



# Growth response of pigs to the supply of phenylalanine and tyrosine offered low-protein diets

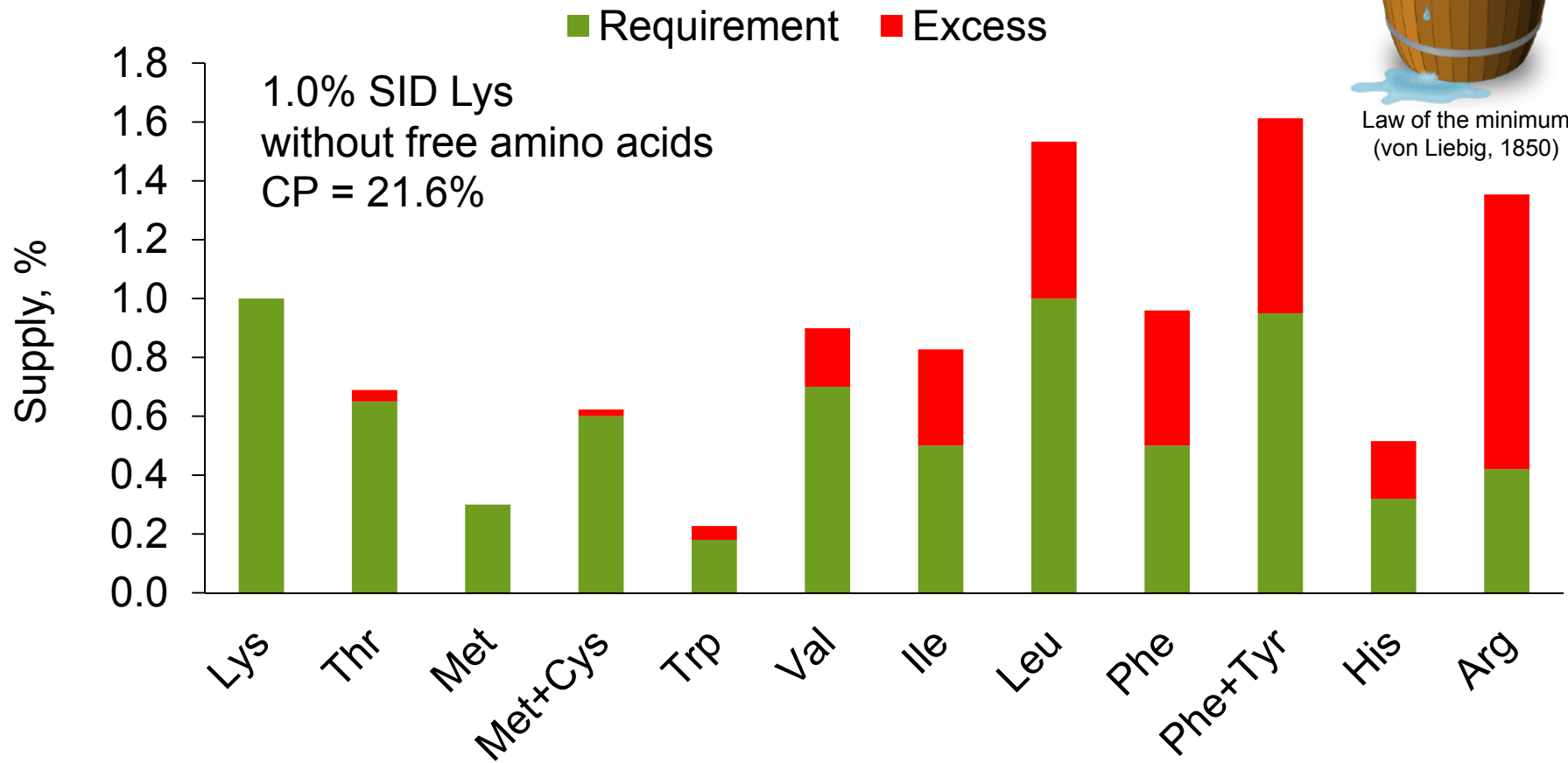
