

Amino acids requirements and utilization by pigs differ between precision and conventional feeding programs



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BACKGROUND

Precision feeding systems: each pig in the herd receives a feed tailored daily to its specific requirements

- ✓ Protein intake can be reduced by 25%
- ✓ Save 6–15\$ per pig produced (Pomar et al., 2010)

Without limiting growth performance

Threonine is the 2nd amino acid limiting for growth and the 1st limiting for maintenance.

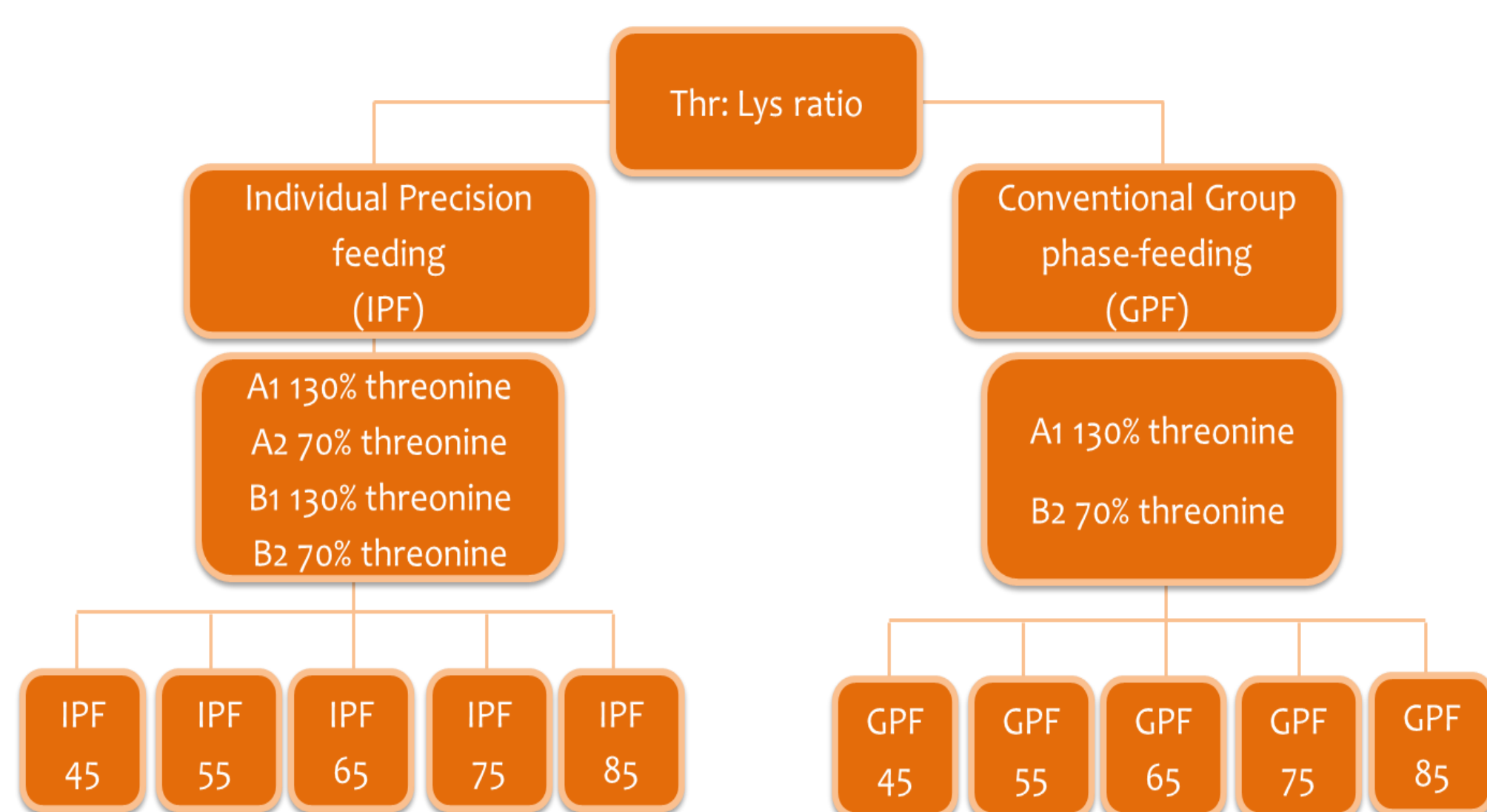
Because in precision feeding pigs receive much less amino acids than in actual group feeding systems, the *optimal threonine* (Thr) to lysine (Lys) ratio *has to be re-evaluated*.

