

## **SWINE SOLUTIONS**

## Firsthand research and experience with PRRS 1-4-4

## By Ernie Hansen, Manager Swine Nutrition and Technical Services, Hubbard Feeds

Although the LLRC-1 wean-to-finish research barn is fully filtered, the reality is that it only takes one positive case of Porcine Reproductive and Respiratory Syndrome (PRRS) in an incoming litter to infect a whole barn. This fact was demonstrated in a recent nursery trial at Hubbard Feeds: 2,334 pigs entered the nursery at 15 lbs. and seroconverted with PRRS during the first three weeks post-weaning. While the pigs started exceptionally well on feed, given their wean age and weight, once the group seroconverted, performance was severely impacted, and most mortality occurred 18–43 days post-placement. By the end of the nursery stage, the mortality rate was just under 30%.

Given that previous research suggested components of soybean meal may have antiviral properties and benefit immune response during disease challenges such as PRRS, a trial was conducted to determine the impact of soybean meal level in diets during the grow-finish stage (See Table 1). Pigs were allotted two treatments with high or low levels of soybean meal, achieved by changing the inclusion of synthetic amino acids. Both treatments were isocaloric. There were 42 replicates per treatment and 21 pigs per pen, with an average starting weight of 90.7 lbs. The experimental diets were fed for 49 days. Pigs fed the high soybean meal diet had improved F/G (2.16 vs. 2.21, P <.01) and numerically higher ADG (2.25 vs. 2.20, P = 0.12) than those fed the lower soybean meal diet. Caloric efficiency was improved on the high soybean meal diet (P < .01), suggesting that the energy level of soybean meal may have been underestimated. While not statistically significant (P = 0.26), pigs on the high soybean meal treatment ended the trial 2.46 lbs. heavier.

Overall, pigs rebounded nicely after the nursery health challenge, with only two recorded mortality events (0.1%) and 11 removals (0.6%). The previous health challenge did not seem to cause a growth lag in the grow-finish stage. Although treatments were applied post-PRRS challenge, other studies show that higher levels of soybean meal may improve the performance of health-challenged pigs, suggesting potential benefits to the immune system. For instance, Johnston et al. (2010) observed that PRRS-positive grow-finish pigs had a 10% improvement in ADG and 8% improvement in F/G when fed high levels of soybean meal. Similar findings have been observed in nursery pigs (Rocha et al., 2013; Rochell et al., 2015). One of the potential modes of action is the presence of bioactive components in soybean meal, such as isoflavones and saponins, which possess anti-inflammatory, antioxidant and antiviral properties (Smith and Dilger, 2018).

It is, without a doubt, that many sow herds in the Midwest and now across the U.S. have experienced the devastation of the PRRS 1-4-4 strain. This virus and accompanying secondary challenges not only wreak havoc at the sow farm but also downstream wean-finish production, as can be seen in our nursery performance. However, we believe this data provides not only a potential dietary strategy but a look at the high level of the performance capability of grow-finish pigs once recovered from a nursery PRRS 1-4-4 break.