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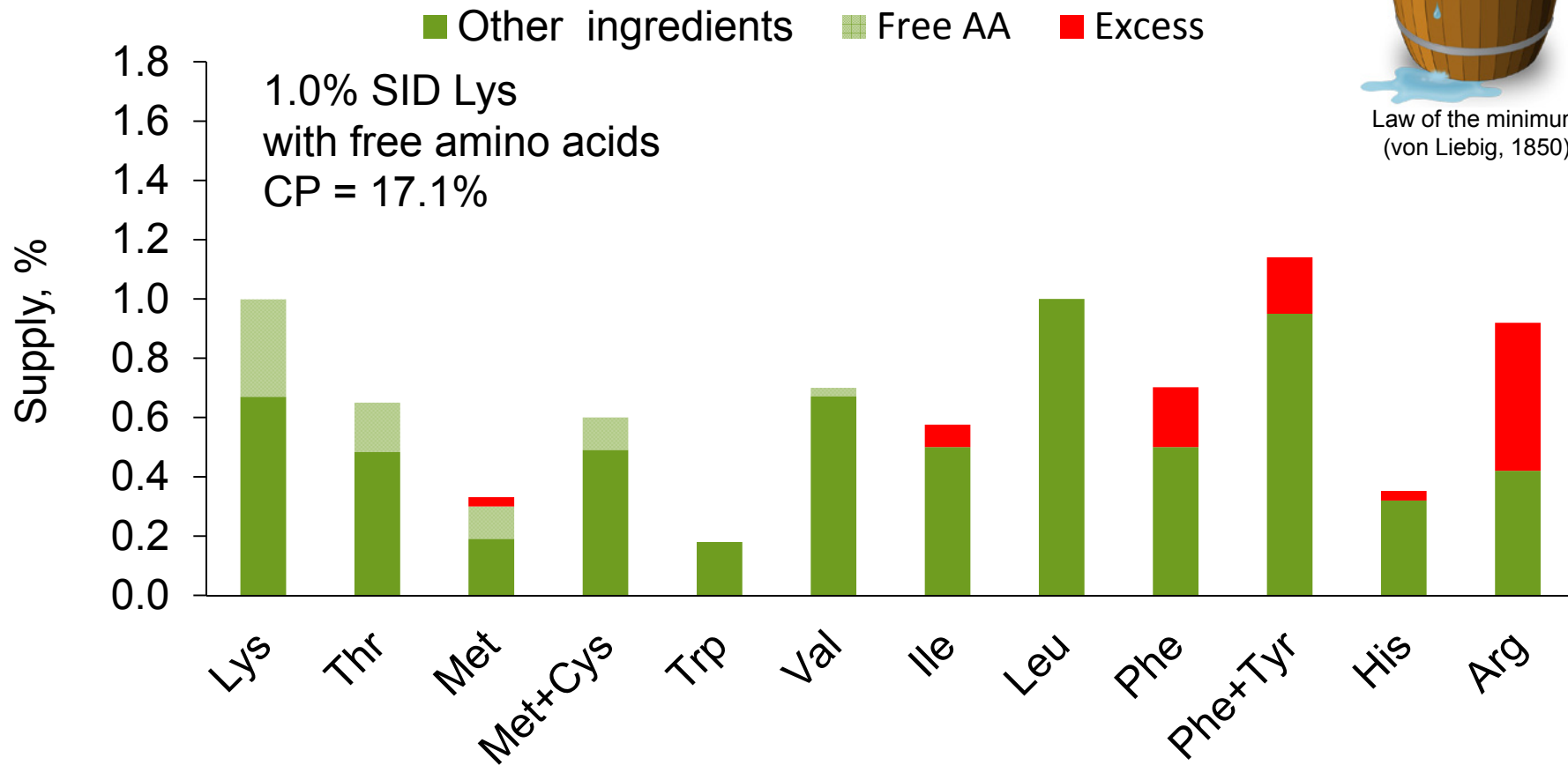
# Using free AA allows improving the AA profile