Objective: to compare the pig's response to five Thr:Lys ratio levels in individual precision feeding (IPF) and conventional group-phase-feeding (GPF) systems

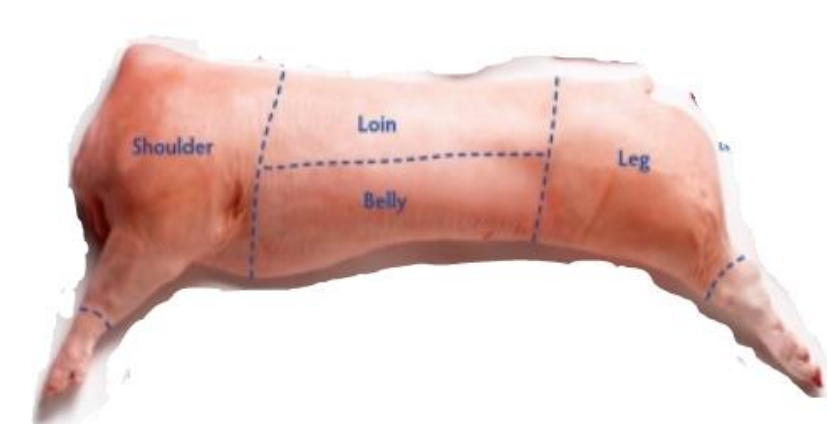
MATERIAL AND METHODS

- ✓ 110 pigs from 25 to 40 kg BW
- ✓ 21 days trial; 2 feeding programs (IPF or GPF) x 5 threonine: lysine ratios (45 to 85);

- ✓ Pigs housed in the same pen and fed with computerized feeding stations



- ✓ Protein deposition estimated by dual X-ray absorptiometry (day 1 and 21)
- ✓ Five pigs per treatment slaughtered
- ✓ Liver and muscles from right side of carcass collected



