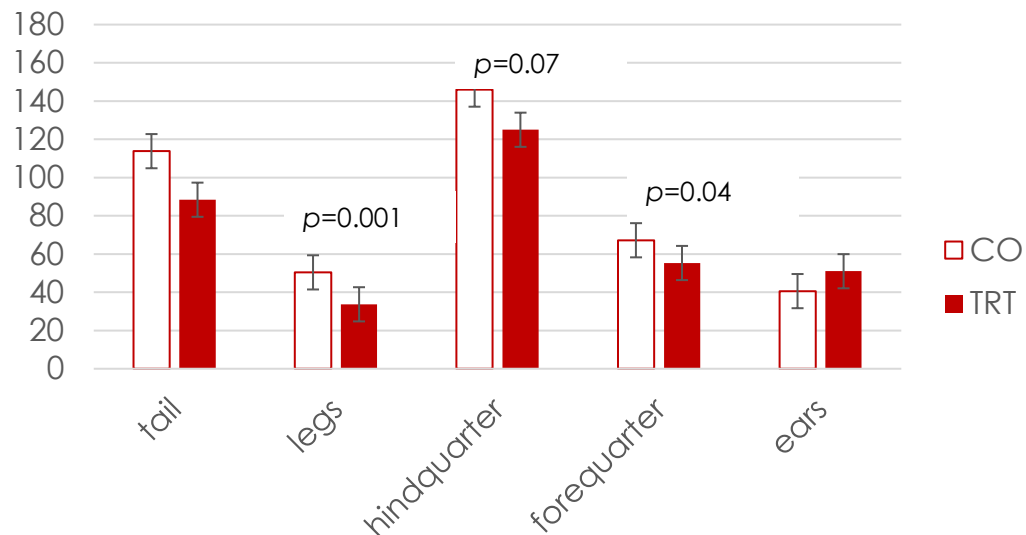
Results – Carcass composition

Parameter	Diet		SEM	P-value
	CO	TRT		Diet
Carcass weight	138	137	1.34	0.72
% lean meat	50.6	49.9	0.34	0.13
Fat mm	33.5	34.8	0.76	0.24
Muscle mm	65	65.9	0.38	0.12
% PDO	96.1	97.6	0.85	0.23

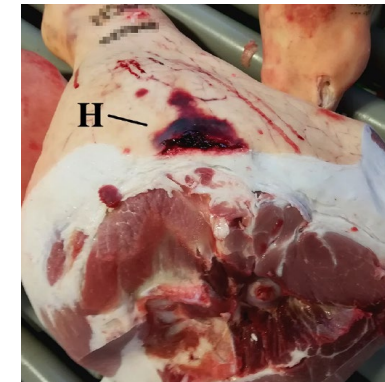
Fatty acids in
Longissimus
lomborum

- In agreement with the literature, our results show no significant difference between carcasses in the CO group and those in the TRT group.
(Carvalho Carellos et al. 2005; Mordenti et al. 2011)

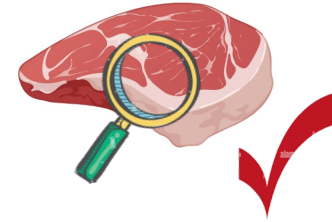
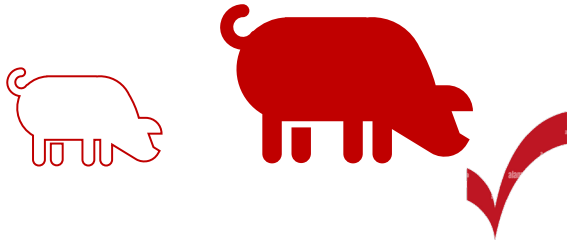
Carcass lesions



- Hams discarded for defects were significantly higher ($p=0.05$) in the CO due to the prevalence of haematomas.



Conclusions



- The study demonstrated that it is possible to reduce the SBM and CP improving grow performance without affecting carcass composition and meat technological characteristics.
- Increasing the environmental sustainability by using local protein sources increases the cost of the feed by 2.25%.
- The increase in the cost can be managed with the reduction of discarded for defects.



- There is a need to continue testing alternative raw materials to make the pig supply chain more sustainable without reducing the quality of the finished products.



Thank you for your attention

Maria Vittoria Graziosi



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