

Net energy in soybean meal and other ingredients

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Take Home Messages

2

Current equations to calculate NE may not be accurate

4

NE in SBM is likely 90 to 100% of NE in corn

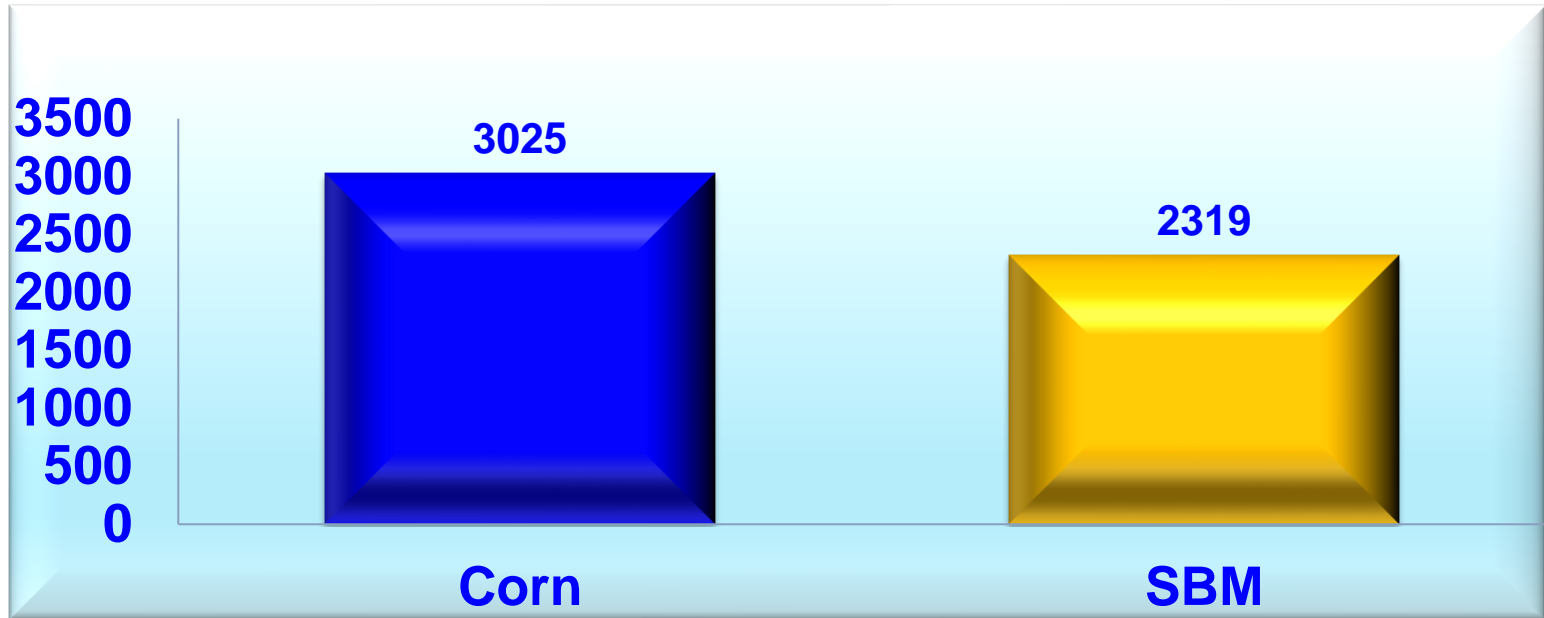
1

No evidence that low CP diets have more NE

3

Modern genotypes of pigs are more efficient in converting diet protein to body protein

There is more NE in corn than in SBM, kcal/kg DM



NRC, 2012

What happens to energy in SBM, kcal/kg DM



NRC, 2012

Adjusted DE system

$$\text{NE} = (0.700 \times \text{DE}) + (1.61 \times \text{EE}) + (0.48 \times \text{Starch}) - (0.91 \times \text{CP}) - (0.87 \times \text{ADF})$$