Ireatment     High AA Low SBM     Low AA High SBM     CV     P<	21-507F: Soybean Meal Level Location: LLRC					
Pens   42   42   42   -   -     No. of Pigs   861   861   -   -     Beginning wt., lb.   90.69   90.71   5.0   .98     Period 1 (18d)   -   -   -   -     ADG   1.99   2.02   6.0   .23     ADFI   3.97   3.94   7.0   .56     FG   1.99   1.94   3.2   .0006     End wt., lb.   126.56   127.31   4.4   .54     Gain   35.89   36.47   5.9   .22     Deads & removals   1d,1r   1d,1r   -   -     Caloric Efficiency   2302.76   2246.05   3.2   .0006     Period 2 (17d)   -   -   -   Caloric Efficiency   2302.76   2246.05   3.2   .0006     Period 2 (17d)   -   -   -   -   Caloric Efficiency   2302.76   2246.05   3.2   .0009     ADFI   5.09   5.13   9.0   .71   FG   .221   2.16   3.7   .009	Treatment	High AA Low SBM	Low AA High SBM	CV	P<	
No. of Pigs $861$ $861$ $ -$ Beginning wt., lb. $90.69$ $90.71$ $5.0$ $.98$ Period 1 (18d) $ -$ ADG $1.99$ $2.02$ $6.0$ $.23$ ADFI $3.97$ $3.94$ $7.0$ $.56$ FG $1.99$ $1.94$ $3.2$ $.0006$ End wt., lb. $126.56$ $127.31$ $4.4$ $.54$ Gain $35.89$ $36.47$ $5.9$ $.22$ Deads & removals $1d, 1r$ $1d, 1r$ $ -$ Caloric Efficiency $2302.76$ $2246.05$ $3.2$ $.0006$ Period 2 (17d) $  -$ ADG $2.30$ $2.37$ $7.4$ $.09$ ADFI $5.09$ $5.13$ $9.0$ $.71$ FG $2.21$ $2.16$ $3.7$ $.009$ End wt., lb. $165.88$ $167.67$ $4.7$ $.29$ Gain $39.18$ $40.31$ $7.4$ $.08$ Deads & removals $4r$ $2r$ $ -$ Caloric Efficiency $2578.17$ $2523.46$ $3.7$ $.009$ Period 3 (14d) $  -$ ADG $2.35$ $2.40$ $8.0$ $.22$ ADFI $5.75$ $5.73$ $9.9$ $.89$ FG $2.44$ $2.38$ $.3.9$ $.005$ End wt., lb. $198.86$ $201.32$ $4.9$ $.26$ Gain $32.94$ $33.64$ $8.0$ $.23$ <trr>Deads &amp; removals<math>3r</math><math>0</math>&lt;</trr>	Pens	42	42	-	-	
Beginning wt., Ib.     90.69     90.71     5.0     .98       Period 1 (18d)	No. of Pigs	861	861	-	-	
Period 1 (18d)       ADG     1.99     2.02     6.0     .23       ADFI     3.97     3.94     7.0     .56       FG     1.99     1.94     3.2     .0006       End wt., lb.     126.56     127.31     4.4     .54       Gain     35.89     36.47     5.9     .22       Deads & removals     1d,1r     1d,1r     -     -       Caloric Efficiency     2302.76     2246.05     3.2     .0006       Period 2 (17d)     ADG     2.30     2.37     7.4     .09       ADFI     5.09     5.13     9.0     .71     FG     2.21     2.16     3.7     .009       Pariod 2 (17d)     ADFI     5.09     5.13     9.0     .71     FG     2.21     2.16     3.7     .009       ADFI     5.09     5.13     9.0     .71     FG     .22     Gain     .39.18     40.31     .74     .08       Deads & removals     4r     2r     -     -	Beginning wt., lb.	90.69	90.71	5.0	.98	
ADG $1.99$ $2.02$ $6.0$ $.23$ ADFI $3.97$ $3.94$ $7.0$ $.56$ FG $1.99$ $1.94$ $3.2$ $.0006$ End wt., lb. $126.56$ $127.31$ $4.4$ $.54$ Gain $35.89$ $36.47$ $5.9$ $.22$ Deads & removals $1d, 1r$ $1d, 1r$ $ -$ Caloric Efficiency $2302.76$ $2246.05$ $3.2$ $.0006$ Period 2 (17d) $ -$ ADG $2.30$ $2.37$ $7.4$ $.09$ ADFI $5.09$ $5.13$ $9.0$ $.71$ FG $2.21$ $2.16$ $3.7$ $.009$ End wt., lb. $165.88$ $167.67$ $4.7$ $.29$ Gain $39.18$ $40.31$ $7.4$ $.08$ Deads & removals $4r$ $2r$ $ -$ Caloric Efficiency $2578.17$ $2523.46$ $3.7$ $.009$ Period 3 (14d) $  -$ ADG $2.35$ $2.40$ $8.0$ $.22$ ADFI $5.75$ $5.73$ $9.9$ $.89$ FG $2.44$ $2.38$ $.39$ $.005$ End wt., lb. $198.86$ $201.32$ $4.9$ $.26$ Gain $32.94$ $33.64$ $8.0$ $.23$ Deads & removals $3r$ $0$ $ -$ Caloric Efficiency $2861.67$ $2791.82$ $3.9$ $.005$ End wt., lb. $198.86$ $201.32$ $4.9$ $.26$ Gain	Period 1 (18d)					
