

## ORAL-PRO™ Vitamin D3 *plus* E

### Aurora Pharmaceutical Research Summary

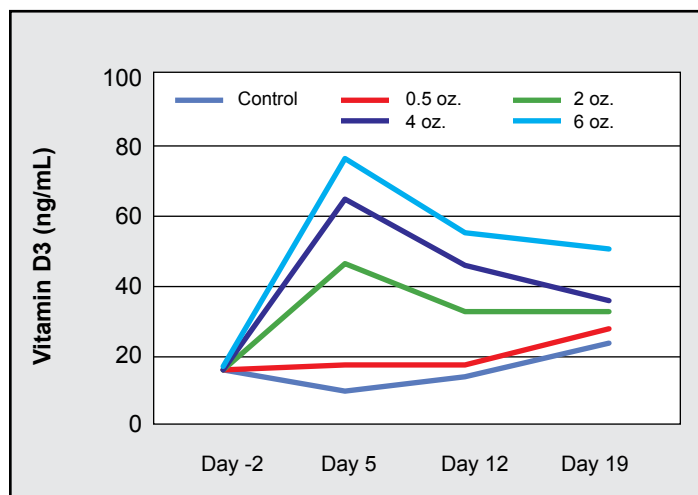
Vitamin D supplementation in pigs has become nutritionally important due to the lack of sunlight in modern pork production. D3 is the preferred form of vitamin D over the plant-based D2, which has poor bioavailability in pigs. Many supplemental vitamin D products have recently emerged on the market. ORAL-PRO™ Vitamin D3 *plus* E is one such product. It is easy to give as a 1 mL pump in the mouth of the piglet or delivered in the drinking water to nursery age pigs. Comparison with competitor products given at label directions showed ORAL-PRO Vitamin D3 *plus* E was superior in raising and maintaining higher serum blood levels (data not shown). Aurora Pharmaceutical has the following research and field trial data to support our dosage recommendation of 2 to 4 oz. per gallon stock solution to maintain normal (25–30 ng/mL)<sup>1</sup> vitamin D3 blood levels. In both studies below, typical nursery ration levels of vitamin D3 were present in the feed.

### Dose titration study nursery

Table 1. Average serum levels of Vitamin D3 by dose and day.

Serum (ng/mL)	Dose				
	Control (0)	0.5 oz.	2 oz.	4 oz.	6 oz.
Day -2	14.15	13.87	14.73	13.17	13.34
Day 5	10.95	16.72	44.27	63.34	77.38
Day 12	13.00	17.54	31.68	45.26	52.61
Day 19	21.89	24.51	31.77	36.61	47.33

### Nursery pig vitamin D3 serum levels



#### Take home message from this research:

- Vitamin D3 in feed does not get pigs to normal blood levels at a time in the nursery when the immune system is challenged through vaccination and/or disease organisms.
- Dose recommendations on other products do not result in normal vitamin D3 levels. (Data not shown.)
- ORAL-PRO Vitamin D3 *plus* E does reach normal blood levels at the recommended dose of 2–4 oz./gallon stock solution metered at 1:128.
- Optimal dose levels (2–4 oz./gallon) depend on the starting level of serum vitamin D3 in the wean pig. Our recommendations are:
  - a. Less than 9 — use 4 oz./gallon of stock solution for 7 days.
  - b. 9 to 14 — use 3 oz./gallon of stock solution for 7 days.
  - c. greater than 14 — use 2 oz./gallon of stock solution for 7 days.

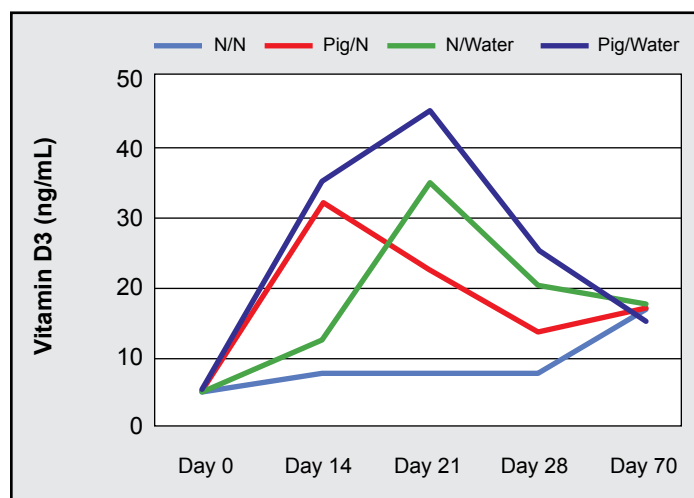
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### Field study piglet and nursery

Table 2. Average serum levels of Vitamin D3 by treatment and day.

Serum (ng/mL)	Treatment (N=nothing, Pig=1 mL dose, Water=2 oz./gal. stock solution)			
	N/N	Pig/N	N/Water	Pig/Water
Day 0 (1 week old)	5.58	4.41	5.20	5.49
Day 14 (weaning)	8.87	31.51	12.84	35.16
Day 21	8.95	23.71	35.82	44.91
Day 28	8.22	14.86	20.50	25.77
Day 70	17.66	17.74	18.16	16.18

### Piglet and nursery vitamin D3 serum levels



#### Take home message from this field trial:

- Vitamin D3 in feed does not get pigs to normal blood levels at a time in the nursery when the immune system is challenged through vaccination and/or disease organisms.
- Giving vitamin D3 to piglets in the farrowing crate and to nursery pigs at arrival to the nursery produced the best results.
- Giving vitamin D3 at weaning only should be given at 2–4 oz. per gallon stock depending on the piglets starting level of D3.
- If you can only give ORAL-PRO Vitamin D3 *plus* E in one place, the nursery is the best place to use it.
- Vitamin D3 is essential for a healthy immune system and bone development.<sup>2</sup> The correct serum level and bioavailability during the transition from the sow to grow-finish may be underestimated as the pig meets some of its greatest performance challenges such as disease exposure, vaccination and nutrient diversification.

1 Goff, JP; Horst, L; Littlelike, ET, Effect of sow vitamin D status at parturition on the vitamin D status of neonatal piglets. J Nutr. 1984. 114:163–169.  
 2 NRC-Nutrient requirements of swine: 11th revised edition. 2012. The National Academies Press (pg 107–108).