

Tips and Tricks for Managing and Preventing Calf Pneumonia

Betsy Karle – UCCE Northern Sacramento Valley & Dr. Sharif Aly – UC Davis School of Veterinary Medicine

After many years of research on dairies across California, our team has created a comprehensive risk assessment tool for bovine respiratory disease (BRD, aka pneumonia) in preweaned dairy calves. See the article on page three for more information about accessing and using this novel tool.

Along the way, we identified several risk factors and management practices that can significantly affect the prevalence of BRD. Here, we outline a few of the most significant factors. Implementing some or many of these practices may lead to fewer sick calves, reduced need for pharmaceuticals, and an improved bottom line.

Maternity Pen Management: Clean and dry is key- not new news, but it really works! Dairies that changed the bedding more than five times monthly had healthier calves.

Colostrum Management: It's no secret that good quality colostrum in adequate doses is vital for calf health. Testing colostrum for IgG levels, feeding at least 3 quarts within 12 hours of life, storing frozen colostrum in bags rather than bottles, and heat-treating colostrum were all practices associated with less BRD in our studies.

Feeding practices: Excellent nutrition for young calves was one of the most significant predictors for success in our studies. The highest scoring management practices were feeding more than 1 gallon of milk per day, pasteurizing milk, testing milk for bacteria levels, feeding youngest to oldest, handling sick calves after healthy ones, and feeding saleable milk.

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Vaccination: Effective vaccines for respiratory diseases are widely available. We found that using injectable vaccines in cows before calving and injectables or intranasals in calves helped to prevent BRD.

Housing: The calf's environment during the preweaning period is incredibly important for disease management and prevention. We found that providing shade, dust control, and individual housing were quite effective in reducing BRD. Using lagoon water to flush under hutches and not providing additional shelter in the form of a roofed area or shade cloth were some of the most significant causes of increased BRD.

The management practices outlined above are a brief overview of results from several comprehensive studies. Producers can use the new risk assessment tool introduced in this issue to take a deeper dive into specific ways to modify management practices to improve health outcomes in the calf herd.

Manure and Methane Recovery

Deanne Meyer – UC Davis Department of Animal Science & UCANR

For most of us, 2020 can't be over soon enough.

Yet, in the digester development world, each day from today through 2024 is precious time to identify facilities, procure funding, and install digesters. Why? To capture methane and use it as valuable renewable compressed natural gas (RCNG) and meet ambitious manure methane reduction targets.

How is the California digester portfolio doing? Since 2015, 119 dairies have installed, or are installing, digesters to capture and utilize manure methane. The number of dairy projects receiving funding by year and developer are shown in **Table 1**. The 2015 projects used methane for electricity. Only two digesters since then use methane for electricity. Almost all facilities use biogas for renewable compressed natural gas.

DAIRY DIGESTER DEVELOPMENT PROJECTS BY COUNTY

■ Stanislaus ■ Merced ■ Fresno/Madera ■ Kings ■ Tulare ■ Kern

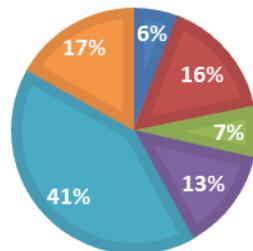


Table 1. Successful dairy digester programs by year and developer.

	Aemetis Biogas LLC	Bennet Environmental	California Bioenergy	Maas Energy Electric
2015			3	3
2017			11	5
2018			20	21
2019		1	26	17
2020	6		2	4

Digesters are being developed in six counties within the San Joaquin Valley. The success of these projects and others yet to come will help California dairies meet the ambitious goal of 40 percent reduction in manure methane from 2013 levels by 2030.

For more information on funding, see the [CDFA website](#).

The First Ever Bovine Respiratory Disease (BRD) Risk Assessment Tool for Preadeaned Dairy Calves

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Bovine Respiratory Disease (BRD), including pneumonia and other respiratory ailments, is the number one killer of dairy calves and poses a significant economic burden to California's dairy industry. BRD in dairy calves has variable clinical presentations, largely due to its complex causes, including multiple viruses, bacteria or a combination of both. There has been no improvement in BRD illness and death rates in dairy calves across the United States in the past several decades. While vaccines and drugs are available to help producers prevent and control this disease, **a comprehensive, herd-specific prevention, and control program** is needed to address each herd's unique risk factors. Equally important, if we are to control BRD in dairy youngstock, **prevention efforts should start at the very beginning**, as early as before calving.

Years of California research has resulted in the BRD Risk Assessment Tool for preweaned dairy calves. The tool is designed to help producers:

- 1) Assess the risk of BRD in a calf herd;
- 2) Identify risk factors to formulate a custom, site-specific and effective BRD control program;
- 3) Determine the burden of BRD in the herd before and after implementing the BRD control program to document the impact of prevention and control efforts.

The first step is to complete a **risk factor questionnaire**. The questionnaire is divided into 6 sections. Each section carries a risk value, with the highest potential risk adding up to 1,000:

- herd demographics (103 points)
- maternity pen (105 points)
- colostrum (145 points)
- milk feeding (244 points)
- vaccination (44 points)
- housing (359 points)

Answering these questions allows the user to estimate and benchmark their total herd risk for BRD in preweaned dairy calves.

The next section in the tool determines the **prevalence of BRD** in the herd's calves at the time of risk assessment. This can be easily completed using the prevalence feature of the UC Davis BRD Score mobile application, which is available for free in the Google or Apple App Stores.

