

9 Appendix

9.1 Slaughter trial

Table A1. pH in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days	SM	+AB	-AB	LF	HF
-6	6.6 \pm 0.3				
-4	6.7 \pm 0.1				
-2	6.6 \pm 0.0				
0	6.8 \pm 0.2				
1		6.9 \pm 0.3	7.0 \pm 0.3	6.7 \pm 0.3	6.7 \pm 0.3
2		6.8 \pm 0.3	6.4 \pm 0.3	6.6 \pm 0.3	6.6 \pm 0.3
5		6.5 \pm 0.3	6.4 \pm 0.3	6.6 \pm 0.3	6.8 \pm 0.3
8		6.8 \pm 0.1	6.8 \pm 0.1	6.23 \pm 0.1	6.2 \pm 0.1
15		6.5 \pm 0.4	6.9 \pm 0.4	6.3 \pm 0.4	6.8 \pm 0.4

Table A2. Dry matter (%) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days	SM	+AB	-AB	LF	HF
-6	12.92 \pm 3.54				
-4	9.89 \pm 1.96				
-2	13.06 \pm 1.63				
0	11.08 \pm 1.77				
1		12.57 \pm 2.19	10.83 \pm 2.19	8.71 \pm 2.19	8.67 \pm 2.19
2		6.46 \pm 2.38	10.41 \pm 2.38	10.15 \pm 2.38	8.15 \pm 2.38
5		4.99 \pm 1.97	6.98 \pm 1.97	8.05 \pm 1.97	6.95 \pm 1.97
8		6.41 \pm 1.40	4.32 \pm 1.40	7.37 \pm 1.40	7.63 \pm 1.40
15		8.60 \pm 1.77	6.34 \pm 1.77	9.88 \pm 1.77	7.83 \pm 1.77

Table A3. Ammonia content (mmol/l) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days	SM	+AB	-AB	LF	HF
-6	18.58 \pm 3.77				
-4	15.22 \pm 2.19				
-2	16.39 \pm 2.33				
0	17.60 \pm 2.61				
1		9.39 \pm 0.94	10.01 \pm 0.94	7.45 \pm 0.94	13.42 \pm 0.94
2		4.35 \pm 1.36	7.99 \pm 1.36	5.13 \pm 1.36	8.37 \pm 1.36
5		6.11 \pm 0.78	9.59 \pm 0.78	5.16 \pm 0.78	2.76 \pm 0.78
8		6.57 \pm 1.02	7.68 \pm 1.02	6.75 \pm 1.02	3.57 \pm 1.02
15		9.00 \pm 1.49	9.19 \pm 1.49	8.85 \pm 1.49	6.13 \pm 1.49

Table A4. *Enterobacteriaceae* counts (cfu/g digesta, VRBD agar) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days postweaning	SM	+AB	-AB	LF	HF
-6	6.8 \pm 0.7				
-4	7.2 \pm 0.9				
-2	7.4 \pm 0.3				
0	7.4 \pm 1.2				
1		6.80 \pm 0.31	7.65 \pm 0.31	7.45 \pm 0.31	8.35 \pm 0.31
2		7.15 \pm 0.57	6.70 \pm 0.57	6.75 \pm 0.57	8.48 \pm 0.57
5		7.80 \pm 0.37	8.25 \pm 0.37	7.80 \pm 0.37	8.20 \pm 0.37
8		7.70 \pm 0.55	7.80 \pm 0.55	8.22 \pm 0.55	7.93 \pm 0.55
15		7.05 \pm 0.79	6.40 \pm 0.79	8.15 \pm 0.79	6.83 \pm 0.79

Table A5. *Enterococci* counts (cfu/g digesta, SB agar) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days postweaning	SM	+AB	-AB	LF	HF
-6	4.5 \pm 3.0				
-4	6.8 \pm 1.4				
-2	5.7 \pm 2.1				
0	3.2 \pm 3.7				
1		4.75 \pm 0.76	6.35 \pm 0.76	6.58 \pm 0.76	6.58 \pm 0.76
2		2.80 \pm 0.68	5.70 \pm 0.68	6.18 \pm 0.68	6.52 \pm 0.68
5		2.53 \pm 0.94	8.38 \pm 0.94	4.45 \pm 0.94	4.55 \pm 0.94
8		3.48 \pm 0.89	4.53 \pm 0.89	4.28 \pm 0.89	3.58 \pm 0.89
15		4.23 \pm 1.20	4.53 \pm 1.20	5.00 \pm 1.20	4.68 \pm 1.20