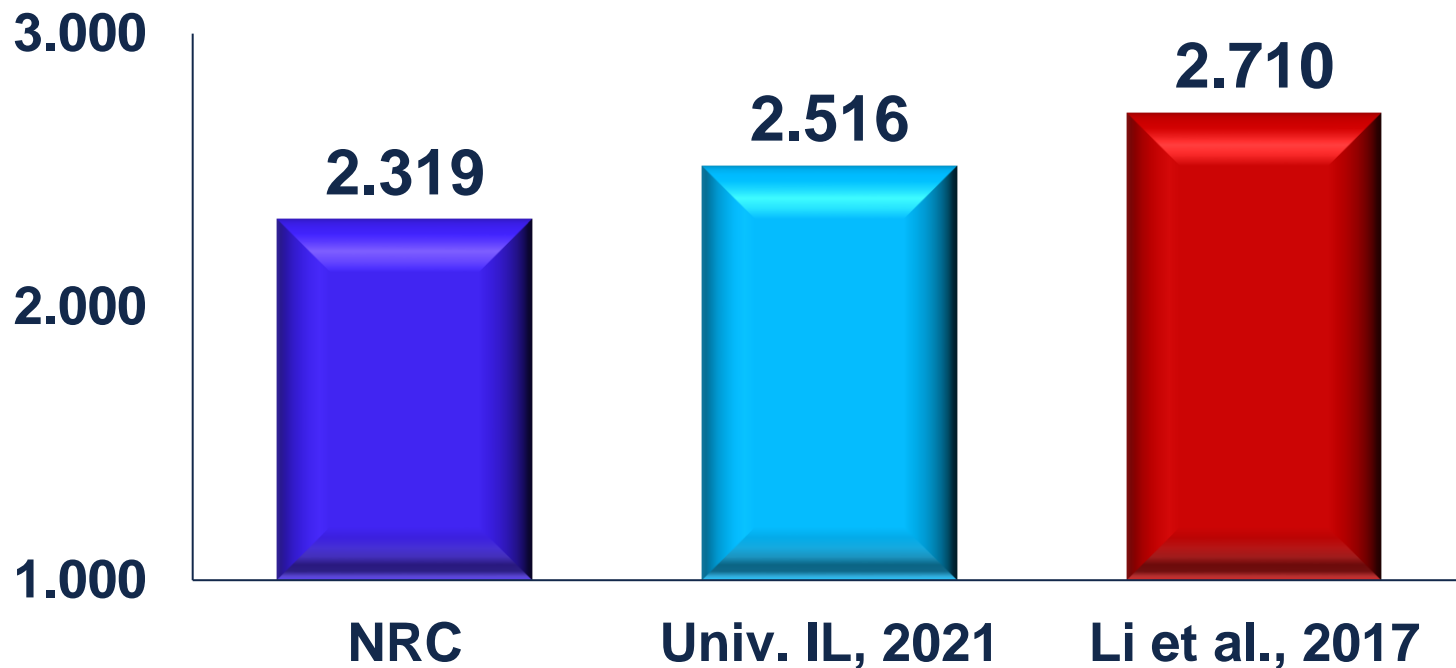
Noblet et al., 1994

DE, ME, NE in Soybean meal, kcal/kg DM

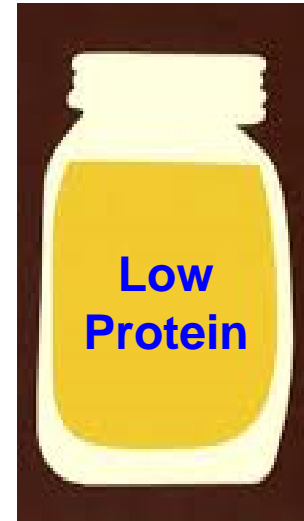
Item	DE	ME	NE
NRC, 2012	4,021	3,660	2,319
France	3,955	3,607	2,262
Brazil	3,970	3,648	2,290
IL, 2015	4,261	4,044	2,467