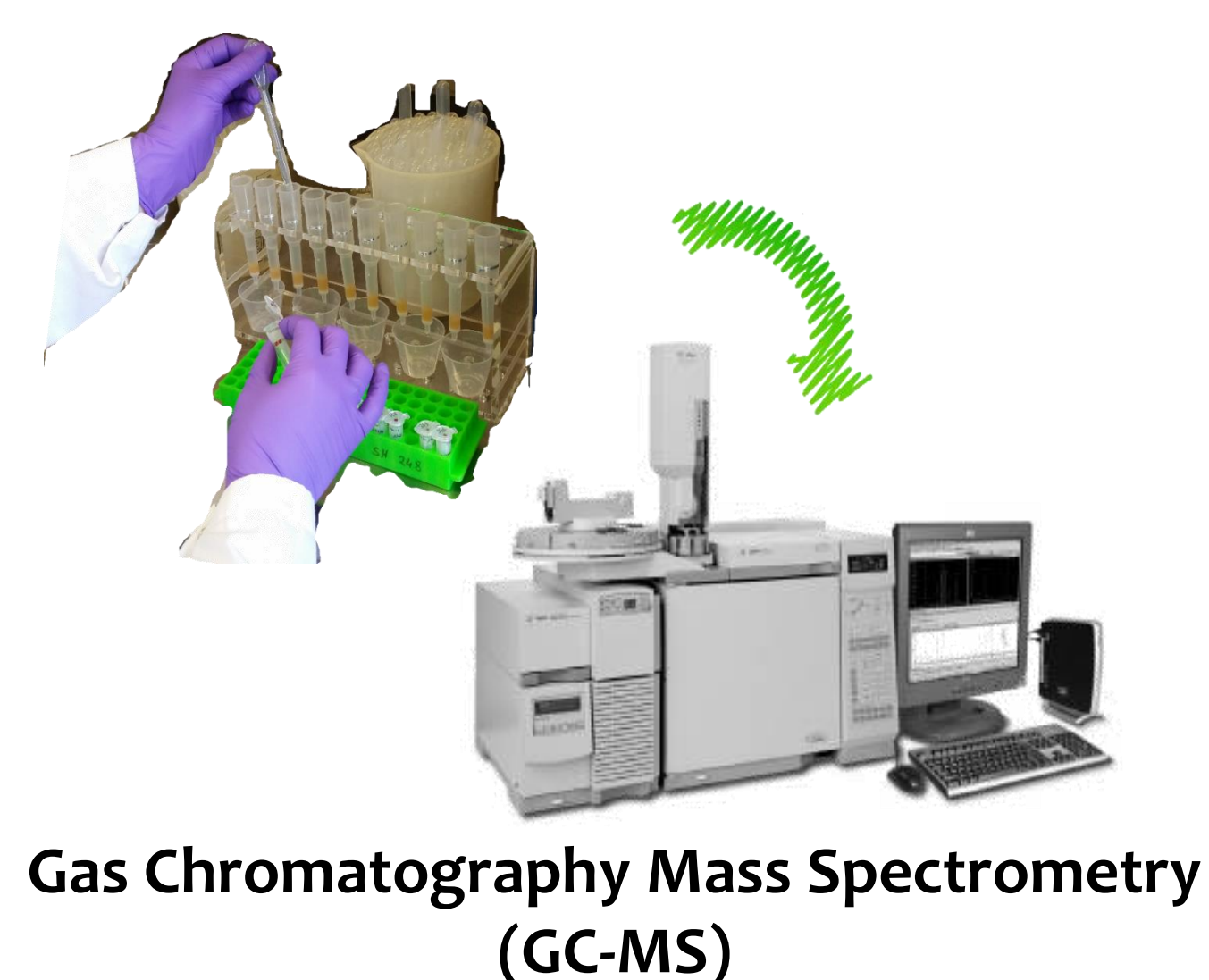
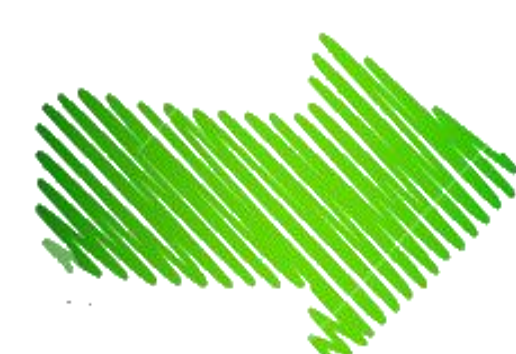
- ✓ AA analyses



