

**Topigs Norsvin**



A close-up photograph of a pig's face, showing its eye, ear, and snout. The pig has light-colored fur with some darker spots. The background is blurred, suggesting an indoor farm setting.

# Animal breeding towards the valuation of new feed

30 August 2021 | Lisanne Verschuren

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# Dutch tractor protest sparks 'worst rush hour'

🕒 1 October 2019



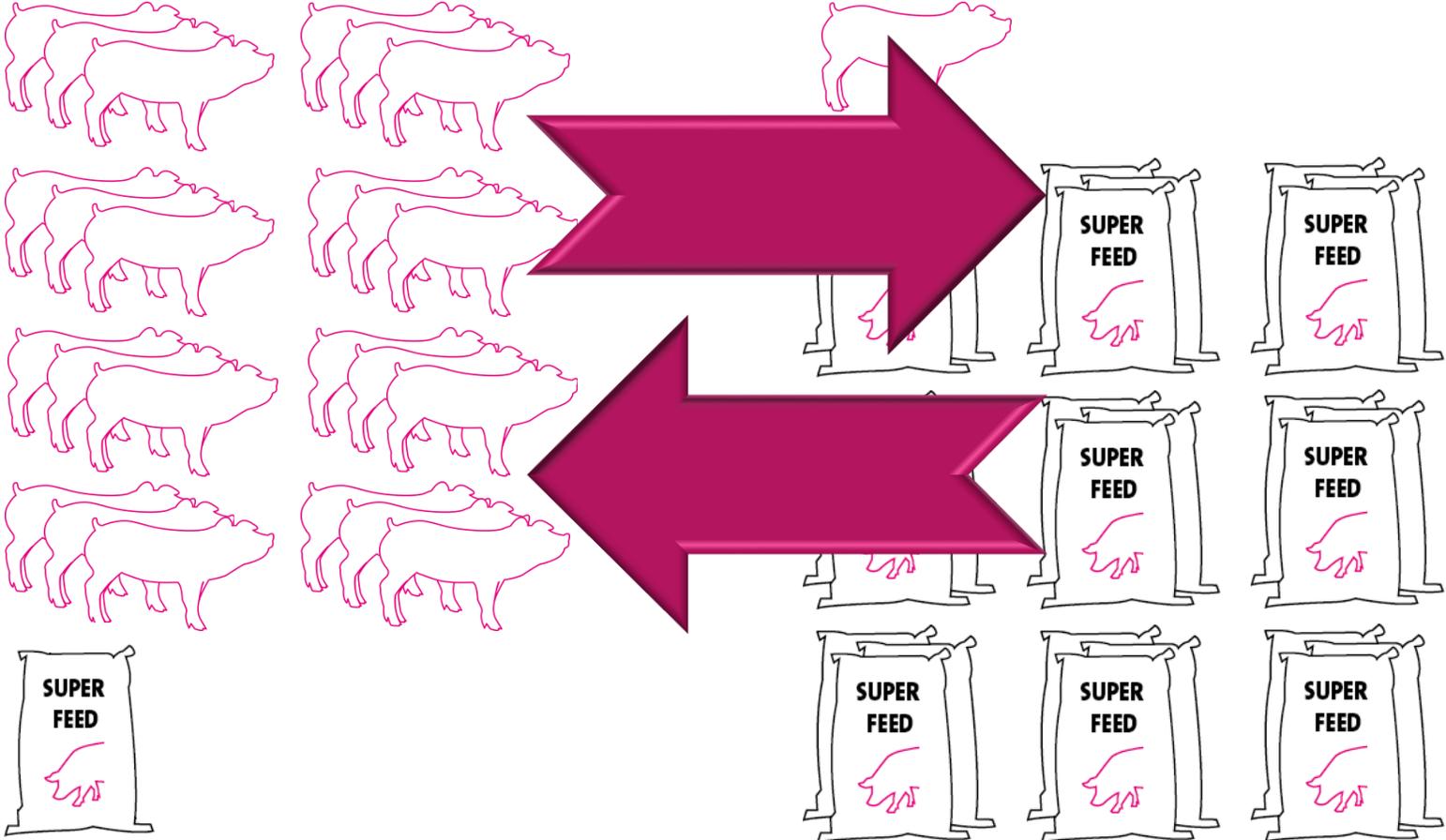
Climate change



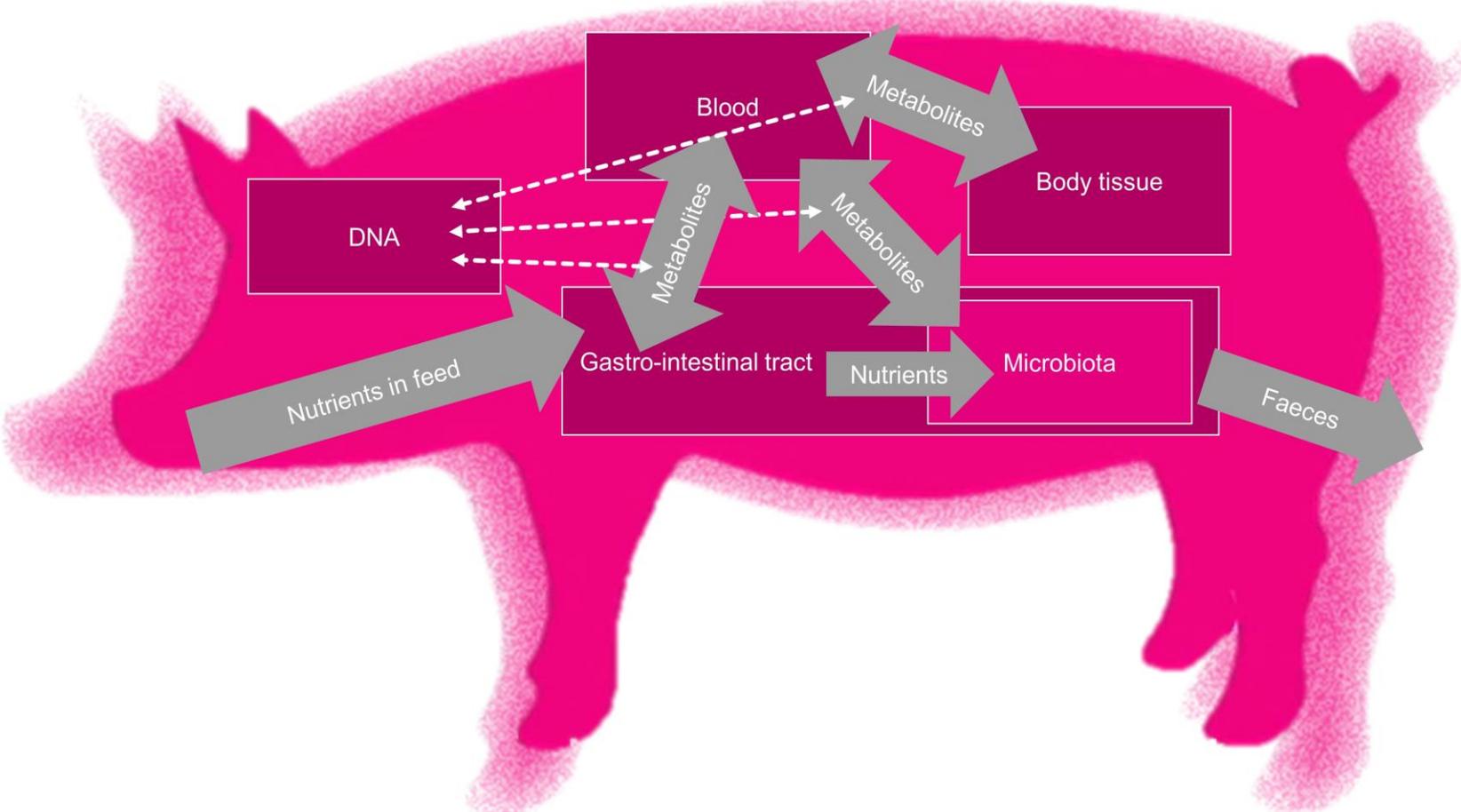
# Genetics and Nutrition

Geneticist

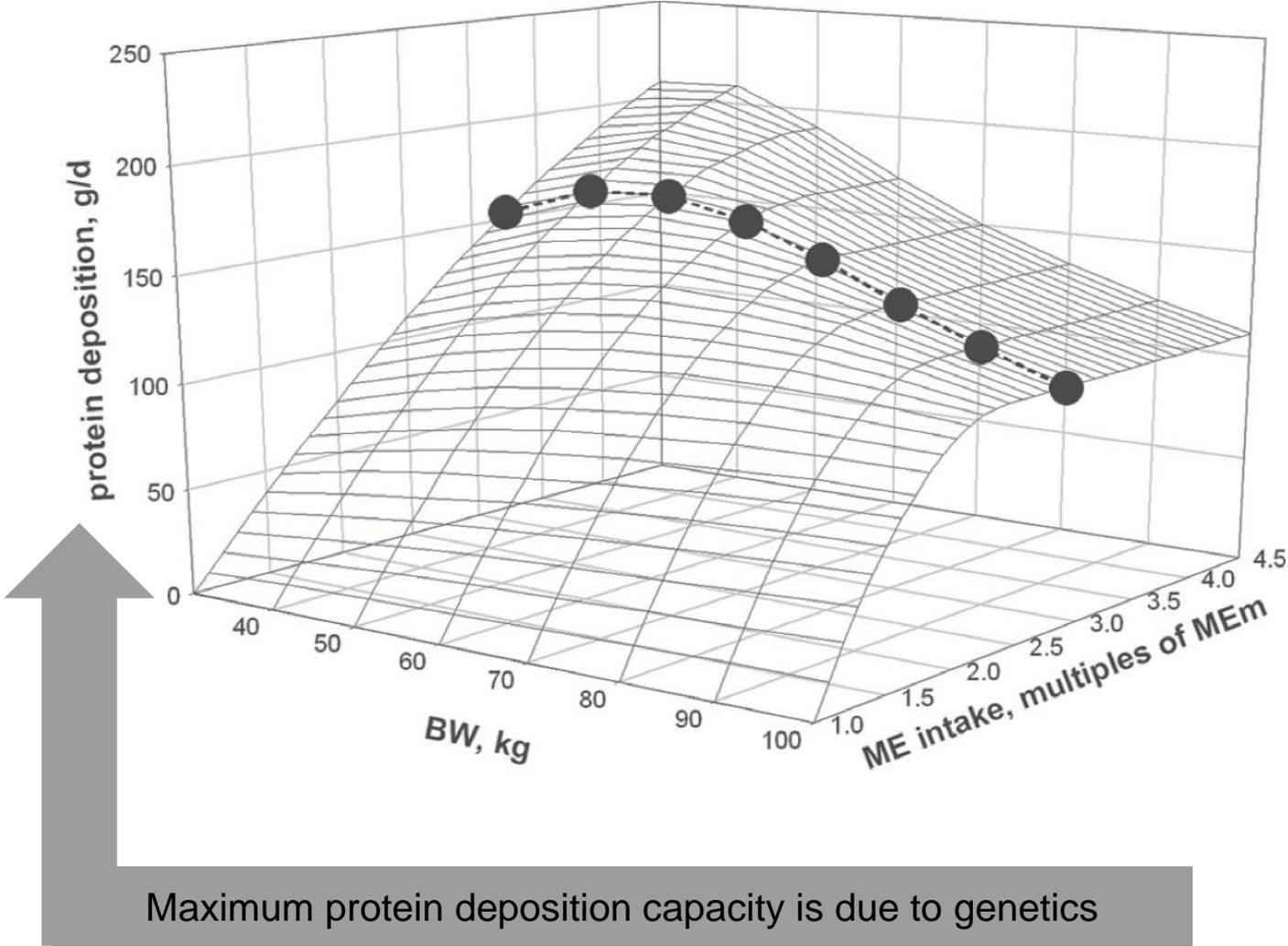