Sotak-Peper et al., 2015

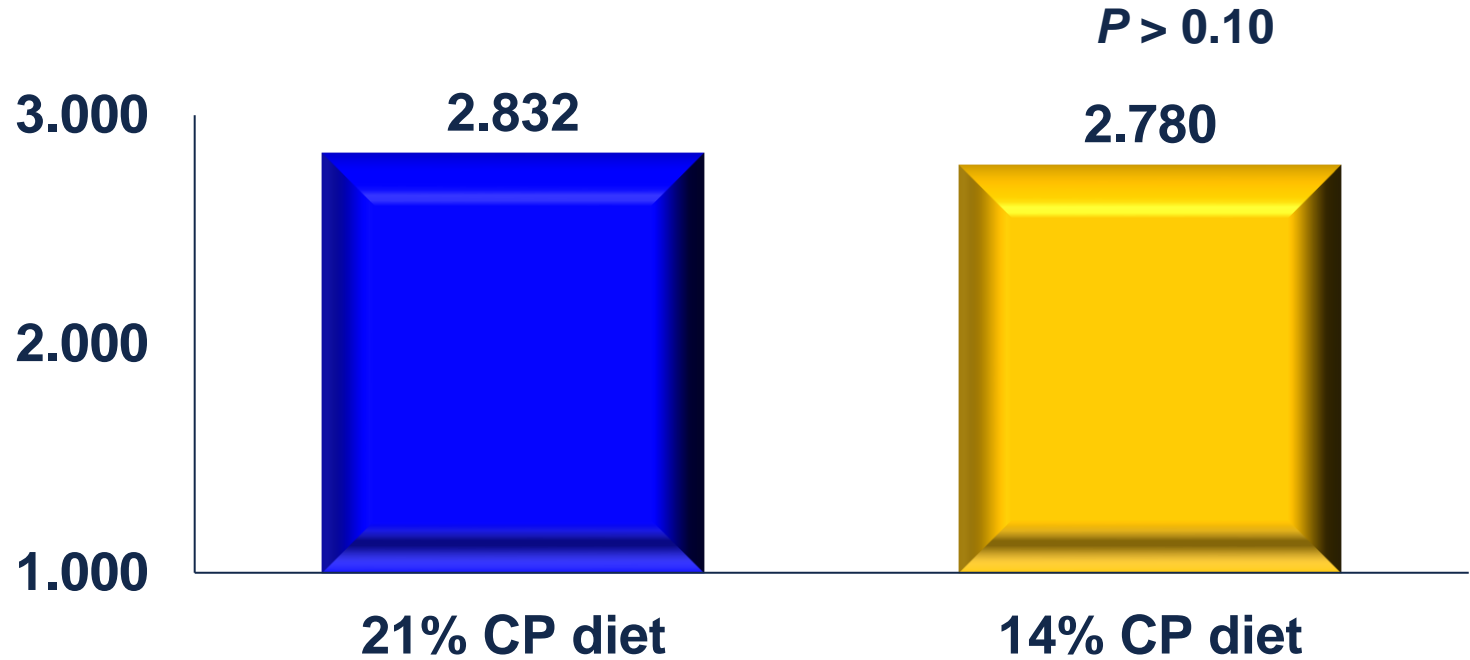
Net energy in soybean meal, kcal/kg, DM



Theory: NE is greater in diets with low CP

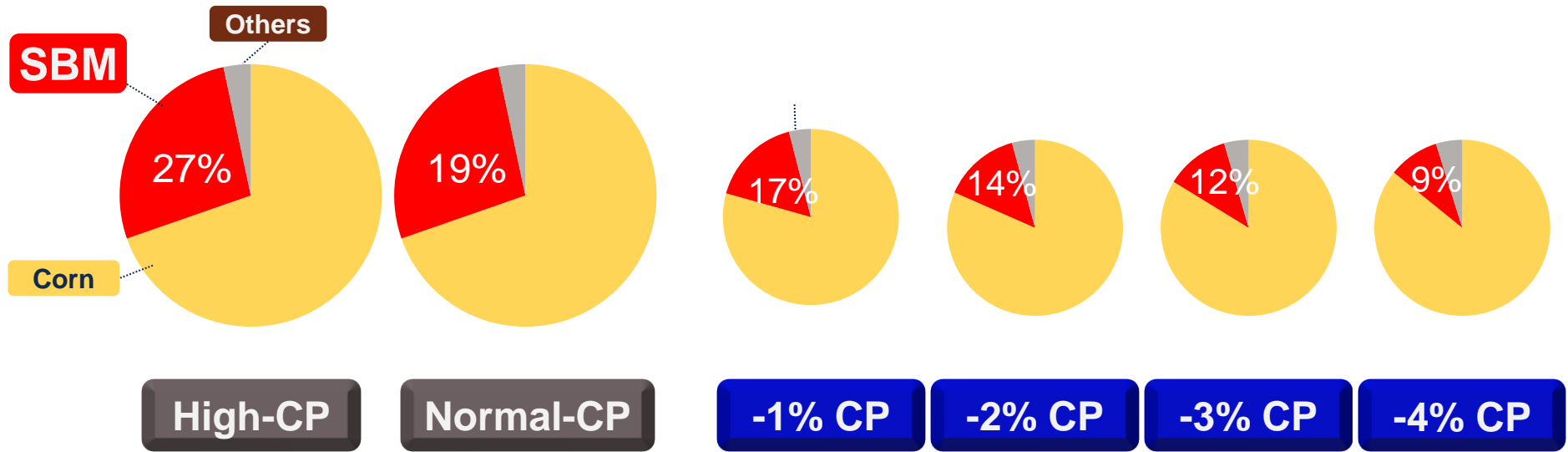


Net energy did not increase with reduced CP

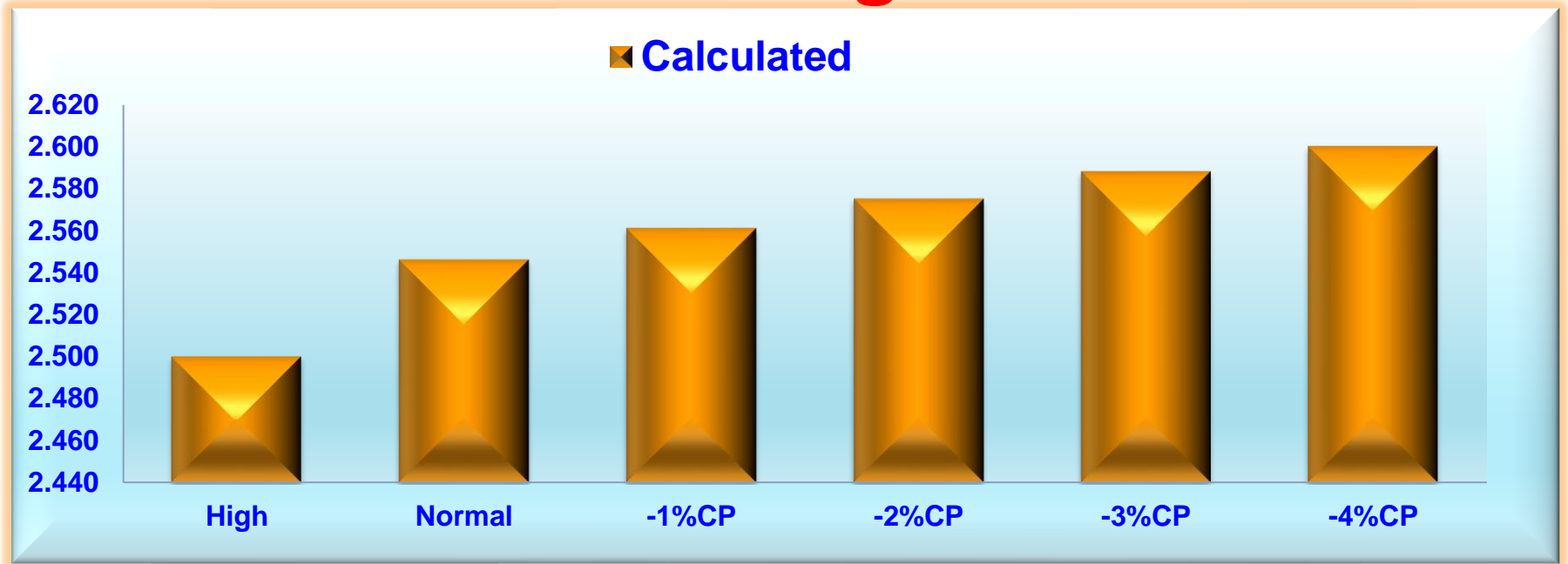


Munoz, 2020

