DAIRY VETERINARY NEWSLETTER

July 2023

USU Veterinary School's 12th Freshman Class, and the Change to a College of Veterinary Medicine

Time passes quickly. It is hard to believe that soon the 12th first-year class will begin veterinary school at Utah State. In addition, on July 1, 2023 the College of Veterinary Medicine at USU welcomed its new faculty, replacing the School of Veterinary Medicine. It was a successful 11 years for the SVM, including graduating approximately 250 veterinarians comprising the first 8 classes that attended USU and then completed the last 2 years of study at Washington State University.

We are now taking the first beginning steps, with many more to follow, in the process of creating a four year veterinary college at USU. If the future of the CVM has the same success that the SVM did, that is all we could ask for. Thanks to all of our students, faculty, alumni, and the many other people who have contributed to this effort. A high proportion of them will also continue to be integral contributors to the new college.

Some Confusion Regarding a Recent Announcement from the DEA

The Utah Veterinary Medical Association has provided some clarification from Dr. Ashley Morgan of the AVMA in response to a recent notification from the Drug Enforcement Administration that has caused some concern and uncertainty for veterinarians:

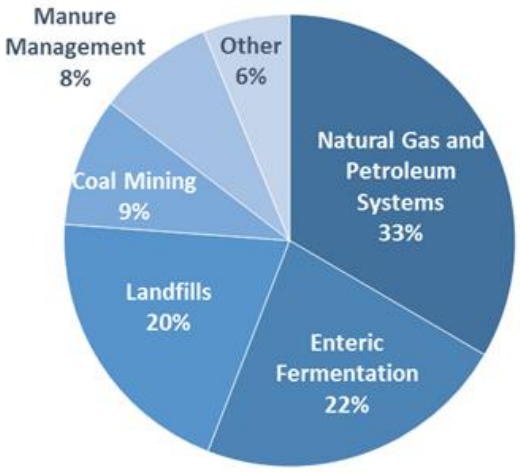
"Dear UVMA Member:
We have received some information from the AVMA regarding a new notification appearing in DEA registration applications (new and renewals) that is creating some confusion among veterinarians. I received a note from Dr. Ashley Morgan from the AVMA with some clarifications. Please see below, and if you have any questions, you can contact her at 202-289-3210:

It was brought to our attention that a new notification appearing in DEA registration applications (new or renewals) are causing veterinarians pause. This notification, which is simply a notification at this time, relates to training requirements that will go in to effect June 21, 2023, for prescribers EXCLUDING veterinarians. Veterinarians were exempted in the federal legislation that created these requirements (page 8 of the attached for anyone interested): See below what was in the requirements:
'(B) QUALIFIED PRACTITIONER.—In this subsection, the term "qualified practitioner" means a practitioner who—(i) is licensed under State law to prescribe controlled substances; and (ii) is not solely a veterinarian.'
We've just resolved this with DEA after hearing about the confusion. DEA will be adding a statement to the notification that says 'This **excludes** Doctors of Veterinary Medicine and the new applications or renewal applications will not require any action.'
Here is a blog post on this issue which might be helpful:"
https://www.avma.org/blog/veterinarians-exempt-new-dea-education-requirement

A Feed Additive Associated with Methane Reduction and Increased Milk Fat

Methane emissions from all sources and their contribution to climate change are becoming less of a disputed topic, at least in terms of most people agreeing that the warming of the atmosphere is a real phenomenon. (Prioritizing it is still politically polarized in the U.S.) Like many other industries (especially energy, see pie chart below), the dairy industry is seeking ways to reduce its contribution to methane emissions. Continuing in a series of their studies along with other colleagues, a paper by A. Melgar et al. in the Journal of Dairy Science, January 2021 evaluated one feed additive and its possible effects on enteric methane emission by dairy cows.

The study evaluated 3-nitrooxypropanol (3-NOP), which has "been identified as a potential enteric [methane] inhibitor." The introduction states, "Mixing 3-NOP in the TMR allows its continual consumption throughout the day and has been shown to be effective to decrease daily enteric [methane] emission [by dairy cattle]."



Interesting data from Exxon Mobil shows relative importance of fossil fuels as well as enteric fermentation, mostly from livestock, as sources of methane emission.

48 Holstein cows (30 2nd-plus lactation, 18 1st lactation) were enrolled in the study at Penn State University's Dairy Teaching and Research Center. Dry matter intake (DMI) of each cow was monitored using a Calan Broadbent Feeding System®, and continuous measurements of enteric methane, CO_2, and hydrogen emissions used the GreenFeed system®. When the study began, cows averaged 118 DIM and 95 lbs. of daily milk.

An enteric emissions measuring stall. 95% of methane from dairy cows comes from eructation, 5% from the rectum.