Table A6. *Lactobacillus* spp. counts (cfu/g digesta, MRS agar) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days postweaning	SM	+AB	-AB	LF	HF
-6	8.9 \pm 0.3				
-4	8.6 \pm 0.6				
-2	9.0 \pm 0.3				
0	8.7 \pm 0.2				
1		6.65 \pm 0.65	7.83 \pm 0.65	7.63 \pm 0.65	6.88 \pm 0.65
2		7.98 \pm 0.43	8.90 \pm 0.43	8.55 \pm 0.43	8.34 \pm 0.43
5		8.08 \pm 0.43	8.65 \pm 0.43	8.45 \pm 0.43	8.13 \pm 0.43
8		8.05 \pm 0.21	7.88 \pm 0.21	8.40 \pm 0.21	8.74 \pm 0.21
15		8.70 \pm 0.77	8.02 \pm 0.77	8.48 \pm 0.77	7.58 \pm 0.77

Table A7. Yeast counts (cfu/g digesta, SG agar) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days postweaning	SM	+AB	-AB	LF	HF
-6	1.1 \pm 1.1				
-4	2.0 \pm 1.3				
-2	1.2 \pm 1.2				
0	1.8 \pm 1.1				
1		3.95 \pm 0.76	4.53 \pm 0.76	2.53 \pm 0.76	2.90 \pm 0.76
2		1.53 \pm 1.29	1.80 \pm 1.29	3.20 \pm 1.29	2.30 \pm 1.29
5		0.50 \pm 0.39	4.13 \pm 0.39	2.83 \pm 0.39	0.60 \pm 0.39
8		2.40 \pm 0.93	3.40 \pm 0.93	3.05 \pm 1.32	3.10 \pm 0.93
15		3.78 \pm 0.64	4.08 \pm 0.64	2.20 \pm 0.64	3.83 \pm 0.64

Table A8. Total VFA (mmol/L) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days postweaning	SM	+AB	-AB	LF	HF
-6	12.33 \pm 6.16				
-4	8.99 \pm 3.50				
-2	13.02 \pm 1.28				
0	8.33 \pm 0.49				
1		9.30 \pm 6.23	9.00 \pm 6.23	5.81 \pm 6.23	17.43 \pm 6.23
2		3.74 \pm 2.34	7.54 \pm 2.34	3.51 \pm 2.34	6.77 \pm 2.34
5		4.90 \pm 3.32	8.15 \pm 3.32	3.00 \pm 3.32	4.81 \pm 3.32
8		6.85 \pm 1.07	4.21 \pm 1.07	6.18 \pm 1.07	2.12 \pm 1.07
15		9.26 \pm 2.92	5.55 \pm 2.92	6.55 \pm 2.92	5.08 \pm 2.92

Table A9. Lactic acid content (mmol/L) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days postweaning	SM	+AB	-AB	LF	HF
-6	21.06 \pm 8.14				
-4	24.70 \pm 2.57				
-2	21.23 \pm 4.51				
0	8.22 \pm 2.38				
1		7.66 \pm 5.34	7.87 \pm 5.34	17.42 \pm 5.34	7.54 \pm 5.34
2		16.05 \pm 13.58	42.27 \pm 13.58	32.15 \pm 13.58	30.29 \pm 13.58
5		9.66 \pm 15.39	26.30 \pm 15.39	30.14 \pm 15.39	25.01 \pm 15.39
8		11.26 \pm 11.12	12.07 \pm 11.12	33.35 \pm 11.12	53.67 \pm 11.12
15		28.15 \pm 14.43	21.32 \pm 14.43	35.94 \pm 14.43	23.92 \pm 14.43

Table A10. Bacterial nitrogen (% total ileal N) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days postweaning	SM	+AB	-AB	LF	HF
-6	8.1 \pm 1.6				
-4	7.3 \pm 1.3				
-2	7.4 \pm 0.7				
0	8.5 \pm 2.1				
1		6.7 \pm 0.8	7.1 \pm 1.9	3.2 \pm 0.8	2.9 \pm 0.9
2		8.5 \pm 0.9	6.7 \pm 1.9	4.9 \pm 0.8	5.4 \pm 0.9
5		9.2 \pm 0.8	6.9 \pm 1.9	3.4 \pm 0.8	4.2 \pm 0.9
8		9.6 \pm 0.8	7.2 \pm 1.9	4.4 \pm 0.8	4.3 \pm 0.9
15		10.3 \pm 0.8	9.5 \pm 1.9	4.1 \pm 0.8	4.1 \pm 0.9