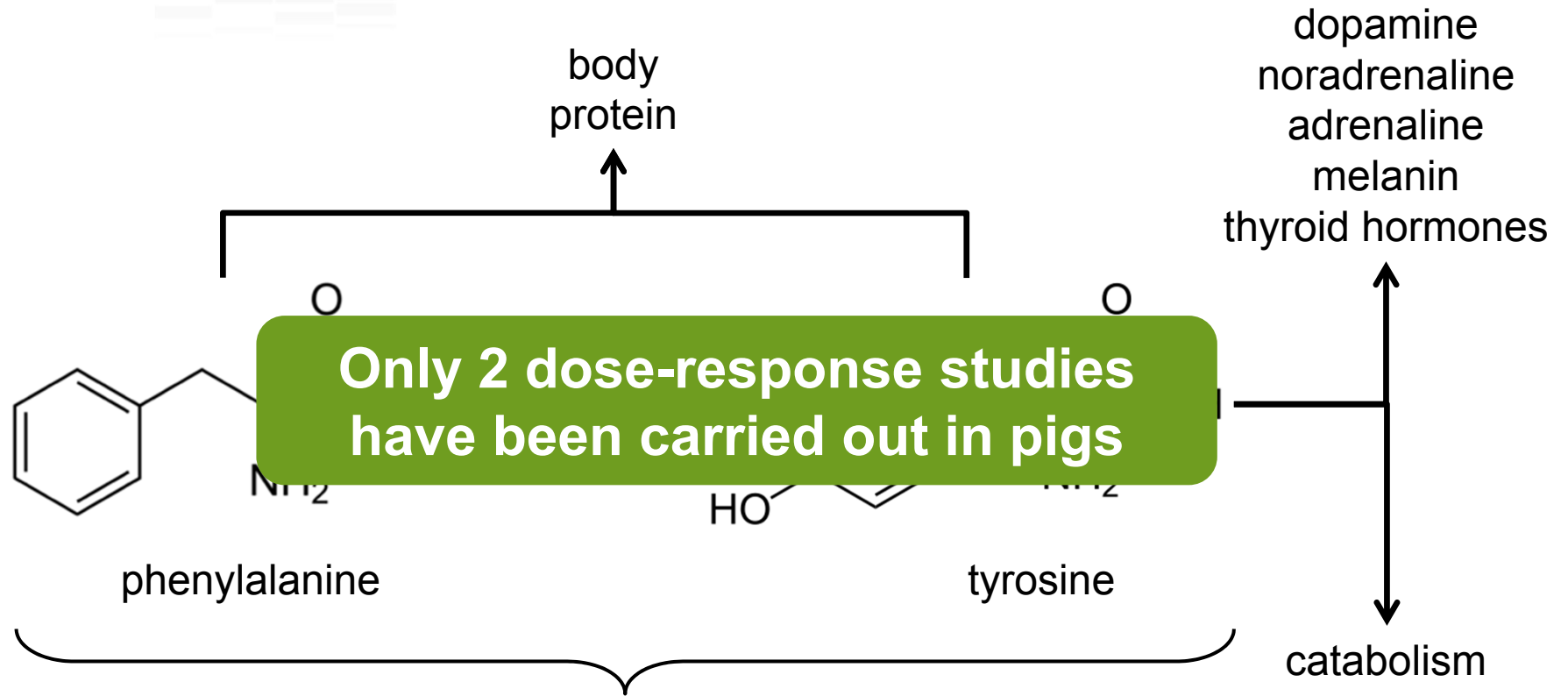
# Using free AA allows improving the AA profile