A completely randomized block design was used. Cows were blocked in pairs by lactation number, DIM, milk production (or genetic estimation of milk production for 1st lactation cows). Within each pair, cows were randomized to either control (CON, placebo) or 3-NOP at 60 mg/kg feed DM basis (NOP) treatment groups. There were 4 cows removed from the study (2 lame, 2 did not consume feed well from the GreenFeed), as well as the cows each was paired with (total n = 8), resulting in 40 cows, 20 blocked pairs, that completed the 15 week study. Thus there were 20 CON fed cows and 20 similar NOP fed cows.

The TMR included corn silage, alfalfa haylage, grass hay, ground corn, roasted soybeans, canola meal, and some other components including vitamin and mineral supplements. (Complete details and analyses of the ration are provided in the paper.) Both the CON (placebo - carrier and propylene glycol only) and the NOP were kept at 4° C (39° F) in a sealed container and mixed daily and then added to a premix. Details of feed offered and refusal weighing, analyses of the ration and DMI calculation are in the paper. During weeks 1, 7, and 14, samples of CON and NOP TMR were analyzed to confirm the 3-NOP concentrations in the rations.

Enteric gas emissions were measured when cows visited the GreenFeed stall; sweet feed pellets induced most cows to visit the device 4 to 6 times (maximum of 6 allowed) per day, similar to how milking robots induce cows to visit. Milking was 2X with daily milk yield recorded, and one day per week both milkings were proportionally sampled and tested for fat, protein, lactose, SCC, and MUN. This allowed calculation of estimated total pounds of fat, protein and lactose. I found it interesting that all NOP treated cows' milk was discarded for the entire study, and 7 days after it was last fed. Apparently there is no established withdrawal time for NOP; presumably NOP is expected to have no milk withholding if it is to be used commercially.

Statistical analysis used mixed linear models, a way to evaluate both categorical (e.g. lactation no.) and continuous numerical (e.g. days in milk) variables for their association with outcomes when repeated measures are made on the same animals over time. The alpha value for statistical significance was 0.05.

Results of enteric methane emission, milk production, and milk fat percentage

As seen in the following table, NOP fed cows had decreased methane emission by 27%, remarkably consistent despite what basis was used, and increased % milk fat from 3.82% to 4.07%, a relative increase of 6.5%:

Table 1. Production compared between cows fed 3-NOP and placebo control, adapted from Melgar et al.

Outcome	Control (placebo)	3-NOP	% change	P value
Methane g/day	411	301	-27%	<0.001***
Methane g/kg milk	11.3	8.2	-27%	<0.001***
Methane g/kg DMI	16.4	11.9	-27%	<0.001***
CO_2 g/day	13,360	13,167	- 1.5%	0.28
CO_2 g/kg milk	363	359	- 1.1%	0.80
Dry matter intake	56 lb	57 lb	+1.7%	0.54
Milk per day	85 lb	84 lb	- 1.2%	0.74
Milk fat %	3.82	4.07	+ 6.5%	0.02**
Fat yield kg/day	1.45	1.52	+ 4.8%	0.05*
Milk protein %	3.11	3.16	+ 1.6%	0.53
Prot yield kg/day	1.17	1.18	+ 0.9%	0.87
SCC	85,400/ml	53,600/ml	- 37%	0.92

Many other important milk production and quality parameters were not significantly different between treatment groups. The paper includes several graphs and interesting details of results as well.

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This was a well done study on an important subject with implications far beyond the dairy industry or only the present time. The authors' conclusion was, "Overall, this study confirmed the effectiveness of 3-NOP as an enteric [methane] mitigant. Similar to previous experiments - - 3-NOP does not appear to affect feed intake or milk production in dairy cows but increases milk fat concentration and yield; this effect may have important implications in future adoption of this mitigation practice by the dairy industry." One important factor to consider in the future will be whether NOP can be fed with no effect on milk safety, with a result that it has no milk withdrawal time. There is no indication in this or similar papers that a milk withdrawal time will be needed. Cost is another factor, although the warming climate and its effects on crop yields, ambient temperatures for cows and people, and water availability represent huge costs for the dairy industry that are far more ominous than a feed additive is likely to be. This is not meant to be a political statement or against our industry. No one is more determined that we continue to have a viable industry that is part of the solution than the dairy veterinarians I know. Science and necessity will dictate whatever changes are ultimately made.

Dairy veterinarians, like all members of our industry, have an interest in this subject. I hope we will hear more about enteric methane reduction via feed additives and be positioned to make sound recommendations to dairy clients as new information continues to emerge.

Please let us know your comments and suggestions for future topics. I can be reached at (435) 760-3731 (Cell), or **David.Wilson@usu.edu**.

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