Nutritionist



# Biological processes involved in feed efficiency

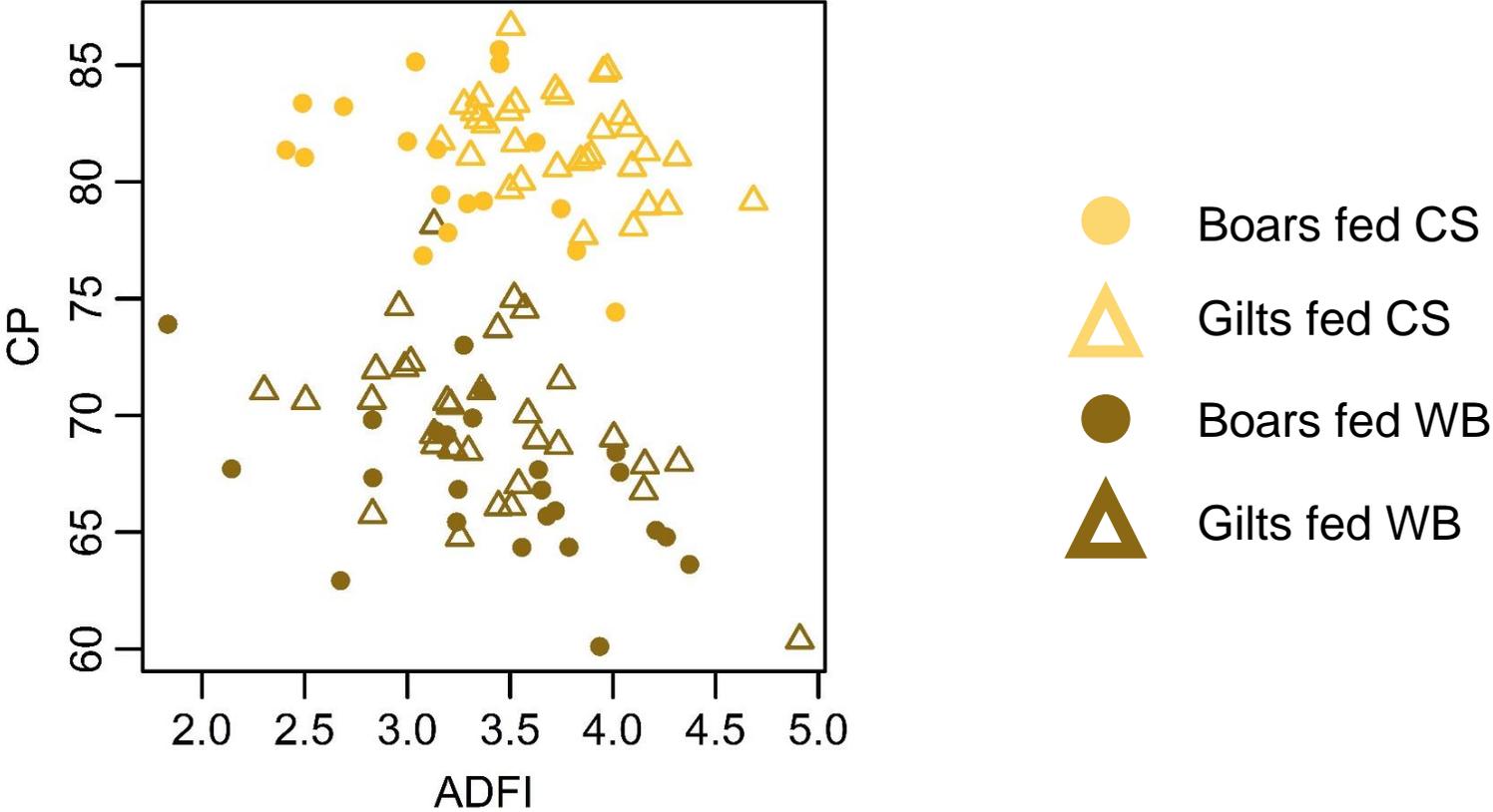


# Energy and protein deposition



van Milgen and Noblet (2003)

# Variation in faecal nutrient digestibility



Verschuren *et al.* (2021)

# Heritability of nutrient digestibility

	<u>CO diet</u>	<u>HF diet</u>	<u>Across diets</u>
	<i>h<sup>2</sup> (SE)</i>	<i>h<sup>2</sup> (SE)</i>	<b>Genetic correlation (SE)</b>
Digestibility coefficients			
Energy, %	0.26 (0.12)	0.54 (0.15)	0.71 (0.20)
Nitrogen, %	0.27 (0.12)	0.56 (0.15)	0.85 (0.21)
Organic matter, %	0.27 (0.12)	0.54 (0.15)	0.76 (0.20)

