4.4 Comparison of balance trials pre- and postweaning

Parameters obtained from both balance trials were statistically compared with each other to assess the possible differences between piglets in pre- and postweaning period. Body weight was not compared, as it was obvious that, due to age, piglets of the preweaning trial have a marked lower BW than those postweaning.

DMI (g/kg BW $^{0.75}$) was lower in preweaning conditions, as one would expect, but only significantly lower compared to home-produced diets LF and HF. Nitrogen intake showed a similar trend, being significantly lower only for HF. For nitrogen excretion values of each postweaning diet proofed to be significantly higher than for milk replacer. Amino acid intake differed between piglets fed milk replacer and those fed starter diets. Most differences were detected between milk replacer and the reference diets +AB and –AB, being generally lower in reference diets, especially for +AB. Excretion of all amino acids in ileal digesta was significantly lower in animals receiving milk replacer compared to those fed the four different starter diets. Based on this apparent ileal digestibility of amino acids (AID_{AA}) were determined for each of the dietary treatments. Statistical analysis revealed significant higher AID_{AA} for each individual and the sum of amino acids in unweaned piglets fed milk replacer (Table 21).

AID_N and $AID_{AA\ total}$ was significantly higher in piglets before weaning compared to weaners receiving starter diets, values being at least 7 units higher.

For the sake of comparability we expressed endogenous and microbial N as g/100g protein and DM intake, respectively (Table 22). In this expression endogenous N was significantly lower before weaning, but between starter diets we could not proof statistical significant differences. For microbial N we observed, that starters were significantly higher than milk replacer, except for LF and comparing starters only, +AB and –AB were significantly higher than LF.

Table 21. Apparent ileal digestibility of amino acids in pigs pre- and postweaning

Amino acids	MR	+AB	-AB	LF	HF
ASP	97.1 ± 0.3 [a]	75.8 ± 1.6 [b]	76.1 ± 1.9 [b]	84.8 ± 1.7 [c]	80.1 ± 1.7 [bc]
THR	95.5 ± 0.4 [a]	76.2 ± 1.3 [b]	77.4 ± 1.6 [b]	87.2 ± 1.5 [c]	79.3 ± 1.5 [b]
SER	97.3 ± 0.2 [a]	80.9 ± 1.1 [b]	82.9 ± 1.3 [b]	89.4 ± 1.2 [c]	83.5 ± 1.2 [b]
GLU	98.3 ± 0.1 [a]	83.4 ± 1.0 [b]	83.0 ± 1.3 [b]	95.1 ± 1.1 [c]	90.2 ± 1.1 [d]
GLY	90.2 ± 1.1 [a]	75.8 ± 1.6 [b]	76.6 ± 2.0 [b]	84.4 ± 1.8 [c]	77.3 ± 1.8 [b]
ALA	92.4 ± 0.4 [a]	76.4 ± 1.9 [bc]	73.6 ± 2.3 [b]	83.5 ± 2.1 [c]	73.9 ± 2.1 [b]
* VAL	96.7 ± 0.2 [a]	77.0 ± 1.4 [bd]	74.7 ± 1.7 [b]	88.6 ± 1.5 [c]	81.5 ± 1.5 [d]
* ILE	97.3 ± 0.2 [a]	80.0 ± 1.3 [bd]	76.5 ± 1.6 [b]	89.6 ± 1.4 [c]	83.5 ± 1.4 [d]
* LEU	97.9 ± 0.2 [a]	81.3 ± 1.1 [b]	80.2 ± 1.3 [b]	90.7 ± 1.2 [c]	84.9 ± 1.2 [b]
TYR	97.5 ± 0.3 [a]	78.9 ± 1.7 [b]	84.2 ± 2.1 [b]	84.0 ± 1.8 [b]	83.7 ± 1.8 [b]
* PHE	97.9 ± 0.2 [a]	84.0 ± 1.0 [b]	82.5 ± 1.2 [b]	92.4 ± 1.1 [c]	86.8 ± 1.2 [b]
* HIS	97.4 ± 0.2 [a]	81.4 ± 1.0 [b]	83.2 ± 1.2 [bd]	91.3 ± 1.1 [c]	86.8 ± 1.2 [d]
* LYS	97.4 ± 0.2 [a]	83.6 ± 1.3 [b]	84.2 ± 1.5 [b]	91.7 ± 1.4 [c]	86.2 ± 1.4 [bc]
* ARG	96.5 ± 0.3 [a]	90.7 ± 0.5 [b]	90.9 ± 0.7 [bc]	93.0 ± 0.6 [c]	92.5 ± 0.6 [bc]
PRO	98.3 ± 0.2 [a]	80.9 ± 1.0 [b]	81.5 ± 1.3 [b]	93.3 ± 1.1 [c]	88.0 ± 1.1 [d]
CYS	93.5 ± 0.5 [a]	67.4 ± 1.8 [b]	75.3 ± 2.2 [b]	86.2 ± 1.9 [c]	74.7 ± 1.9 [b]
* MET	98.4 ± 0.2 [a]	85.8 ± 0.9 [b]	87.1 ± 1.1 [b]	90.8 ± 1.0 [b]	86.3 ± 1.0 [b]
* TRP	97.1 ± 0.5 [a]	70.9 ± 1.7 [b]	80.0 ± 2.0 [bc]	88.2 ± 1.8 [c]	80.2 ± 1.8 [b]
total amino acids	97.2 ± 0.2 [a]	80.6 ± 1.1 [b]	80.8 ± 1.4 [bc]	90.9 ± 1.2 [c]	85.2 ± 1.2 [b]

