

LeanFuel®

Effects of a blend of phytonutrients (LeanFuel®) on performance and market weight in finisher pigs during the late finishing phase when compared to 1500 kcal and 1600 kcal diets

M.R. Bible, J.Y. Jacela, S.J. England, T.M. Fakler, K.T. Soltwedel and F.B. Sandberg

Furst-McNess Company, Freeport, IL

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Abstract

The objective of this study was to determine the effects of LeanFuel® on performance in finishing pigs when compared to Negative Control (1500 kcal) and Positive Control (1600 kcal) diets. A total of 769 EBX Ultra finisher pigs (Average Body Weight=204.8 lbs) were randomly allocated to Negative Control, Positive Control and Negative Control + 5 lbs LeanFuel®. All diets met or exceeded NRC requirements. Pigs were allocated by sex, body weight, and pigs per pen (21 to 33 pigs/pen) and 10 replications/treatment. Pens of pigs were weighed and feed disappearance was recorded on day 0, 21, and 37, which were used to calculate Average Daily Gain (ADG), Average Daily Feed Intake (ADFI), and Feed:Gain Ratio (F:G). Body Weight was calculated by taking the pen weight divided by the pigs per pen. Pigs were marketed for slaughter on day 28 and 37. On day 28 the 4 largest pigs were marketed from all pens across all treatments, and the remainder in each pen were marketed on day 37. All data were analyzed using the MIXED procedure of SAS with a randomized complete block design. Pen served as the experimental unit for growth performance, health status, and market weight. Pig served as the experimental unit for carcass characteristics. Differences among treatments were considered significant when $P \leq 0.05$. During day 0–21, prior to 1st marketing, there was no difference in ADG amongst treatments, including no difference between Negative Control and Positive Control. After the 1st marketing ADFI was affected by treatment ($P < 0.05$) with it being greatest for LeanFuel® (6.17 lbs/day) which was greater than Positive Control (5.91 lbs/day) that in turn was greater than Negative Control (5.80 lbs/day). Growth rate was the same for LeanFuel® (2.07 lbs/day) and Positive Control (2.05 lbs/day) and numerically greater than Negative Control (1.93 lbs/day). F:G was higher ($P < 0.05$) for Positive Control (2.88) than both Negative Control (2.99) and LeanFuel® (2.97). Hot carcass weight for the first cut was affected by treatment with Positive Control (210.3 lbs) and LeanFuel® (205.7 lbs) being greater ($P < 0.01$) than Negative Control (200.4 lbs). For the 2nd marketing Positive Control (203.5 lbs) was greater ($P < 0.01$) than both Negative Control (196.9 lbs) and LeanFuel® (198.9 lbs). Overall carcass weight was greater ($P < 0.01$) for Positive Control (205.2 lbs) than LeanFuel® (200.6 lbs) and Negative Control (198.0 lbs). This trial suggests that high energy diets and LeanFuel® may be beneficial for increasing ADFI, ADG and market weight in late finishing pigs.

Background

LeanFuel® is a blend of phytonutrients that support performance in pigs. Previous research has shown that it supports health and livability of pigs in late-finishing.

Objective

The objective of this experiment was to determine the effects of LeanFuel® on finishing pig performance when compared to low-energy (1500 kcal) and high-energy (1600 kcal) diets.

Materials & Methods

Experimental Design

- 769 finishing pigs (EBX Ultra; Body Weight=204.8 lbs)
- Pigs were allotted to 3 dietary treatments by sex and body weight in a randomized complete block design
- 21–33 pigs/pen
- Pigs were weighed by pen and feed disappearance recorded on day 0, 21, and 37 to calculate ADG, ADFI, and F:G.
- Pigs were marketed on day 28 and 37 and carcass data collected.

Dietary Treatments

- Negative control (1500 kcal)
- Positive control (1600 kcal)
- Negative control + 5 lbs LeanFuel®

Statistical Analysis

- All data were analyzed using the MIXED procedure of SAS with a randomized complete block design.
- Pen was the experimental unit for growth performance, health status, and market weight.
- Pig was the experimental unit for carcass characteristics.
- Differences among treatments were considered significant when $P \leq 0.05$.

Diets

Table 1: LeanFuel® contains no added fat.

Item, %	Negative Control 1500 kcal	Positive Control 1600 kcal	LeanFuel®
Corn	1330	1243.6	1327
DDGS	400	400	400
SBM	232	238	232.2
Limestone	19.2	18.8	17.2
Salt	8	8	8
L-Lys HCl	5.6	5.6	5.6
VTM	3	3	3
Ronozyme	1	1	1
Monocalcium phosphate	0.8	1.6	0.6
L-Thr	0.4	0.6	0.4
Choice white grease	0	79.8	0
LeanFuel™	0	0	5
Total	2000	2000	2000
Calculated Analysis			
DM, %	88.89	89.3	88.89
CP, %	16.76	16.56	16.79
ME, kcal/lb	1515	1600	1513
Ca:P, %	1.10	1.10	1.10
STTD P, %	0.35	0.36	0.35
SID Lys:NE, g/Mcal	2.95	2.77	2.96
SID Met:Lys, %	0.35	0.34	0.35
SID Met+Cys:Lys, %	0.68	0.66	0.68
SID Thr:Lys, %	0.66	0.66	0.66
SID Trp:Lys, %	0.18	0.18	0.18