AA concentration in liver



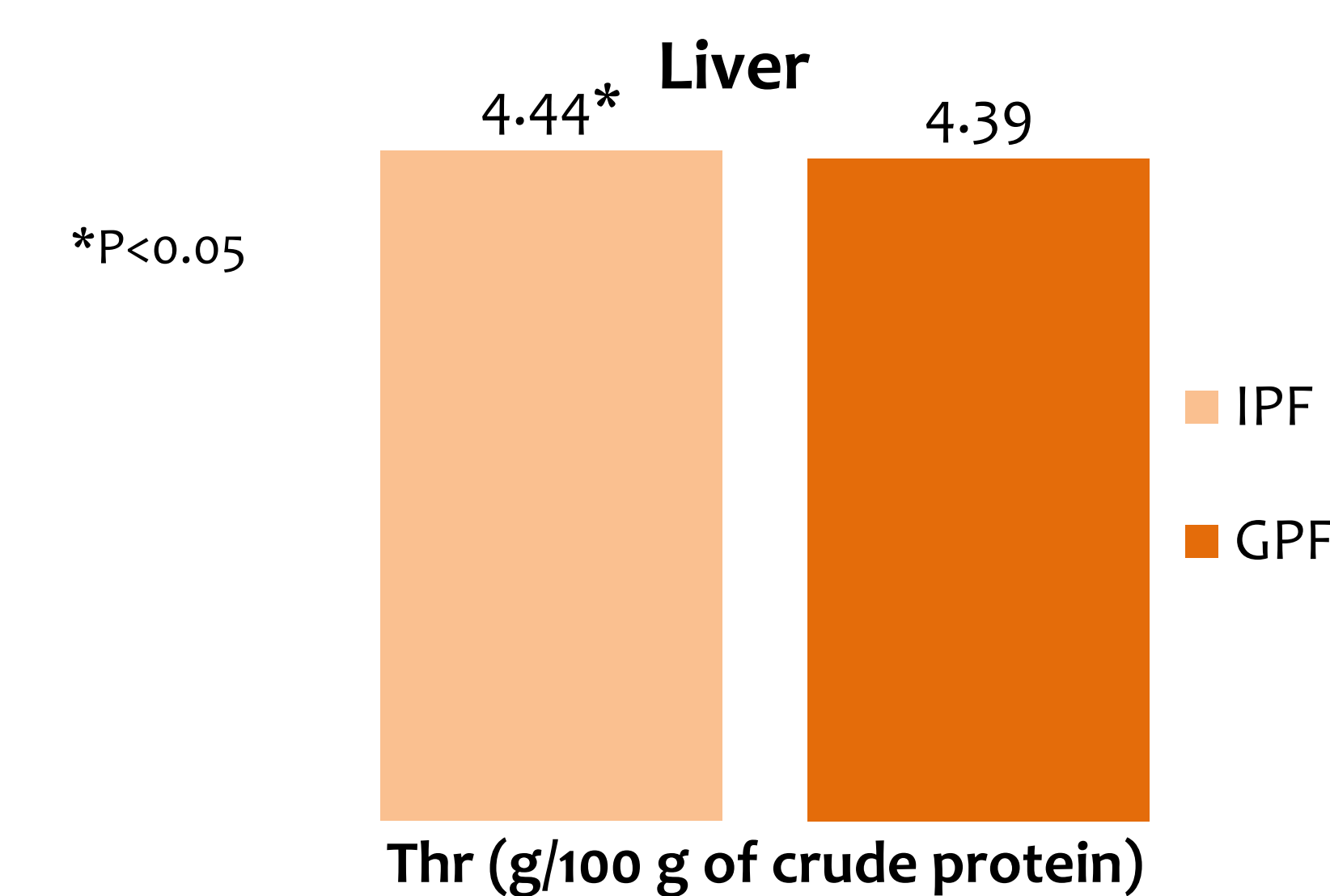