ADFI $3.97$ $3.94$ $7.0$ $.56$ FG $1.99$ $1.94$ $3.2$ $.0006$ End wt., lb. $126.56$ $127.31$ $4.4$ $.54$ Gain $35.89$ $36.47$ $5.9$ $.22$ Deads & removals $1d, 1r$ $1d, 1r$ $ -$ Caloric Efficiency $2302.76$ $2246.05$ $3.2$ $.0006$ Period 2 (17d) $  -$ ADG $2.30$ $2.37$ $7.4$ $.09$ ADFI $5.09$ $5.13$ $9.0$ $.71$ FG $2.21$ $2.16$ $3.7$ $.009$ End wt., lb. $165.88$ $167.67$ $4.7$ $.29$ Gain $39.18$ $40.31$ $7.4$ $.08$ Deads & removals $4r$ $2r$ $ -$ Caloric Efficiency $2578.17$ $2523.46$ $3.7$ $.009$ Period 3 (14d) $   -$ ADG $2.35$ $2.40$ $8.0$ $.22$ ADFI $5.75$ $5.73$ $9.9$ $89$ FG $2.44$ $2.38$ $3.9$ $.005$ End wt., lb. $198.86$ $201.32$ $4.9$ $.26$ Gain $32.94$ $3.64$ $8.0$ $.23$ Deads & removals $3r$ $0$ $ -$ Caloric Efficiency $2861.67$ $2791.82$ $3.9$ $.005$ Cumulative (49d) $   -$ ADG $2.20$ $2.25$ $6.5$ $.12$ A	ADG	1.99	2.02	6.0	.23	
FG $1.99$ $1.94$ $3.2$ $.0006$ End wt., lb. $126.56$ $127.31$ $4.4$ $.54$ Gain $35.89$ $36.47$ $5.9$ $.22$ Deads & removals $1d, 1r$ $1d, 1r$ $ -$ Caloric Efficiency $2302.76$ $2246.05$ $3.2$ $.0006$ Period 2 (17d) $ -$ ADG $2.30$ $2.37$ $7.4$ $.09$ ADFI $5.09$ $5.13$ $9.0$ $.71$ FG $2.21$ $2.16$ $3.7$ $.009$ End wt., lb. $165.88$ $167.67$ $4.7$ $.29$ Gain $39.18$ $40.31$ $7.4$ $.08$ Deads & removals $4r$ $2r$ $ -$ Caloric Efficiency $2578.17$ $2523.46$ $3.7$ $.009$ Period 3 (14d) $40.31$ $7.4$ $.08$ ADG $2.35$ $2.40$ $8.0$ $.22$ ADFI $5.75$ $5.73$ $9.9$ $.89$ FG $2.44$ $2.38$ $3.9$ $.005$ End wt., lb. $198.86$ $201.32$ $4.9$ $.26$ Gain $32.94$ $33.64$ $8.0$ $.23$ Deads & removals $3r$ $0$ $ -$ Caloric Efficiency $2861.67$ $2791.82$ $3.9$ $.005$ Cumulative (49d) $4.86$ $4.86$ $8.5$ $.97$ ADG $2.20$ $2.25$ $6.5$ $.12$ ADFI $4.86$ $4.86$ $8.5$ $.97$ <td>ADFI</td> <td>3.97</td> <td>3.94</td> <td>7.0</td> <td>.56</td>	ADFI	3.97	3.94	7.0	.56	
End wt., lb.126.56127.314.4.54Gain $35.89$ $36.47$ $5.9$ .22Deads & removals $1d, 1r$ $1d, 1r$ $ -$ Caloric Efficiency $2302.76$ $2246.05$ $3.2$ .0006Period 2 (17d) $  -$ ADG $2.30$ $2.37$ $7.4$ .09ADFI $5.09$ $5.13$ $9.0$ .71FG $2.21$ $2.16$ $3.7$ .009End wt., lb. $165.88$ $167.67$ $4.7$ .29Gain $39.18$ $40.31$ $7.4$ .08Deads & removals $4r$ $2r$ $ -$ Caloric Efficiency $2578.17$ $2523.46$ $3.7$ .009Period 3 (14d) $4$ $2.38$ $3.9$ .005ADFI $5.75$ $5.73$ $9.9$ $89$ FG $2.44$ $2.38$ $3.9$ .005End wt., lb. $198.86$ $201.32$ $4.9$ .26Gain $32.94$ $33.64$ $8.0$ .23Deads & removals $3r$ $0$ $ -$ Caloric Efficiency $2861.67$ $2791.82$ $3.9$ .005Cumulative (49d) $4.86$ $4.86$ $8.5$ .97FG $2.20$ $2.25$ $6.5$ .12ADFI $4.86$ $4.86$ $8.5$ .97	FG	1.99	1.94	3.2	.0006	