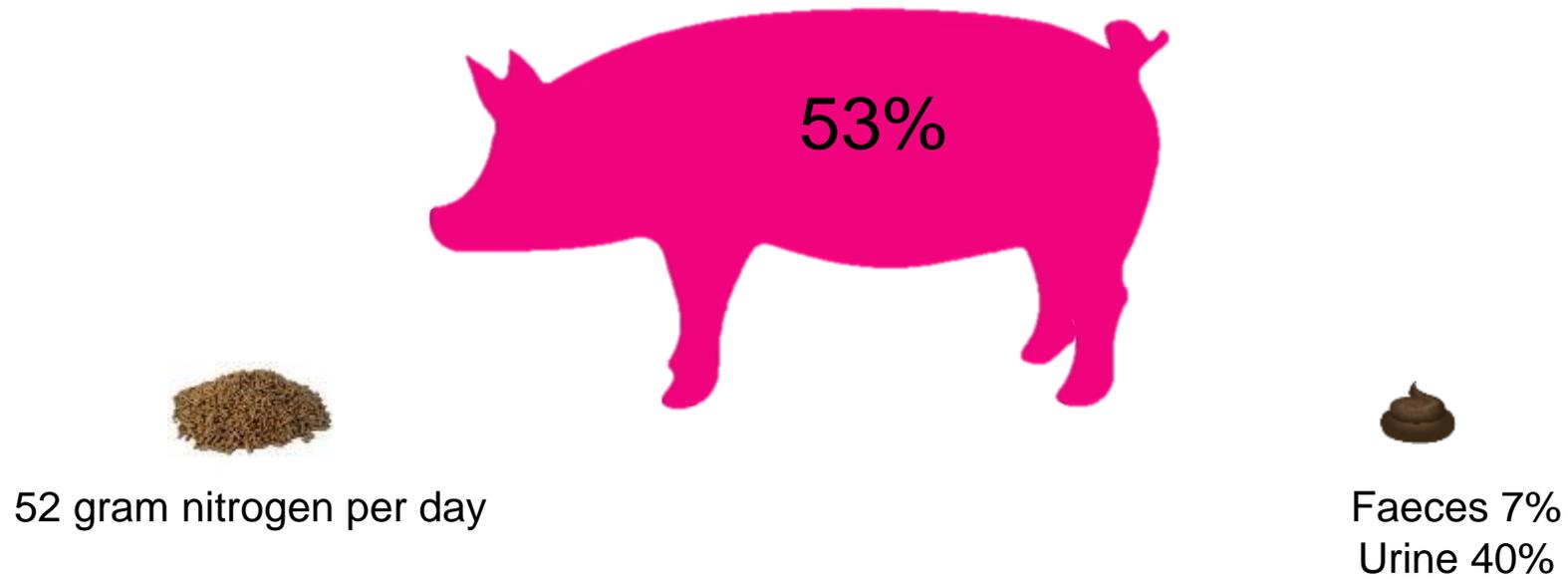
Déru *et al.* (2020)

# Genetic correlation of nutrient digestibility and feed efficiency

	Diets combined		
	Energy	Nitrogen	Organic Matter
Growth traits			
FCR, kg/kg	-0.27 (0.17)	-0.24 (0.10)	-0.23 (0.17)
DFI, kg/day	-0.51 (0.17)	-0.53 (0.13)	-0.45 (0.17)
ADG, g/day	-0.34 (0.17)	-0.15 (0.17)	-0.34 (0.17)
RFI, g/day	-0.66 (0.16)	-0.54 (0.16)	-0.56 (0.16)