Table A11. Nitrogen content (%) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Days postweaning	SM	+AB	-AB	LF	HF
-6	7.10 \pm 0.37				
-4	5.87 \pm 0.92				
-2	5.31 \pm 1.06				
0	5.28 \pm 1.09				
1		4.94 \pm 0.72	4.86 \pm 0.75	3.78 \pm 0.72	3.99 \pm 0.72
2		4.26 \pm 0.29	4.58 \pm 0.24	2.50 \pm 0.24	2.66 \pm 0.24
5		4.22 \pm 0.31	4.32 \pm 0.31	2.55 \pm 0.31	2.57 \pm 0.31
8		3.83 \pm 0.43	4.65 \pm 0.43	2.94 \pm 0.43	2.07 \pm 0.43
15		4.06 \pm 0.66	5.40 \pm 0.66	2.96 \pm 0.66	2.19 \pm 0.66

Table A12. Amines (mg/kg ADM) in ileal digesta of suckling piglets and piglets postweaning, fed four diets (LSM \pm SE)

Day	SM	+AB	-AB	LF	HF
putrescine					
-6	114.64 \pm 67.43				
-4	137.74 \pm 73.63				
-2	45.26 \pm 23.94				
0	66.19 \pm 35.81				
1		22.46 \pm 32.69	22.11 \pm 16.93	19.63 \pm 18.14	23.31 \pm 37.79
2		35.26 \pm 37.73	63.07 \pm 16.93	31.23 \pm 18.14	82.21 \pm 37.79
5		70.91 \pm 32.69	47.01 \pm 16.93	50.68 \pm 18.14	50.47 \pm 37.79
8		67.43 \pm 32.69	40.36 \pm 16.93	57.52 \pm 18.14	111.96 \pm 37.79
15		33.12 \pm 32.69	33.98 \pm 16.93	80.92 \pm 18.14	61.68 \pm 37.79
histamin					
-6	181.06 \pm 39.51				
-4	186.43 \pm 169.53				
-2	251.92 \pm 202.23				
0	264.80 \pm 204.87				
1		25.28 \pm 26.33	17.81 \pm 17.38	49.26 \pm 20.51	21.79 \pm 29.49
2		96.28 \pm 37.23	72.53 \pm 17.38	77.14 \pm 20.51	69.90 \pm 29.49
5		57.52 \pm 26.33	54.77 \pm 17.38	75.40 \pm 20.51	48.52 \pm 29.49
8		26.63 \pm 26.33	36.51 \pm 17.38	77.40 \pm 20.51	95.66 \pm 29.49
15		96.28 \pm 26.33	43.68 \pm 17.38	96.41 \pm 20.51	87.03 \pm 41.70
cadaverine					
-6	15.87 \pm 6.67				
-4	81.86 \pm 86.02				
-2	33.02 \pm 29.12				
0	64.80 \pm 60.47				
1		13.13 \pm 16.71	11.92 \pm 11.18	15.86 \pm 28.46	16.77 \pm 51.03
2		29.10 \pm 20.07	48.06 \pm 11.18	26.79 \pm 28.46	111.81 \pm 51.03
5		38.17 \pm 16.71	35.76 \pm 11.18	45.53 \pm 28.46	44.38 \pm 51.03
8		29.78 \pm 16.71	32.19 \pm 11.18	37.60 \pm 28.46	107.50 \pm 51.03
15		38.93 \pm 20.07	30.32 \pm 11.18	94.39 \pm 28.46	66.34 \pm 51.03
spermidine					
-6	35.30 \pm 18.30				
-4	55.06 \pm 24.00				
-2	39.67 \pm 28.38				
0	47.48 \pm 11.79				
1		17.63 \pm 4.88	20.14 \pm 5.90	8.99 \pm 5.15	19.56 \pm 8.93
2		13.80 \pm 6.96	17.00 \pm 5.90	22.22 \pm 5.15	36.01 \pm 8.93
5		128.07 \pm 6.96	11.31 \pm 7.32	6.54 \pm 5.15	18.30 \pm 8.93
8		8.01 \pm 4.88	12.42 \pm 5.90	17.97 \pm 7.28	23.69 \pm 8.93
15		14.38 \pm 4.88	12.89 \pm 5.90	16.50 \pm 5.15	14.38 \pm 8.93
spermine					
-6	59.20 \pm 21.86				
-4	117.26 \pm 53.63				
-2	80.40 \pm 56.45				
0	133.75 \pm 27.20				
1		37.98 \pm 17.37	45.87 \pm 10.96	38.70 \pm 10.88	46.35 \pm 13.76
2		23.27 \pm 19.87	35.30 \pm 10.96	59.65 \pm 10.88	58.78 \pm 13.76
5		63.70 \pm 19.87	28.92 \pm 10.96	28.23 \pm 10.88	28.92 \pm 13.76
8		17.08 \pm 17.37	23.91 \pm 10.96	34.38 \pm 10.88	44.17 \pm 13.76
15		35.75 \pm 17.37	29.26 \pm 10.96	50.78 \pm 10.88	24.81 \pm 13.76