Gain   35.89   36.47   5.9   .22     Deads & removals   1d,1r   1d,1r   -   -     Caloric Efficiency   2302.76   2246.05   3.2   .0006     Period 2 (17d)   -   -   -   -     ADG   2.30   2.37   7.4   .09     ADFI   5.09   5.13   9.0   .71     FG   2.21   2.16   3.7   .009     End wt., lb.   165.88   167.67   4.7   .29     Gain   39.18   40.31   7.4   .08     Deads & removals   4r   2r   -   -     Caloric Efficiency   2578.17   2523.46   3.7   .009     Period 3 (14d)   4v   2r   -   -   -     ADFI   5.75   5.73   9.9   .89   FG   2.44   2.38   3.9   .005     End wt., lb.   198.86   201.32   4.9   .26   Gain   .23   Deads & removals   3r   0   -   -     Caloric Efficiency   2861	End wt., lb.	126.56	127.31	4.4	.54	
Deads & removals   1d,1r   1d,1r   -   -     Caloric Efficiency   2302.76   2246.05   3.2   .0006     Period 2 (17d)   .   .   .   .   .     ADG   2.30   2.37   7.4   .09     ADFI   5.09   5.13   9.0   .71     FG   2.21   2.16   3.7   .009     End wt., lb.   165.88   167.67   4.7   .29     Gain   39.18   40.31   7.4   .08     Deads & removals   4r   2r   -   -     Caloric Efficiency   2578.17   2523.46   3.7   .009     Period 3 (14d)   .   .   .22   ADFI   5.75   5.73   9.9   .89     FG   2.44   2.38   3.9   .005   .23   .26   .23     ADFI   5.75   5.73   9.9   .89   .26   .23   .24   .23   .26     Gain   32.94   33.64   8.0   .23   .26   .23   .26   .23 <t< td=""><td>Gain</td><td>35.89</td><td>36.47</td><td>5.9</td><td>.22</td></t<>	Gain	35.89	36.47	5.9	.22	
Caloric Efficiency     2302.76     2246.05     3.2     .0006       Period 2 (17d)	Deads & removals	1d,1r	1d,1r	-	-	
Period 2 (17d)     ADG   2.30   2.37   7.4   .09     ADFI   5.09   5.13   9.0   .71     FG   2.21   2.16   3.7   .009     End wt., lb.   165.88   167.67   4.7   .29     Gain   39.18   40.31   7.4   .08     Deads & removals   4r   2r   -   -     Caloric Efficiency   2578.17   2523.46   3.7   .009     Period 3 (14d)   ADG   2.35   2.40   8.0   .22     ADFI   5.75   5.73   9.9   .89     FG   2.44   2.38   3.9   .005     End wt., lb.   198.86   201.32   4.9   .26     Gain   32.94   33.64   8.0   .23     Deads & removals   3r   0   -   -     Caloric Efficiency   2861.67   2791.82   3.9   .005     Cumulative (49d)   32.0   2.25   6.5   .12     ADFI   4.86   4.86   8.5   .97 <td>Caloric Efficiency</td> <td>2302.76</td> <td>2246.05</td> <td>3.2</td> <td>.0006</td>	Caloric Efficiency	2302.76	2246.05	3.2	.0006	
ADG   2.30   2.37   7.4   .09     ADFI   5.09   5.13   9.0   .71     FG   2.21   2.16   3.7   .009     End wt., lb.   165.88   167.67   4.7   .29     Gain   39.18   40.31   7.4   .08     Deads & removals   4r   2r   -   -     Caloric Efficiency   2578.17   2523.46   3.7   .009     Period 3 (14d)   40.31   7.4   .08   .22     ADG   2.35   2.40   8.0   .22     ADFI   5.75   5.73   9.9   .89     FG   2.44   2.38   3.9   .005     End wt., lb.<	Period 2 (1/d)	2.20	2 27	7 4	00	
ADFI   5.09   5.13   9.0   ./1     FG   2.21   2.16   3.7   .009     End wt., lb.   165.88   167.67   4.7   .29     Gain   39.18   40.31   7.4   .08     Deads & removals   4r   2r   -   -     Caloric Efficiency   2578.17   2523.46   3.7   .009     Period 3 (14d)   ADG   2.35   2.40   8.0   .22     ADFI   5.75   5.73   9.9   .89     FG   2.44   2.38   3.9   .005     End wt., lb.   198.86   201.32   4.9   .26     Gain   32.94   33.64   8.0   .23     Deads & removals   3r   0   -   -     Caloric Efficiency   2861.67   2791.82   3.9   .005     Cumulative (49d)   J   J   J   J   J   J     ADG   2.20   2.25   6.5   .12     ADFI   4.86   4.86   8.5   .97     EG </td <td>ADG</td> <td>2.30</td> <td>2.37</td> <td>7.4</td> <td>.09</td>	ADG	2.30	2.37	7.4	.09	