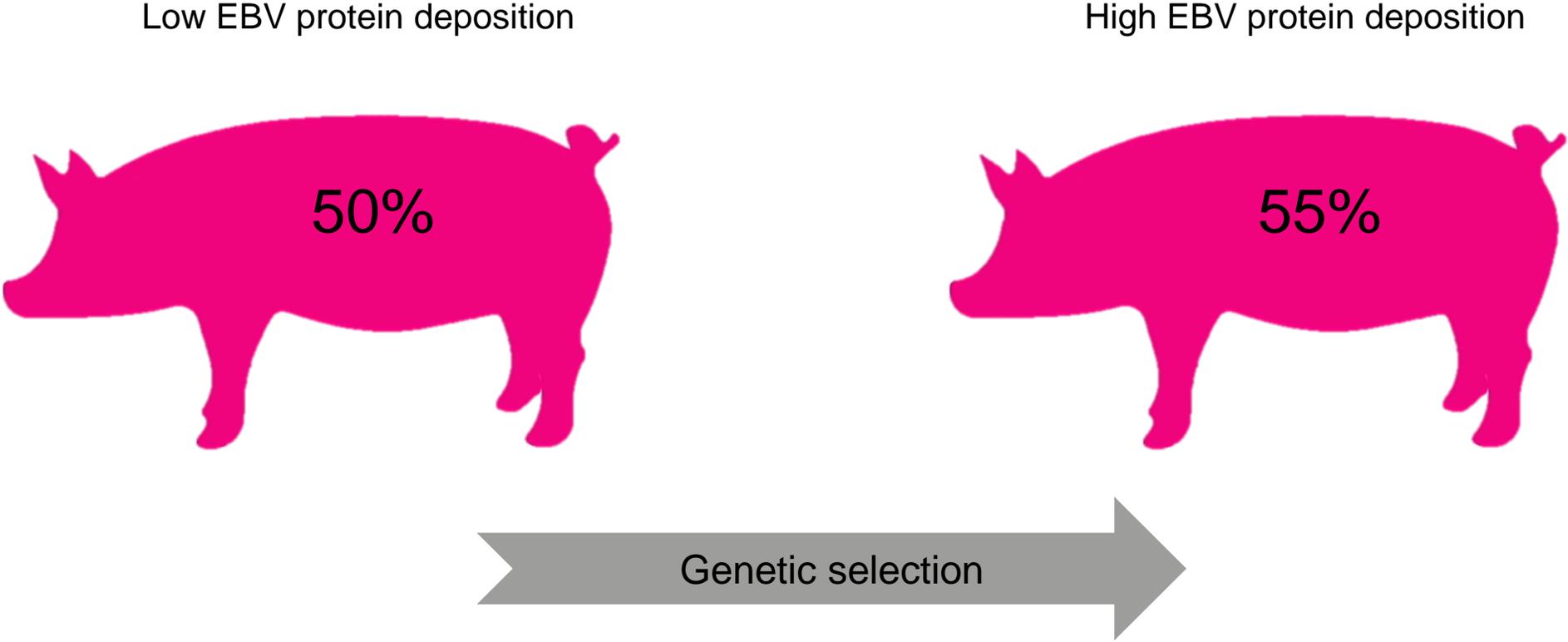
Déru *et al.* (2020)

# Nitrogen efficiency



Van der Peet-Schweering *et al.* (2021)

# Breeding value for protein deposition



Van der Peet-Schweering *et al.* (2021)

# Variation in dietary nitrogen efficiency

Nitrogen efficiency (%)	Overall period			Nitrogen efficiency		
	ADG	FCR	ADFI	Starter	Grower	Finisher
<b>Starter</b>	0.11	-0.47	-0.17	<b>0.22</b>		
<b>Grower</b>	-0.11	-0.68	-0.50	0.92	<b>0.27</b>	
<b>Finisher</b>	-0.43	-0.90	-0.92	0.13	0.47	<b>0.21</b>

