Effects of dietary NE value, stocking density, feeder space and sex in grow-finish hogs

Miranda Smit[1], Xun Zhou[2], José Landero[2], Malachy Young[2], Eduardo Beltranena*[1]

[1]*Alberta Agriculture and Forestry,* [2]*Gowans Feed Consulting* *Eduardo.Beltranena@gov.ab.ca, 780-427-4567

Alberta Agriculture and Forestry

Background

We have previously shown that feeding low, constant net energy (2.1 Mcal NE) diets to growout hogs resulted in greater revenue than feeding higher NE levels (2.2, 2.3, 2.4 Mcal), but pigs must be able to increase feed intake to make up for the lower dietary energy density. However, this might be difficult in crowded pens. Feeder access or # of feeder spaces/pen may also affect feed intake. To establish the relationships among dietary NE level, stocking density, feeder space and sex, we studied the effects of these parameters and their interactions in grow-finish hogs.

Our objective

The objective of this study was to compare the growth performance and carcass traits of grow-finish barrows and gilts fed low (2.2 Mcal) or high (2.35 Mcal) NE levels, with 2 or 3 feeder spaces/pen, and housed at 2 stocking densities (18 vs. 22 pigs).

What we did

- We conducted this commercial-scale pig trial at a contract grower barn set up as a test facility (Lougheed, AB).
- 960 barrows and 960 gilts (~31 kg BW) were housed in 96 pens by sex, 18 or 22 pigs per pen.
- Barrows and gilts were fed two NE levels: low (2.20 Mcal/kg) or high (2.35 Mcal/kg) over 5 growth phases.
- Within each growth phase, diets were formulated to equal g SID Lys/Mcal NE.
- Low NE diets were based on wheat/barley , whereas high NE diets were based on wheat and field pea with some canola oil.
- Pen BW and feed disappearance (ADFI) were measured for each growth phase, biweekly from start of shipping for slaughter, and at slaughter weight (130 kg).
- Pigs were slaughtered at Maple Leaf (Brandon, MB). Individual warm carcasses were weighed and graded (Destron).

What we observed

Effects on growth performance

For the overall trial, hogs fed low NE diets consumed 111 g/d more feed (P<0.001), but gained 9 g/d less (P<0.10) than those fed high NE diets. Feed intake was 44 g/d greater (P<0.10) for pens with 18 vs. 22 hogs and 62 g/d greater (P<0.010) for pens with an extra feeder. Hogs grew 29 g/d more (P<0.001) in pens with 18 vs. 22 pigs and 13 g/d more (P<0.050) with an extra feeder. G:F was 15 g/kg lower (P<0.001) in hogs fed low vs. high NE diets and 4 g/kg greater (P<0.10) in pens with 18 vs. 22 hogs. Feeder space did not affect G:F. (Figure 1).

Effects on carcass traits

NE value and stocking density affected both ship weight and days to shipping (Table 1). Therefore, days to 130 kg BW was estimated. Hogs fed low vs. high NE diets took 1.6 days longer (P<0.050) and hogs in 22-pig pens vs. 18-pig pens took 3.4 days longer (P<0.001) to reach 130 kg BW. Hogs fed low vs. high NE diets had 69 g lighter (P<0.050) carcass wt. Dietary NE level, stocking density and feeder space had no effect on dressing %, backfat depth, loin depth or pork yield. (Table 1).

Effects on economics

Diet cost averaged $21.87 per tonne less (P<0.001) feeding low vs. high NE diet. Income margin after subtracting feed cost (ISFC) per hog was $1.82 greater feeding low vs. high NE diet; and $1.98 greater for 18 vs. 22 pigs/pen (Table 2). Amount of feeder spaces did not affect ISFC (Table 2).

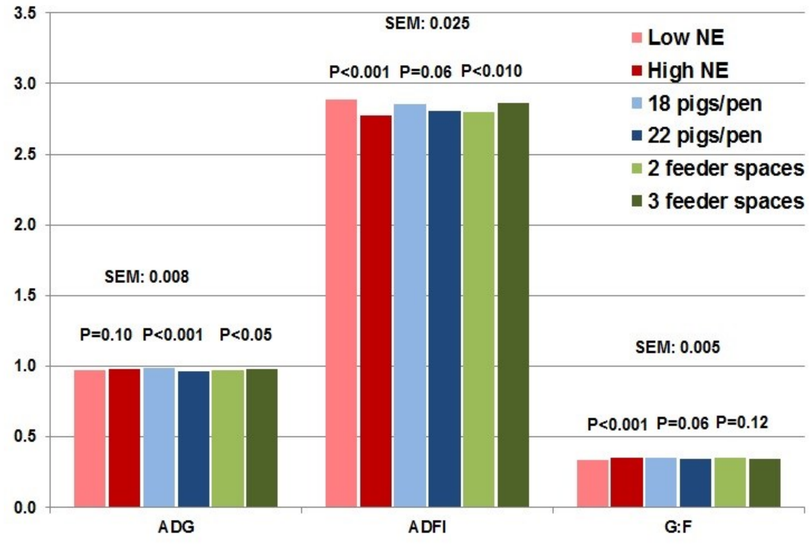

Figure 1. Effect of dietary NE level, feeder space and stocking density on growth performance

Table 1. Effect of dietary NE level, stocking density and feeder space on carcass traits

	NE value		Stocking density		Feeder spaces		SEM	P-value		
	2.20	2.35	18	22	2	3		NE	Stock	Feeder
Days to ship	24.5	22.9	22.7	24.7	24.1	23.1	1.5	0.055	<0.050	0.376
Ship wt	129.3	130.1	130.3	129.1	129.8	129.7	0.7	<0.050	<0.010	0.756
Days to 130 kg BW	24.9	23.3	22.4	25.8	24.5	23.7	0.8	<0.050	<0.001	0.224
Carc wt	102.02	102.71	102.56	102.17	102.47	102.25	0.31	<0.050	0.270	0.522
Dressing	78.67	78.71	78.60	78.78	78.87	78.51	0.16	0.856	0.450	0.112
BF	18.45	18.85	18.82	18.49	18.59	18.71	0.61	0.211	0.314	0.710
LD	61.54	62.27	62.13	61.68	61.90	61.91	0.69	0.108	0.320	0.984
Lean yield	60.75	60.60	60.62	60.73	60.70	60.65	0.22	0.349	0.493	0.728
Index	108.45	108.93	108.80	108.58	108.64	108.74	0.23	<0.050	0.235	0.601

Table 2. Effect of dietary NE level, stocking density and feeder space on feed cost and gross income margin subtracting feed cost (ISFC) in CA$

	NE value		Stocking density		Feeder spaces		SEM	P-value		
	2.20	2.35	18	22	2	3		NE	Stock	Feeder
$/tonne	211.14	233.01	222.15	222.00	222.09	222.06	6.06	<0.001	0.754	0.951
$/pig	64.74	68.08	66.34	66.48	66.11	66.71	5.35	<0.001	0.742	0.148
$/kg BW gain	0.63	0.66	0.64	0.65	0.64	0.65	0.01	<0.001	0.052	0.202
ISFC/pig	71.88	70.06	71.96	69.98	71.44	70.51	24.31	<0.050	<0.010	0.206

Take home message

A lack of interactions between dietary NE value, stocking density and feeder space indicates that lower NE diets can be fed to hogs even if they are crowded. Lower NE diets resulted once again in greater profitability. An extra feeder space/pen did not boost profitability further.

Acknowledgements

This research was funded by

Swine Innovation Porc