FG   2.21   2.16   3.7   .009     End wt., lb.   165.88   167.67   4.7   .29     Gain   39.18   40.31   7.4   .08     Deads & removals   4r   2r   -   -     Caloric Efficiency   2578.17   2523.46   3.7   .009     Period 3 (14d)     -   -     ADG   2.35   2.40   8.0   .22     ADFI   5.75   5.73   9.9   .89     FG   2.44   2.38   3.9   .005     End wt., lb.   198.86   201.32   4.9   .26     Gain   32.94   33.64   8.0   .23     Deads & removals   3r   0   -   -     Caloric Efficiency   2861.67   2791.82   3.9   .005     Cumulative (49d)      3.64   8.0   .23     ADG   2.20   2.25   6.5   .12     ADFI   4.86   4.86   8.5   .97     EG   2.21		5.09	5.13	9.0	./ 1	
Gain   39.18   40.31   7.4   .08     Deads & removals   4r   2r   -   -     Caloric Efficiency   2578.17   2523.46   3.7   .009     Period 3 (14d)   7.4   .08   .07   .09     ADG   2.35   2.40   8.0   .22     ADFI   5.75   5.73   9.9   .89     FG   2.44   2.38   3.9   .005     End wt., lb.   198.86   201.32   4.9   .26     Gain   32.94   33.64   8.0   .23     Deads & removals   3r   0   -   -     Caloric Efficiency   2861.67   2791.82   3.9   .005     Cumulative (49d)   32.04   2.25   6.5   .12     ADFI   4.86   4.86   8.5   .97     FG   2.21   2.16   2.9   .000/	ru Endwet Ib	2.21	2.10	5.7	.009	
Calari   32.18   40.31   7.4   .06     Deads & removals   4r   2r   -   -     Caloric Efficiency   2578.17   2523.46   3.7   .009     Period 3 (14d)     -   -     ADG   2.35   2.40   8.0   .22     ADFI   5.75   5.73   9.9   .89     FG   2.44   2.38   3.9   .005     End wt., lb.   198.86   201.32   4.9   .26     Gain   32.94   33.64   8.0   .23     Deads & removals   3r   0   -   -     Caloric Efficiency   2861.67   2791.82   3.9   .005     Cumulative (49d)      3.64   8.0   .23     ADG   2.20   2.25   6.5   .12   ADFI   4.86   4.86   8.5   .97     EG   2.21   2.16   2.9   0.004    29   0.004	Gain	20.18	/0.21	4.7 7.4	.29	
Caloric Efficiency   2578.17   2523.46   3.7   .009     Period 3 (14d)   ADG   2.35   2.40   8.0   .22     ADFI   5.75   5.73   9.9   .89     FG   2.44   2.38   3.9   .005     End wt., lb.   198.86   201.32   4.9   .26     Gain   32.94   33.64   8.0   .23     Deads & removals   3r   0   -   -     Caloric Efficiency   2861.67   2791.82   3.9   .005     Cumulative (49d)   ADG   2.20   2.25   6.5   .12     ADFI   4.86   4.86   8.5   .97     FG   2.21   2.16   2.9   0.004	Deads & removals	59.10 Лr	40.51 2r	7.4	.00	
Period 3 (14d)     District (14)     District (14)       ADG     2.35     2.40     8.0     .22       ADFI     5.75     5.73     9.9     .89       FG     2.44     2.38     3.9     .005       End wt., lb.     198.86     201.32     4.9     .26       Gain     32.94     33.64     8.0     .23       Deads & removals     3r     0     -     -       Caloric Efficiency     2861.67     2791.82     3.9     .005       Cumulative (49d)      ADG     2.20     2.25     6.5     .12       ADFI     4.86     4.86     8.5     .97     FG     .216     .29     .000/d	Caloric Efficiency	2578 17	2523 46	37	009	
