

Impact of Empyreal® 75 Inclusion in the Diet of the Nursery Pig

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Background: Stress associated with diet and housing changes can negatively impact the lifetime performance of production livestock. This is especially true of livestock being weaned. In modern swine production, the impact of weaning not only can cause acute issues associated with morbidity and mortality, but also determine the performance of the hog in the grower and finisher phases. Empyreal 75 is a corn protein concentrate that has shown to have positive impacts at lower levels of inclusion in monogastrics and be beneficial at improving piglet feed intake in the nursery phase.

Objective: To test the impact of different levels of Empyreal 75 in newly weaned pigs in the nursery phase.

Materials and Methods:

- Trial was conducted at the Experimental Farm, Universidad de las Fuerzas Armadas ESPE, Universidad San Francisco de Quito, USFQ, Ecuador.
- 40 newly weaned pigs at 21 days of age and weighing 6.9 kg (± 1.2 kg) were blocked by weight and randomly allocated to one of four treatment groups, containing increasing levels of Empyreal 75: 0%, 5%, 10% and 15% of the diet on a dry matter basis (Table 1).
- Diets were formulated isocaloric and isonitrogenous to provide same metabolizable energy, protein, amino acids, minerals and vitamins values (NRC) and can be seen in Table 1. Diets were amended based on phase or weight of the pigs: Diet 1 (6–11 kg); Diet 2 (11–17 kg), Diet 3 (17–25 kg).
- Initial weight, final weight, average daily gain and feed conversion data were collected and analyzed to compare differences between treatment groups.

Table 1: Treatment group formulations by phase

	Empyrean 75 Inclusion											
	Phase 1: 6–11 kg				Phase 2: 11–17 kg				Phase 3: 17–25 kg			
Ingredient	0%	5%	10%	15%	0%	5%	10%	15%	0%	5%	10%	15%
Corn	46.07	44.34	43.01	44.86	51.72	54.47	57.40	55.79	67.96	72.18	76.14	76.08
Lactose	20.00	20.00	20.00	20.00	12.50	12.50	12.50	12.51	0.00	0.00	0.00	0.00
Soybean Meal (46%)	9.03	10.00	10.00	4.56	18.78	12.43	5.41	4.40	24.70	15.38	5.88	0.00
Empyrean 75	0.00	5.00	10.00	15.00	0.00	5.00	10.00	15.00	0.00	5.00	10.00	15.00
Soy Protein Concentrate	6.12	2.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fish Meal (65%)	6.00	6.00	5.70	5.00	5.30	5.00	5.00	0.00	0.00	0.00	0.00	0.00
Bovine Plasma	5.00	3.50	1.50	0.00	3.50	2.00	0.50	0.00	0.00	0.00	0.00	0.00
Soybean Oil	3.01	3.63	4.26	4.51	2.77	2.75	2.71	4.40	1.36	1.22	1.16	1.63
Nucleotides	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Phosphate	1.08	1.17	1.28	1.46	1.19	1.33	1.46	2.09	1.28	1.46	1.65	1.78
Glutamate	0.80	0.40	0.20	0.00	0.60	0.30	0.15	0.00	0.30	0.15	0.08	1.00
Calcium	0.38	0.37	0.38	0.41	0.83	0.83	0.81	1.11	1.12	1.08	1.04	1.01
Salt	0.35	0.44	0.56	0.66	0.47	0.56	0.65	0.69	0.49	0.49	0.49	0.74
Methionine	0.10	0.18	0.25	0.34	0.12	0.20	0.29	0.41	0.15	0.11	0.23	0.31
Lysine	0.06	0.36	0.60	0.90	0.17	0.47	0.77	1.09	0.40	0.64	0.90	1.04
Threonine	0.00	0.06	0.14	0.19	0.03	0.07	0.18	0.25	0.18	0.19	0.24	0.23
Tryptophan	0.00	0.04	0.08	0.12	0.01	0.06	0.11	0.13	0.07	0.11	0.15	0.17
Valine	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.13	0.00	0.00	0.04	0.02
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100