There is more corn in low protein diets

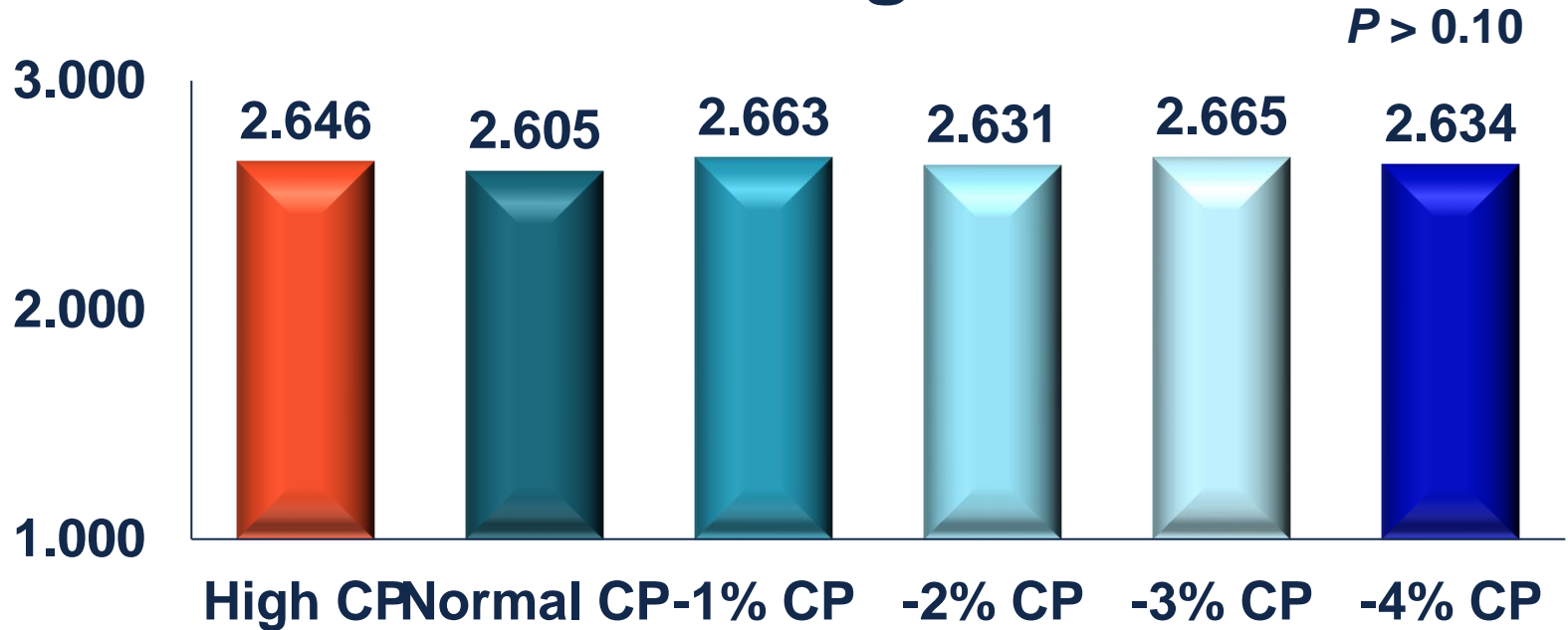


Calc. NE increases as SBM is reduced, kcal/kg



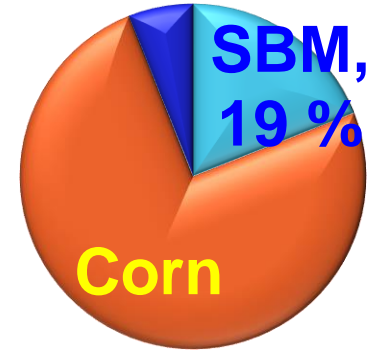
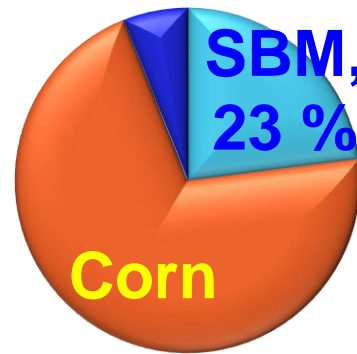
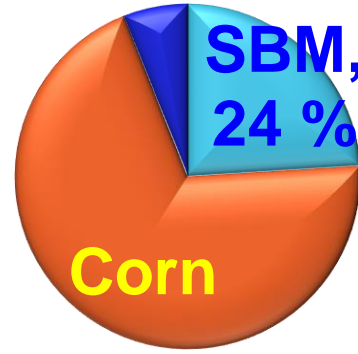
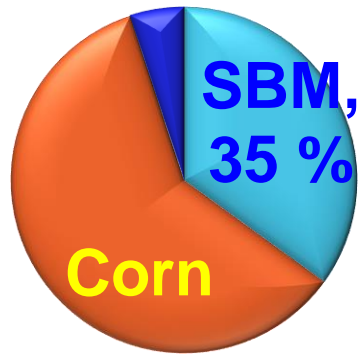
NRC, 2012