Law of the minimum  
(von Liebig, 1850)



# Metabolism of Phe and Tyr



60% SID Phe:Lys  
(NRC, 2012)

94% SID (Phe+Tyr):Lys  
(NRC, 2012)

# Experimental design



6 wks  
~11 kg

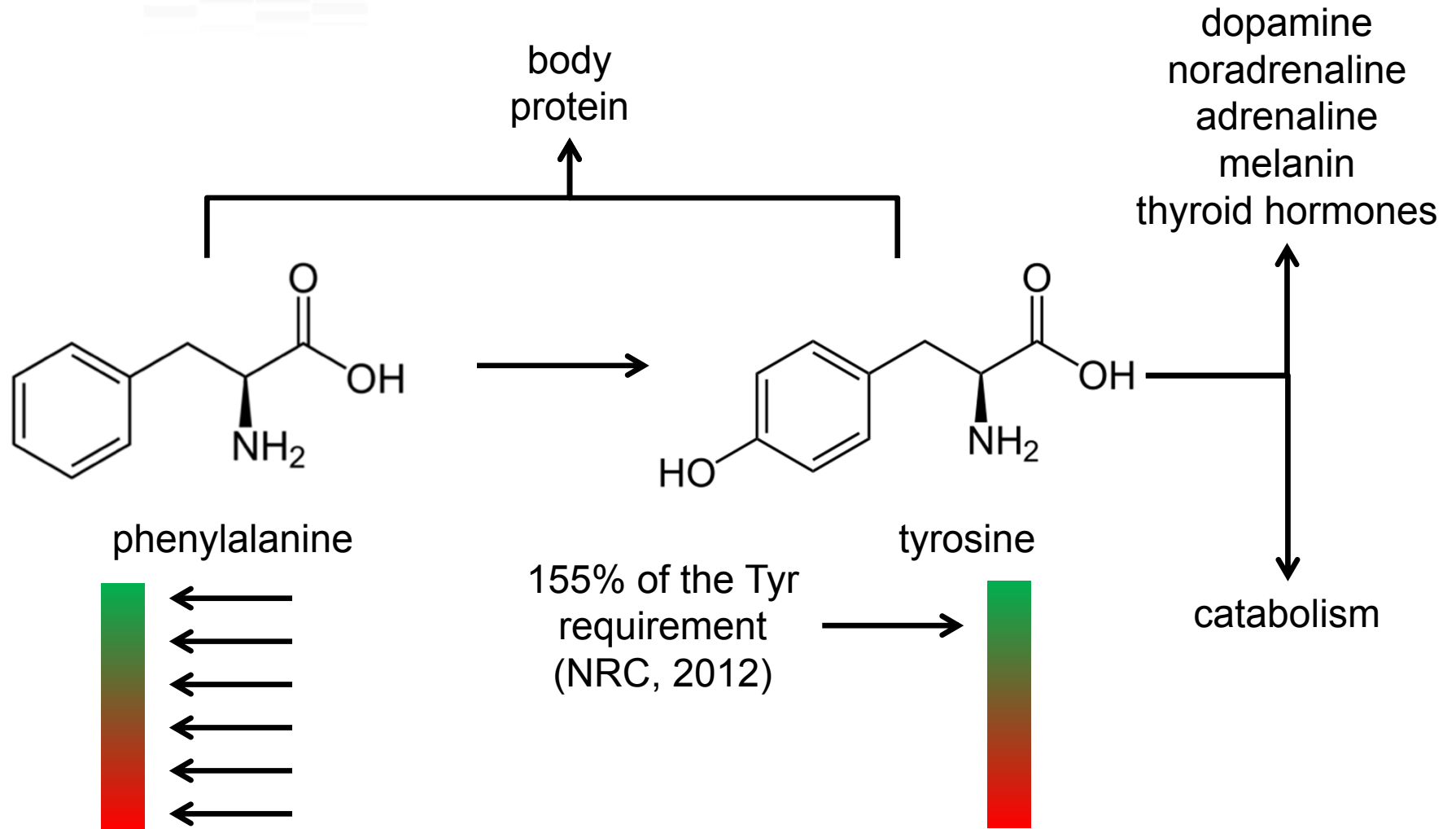
- Piétrain x (Large White x Landrace)
- Blocks of castrated males and females
- 14 piglets per treatment
- Housed individually
- Response criteria:
  - Feed intake
  - Body weight gain