Table A13. Amino acid and D-alanine content in ileal digesta pre-and postweaning (g/16g N), over all days (LSM \pm SE)

Amino acids	SM	+AB	-AB	LF	HF
ASP	5.78 \pm 0.42	6.51 \pm 0.24	6.64 \pm 0.24	6.54 \pm 0.23	6.21 \pm 0.23
THR	4.53 \pm 0.30	3.84 \pm 0.15	4.02 \pm 0.15	4.41 \pm 0.15	4.12 \pm 0.15
SER	3.73 \pm 0.29	3.31 \pm 0.11	3.49 \pm 0.11	3.61 \pm 0.11	3.31 \pm 0.11
GLU	10.31 \pm 0.60	10.30 \pm 0.34	10.53 \pm 0.34	11.02 \pm 0.33	11.03 \pm 0.33
GLY	4.02 \pm 0.34 ^a	5.98 \pm 0.33 ^b	5.31 \pm 0.33 ^b	8.11 \pm 0.33 ^b	7.20 \pm 0.33 ^b
ALA	3.50 \pm 0.21 ^a	3.70 \pm 0.14 ^{ab}	3.78 \pm 0.14 ^{ab}	4.51 \pm 0.14 ^b	4.33 \pm 0.14 ^b
VAL	3.98 \pm 0.25 ^a	3.90 \pm 0.13 ^{ab}	4.01 \pm 0.13 ^{ab}	4.78 \pm 0.12 ^b	4.67 \pm 0.12 ^{ab}
ILE	2.67 \pm 0.14 ^a	2.88 \pm 0.11 ^{ab}	2.95 \pm 0.11 ^{ab}	3.18 \pm 0.11 ^b	3.21 \pm 0.11 ^b
LEU	4.42 \pm 0.30 ^a	4.97 \pm 0.17 ^{ab}	5.11 \pm 0.17 ^{ab}	5.40 \pm 0.17 ^b	5.56 \pm 0.17 ^b
TYR	3.18 \pm 0.23	2.98 \pm 0.20	3.20 \pm 0.20	3.09 \pm 0.20	2.90 \pm 0.20
PHE	2.15 \pm 0.16 ^a	2.79 \pm 0.10 ^b	2.87 \pm 0.10 ^b	3.25 \pm 0.10 ^b	3.22 \pm 0.10 ^b
HIS	1.24 \pm 0.08 ^a	1.58 \pm 0.05 ^b	1.58 \pm 0.05 ^b	1.89 \pm 0.05 ^b	1.84 \pm 0.05 ^b
LYS	4.04 \pm 0.26	3.81 \pm 0.15	3.92 \pm 0.15	3.72 \pm 0.15	3.92 \pm 0.15
ARG	1.75 \pm 0.13 ^a	2.91 \pm 0.11 ^b	3.03 \pm 0.11 ^b	3.23 \pm 0.11 ^b	3.09 \pm 0.11 ^b
PRO	6.22 \pm 0.37 ^a	4.19 \pm 0.18 ^b	4.09 \pm 0.18 ^b	5.59 \pm 0.18	4.74 \pm 0.18 ^b
CYS	2.01 \pm 0.20	1.39 \pm 0.19	1.33 \pm 0.19	2.39 \pm 0.17	2.61 \pm 0.17
MET	0.84 \pm 0.09	0.66 \pm 0.09	0.63 \pm 0.09	0.96 \pm 0.08	1.02 \pm 0.08
TRP	1.16 \pm 0.03	1.08 \pm 0.06	1.14 \pm 0.06	1.23 \pm 0.05	1.15 \pm 0.05
total AA	65.38 \pm 3.30 ^a	66.38 \pm 1.61 ^{ab}	67.30 \pm 1.61 ^{ab}	76.88 \pm 1.58 ^b	74.13 \pm 1.58 ^{ab}
D-alanine	0.48 \pm 0.04 ^a	0.54 \pm 0.03 ^{ab}	0.46 \pm 0.03 ^{ab}	0.24 \pm 0.03 ^b	0.25 \pm 0.03 ^b

Mean values with unlike superscripts in one line are significantly different (Tukey-test, P<0.05)