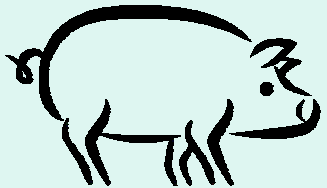


The effect of offering two feeds, with or without pharmacological levels of zinc oxide, on the individual feeding behaviour and performance of weaned piglets

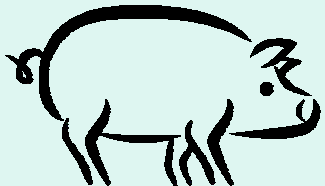


F H Reynolds, J M Forbes, R D Slade and H M Miller



Zinc Oxide (ZnO)

- Pharmacological supplementation
 - 2500 - 3100ppm in weaner pig diets
 - Efficacy well known
 - Reduces post weaning diarrhoea
 - Promotes piglet performance
- Feed Intake (ZnO)
 - Increase...
 - Appetite Suppressant?



**Pharmacological
ZnO**

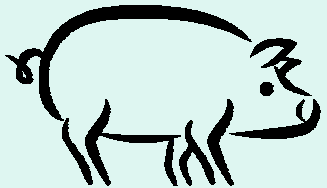


**Nutritional
Requirement**



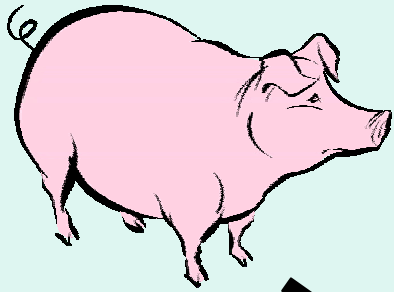
Choice Research

- Established ability of piglet to select for a nutritional requirement
 - Kyriazakis *et al.* (1990)
 - Dalby *et al.* (1995)



Question/ Hypothesis

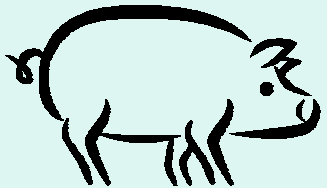
Piglet choice between two foods:



3100ppm
ZnO (Z)



No ZnO (U)

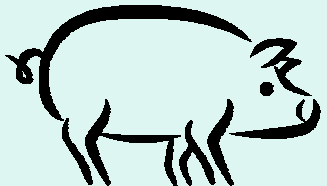


- Avoidance of high levels of ZnO?
- Selection for a prophylactic benefit?



Materials & Methods

- 60 piglets weaned at ~28 days and $7.8 \text{ kg} \pm 0.14$
- 8 mixed sex groups of 7 or 8 piglets per pen
- *Ad-libitum* access to a choice of two different foods:
 - Un-supplemented (U)
 - Supplemented (ZnO: 3.1g/kg)
- Piglets weighed: Weaning, d7, d13
- Incidence of scour recorded



