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Memo

To: 'Ubiquitous Collaborators' in Vitamin D₃
From: Steve
CC:
Date: 8/28/2011
Re: Administration ideas for oral Wean-D, equipment and experiences

Wean-D is being supplied to 'Ubiquitous Collaborators' through the VCPR auspices as we learn what and how it impacts pigs. It is not a commercial product. Efforts have begun to make it commercially available thus simplifying the process but, in the meantime, I believe a veterinary oversight role via the VCPR is mandatory. Contact me at shenry@aahpa.com or 785.366.6154 and we'll facilitate supply for you. Dr. Jesse Goff at GlycoMyr Labs is preparing the 40,000IU/ml D₃ after assuring potency of base product through assay at Heartland Assays by Dr. Ron Horst. It appears adequate quantity can be produced to supply requests of the 'Ubiquitous Collaborator' network. Depending on the easiest/least costly route material will be shipped out of Ames or Abilene. Gale Rock, in our office, is the centralized manager for orders and will make sure it gets to where it is going and that the addresses and books are in order. Contact Gale at grock@aahpa.com or 785.263.2398 ext 233.

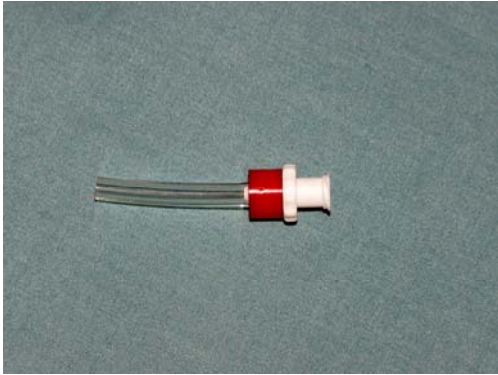
As usual, the people in the barns come up with better, practical and easier ways to do work! This is a distillation from experience credited to caretakers. The equipment and methods for administering the 1cc oral dose of Wean-D that appear to be most popular with our people today are as follows:

1. Cannula for oral administration that is flexible, soft and durable as well as being a luer lock tip is made from a portion of the SlapShot device. I contacted the company and they made 100 of them to distribute. Cost is \$1.10 each and pretty durable. It locks onto luer lock tip on syringe. If you want some, email Gale Rock in our office grock@aahpa.com or to Lisa, Megan or Steve and we'll mail them to you.
2. Dosing device is a Prima Shooter 2ml syringe with large draw-off. Cannula locks into the delivery hub nicely. Syringe, tubing and draw-off hub are less than \$20 depending on source. Available from most supply houses or contact Gale.
3. Bottles of Wean-D in 1 liter serum bottles with caps to match the large draw-offs allow a 'closed system' that captures all the material in a bottle. Working on making the Wean-D in 1

liter serum bottles with rubber stopper/clamp ring so it matches the Prima draw-off. Those will be available as soon as possible. In the meantime the quarts are used by putting the syringe draw tubing into the bottle.

4. Mount bottles in the Prima VacPac sleeve on the side of processing cart and the equipment is complete. Sleeve is about \$12.

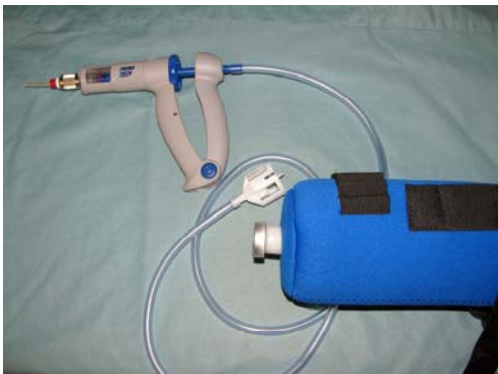
Cannula for oral administration



Cannula mounted in Prima Shooter 2ml



Prima Shooter 2ml tubing to the sleeve with the bottle of Wean-D



The VacPac sleeve mounts on the side of the processing cart vertically. This extracts all the contents of the bottle and reduces the wastage and keeps material well contained. Administrators are able to capture all 1000 doses from a bottle with this method.

Draw-off to lock into bottle of Wean-D



So what are the 'big picture' results from the 'Ubiquitous Collaboration' project to date?

- Colleagues have been testing pigs from the southern to the northern US and from the Rockies to the Ohio river at this point. Multiple 'mini-trials' are in place with results so far predominantly 'word-of-mouth' and observational. Others are reporting what we have observed – treated pigs are 'different' in positive ways. Now to quantify what we can and come up with ways to describe accurately 'activity, brightness, vigor, behavior, robust pigness.... (I always think of Tim Loula's *'just give me a no-hassle pig'* statement when I look at happy pigs....)
- Everywhere the results show that 25(OH)D levels in ~3 week old pigs are in the single digits. Exceptions are pigs with sunlight exposure but these are few, but very interesting. Farrowing houses in some southern parts of the US have curtain sides. One Collaborator has clearly shown a five-fold higher 25(OH)D serum level for the pigs that 'live' next to the south curtain.
- Values decrease as sampling moves north with across-the-country average for samples taken in June and July, 26 collaborators = 6.5ng/ml 25(OH)D. As these are the peak months of opportunity to capture UV_B it is interesting to speculate what this will look like Jan-Feb. Can't wait to find out.
- Wean-D administration of 40,000IU at processing predictably elevates levels at weaning above the rachitic break point (~15ng/ml) and in most cases close to the physiologic optimum of >25ng/ml which is needed for optimum immune function.
- Small sample of 'Sunshine Pigs', born outdoors in Kansas in the summer, had 25(OH)D of 58.5ng/ml in 2 litters. Thanks to collaboration from some enthusiastic 4-H kids, we were able to find and capture 3 ½ week old pigs that had farrowed outdoors and lived in the sticker patch, as well as a litter on a porch farrowing skid house. Fun bleeding these pigs! Amazing what the sun can do – and how much vitamin D the pig's skin can make.
- Data are beginning to be collected from controlled trials by the K-State Swine Nutrition Team and other projects. Those will add to the knowledge base. One trial is nearing completion, another is beginning and there will be reports at K-State Swine Day, November 17th in Manhattan.
- Our nursery data, focused on PFTS pigs and mortality, show a sharp drop in early post-weaning mortality, a sharp reduction in PFTS pigs and improved feed consumption. One 'from-the-barn' assessment was the observation of an outstanding nursery manager. He was tuned in to how long

it took pigs to consume their requisite 3lbs of pellets before switching to the auger feed. (I think this is a great observation and tool to use – how did the pigs start?) His observation is that pellets are gone 2 days earlier is a big deal. Still waiting for winter, though. This is the easy time for weaned pigs. Waiting to see if it continues.

- Hump-back pigs are another indicator of D₃ deficiency and, at this point, the monthly count method suggests that Wean-D treated pigs have a greatly reduced incidence. In one system, Lisa does a methodical count of incidence and it looks good today with greatly reduced numbers of hump-back pigs. Now to see if this holds up into the fall and winter.

Really appreciate the feedback and input from all involved in this exercise. Beyond the pounds and dollars, is this making a difference? Only careful observation can capture some of the subtleties in the barn. We want that feedback. Our goal remains to produce normal 25(OH)D levels in weaned pigs, something we can quantify, and then to let the pigs tell us what the outcome is.

More to come..... and thanks for collaborating!

Steve