Results

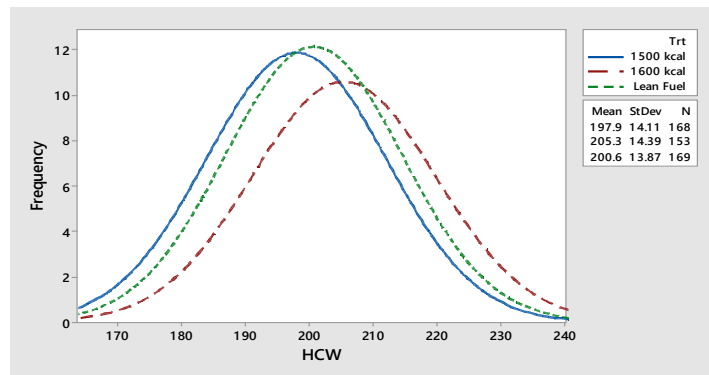


Figure 1. Hot carcass weight (HCW, lbs) distribution

Conclusion

- Pigs on LeanFuel® and on Positive Control had similar growth rates.
- ADFI was highest in LeanFuel® pigs after first cut.
- F:G was higher for Positive Control than both Negative Control and LeanFuel®.
- Overall carcass weight was greater for Positive Control (205.2 lbs) than LeanFuel® (200.6 lbs) and Negative Control (198.0 lbs).
- This trial suggests that high energy diets and LeanFuel® may be beneficial for increasing ADFI, ADG and market weight in late finishing pigs.
- Full paper: <https://doi.org/10.1093/jas/sky073.236>

Results

Table 2: LeanFuel® has a comparable ADG and final Body Weight as Positive Control with added fat.

Item	Treatment			SEM	P-value
	Negative Control (1500 kcal)	Positive Control (1600 kcal)	Negative Control + LeanFuel®		
BW, lb					
Day 0	204.4	205.7	204.8	3.7	0.8016
Day 21	244.3	245.6	244.9	4.2	0.8928
Day 37	268.5	271.8	271.2	3.5	0.4785
Day 0 - 21					
ADG, lb	1.89	1.90	1.89	0.06	0.9891
ADFI, lb	5.93	5.73	5.97	0.15	0.4130
F:G	3.13	3.01	3.15	0.01	0.1705
Day 21 - 37					
ADG, lb	1.93	2.05	2.07	0.08	0.2854
ADFI, lb	5.80 ^b	5.91 ^a	6.17 ^{a,b}	0.15	0.0488
F:G	2.99	2.88	2.97	0.01	0.4491
Day 0 - 37					
ADG, lb	1.91	1.96	1.96	0.04	0.6276
ADFI, lb	5.89	5.80	6.04	0.13	0.2368
F:G	3.08 ^b	2.96 ^a	3.09 ^b	0.01	0.0388

^{a,b}Values in a row with different superscripts differ (Probability Value ≤ 0.05)

Table 3: LeanFuel® produced a heavier pig at marketing.

Item	Treatment			SEM	P-value
	Negative Control 1500 kcal	Positive Control 1600 kcal	Negative Control + LeanFuel®		
Market BW, lb					
No. pigs	250	256	251		
Rep.	10	10	10		
1st Cut	279.5	283.5	283.5	3.5	0.4596
2nd Cut	266.1	267.0	267.9	4.4	0.9067
Overall Cut	270.5	272.0	273.1	3.7	0.5994

Table 4: LeanFuel® produced a leaner carcass than the diet with added fat.

Item	Treatment			SEM	P-value
	Negative Control 1500 kcal	Positive Control 1600 kcal	Negative Control + LeanFuel®		
Slaughter, Load 1					
No. of Pig	40	39	40		
Hot Carcass Wt, lb	200.4 ^b	210.3 ^a	205.7 ^a	1.8	0.0014
Fat Depth, in	1.32	1.42	1.4	0.05	0.2612
Muscle Depth, in	6.81	6.76	6.78	0.08	0.8542
Lean percent, %	56.45	56.09	56.17	0.18	0.3294
Slaughter, Load 2					
No. of Pigs	128	114	129		
Hot Carcass Wt, lb	196.9 ^b	203.5 ^a	198.9 ^b	1.3	0.0019
Fat Depth, in	0.50 ^b	0.55 ^a	0.52 ^b	0.01	0.0079
Muscle Depth, in	2.56	2.62	2.59	0.02	0.1124
Lean percent, %	56.03	55.95	56.05	0.12	0.8392
Slaughter, Overall					
No. of Pigs	168	153	169		
Hot Carcass Wt, lb	198.0 ^b	205.2 ^a	200.6 ^b	1.1	<.00001
Fat Depth, in	0.51 ^b	.55 ^a	0.52 ^b	0.01	0.0031
Muscle Depth, in	2.59	2.63	2.61	0.02	0.2572
Lean percent, %	56.13	55.99	56.08	0.10	0.6025

^{a,b}Values in a row with different superscripts differ significantly (Probability Value ≤ 0.05).