Straw bedding affects growth performance and carcass fat distribution in grower-finisher pigs

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Inherent differences between the environments of conventional (C) and deep-litter (DL) pig housing systems are large and can affect the energy metabolism of the growing pig resulting in differences in growth and fat distribution (Trezona *et al.*, 2005). The presence of bedding is a major difference between C and DL housing. Bedding may affect energy metabolism in the pig via its thermal properties or via ingestion. The aim of this experiment was to quantify the effects of straw, as bedding and via ingestion, on growth and fat distribution in growing pigs.

Ninety-six Large White x Landrace female pigs were stratified by live weight (LW) (16.1±0.26 kg) at eight weeks of age into groups of six and housed in commercial grower-finisher pens within a naturally ventilated shed. The experiment was a 2x2 factorial design with two dietary treatments: 1) CD, commercial grower (13.4 MJ DE/kg 0.99% lysine, 17.6% NDF, 6.7% ADF) and finisher (13.0 MJ DE/kg, 0.68% lysine, 18.7% NDF, 7.8% ADF) diets and 2) SD, commercial grower-finisher diets fortified with 10% wheat straw (grower: 12.3 MJ DE/kg, 0.91% lysine, 22.5% NDF, 10.2% ADF; finisher: 11.9 MJ DE/kg, 0.63% lysine, 23.5% NDF, 11.2% ADF). Two floor treatments were also investigated: 1) CF, partially slatted concrete flooring and 2) SF, straw bedding as flooring (~15 cm thick). At 24 weeks of age pigs were slaughtered at a commercial abattoir and 24 hours after slaughter one side of the carcass, 12 pigs/treatment, was collected and analyzed for fat and lean content (dual energy X-ray absorptiometry). Data were analyzed by two-way analysis of variance (Genstat v8).

Pigs appeared to compensate for the energy dilution of the SD diet by increasing voluntary food intake (VFI), however there was no effect on feed conversion efficiency (FCE) ($P>0.10$). Increased gut-fill for SD fed pigs may partly explain results for FCE as pigs without access to straw had the lowest LW and pigs with straw bedding and fed the SD diet were the heaviest. Live weight was intermediate for pigs in the SD-CF and CD-SF groups. Nonetheless, pigs fed the SD diet and/or housed on bedding had higher CW and similar dressing percentage compared to pigs without access to straw indicating that actual gain was higher. It is probable that the thermal effect of bedding contributed to higher LW by reducing the pigs' energy demand for thermoregulation and sparing more energy for growth. There were no differences in P2 backfat depth ($P>0.100$) and total carcass composition. However, there was a trend ($P<0.10$) for the interaction between diet and floor to alter fat distribution in the belly and ham primals. These results suggest that the presence of straw may contribute to the growth and carcass differences observed between C and DL pigs.

Table 1. Growth and carcass characteristics of pigs raised in different housing treatments

						P-value		
	SD-CF	**SD-SF**	**CD-CF**	**CD-SF**	**SEM[1]**	**Diet**	**Floor**	**D*F**
VFI (kg/day)	2.53[b]	2.60[b]	2.38[a]	2.35[a]	0.055	0.003	0.697	0.963
LW (kg) at 24 weeks of age	115.1[b]	119.0[c]	110.4[a]	114.4[b]	1.59	0.005	0.023	0.963
Carcass weight (kg)	78.5	81.5	76.4	78.4	1.45	0.085	0.084	0.762
Dressing %	68.2	68.5	69.2	68.8	0.58	0.288	0.970	0.529
Fat % side	18.2	19.6	20.8	19.0	1.10	0.499	0.962	0.138
Fat % shoulder	14.0	14.1	15.7	14.3	0.62	0.214	0.462	0.169
Fat% loin	23.8	25.8	26.0	24.3	1.43	0.700	0.979	0.211
Fat% belly	29.5	32.7	33.7	31.6	1.60	0.635	0.430	0.099
Fat% ham	13.9	14.7	16.3	14.5	0.85	0.330	0.786	0.097

[1]SEM = pooled standard error of mean.

References

TREZONA, M., MULLAN, B.P., PLUSKE, J.R., PETHICK, D.W. and D'SOUZA, D.N. (2005). In 'Manipulating Pig Production X', p 277, ed J.E. Paterson. (Australasian Pig Science Association: Werribee).