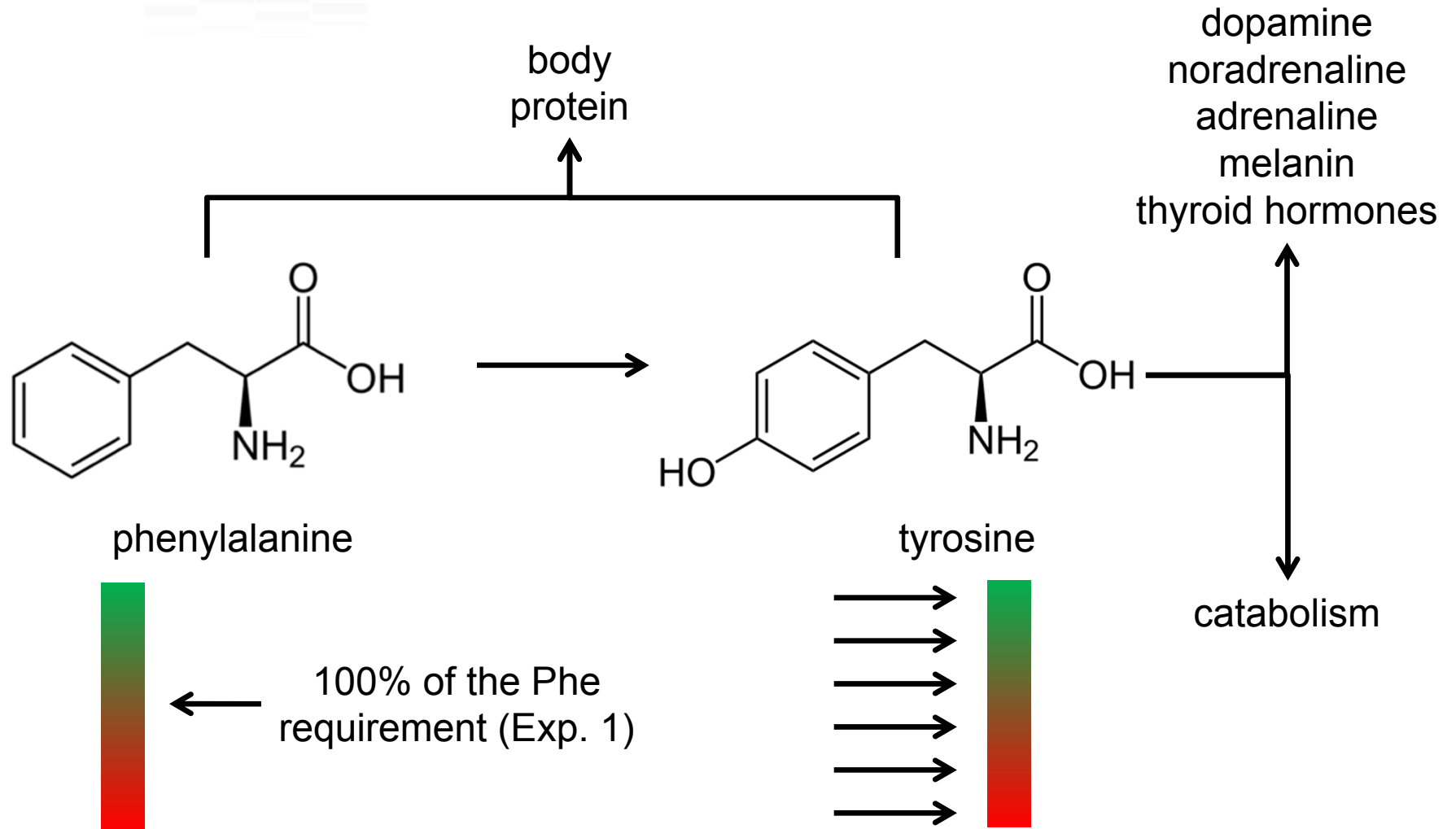
9 wks  
~20 kg

21 days

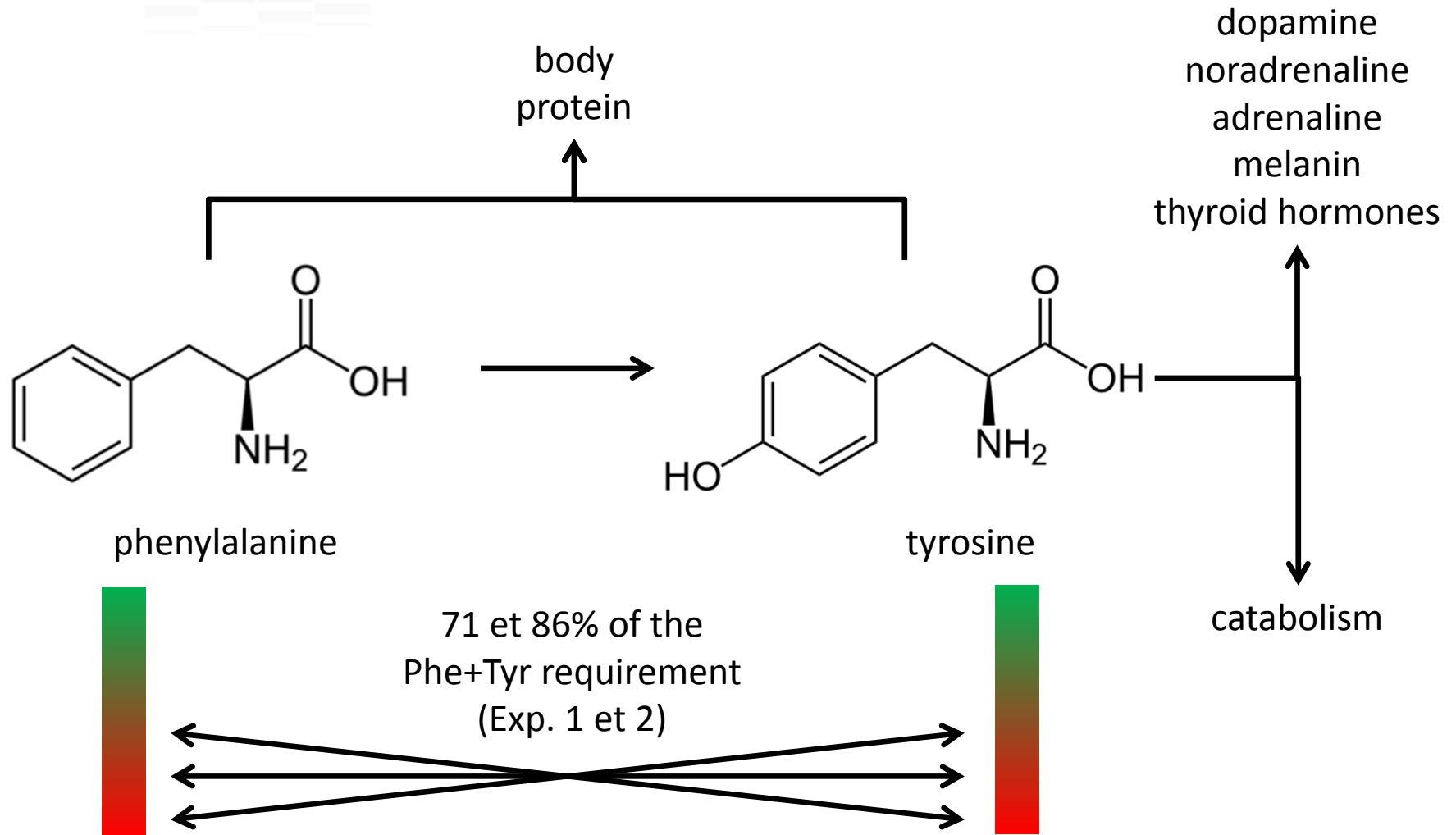
# Exp. 1: Phe dose-response study



# Exp. 2: Tyr dose-response study



# Exp3: Substitution of Tyr by Phe

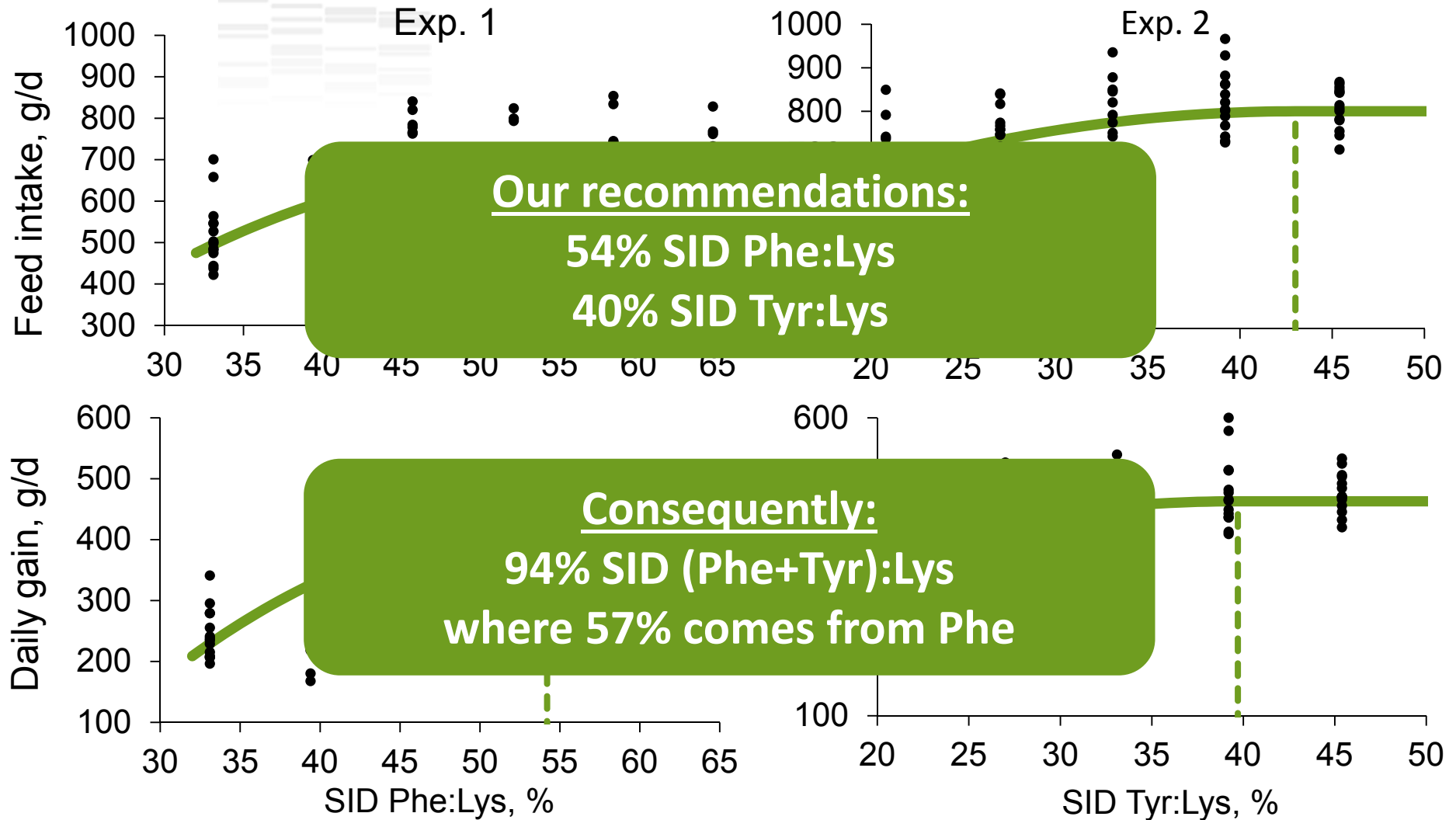




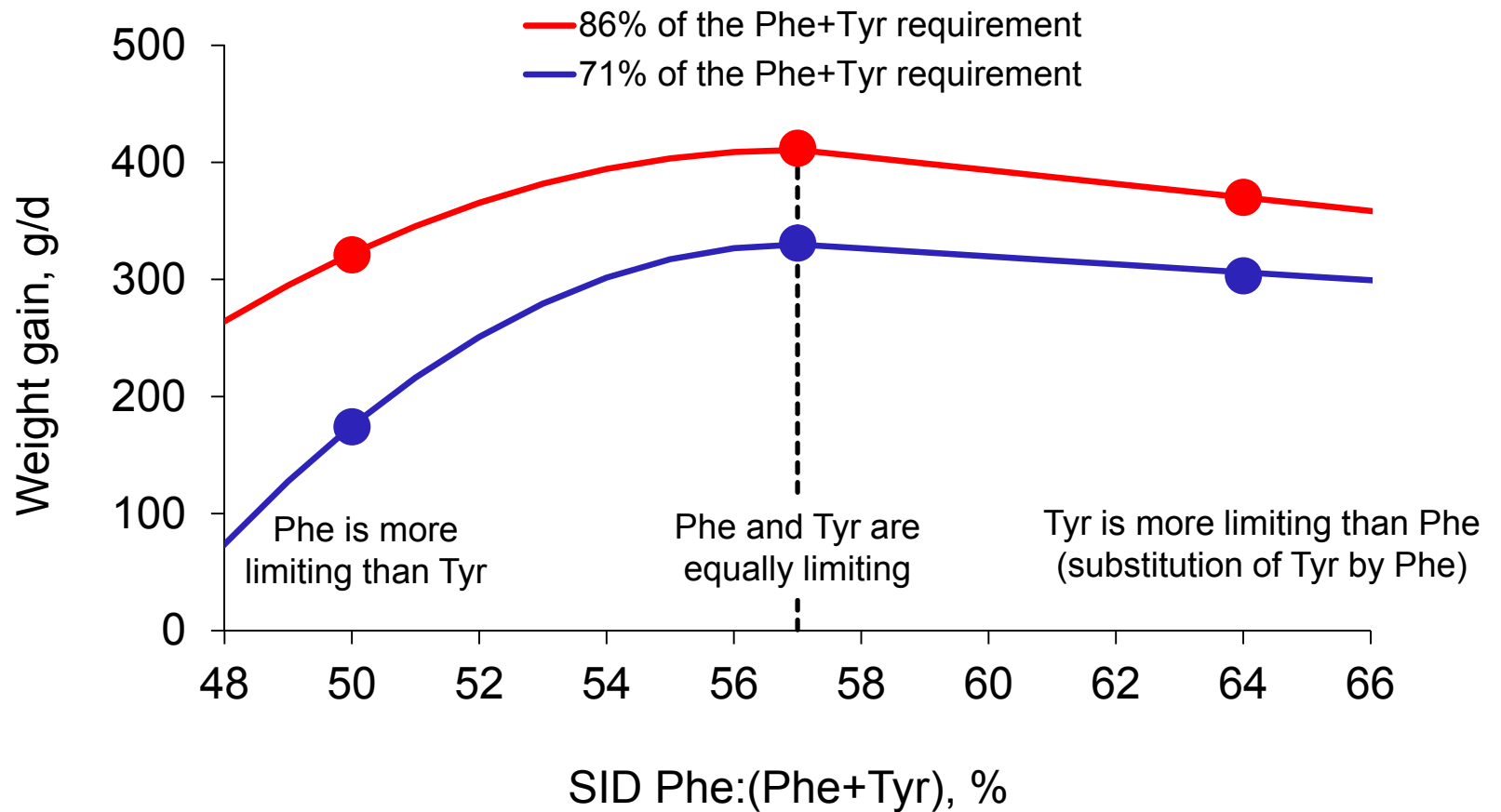