The third and final section of the tool mirrors the questions from section 1, where producers **identify interventions to reduce the risk score**. In addition to identifying practices needed to lower the risk score of the herd, there is space allocated to record the results from the BRD scoring in the previous step.

Development of the risk assessment tool for BRD was based on two large studies; a longitudinal cohort study now known as the BRD 10K, and a state-wide cross-sectional study now known as the BRD 100. The complete tool is available on the UC Davis website: <https://escholarship.org/uc/item/1jb2f7rm>.

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Our research has clearly shown that implementing management practices to reduce respiratory disease is effective and has economic value at the end of the day (see August 2020 Golden State Dairy Newsletter for additional information). Furthermore, focus on prevention of disease can benefit antimicrobial stewardship efforts, helping preserve the efficacy and availability of important pharmaceuticals.

Research Roundup: It's Not Just the Equipment

Jennifer Heguy – UCCE Merced, Stanislaus & San Joaquin Counties, Patricia Price – UC Davis,
Deanne Meyer – UC Davis Department of Animal Science & UCCE

Thinking about installing a solids separator to help manage manure on your dairy? The first question you might ask yourself is: what do I want to accomplish?

Here are a few options:

- Remove fiber – to be used as bedding or land applied
- Reduce volatiles – to reduce methane emissions associated with manure handling (*see more on recent work below*)
- Reduce solid buildup – allowing for more liquid storage capacity in the lagoon
- Remove/relocate nutrients – to move nutrients to fields further than liquid manure nutrients can reach, or to manifest nutrients off the farm completely.

Another important question: where are my cattle located? Manure deposited on a concrete surface is handled differently than that in a corral. Where cattle spend their day determines how manure can be collected, transported, treated and used. For instance, focusing on manure from lactating cows, where more time is spent in freestalls, might make the most sense from a solids collection and methane reduction perspective.

From previous research (1990s), one could expect from 5 to 15% solids removal, depending on where the separator was located. Separators between the flush and lagoon were more successful at removing solids than separators utilized after flush water entered lagoons.

CDFA's Alternative Manure Management Program calculator assumes about 16% reduction in methane emissions from screen separators and 24% reduction in emissions from screw press separators. From a nutrient management perspective, the amount of nitrogen (N), phosphorus (P) and potassium (K), as well as salt in these removed solids is small compared with what passes through to the lagoon.

In a recent study, we sampled two separator systems over a year's time to look at volatile solids removal (methane reduction; *Figure 1, next page*). The single-stage separation system (B) sampled had a higher concentration of volatile solids in the flush material and removed a greater amount than the two-stage separation system (A) sampled. Percent reduction is highlighted in the figure.

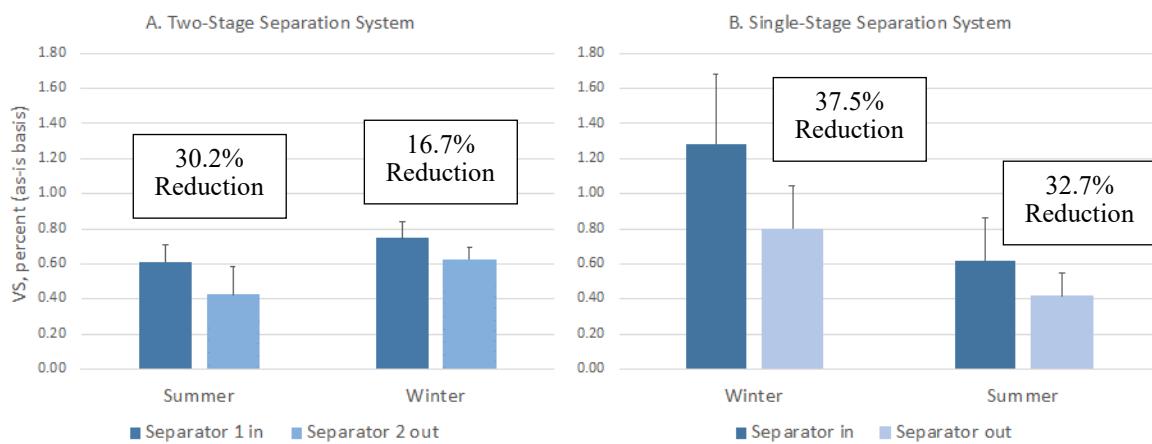


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We found there was variability in flush water volatile solids concentrations over time, and to truly reflect what is happening on an individual farm, many samples over multiple seasons are necessary. It was also apparent that results will differ with farms, as management of cows will impact how well separators work. For freestall dairies, winter usually means cows are on concrete all day with no soakers running. Freestalls may be bedded more frequently in winter than summer. In summer, cattle are in corrals or in freestalls. Less manure falls on concrete as cows spend additional time in exercise areas and soakers run frequently to help control the cows' climate. Less manure is used for bedding freestalls. Animal management matters and it impacts how well separators work.

Figure 1. Average percent volatile solids (as-is basis)



Nutritionist Input Needed

The ask: Nutritionist survey on the needs and limitations of feeding and formulating protein, with a special focus on amino acid requirements.

Why: To better understand the extent of protein and amino acid considerations in California diets; to inform future research and extension programming.

The details: The survey is anonymous and will take 10 minutes to complete. It is not sponsored by any company or group. Results will be shared as aggregate data.

Link to the survey: https://ucdavis.co1.qualtrics.com/jfe/form/SV_4HqAq4rSV9dZfrD

If you have any questions or comments, please feel free to call or email.

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