NE did not change with reduced CP, kcal/kg DM



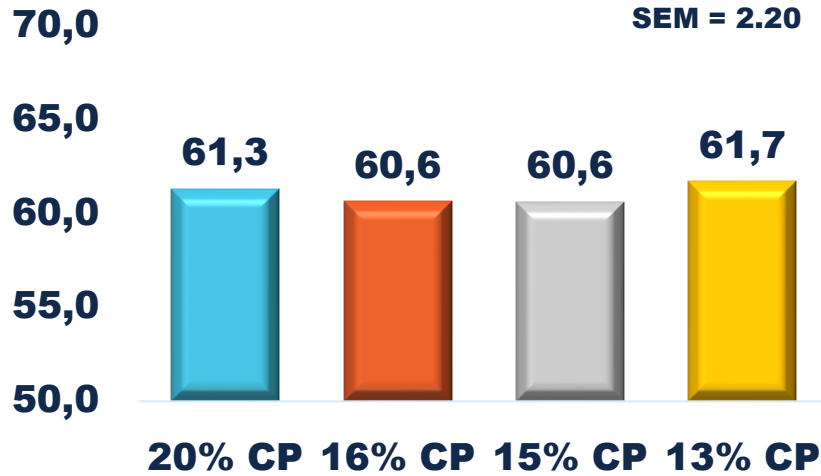
Cristobal et al., 2024a

Comparative slaughter procedure

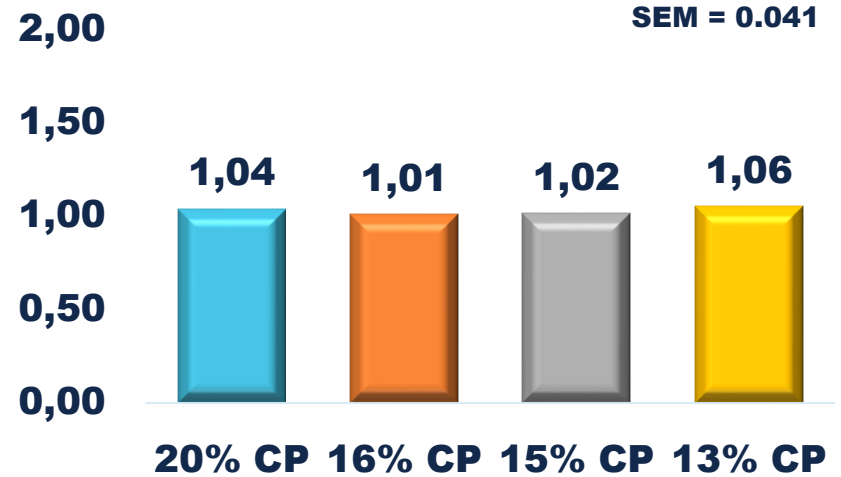


Christobal et al., 2024b

Final BW, kg



ADG, kg/d

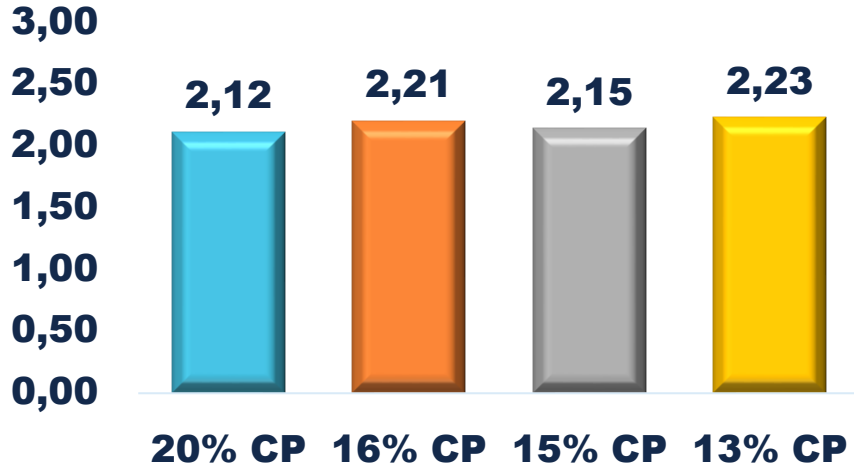


Christobal et al., 2024b



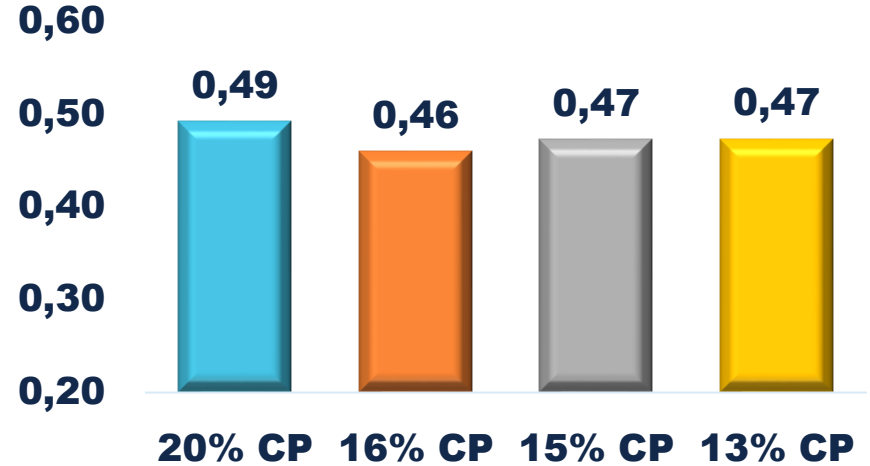
ADFI, kg/d

SEM = 0.072



G:F

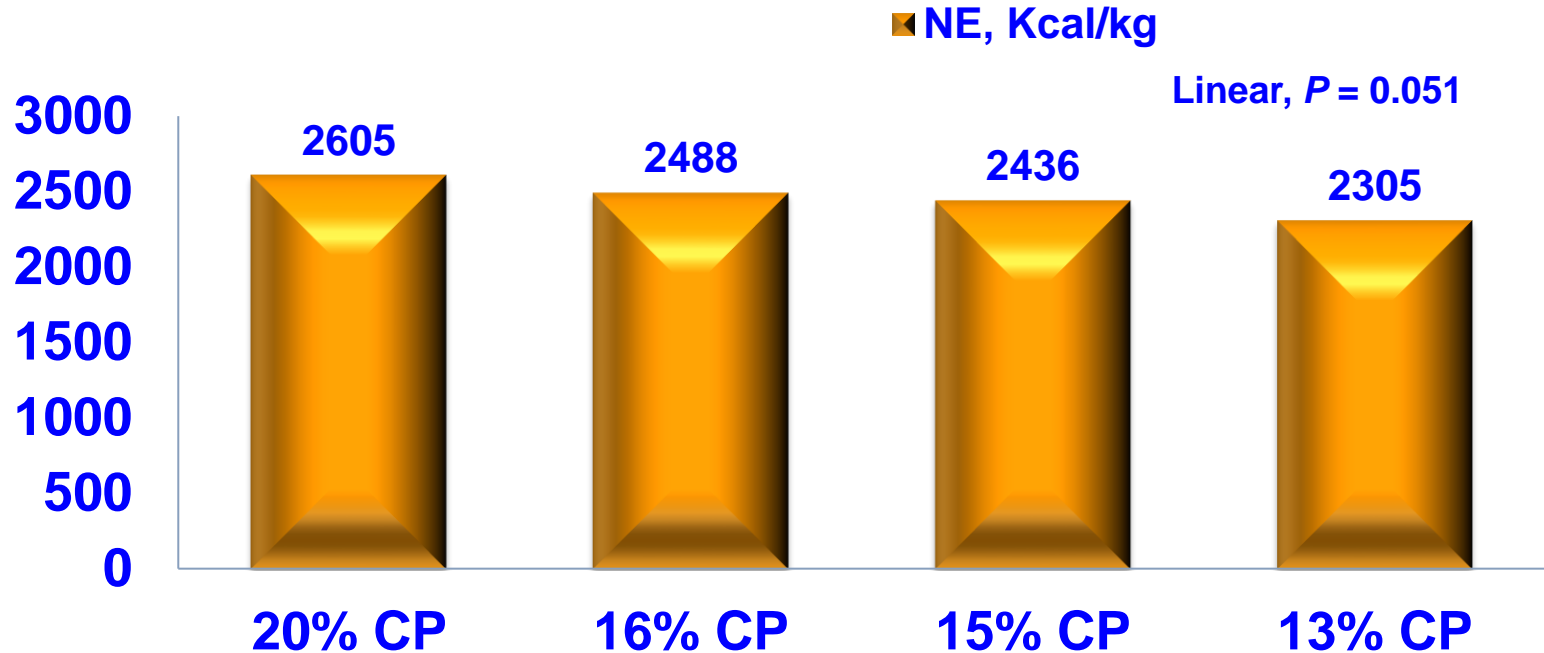
SEM = 0.014



Christobal et al., 2024b



NE in diets did not increase as CP was reduced



Christobal et al., 2024b

Adjusted DE system

$$NE = (0.700 \times DE) + (1.61 \times EE) + (0.48 \times \text{Starch}) - (0.91 \times CP) - (0.87 \times ADF)$$