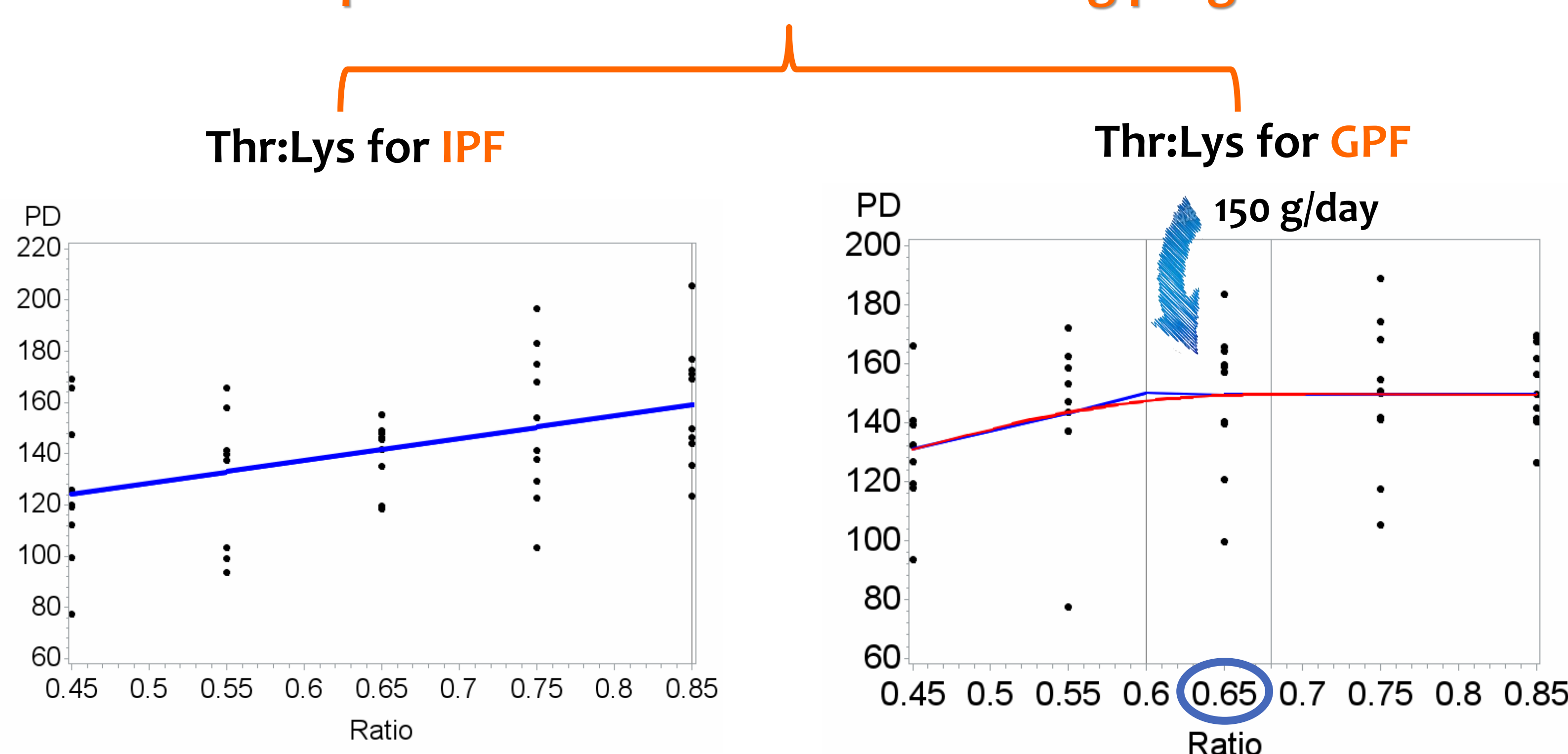
AA concentration in Longissimus Dorsi