ADG   2.35   2.40   8.0   .22     ADFI   5.75   5.73   9.9   .89     FG   2.44   2.38   3.9   .005     End wt., lb.   198.86   201.32   4.9   .26     Gain   32.94   33.64   8.0   .23     Deads & removals   3r   0   -   -     Caloric Efficiency   2861.67   2791.82   3.9   .005     Cumulative (49d)    ADG   2.20   2.25   6.5   .12     ADFI   4.86   4.86   8.5   .97     FG   2.21   2.16   2.9   0.004	Period 3 (14d)	2370.17	2020.10	5.7	.005	
ADFI     5.75     5.73     9.9     .89       FG     2.44     2.38     3.9     .005       End wt., lb.     198.86     201.32     4.9     .26       Gain     32.94     33.64     8.0     .23       Deads & removals     3r     0     -     -       Caloric Efficiency     2861.67     2791.82     3.9     .005       Cumulative (49d)     -     -     -     -       ADG     2.20     2.25     6.5     .12       ADFI     4.86     4.86     8.5     .97       FG     2.21     2.16     2.9     0.004	ADG	2.35	2.40	8.0	.22	
FG     2.44     2.38     3.9     .005       End wt., lb.     198.86     201.32     4.9     .26       Gain     32.94     33.64     8.0     .23       Deads & removals     3r     0     -     -       Caloric Efficiency     2861.67     2791.82     3.9     .005       Cumulative (49d)     ADG     2.20     2.25     6.5     .12       ADFI     4.86     4.86     8.5     .97       FG     2.21     2.16     2.9     000/4	ADFI	5.75	5.73	9.9	.89	
End wt., lb.     198.86     201.32     4.9     .26       Gain     32.94     33.64     8.0     .23       Deads & removals     3r     0     -     -       Caloric Efficiency     2861.67     2791.82     3.9     .005       Cumulative (49d)           ADG     2.20     2.25     6.5     .12       ADFI     4.86     4.86     8.5     .97       FG     2.21     2.16     2.9     0.004	FG	2.44	2.38	3.9	.005	
Gain     32.94     33.64     8.0     .23       Deads & removals     3r     0     -     -       Caloric Efficiency     2861.67     2791.82     3.9     .005       Cumulative (49d)     32.20     2.25     6.5     .12       ADG     2.20     2.25     6.5     .97       FG     2.21     2.16     2.9     0004	End wt., lb.	198.86	201.32	4.9	.26	
Deads & removals     3r     0     -     -       Caloric Efficiency     2861.67     2791.82     3.9     .005       Cumulative (49d)     ADG     2.20     2.25     6.5     .12       ADFI     4.86     4.86     8.5     .97       FG     2.21     2.16     2.9     0004	Gain	32.94	33.64	8.0	.23	
Caloric Efficiency     2861.67     2791.82     3.9     .005       Cumulative (49d)     ADG     2.20     2.25     6.5     .12       ADFI     4.86     4.86     8.5     .97       FG     2.21     2.16     2.9     0004	Deads & removals	3r	0	-	-	
Cumulative (49d)       ADG     2.20     2.25     6.5     .12       ADFI     4.86     4.86     8.5     .97       FG     2.21     2.16     2.9     0004	Caloric Efficiency	2861.67	2791.82	3.9	.005	
ADG     2.20     2.25     6.5     .12       ADFI     4.86     4.86     8.5     .97       FG     2.21     2.16     2.9     0004	Cumulative (49d)					
ADFI 4.86 4.86 8.5 .97	ADG	2.20	2.25	6.5	.12	
	ADH	4.86	4.86	8.5	.97	
	FG	2.21	2.16	2.9	.0004	
Gain 108.47 110.50 6.7 .21	Gain Deade 8 removale	108.47	110.50	6.7	.21	
Caloric Efficiency 2570.48 2510.05 2.0 0004	Caloric Efficiency	2570.49	2510.95	- 20	-	