

92. Calculated requirement of ME and pcD lysine in growing finishing boars

Kalkulierter Bedarf an ME und pcv Lysin von Mastberhybriden

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To prevent the risk of boar odour the castration of piglets is common practice, but associated with avoidable pain. Hence, fattening of boars is one viable alternative to improve animal-welfare and to enhance economic aspects, as boars evolve a decreased feed intake and a more efficient feed conversion ratio in comparison to barrows. In addition, the carcass of boars seems to have both lower fat and higher lean-meat content (1). Therefore, the aim of this study was to calculate the ME and precaecal digestible (pcD) lysine requirement of boars based on the overall results of joint research project.

Methods: In general, the estimation of the requirement of boars was based on the assumptions that live weight (LW), LW gain (LWG) and chemical composition of LWG are the primary determinants which are linked to the gross requirement via respective conversion factors (GfE 2008). The latter were assumed to apply for boars as well, while LWG and chemical body composition were experimentally determined for boars (2) and finally modelled by using the Gompertz-equation: $y = a \cdot \exp(-b \cdot \exp(-c \cdot t))$ where $y = LW$ (kg), $t =$ time (d) and a (asymptotic LW), b and c are regression coefficients. For determination of chemical body composition boar subsets of the growth experiments (3) were used and analysed for crude nutrients according to the methods of the VDLUFA.

Based on the modelled LWG and the progression of chemical composition in LWG the requirements were estimated using the equations by the GfE (4).

Results: The estimated initial, and the asymptotic (adult) LW amounted to ~26 kg ($t=0$) and 219 kg (a), respectively. The initial and final body protein contents of 159 g/kg LW and 166 g/kg LW corresponded to a LW range between 29 and 121 kg which was used for linear regression: body protein content (g/kg LW) = $157.7 + 0.0673 \cdot LW$ (kg). Body fat content was similarly evaluated (initial and final fat contents of 82 g/kg LW and 205 g/kg, respectively): body fat content (g/kg LW) = $51.98 + 1.2168 \cdot BW$ (kg). Based on these regressions the net requirements were modelled as a precondition for estimation of gross requirements according to GfE (4) (table).

LW	25- 30 kg	30- 35 kg	35- 40 kg	40- 45 kg	45- 50 kg	50- 55 kg	55- 60 kg
LWG (g/d)	733	801	855	903	941	973	955
pcD lys (g/d)	13.8	15.1	16.2	17.2	18.0	18.7	19.2
ME (g/d)	15.65	16.81	18.44	20.01	21.42	22.75	23.92
LW	60- 65 kg	65- 70 kg	70- 75 kg	75- 80 kg	80- 85 kg	85- 90 kg	90- 95 kg
LWG (g/d)	1005	1018	1029	1035	1037	1036	1031
pcD lys (g/d)	19.4	19.8	20.0	20.2	20.4	20.4	20.4
ME (g/d)	24.90	25.90	26.85	27.70	28.47	29.16	29.75
LW	95- 100 kg	100- 105 kg	105- 110 kg	110- 115 kg	115- 120 kg	120- 125 kg	
LWG (g/d)	1023	1008	991	970	947	919	
pcD lys (g/d)	20.4	20.2	19.9	19.6	19.3	18.8	
ME (g/d)	30.27	30.77	31.35	31.84	32.27	32.58	

The (total) ME and pcD lysine requirements were 2689 MJ (29.84 MJ/kg LW accretion) and 1956 g (21.7 g/kg LW accretion). While the calculated pcD lysine requirement agrees more or less with the recommendations of GfE (4) for barrows and gilts, the ME requirement of boars seemed to be markedly reduced which may result from a constant protein, but a parallel significantly reduced fat accretion.

Conclusion: The results demonstrate that growing finishing boars have only a little higher pcD lysine requirement compared to barrows and gilts whilst the decreased demand for ME might be due to the reduced body fat content. The findings present above are a result of a joint research project "Feeding of boars" (313-06.01-28-1-38.026-10 up to 313-06.01-28-1-38.031-10 BMEL) were fundamentals of recommendations for boar nutrition should be established in cooperation with several research institutes and economy partners.

1) Dobrowolski A., R. Höreth and W. Branscheid, (1995): *Schriftenreihe des Bundesministeriums für Ernährung, Landwirtschaft und Forsten*, Heft 449; „Die Ebermast“.

2) Müller S., L. Hagemann, M. Weber, A. Berk, A. Zeyner und K. Büsing (2014): *Züchtungskunde*, 86, (5/6) S. 400-419

3) Otten C., A. Berk, S. Müller, M. Weber und S. Dänicke, (2013): *Arch. Anim. Nutr.* 67, 6, 477-491.

4) GfE (2008)

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