Results – Weight (Table 2):

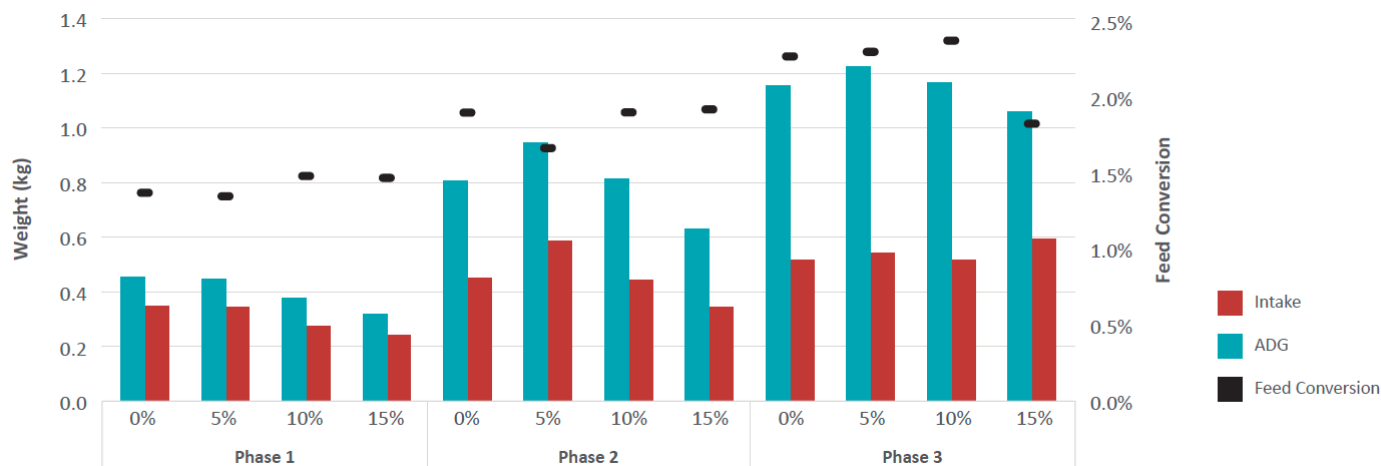
- There was no significant difference between treatment groups for initial weight, final weight, feed consumption, ADG or feed conversion over the 44-day trial.
- Numerically, the pigs in the 10% and 15% Empyrean 75 groups had lower intakes, final weights, ADG and feed conversion.
- Pigs in the 5% Empyrean 75 group were heavier at the end of the trial, had better feed consumption, and improved ADG and feed conversion.

Table 2: Pig performance of the 44-day trial

	Empyrean 75 Inclusion			
Item	0%	5%	10%	15%
Initial Wt. (kg)	6.86	6.86	6.73	7.03
Final Wt. (kg)	26.23	27.95	24.83	24.14
Feed Consumption (g/day)	883.71	951.4	864.23	746.02
ADG (kg/day)	0.443	0.482	0.412	0.399
Feed Conversion	2.014	2.002	2.133	1.8656

Pig Performance by Phase (Figure 1):

- Phase 1: Feed intake and ADG was significantly lower for the 10% and 15% groups compared to the control and 5% Empyreal 75 group. There was no difference in feed conversion.
- Phase 2: The 5% Empyreal 75 treatment had the highest consumption, best feed conversion and had significantly better ADG.
- Phase 3: There was no significant difference in feed consumption, ADG or conversion.



Conclusions: In this trial, the inclusion of Empyreal 75 at up to 5% of the diet improved nursery pig performance over the course of the 44-day trial. It should be noted that lack of performance in the 10% and 15% diets may be due to lack of plasma in phases one and two. Starting pigs off on the right foot with at least 5% Empyreal 75 should lead to improved gain and performance.

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