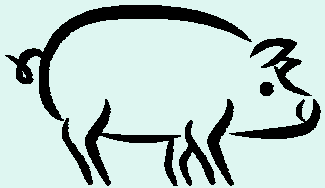


Feed Intake & Behaviour

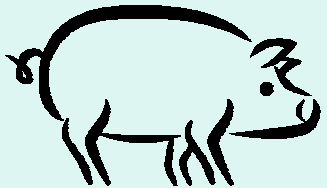
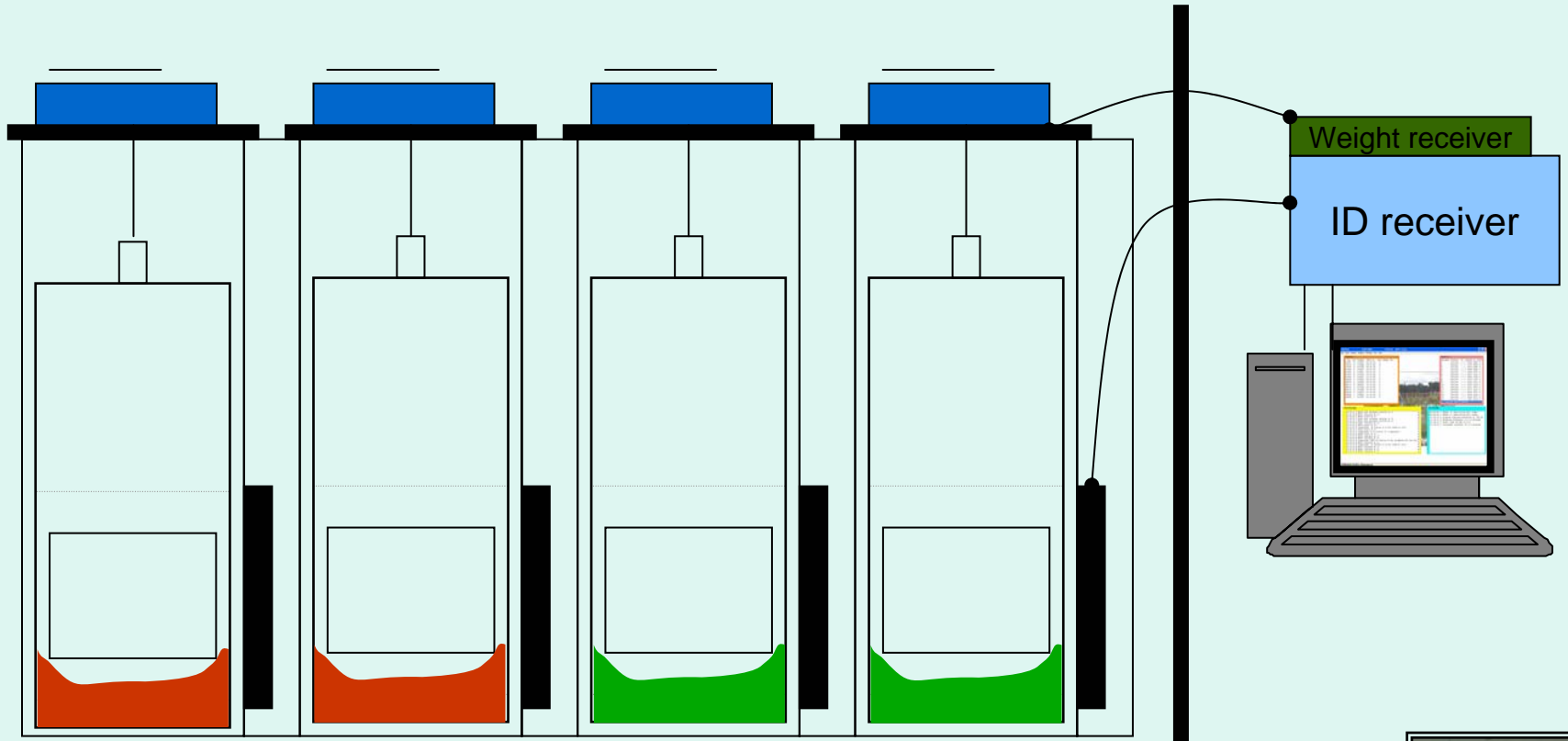
- Daily pen feed intake per food (kg/day)
 - Manual trough weights
- Individual piglet feeding behaviour:



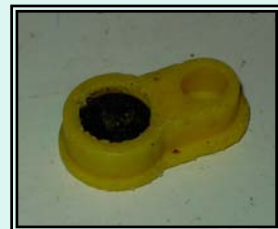
- Multi-spaced recording system
 - (Leeds University Pig INTake System (LUPINS))
- Feeding time (minutes) per animal at each trough.



Leeds University Pig INtake System (LUPINS)

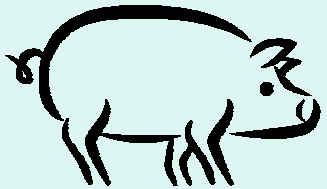


Individual transponder ear tag.