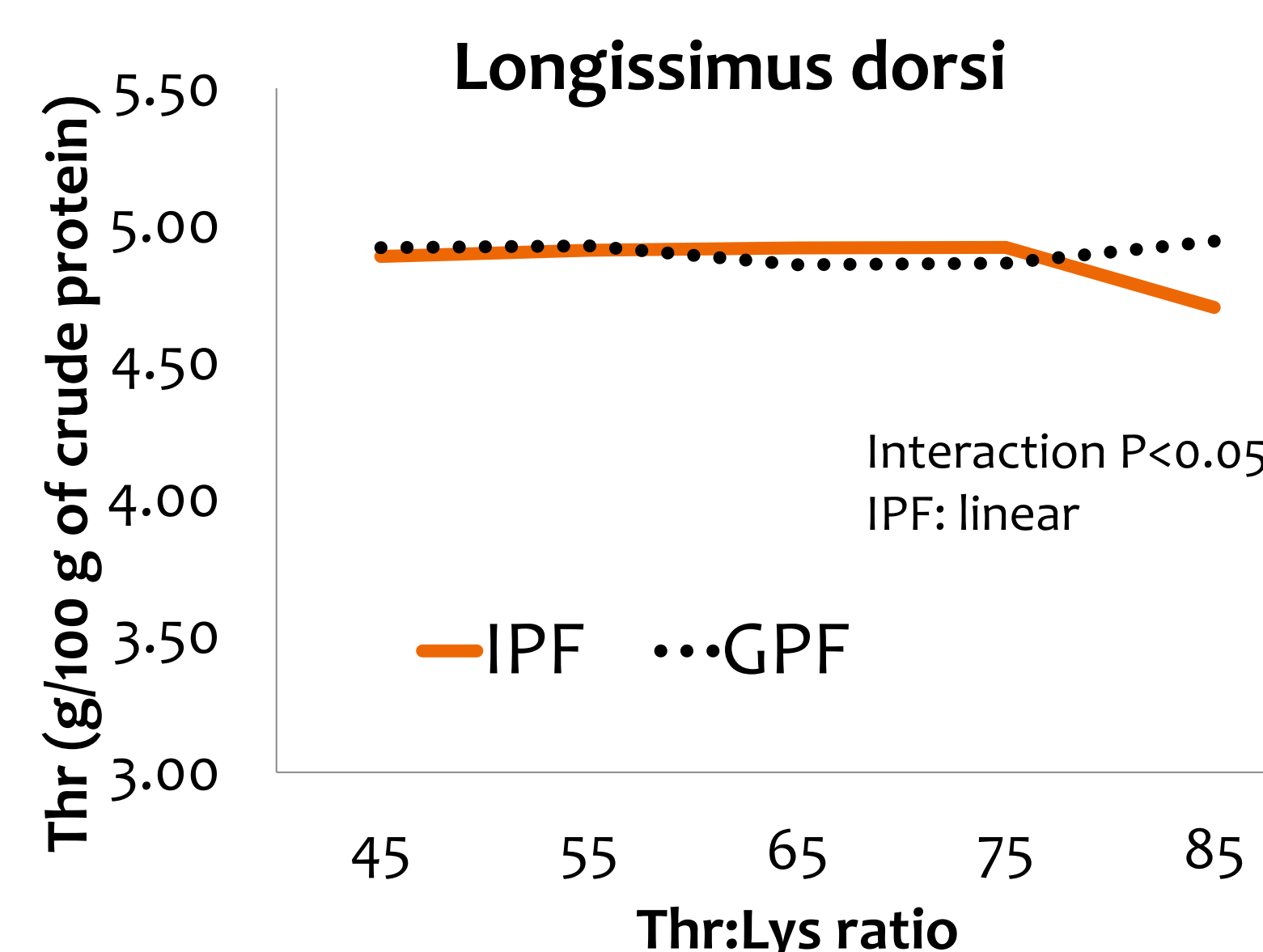
RESULTS AND DISCUSSION

	Individual precision feeding program (IPF)					Group phase feeding program (GPF)					MSE	Thr: Lys	IPF vs GPF	Interaction
	IPF45	IPF55	IPF65	IPF75	IPF85	GPF45	GPF55	GPF65	GPF75	GPF85				
BW initial, kg	26.02	26.19	25.55	25.20	26.03	26.67	25.70	25.84	25.68	26.20	0.80	0.40	0.49	0.84
ADFI, kg	1.44	1.45	1.52	1.67	1.50	1.47	1.45	1.49	1.50	1.39	0.13	0.22	0.22	0.56
ADG, kg	0.64	0.67	0.76	0.80	0.83	0.68	0.73	0.78	0.77	0.76	0.04	Lin	0.91	0.53
G:F	0.46	0.47	0.51	0.49	0.56	0.46	0.52	0.52	0.52	0.55	0.05	Lin	0.27	0.74
SID Lys intake, g/d	11.48	12.25	12.32	13.58	12.84	12.63	12.43	12.83	12.77	12.01	1.11	0.37	0.90	0.30
SID Thr intake, g/d	6.28	7.82	8.99	11.20	11.76	6.85	7.92	9.37	10.50	11.01	0.87	Lin	0.77	0.38
PD in gain (%)	20.88	20.40	21.83	20.58	20.66	20.35	19.49	20.71	20.69	20.89	0.49	0.37	0.28	0.77
Crude protein intake, g/d	222.29	238.38	236.07	258.22	248.64	250.19	229.22	247.17	244.80	234.12	21.47	0.60	0.96	0.28
Nitrogen retention, %	58.12	54.68	60.63	59.07	64.51	51.20	57.62	61.20	61.03	65.20	5.37	Lin	0.93	0.43
BW final, kg	39.42	40.09	41.97	42.67	43.31	40.09	41.32	42.27	42.18	41.96	0.92	0.25	0.89	0.55

AA requirements differ between feeding programs



AA retention in organs may be more efficient in IPF than GPF pigs and, under AA restriction, organs seem to be prioritized over muscles



Thr level can modify longissimus dorsi AA composition for IPF pigs based on the AA intake.

TAKE HOME MESSAGE

Feeding systems can affect the way pigs use Thr. The Thr:Lys ratio that maximizes growing pig response differs between conventional and precision feeding systems.

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