# Grouping pigs based on genetic potential

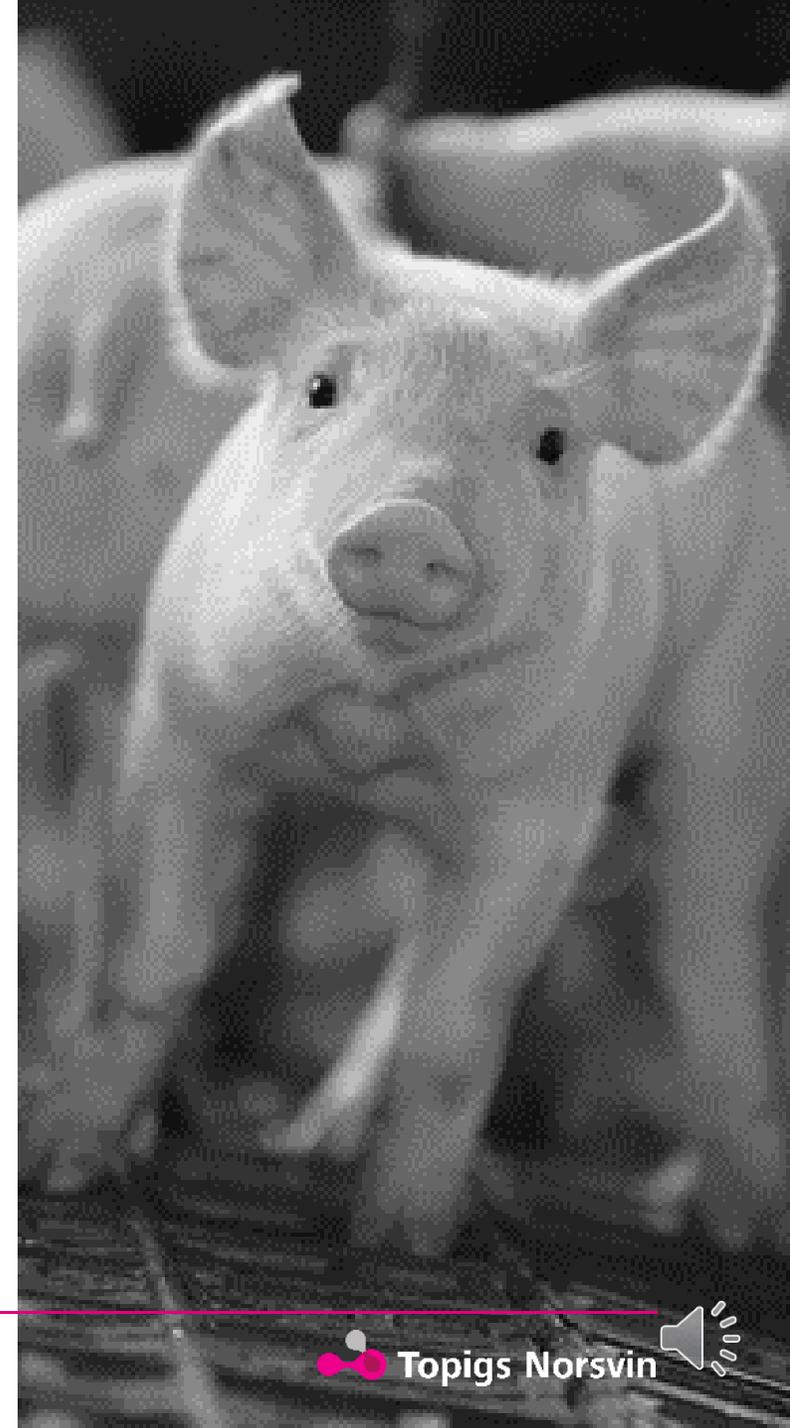
	HH	HH	LL	LL	LL	SEM <sup>1</sup>	P-Value
	Control	Luxurious	Control	Less luxurious	Luxurious		
Revenue	149,22 <sup>a</sup>	148,60 <sup>a</sup>	139,03 <sup>b</sup>	138,42 <sup>b</sup>	137,40 <sup>b</sup>	1,695	<0,001
Costs buying piglets	41,76 <sup>a</sup>	41,85 <sup>a</sup>	36,15 <sup>b</sup>	36,29 <sup>b</sup>	35,66 <sup>b</sup>	0,309	<0,001
Costs feed	66,99 <sup>ab</sup>	68,49 <sup>a</sup>	64,91 <sup>bc</sup>	64,20 <sup>c</sup>	66,32 <sup>abc</sup>	0,782	0,003
Costs pig losses	2,92	2,92	2,92	2,92	2,92		
Other costs	4,20	4,20	4,20	4,20	4,20		
Balance	33,35 <sup>a</sup>	31,14 <sup>ab</sup>	30,85 <sup>ab</sup>	30,81 <sup>ab</sup>	28,30 <sup>b</sup>	1,464	0,13

Van der Peet-Schweering *et al.* (2016)

# Conclusions

Bridging the gap between genetics and nutrition by

- Breeding for improved faecal nutrient digestibility and nitrogen efficiency
- Grouping and feeding pigs based on expected performance
- Predicting grower-finisher performance based on genetics
- Developing feeding strategies to express more genetic variation



# Acknowledgement





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