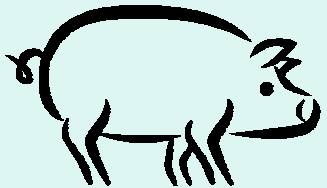
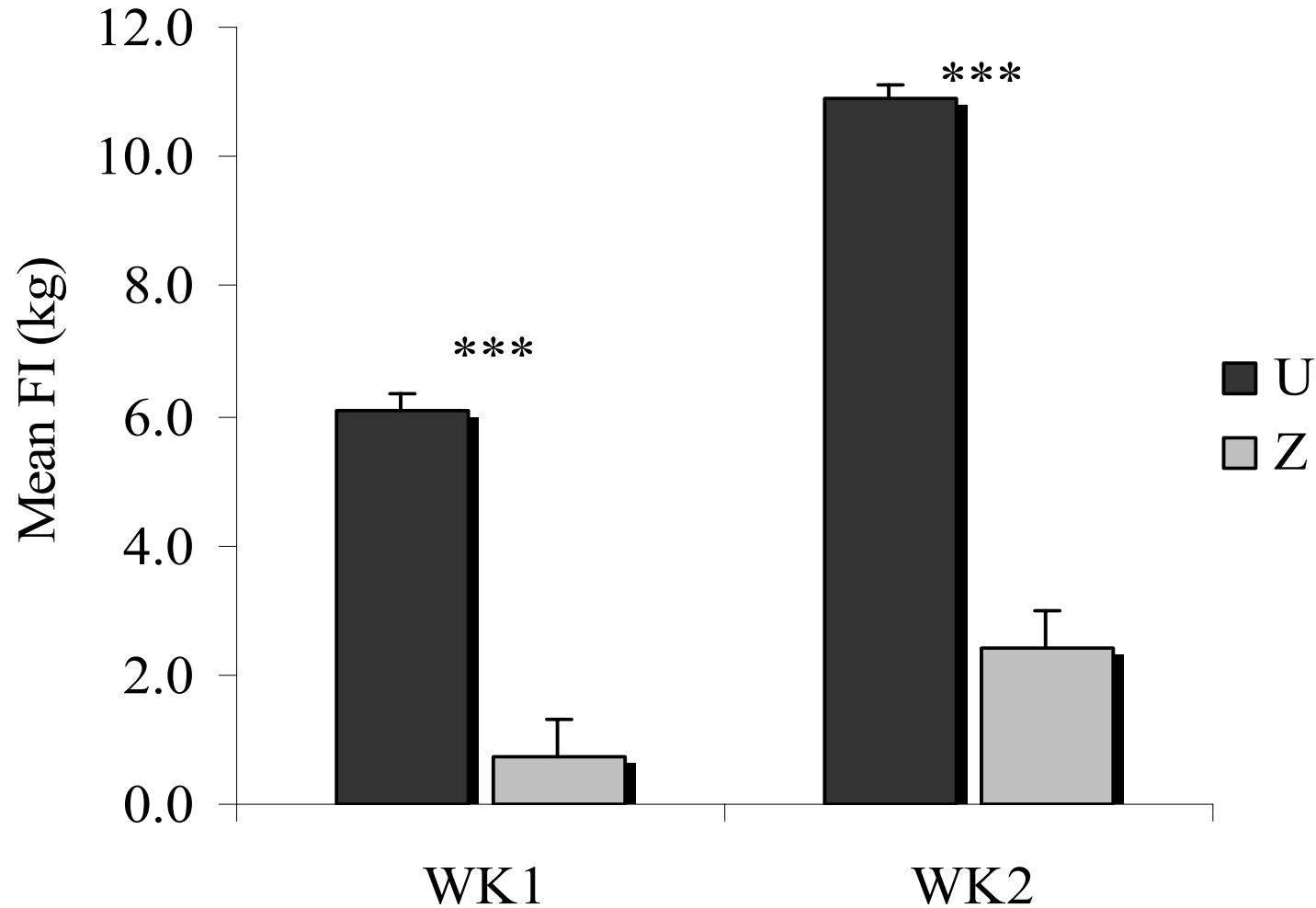


