

LeanFuel®

Responses to feeding higher levels of dried distiller grains with solubles (DDGS) for gilts and barrows, when supplemented with plant extracts (LeanFuel®)

F. B. Sandberg, S. J. England, and M. R. Bible

Furst-McNess Company, Freeport, IL

Journal of Animal Science, Volume 94, Issue suppl_2, April 2016, Page 97

Abstract

The objective of this study was to determine the effects of feeding a diet with 50% dried distiller grains with solubles either unsupplemented (Control) or supplemented with 2.5 lbs LeanFuel® per ton of complete feed in gilts and barrows from a high lean genetic. The experiment lasted for 83 days and was conducted at a commercial research facility with 986 pigs (493 gilts and 493 barrows), weighing 82.9 lbs at the beginning of the trial, and allocated to Control-Barrow (number=8 pens), Control-Gilt (n=8 pens), LeanFuel®-Barrow (n=9 pens) and LeanFuel®-Gilt (n=9 pens), where pens were blocked by weight, sex and location in the barn. A FANCOM feed weighing system measured feed delivered to the individual pens, and weight of pigs and feed disappearance were measured on day 0, 14, 28, 42, 56, 70 and 83. Weights and feed were used to calculate Average Daily Gain (ADG), Average Daily Feed Intake (ADFI) and Feed Conversion Rate (FCR). Data were analyzed as a completely randomized design as a 2x2 factorial using General Linear Model (GLM) in Minitab with Tukey's test to determine differences between dietary treatments. For day 83 Body Weight, there was a treatment x sex interaction. The Control-Gilt (230.4 lbs) weighed less ($P < 0.001$) than Control-Barrow (244.0 lbs), LeanFuel®-Barrow (244.0 lbs) and LeanFuel®-Gilt (237.9 lbs). For day 0-83, the pigs fed LeanFuel® (1.90 lbs) tended ($P < 0.10$) to have a higher ADG than the pigs fed Control (1.86 lbs). Also, the barrows (1.94 lbs) gained more ($P < 0.001$) compared to the gilts (1.86 lbs). There was a treatment x sex interaction ($P < 0.05$) for day 0-83 ADG. The LeanFuel®-Barrow (1.94 lbs) and Control-Barrow (1.93 lbs) gained more weight than the LeanFuel®-Gilt (1.86 lbs), and the LeanFuel®-Gilt had a higher ADG compared to the Control-Gilt (1.78 lbs). The Barrows (5.65 lbs) had a higher ADFI ($P < 0.001$) compared to the Gilts (5.24 lbs). The pigs fed the Control (5.36 lbs) consumed less feed ($P < 0.05$) compared to the pigs fed LeanFuel® (5.53 lbs). There was no treatment x sex interaction ($P > 0.10$) for ADFI. There were no significant effects on Feed Conversion Rate (Control-Barrow=2.90, LeanFuel®-Barrow=2.94, Control Gilt= 2.88, LeanFuel®-Gilt=2.88; $P > 0.10$) for day 0-83. In conclusion, in high dried distiller grains with solubles diets LeanFuel® significantly improved growth rate of gilts, and could be used as a tool to allow higher levels of dried distiller grains with solubles to be fed to gilts, to reduce feed input costs, without loss of performance.

Background

- LeanFuel® is a Patent Pending blend of plant extracts, vitamins and minerals. LeanFuel® is designed to support feed intake and maintain performance and health in finishing pigs.
- High fiber diets are known to reduce feed intake, and we wanted to investigate whether LeanFuel® could maintain feed intake.
- Gilts and Barrows may be affected differently by fiber levels.

Objective

The objective of this study was to determine the effects of feeding a diet high in fiber containing 50% dried distiller grains with solubles, either with or without 2.5 lbs LeanFuel® per kg of complete feed, in both gilts and barrows from a high lean genetic (Pietrain cross).

Treatments

- Control-Barrow – Barrows fed Negative Control
- Control-Gilt – Gilts fed Negative Control
- LeanFuel®-Barrow – Barrows fed LeanFuel®
→ 2.5 lbs of LeanFuel® per ton of feed
- LeanFuel®-Gilt – Gilts fed LeanFuel®
→ 2.5 lbs of LeanFuel® per ton of feed

Materials & Methods

- 986 high lean genetic (Pietrain cross), commercial pigs (initial Body Weight 82.9 lbs)
- Blocked by weight, sex and location
- Housed in a commercial wean-to-finish barn
- 83-day study
- 4 treatments (8-9 reps/trt)
- FANCOM feeding system
- Diets, in meal form, met or exceeded 2012 NRC requirements

Performance

- Pens of pigs weighed on day 0, 14, 28, 42, 56, 70 and 83
- Feed disappearance measured
- ADG, ADFI, and FCR calculated

Statistical Analysis

- CRD
→ 2x2 factorial
 - No LeanFuel® vs. LeanFuel®
 - Barrows vs. Gilts
- Minitab
→ General Linear Model (GML) procedure
→ Tukey's test to determine differences
- Experimental Unit = pen
- Means reported as Adjusted Means

Table 1: Composition of Phase 1 (60-100 lbs).