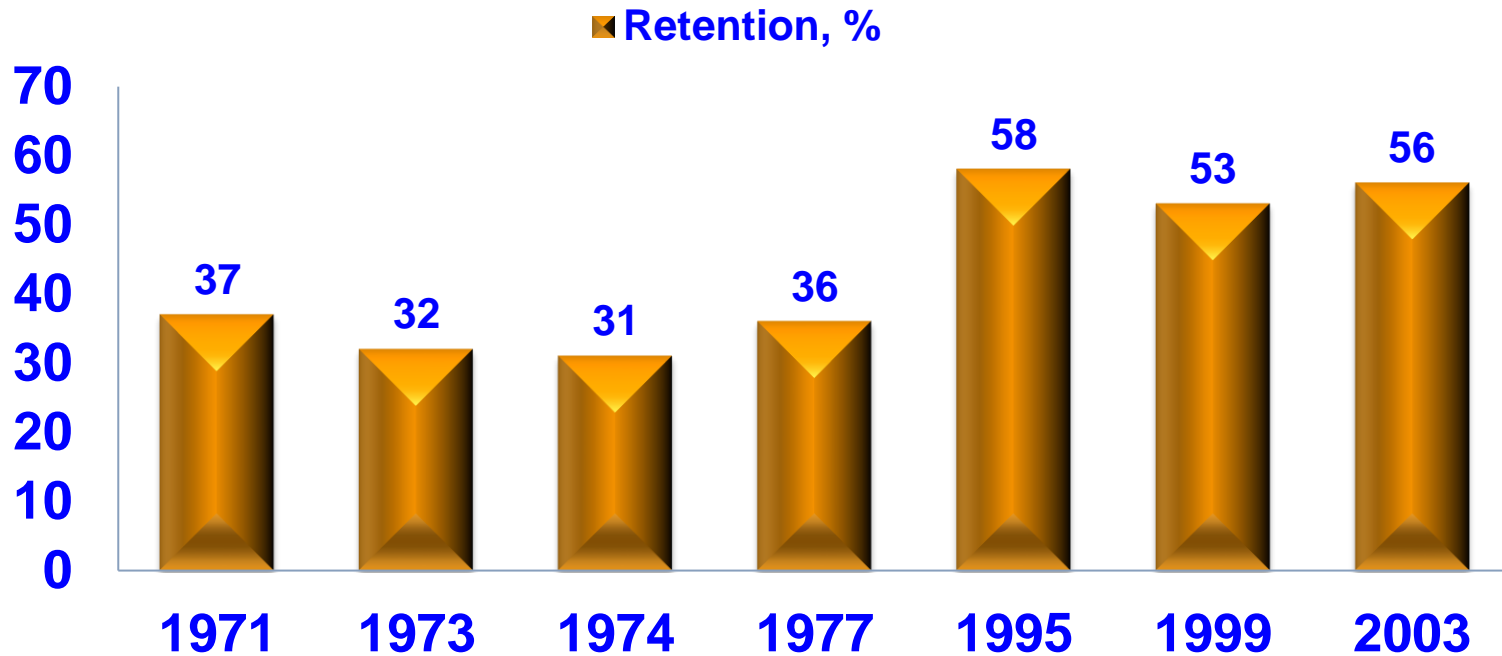


Conclusions from previous N-balance work

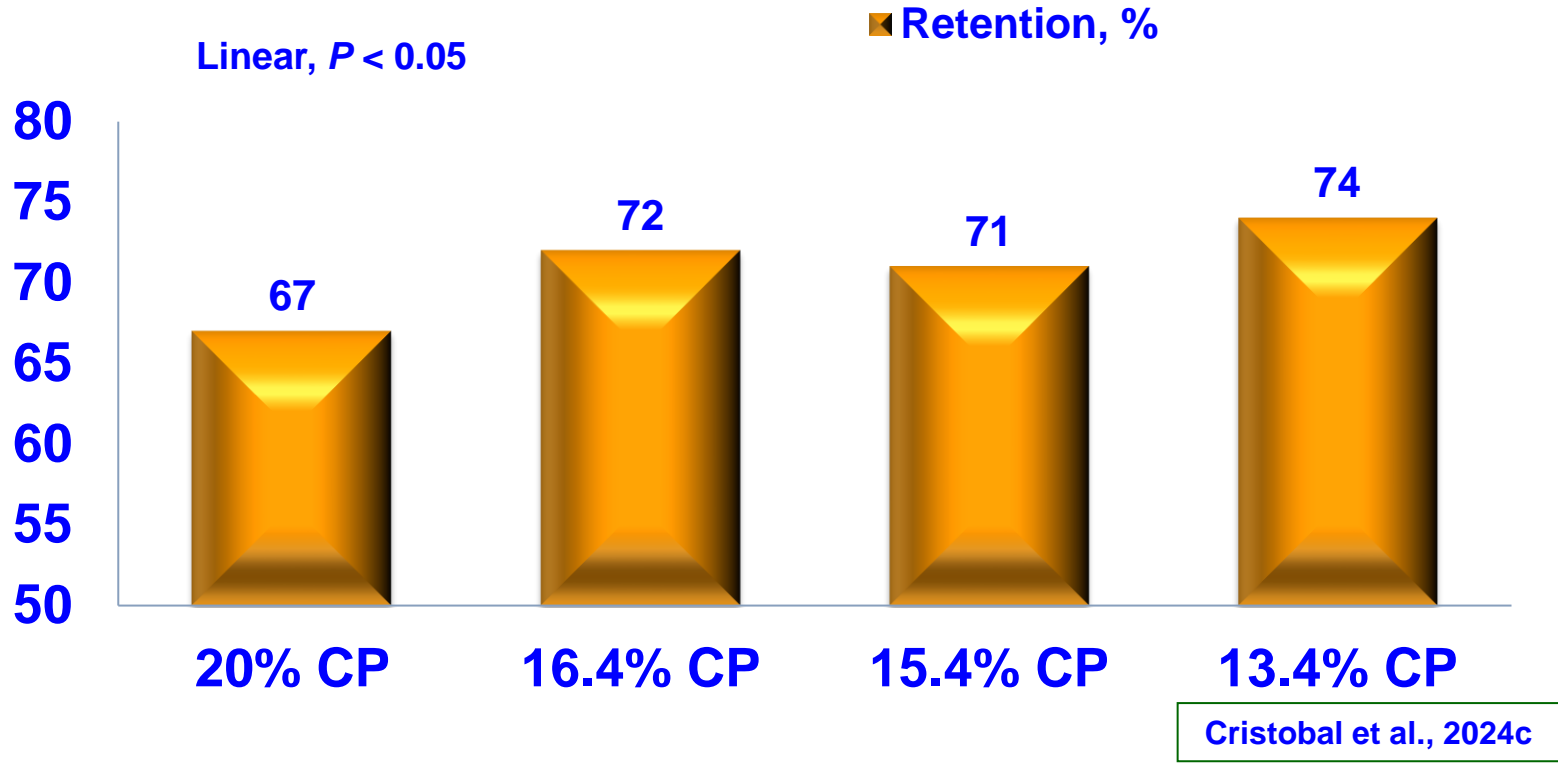
It can be assumed that nitrogen retention never exceeds 45 to 50% of absorbed nitrogen