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

* essential amino acids

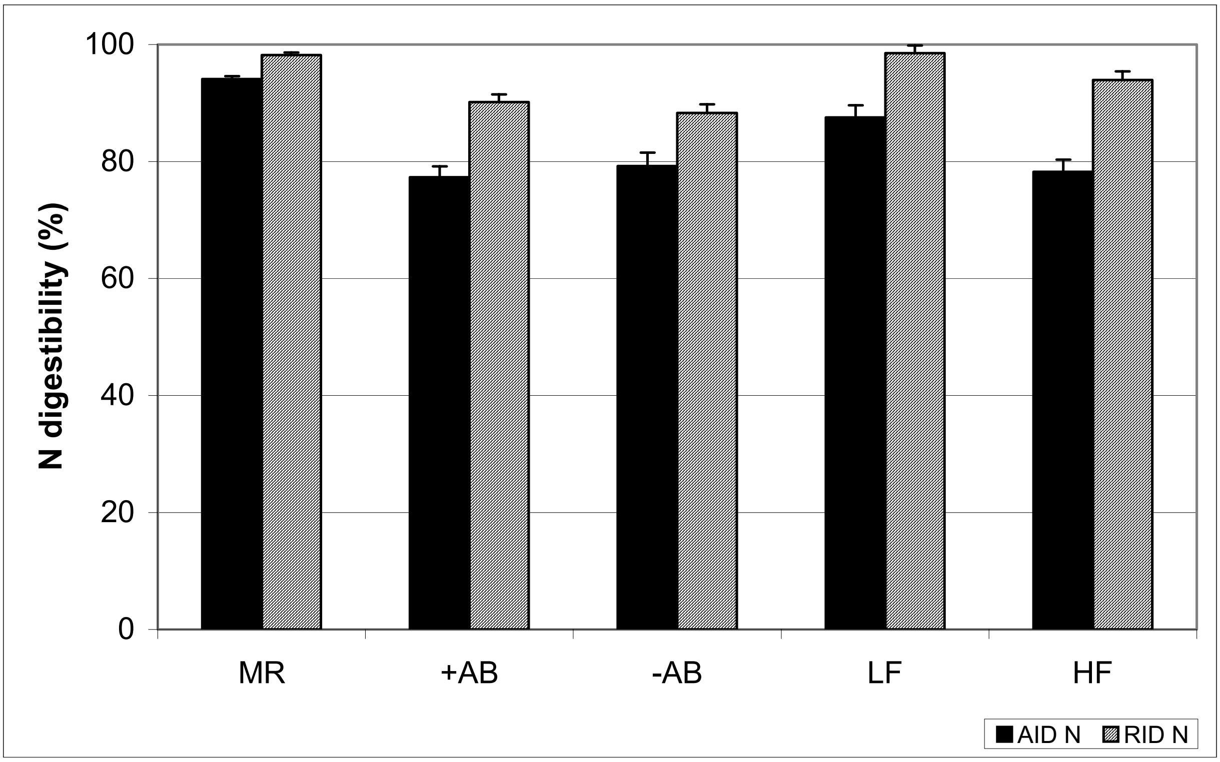
RID_N was significantly higher before weaning compared to the reference diets +AB and –AB. There was no significant difference between animals fed milk replacer and those with home-produced diets LF and HF. Apparent and real nitrogen digestibility at ileal level are given in Table 29.

Table 22. Endogenous and bacterial nitrogen in ileal content of piglets pre- and postweaning

Diet	Endogenous N (g/100 g CPI)	Endogenous N (g/100 g DMI)	Microbial N (g/100 g CPI)	Microbial N (g/100 g DMI)
MR	0.65 ± 0.04 [a]	0.17 ± 0.01 [a]	0.11 ± 0.05 [a]	0.03 ± 0.01 [a]
+AB	1.94 ± 0.26 [b]	0.46 ± 0.06 [b]	0.41 ± 0.13 [b]	0.10 ± 0.03 [b]
-AB	1.45 ± 0.30 [b]	0.34 ± 0.07 [b]	0.39 ± 0.07 [b]	0.09 ± 0.02 [b]
LF	1.76 ± 0.26 [b]	0.38 ± 0.06 [b]	0.18 ± 0.07 [ca]	0.04 ± 0.01 [ca]
HF	2.61 ± 0.30 [b]	0.61 ± 0.07 [b]	0.28 ± 0.13 [bc]	0.07 ± 0.03 [bc]

Mean values with unlike superscripts in one column are significantly different (P<0.05)

Figure 29. Apparent and real ileal digestibility of nitrogen in piglets pre- and postweaning



On the assumption, that 100 % total nitrogen consists of endogenous, microbial and dietary nitrogen, we calculated the proportion of the respective nitrogen source. Figure 30 shows the composition of total nitrogen at ileal level. There was but one significant difference in endogenous nitrogen contribution for –AB being significantly lower than milk replacer. The same applied for exogenous nitrogen contribution. We could not demonstrate statistical differences in bacterial nitrogen contribution. Comparison between the starters solely revealed that endogenous nitrogen was significantly lower in animals fed the reference diets +AB and –AB compared to LF. For microbial N the situation appeared vice versa, being higher in the reference diets than in HF.

Figure 30. Constitution of total ileal nitrogen in piglets pre- and postweaning (%)