Results



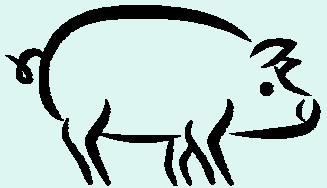
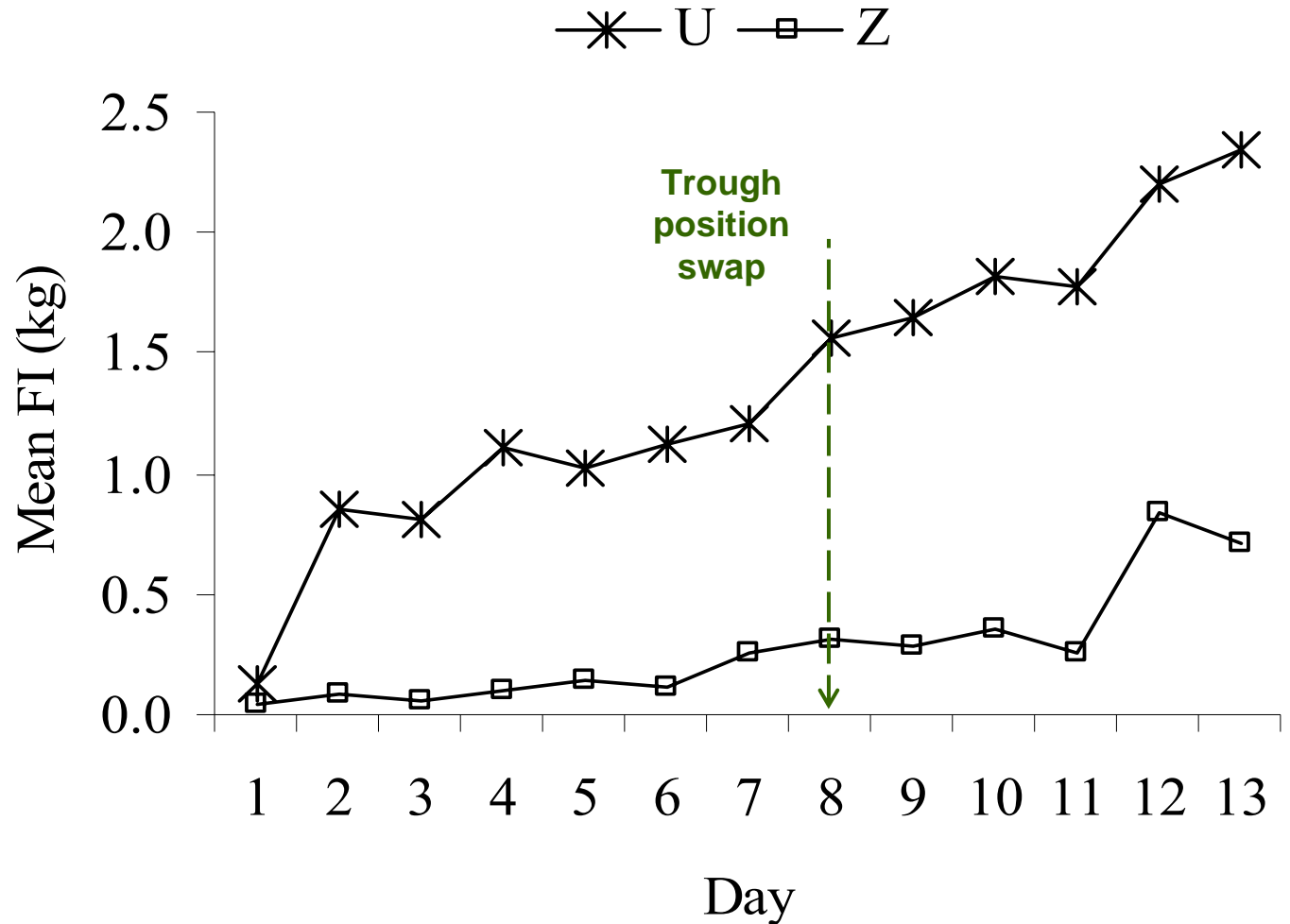
Total pen feed intake (kg/wk)

U = Unsupplemented
Z = ZnO (3.1g/kg).



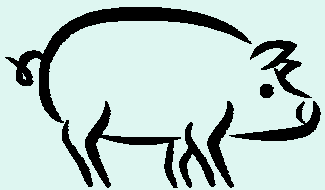
Daily Feed Intake (kg/day)

U = Unsupplemented
Z = ZnO (3.1g/kg).