Noblet et al., 2004

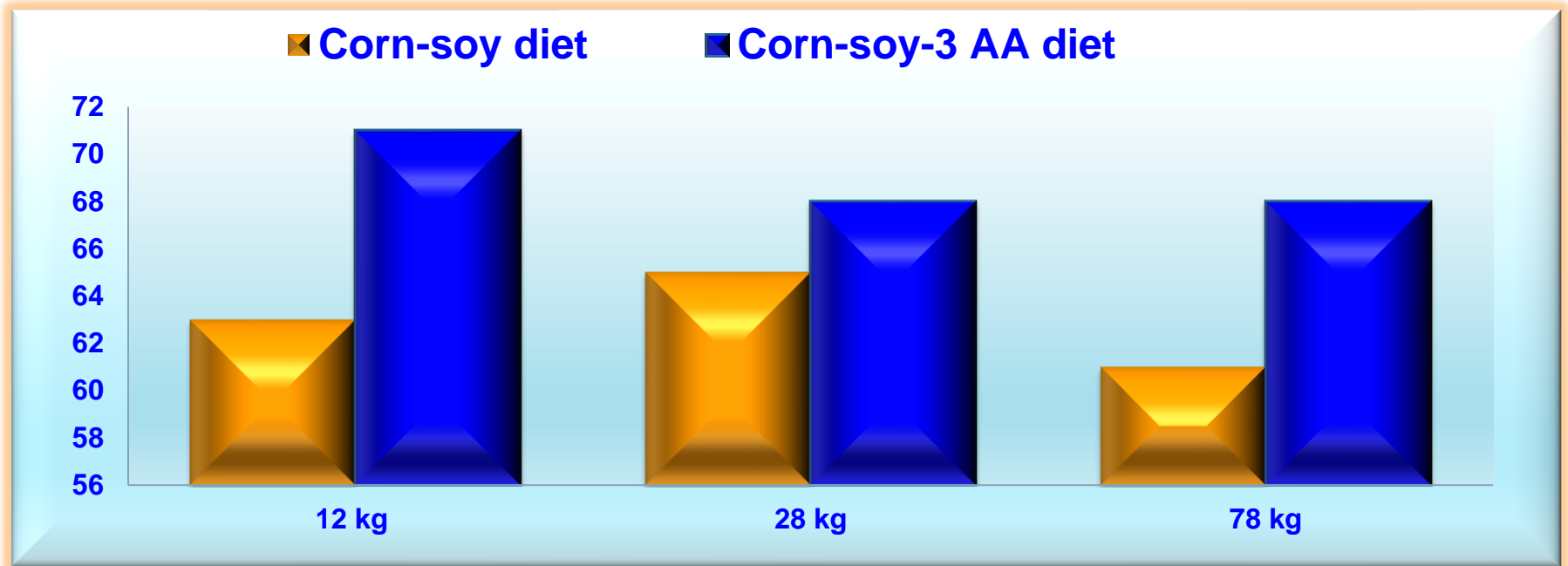
N retention (% of intake) in growing pigs



