

The Effects of Compensatory Growth on Feed Intake and Production Efficiency

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Introduction

There is evidence (Therkildsen et al., 2002) that restrictive feeding (growing phase), can stimulate compensatory gain during the finishing period. The authors also indicated that feed digestibility, efficiency of protein (meat) synthesis and measurements of meat quality were improved when pigs were limit fed during the growing period. They hypothesized that a faster growing pig (compensatory gain) could be conducive to an improved meat tenderness and quality.

This trial was designed to further investigate the performance and economic ramifications of limit feeding during the growing phase. Carcass and meat quality estimates were also measured to determine if limit feeding improves meat tenderness while reducing fat deposition.

Objectives:

The project will evaluate the effects of feeding strategy (full versus limit feeding) and gender (gilt versus barrow) based on growth performance, feed intake, carcass and meat quality and economic returns. The following objectives will be specifically addressed:

- 1) To determine the effects of feeding strategy (full versus limit feeding) on pig performance, feed intake and efficiency, carcass and meat characteristics and economic returns.
- 2) To determine the effects of gender (gilt versus barrow) on pig performance, feed intake and efficiency, carcass and meat characteristics and economic returns.
- 3) To determine if there are interactions between feeding strategy and gender for pig growth rate, feed intake and efficiency, carcass/meat characteristics and economic returns.

Experimental Procedures:

One hundred and eight feeder pigs (30 kg - average weight) were randomly assigned to eighteen pens with six pigs per pen. A specific gender (gilt or barrow) and feeding strategy was assigned to each pen to provide three replications (pens) for each treatment combination.

- 1) **Control Group (ad lib feeding):** - Grower diet based on corn, SBM, and vitamin/mineral premix (18% crude protein; 0.9% lysine) was fed *ad libitum* until the pigs were marketed. The same diet formulation was used for all 3 feeding strategy groups.
- 2) **Limit Fed Group (85% of control):** - Feed allocations on a pen basis were limited to 85% of *ad libitum* feed intake (control group) until the pigs weighed 60 kg – pigs were then fed *ad libitum* until they are marketed.
- 3) **Limit Fed Group (70% of control):** - Feed allocations on a pen basis were limited to 70% of *ad libitum* feed intake until the pigs again weighed 60 kg – pigs were then fed *ad libitum* until they were marketed.

Feed intake and live pig weights were recorded weekly. They were marketed on an individual animal basis when they weighed approximately 110 kilograms (107 to 113 kg

range). Ultrasound measurements of backfat and loin depths were taken at the start, in the middle and before the pigs were marketed. Carcass measurements were recorded at the abattoir with a loin section cut into chops for determination of drip loss, lean colour, intramuscular fat, tenderness (Warner-Bratzler shear force) and pH. Differences in growth rate, feed intake and efficiency (growing and finishing phases and from start of the growing phase to slaughter), carcass and meat quality characteristics are presently being analyzed.

Results to date:

Preliminary results are summarized in Table 1 for growth rate and feed intake. Carcass and meat quality differences will be available in the near future. Compensatory gain was observed during the finishing period (> 60 kg) when limit feeding was practiced during the growing phase. Compensatory gain resulted in a similar number of days to market and an improved feed efficiency (control versus 70% feed intake).

Table 1. Effects of feeding strategy and gender on pig growth performance and feed intake.

	Feeding Level			Gender	
	Control	85% Feed Intake	70% Feed Intake	Barrow	Gilt
Growth Performance and Feed Intake					
Ave. Final Wt. (kg)	108.4	107.9	108.3	109.2	107.3
Days to Market	73.1	74.1	72.3	70.5 ^d	75.9 ^e
Average Daily Gain (kg)	1.03	1.03	1.05	1.09 ^d	0.99 ^e
ADG – growing (kg)	1.06 ^a	1.00 ^a	0.89 ^b	1.00	0.97
ADG – finishing (kg)	1.02 ^a	1.06 ^a	1.16 ^b	1.16 ^d	1.00 ^e
Total Feed Intake (kg)	197.6 ^a	197.2 ^a	182.8 ^b	194.8	190.3
Feed Intake (kg/d)	2.7 ^a	2.6 ^a	2.5 ^b	2.7 ^c	2.5 ^d
Feed intake growing (kg/d)	2.4 ^a	2.1 ^b	1.7 ^c	2.1	2.1
Feed to Gain (F/G)	2.9 ^{ab}	3.0 ^a	2.7 ^b	2.9	2.8

^{a,b,c} LS means within row for feeding level that do not share a common superscript differ ($p < 0.05$).

^{d,e} LS means within row for gender that do not share a common superscript differ ($p < 0.05$).

References

Therkildsen, M., B. Riis, A. Karlsson, P. Ertbjerg, P. P. Purslow, M. Dall Aaslyng, and N. Oksbjerg. 2002. Compensatory growth response in pigs, muscle protein turn-over and meat texture: effects of restriction/realimentation period. *Anim. Sci.* 75:367-377.

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