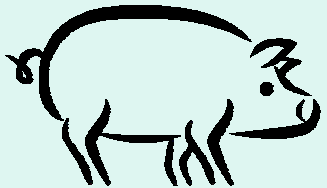
Scour and Performance

		Week 1		Week 2	
	%	ADG	sem	ADG	sem
Scouring	37	-0.020	0.014	0.286	0.020
Healthy	63	0.074	0.010	0.265	0.015
	p	<0.001		ns	



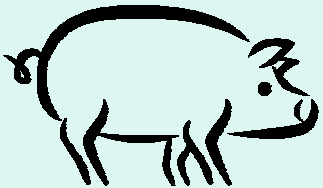
Scour and Choice

	Scouring	sem	Healthy	sem	p value
Week 1					
U	0.815	0.03	0.805	0.03	ns
Z	0.185	0.03	0.195	0.03	ns
Total U&Z (mins)	143.52	13.6	174.10	10.0	0.086
Week2					
U	0.765	0.04	0.762	0.03	ns
Z	0.235	0.04	0.238	0.03	ns
Total U&Z (mins)	215.76	20.3	216.940	15.0	ns



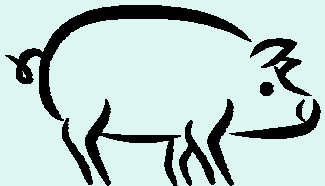
Discussion

- ZnO supplemented food rejected
 - Unpleasant taste?
- Despite aversion to ZnO, a nominal amount eaten
 - ‘Continuous’ sampling
- Food choice was unaffected by trough change
 - Rapid adaptation



Discussion

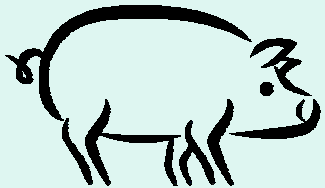
- Piglet growth was comparable to the gain of pigs fed a non ZnO diet at our facility (Miller & Slade, 2006)
 - Insufficient ZnO to experience a prophylactic effect.
- Scouring piglets grew more slowly than healthy piglets immediately post weaning
 - No selection for a pharmacological benefit.
- Pigs had no prior experience of ZnO benefits
 - Would prior experience result in a different choice?



Conclusions

Piglets displayed an immediate and consistent aversion to the ZnO supplemented food suggesting unpleasant organoleptic properties due to zinc oxide supplementation.

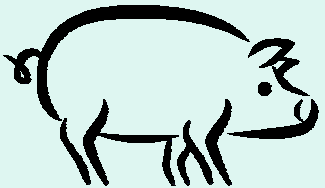
Food choice behaviour was unchanged due to incidence of scour, demonstrating the inability of scouring piglets to innately recognize the benefits associated with ingestion of a ZnO supplemented food.

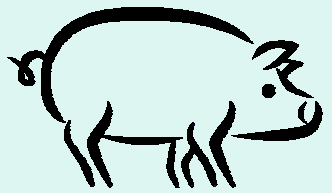


Acknowledgements

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Helen Miller
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Richard Slade
Siobhan Carroll
Kevin White





Proportional and absolute results of feeding time per food

		Week 1				Week 2			
		U %	Z %	U (mins)	Z (mins)	U %	Z %	U (mins)	Z (mins)
Body weight at weaning (kg)									
≤ 7.0	Small (n=19)	0.79	0.21	106.55	31.58	0.79	0.21	147.27	38.00
≥ 7.1 ≤ 8.0	Medium (n=20)	0.81	0.19	118.08	26.15	0.74	0.26	141.55	55.09
≥ 8.1	Large (n=21)	0.86	0.14	168.65	30.39	0.76	0.24	196.24	63.69
	sem	0.04	0.04	15.21	5.17	0.04	0.04	19.26	11.02
	p – value	ns	ns	0.055	ns	ns	ns	ns	ns
Gender									
	Female (n=28)	0.84	0.16	131.66	24.69	0.77	0.23	164.56	51.45
	Male (n=32)	0.80	0.20	130.53	34.05	0.76	0.24	158.81	53.07
	sem	0.03	0.03	10.61	3.60	0.03	0.03	13.43	7.69
	p - value	ns	ns	ns	0.072	ns	ns	ns	ns