Ingredient	Control	LeanFuel®
Corn	927	924.5
DDGS	700	700
Soybean Meal	290	290
Choice White Grease	30	30
Limestone	28	28
Other ¹	25	25
LeanFuel®		2.5
TOTAL	2000	2000

¹Other – salt, vitamin and trace mineral premix, L-lysine HCl, DL-methionine, L-threonine, L-tryptophan and phytase.

Table 2: Composition of Phase 2 (100-160 lbs).

Ingredient	Control	LeanFuel®
Corn	765	762.5
DDGS	1000	1000
Soybean Meal	155	155
Choice White Grease	30	30
Limestone	27	27
Other1	23	23
LeanFuel®		2.5
TOTAL	2000	2000

¹Other – salt, vitamin and trace mineral premix, L-lysine HCl, DL-methionine, L-threonine, L-tryptophan and phytase.

Table 3: Composition of Phase 3 (160-200 lbs).

Ingredient	Control	LeanFuel®
Corn	873.5	871
DDGS	1000	1000
Soybean Meal	55	55
Choice White Grease	25	25
Limestone	25	25
Other1	21.5	21.5
LeanFuel®		2.5
TOTAL	2000	2000

¹Other – salt, vitamin and trace mineral premix, L-lysine HCl, DL-methionine, L-threonine, L-tryptophan and phytase.

Table 4: Composition of Phase 4 (200-240 lbs).

Ingredient	Control	LeanFuel®
Corn	930	927.5
DDGS	1000	1000
Choice White Grease	25	25
Limestone	24	24
Other1	21	21
LeanFuel®		2.5
TOTAL	2000	2000
TOTAL	2000	2000

¹Other – salt, vitamin and trace mineral premix, L-lysine HCl, DL-methionine, L-threonine, L-tryptophan and phytase.

Results

Table 5: LeanFuel® positively impacted performance parameters, even when using high levels of fiber (DDGS)

Growth Performance						P-value		
day 0-83	Control-Barrow	Control-Gilt	LeanFuel®-Barrow	LeanFuel®-Gilt	SE	Trt	Sex	TxS
Body Weight, lb	244.0 ^a	230.4 ^b	244.0 ^a	237.9 ^a	5.0	0.039	<0.001	0.037
ADG, lb	1.93 ^a	1.78 ^c	1.94 ^a	1.86 ^b	0.05	0.015	<0.001	0.027
ADFI, lb	5.59	5.13	5.70	5.36	0.22	0.032	<0.001	0.414
FCR	2.90	2.88	2.94	2.88	0.12	0.629	0.395	0.553

^{a,b,c}Means with different superscripts in the same row differ at P<0.05.

Conclusion

- Body Weight
 - LeanFuel® fed pigs had a higher Body Weight compared to Control.
 - Gilts were lighter than Barrows.
 - Treatment by Sex Interaction where Control-Gilt were lighter in contrast with Control-Barrow, LeanFuel®-Barrow, and LeanFuel®-Gilt.
- Average Daily Gain (ADG)
 - Pigs fed LeanFuel® had a higher ADG than Control.
 - Barrows gained more per day compared to Gilts.
 - LeanFuel®-Gilt had a lower ADG than the LeanFuel®-Barrow and Control-Barrow, but LeanFuel®-Gilt had a higher ADG than Control-Gilt.
- Average Daily Feed Intake (ADFI)
 - LeanFuel® fed gilts had a higher ADFI compared to Control fed Gilts (0.23 lbs/day), but intake was not increased as greatly in barrows fed LeanFuel® (0.11 lbs/day), which may have been due to bulk fiber constraints being reached in the barrows.
- With the relatively high protein requirement of gilts, LeanFuel® could be used to allow feeding greater levels of dried distillers grains with solubles in gilt rations to reduce feed costs, without loss of performance.
- Full paper: <https://doi.org/10.2527/msasas2016-204>