N retention in growing pigs

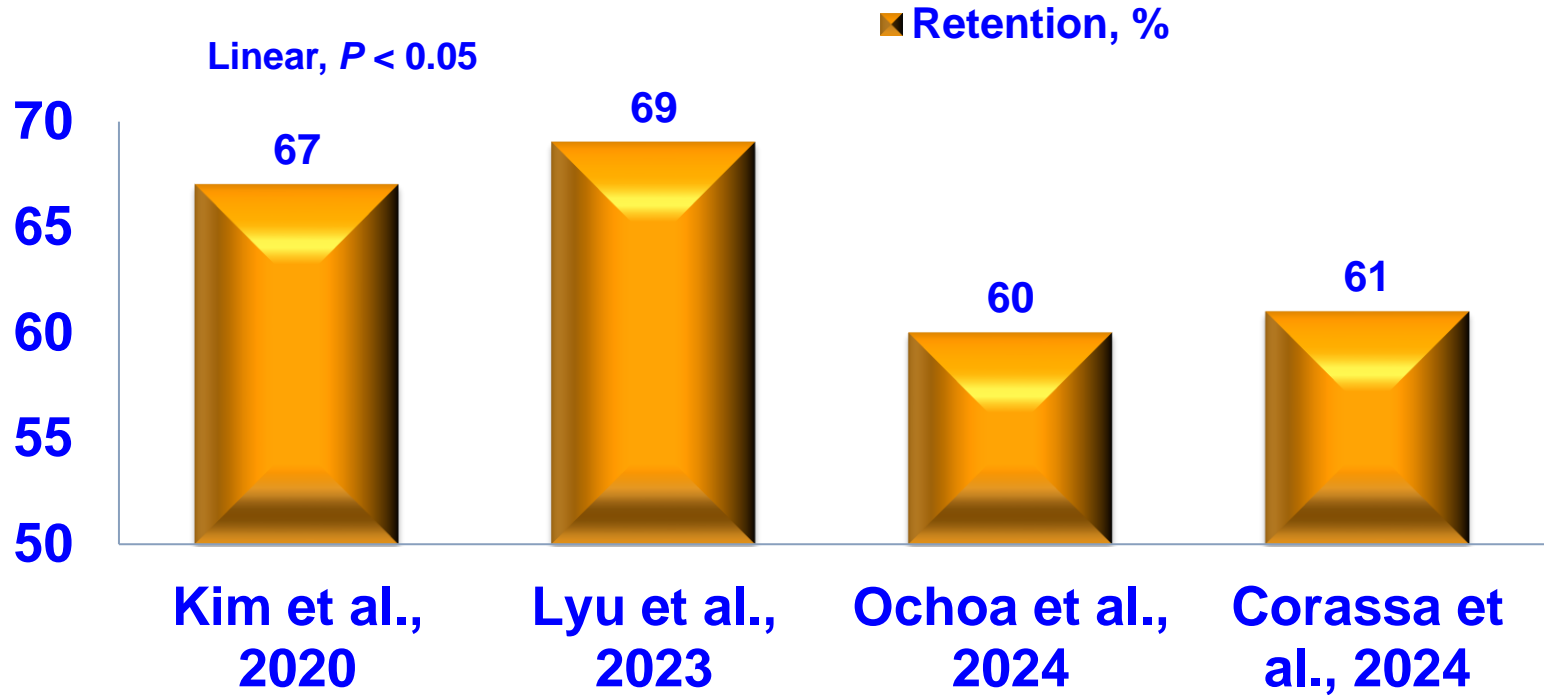


N-retention is high regardless of BW, % of intake



Univ. IL., Unpublished

Recent data for N retention in growing pigs



45% retention vs. 70% retention of N

Deaminated AA: 58%

Protein synthesis: 83%

46% SBM: +163 kcal/kg



Impact of NE in SBM

Greater DE = +170 kcal NE/kg

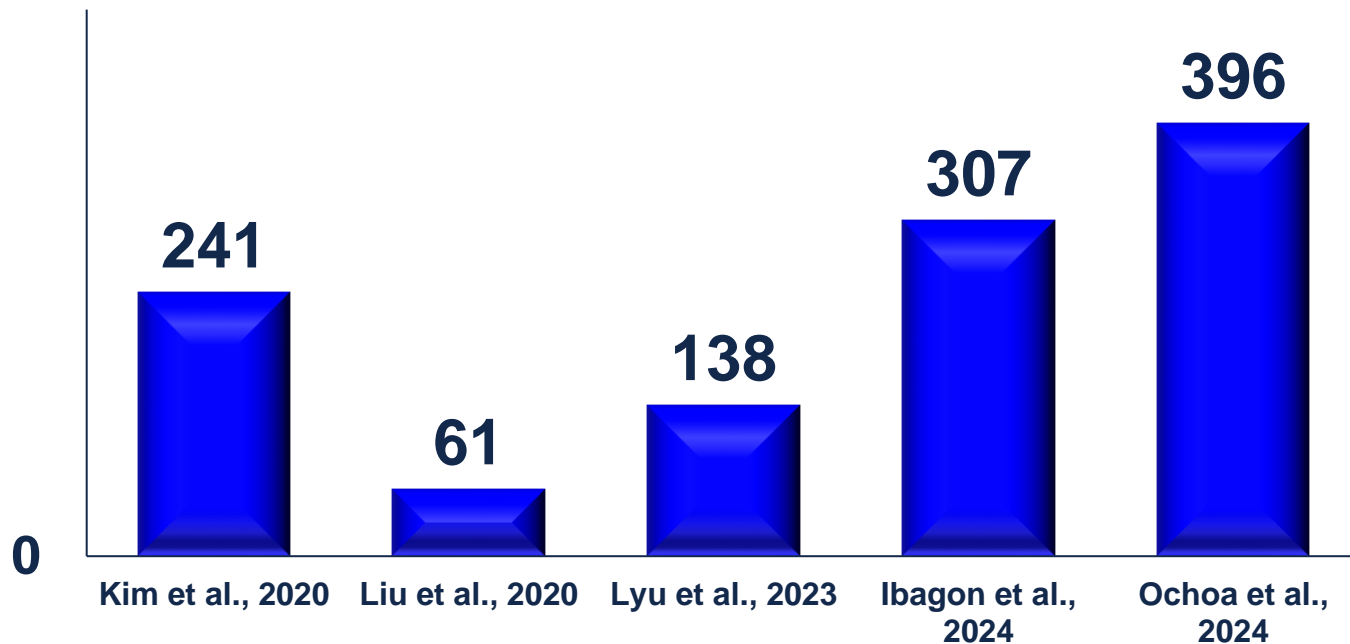
Increased N retention = +165 kcal NE/kg

Total.....= + 335 kcal NE/kg

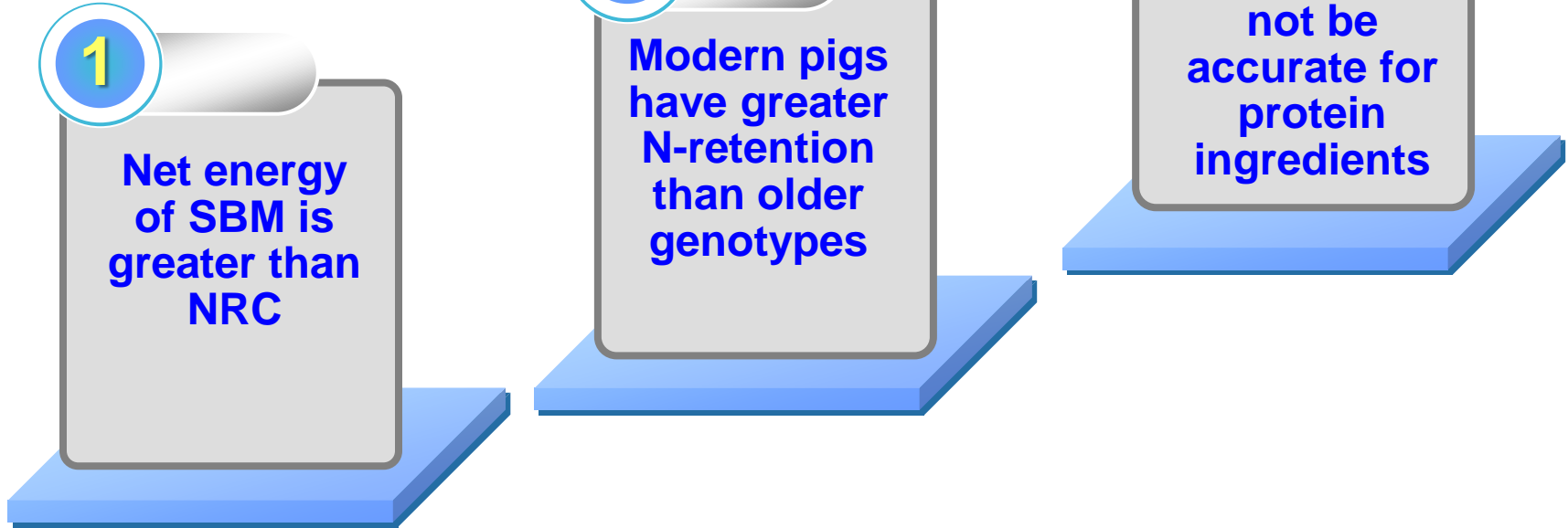
“New” NE in SBM (2,087 + 335) **2,422 kcal NE/kg**

----- or **2,691kcal/kg DM**

Extra NE in SBM calc. from corn-SBM diets, kcal/kg, DM



Conclusions



Conclusions, Cont.

4

No evidence that Low CP diets have greater NE

5

Possible that some of the response to SBM is related to biological components

6

NE of SBM is likely between 90 and 100% of corn

Acknowledgement



<http://nutrition.ansci.illinois.edu>