## Composition of the basal diets (%)

Dose-response	Phe (Exp. 1)	Tyr (Exp. 2)	Phe:(Phe+Tyr) (Exp. 3)	
Wheat	50.0	50.0	50.0	50.0
Barley	28.4	28.4	28.4	28.4
Corn starch	5.8	6.1	6.0	6.0
L-Lys HCl	1.0	1.0	1.0	1.0
L-Phe	-	0.21	0.05	0.13
L-Tyr	0.36	-	0.08	0.14
11 other amino acids	+	+	+	+
CP	14.8	14.3	14.2	14.6
SID Lys	1.01	1.01	1.01	1.01

# Response to the Phe and Tyr supply



# Response to the substitution of Tyr by Phe



## Conclusions

- ❖ The information concerning the response of pigs to the Phe and Tyr supply has been doubled 😊
- ❖ Tyr cannot replace Phe on an equimolar basis
- ❖ Our recommendations:
  - ❖ 54% SID Phe:Lys
  - ❖ 40% SID Tyr:Lys
  - ❖ not to express the requirement on a Phe+Tyr basis

## Further reading

*Animal* (2014), 8:9, pp 1412–1419 © The Animal Consortium 2014  
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# Performance of piglets in response to the standardized ileal digestible phenylalanine and tyrosine supply in low-protein diets

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