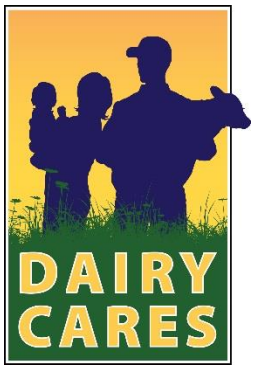

Submitted online

June 12, 2015

Mary D. Nichols, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Short-Lived Climate Pollutant Reduction Strategy, Concept Paper

Dear Chair Nichols:

On behalf of Dairy Cares, thank you for the opportunity to submit comments on the California Air Resources Board (CARB's) May 7, 2015 "Short-Lived Climate Pollutant Reduction Strategy Concept Paper" (Concept Paper).

Dairy Cares (www.dairycares.com) is a coalition of California's dairy producer and processor organizations, including the state's largest producer trade associations (*Western United Dairymen, California Dairy Campaign, Milk Producers Council, California Farm Bureau Federation* and *California Cattlemen's Association*) and the largest milk processing companies and cooperatives (including *California Dairies, Inc., Dairy Farmers of America-Western Area Council, Hilmar Cheese Company*, and *Land O'Lakes, Inc.*), and others. Formed in 2001, Dairy Cares is dedicated to promoting the long-term environmental and economic sustainability of California dairies.

Dairy Cares recognizes the importance of reducing greenhouse gases (GHGs) in California and elsewhere as a strategy to slow global warming. It is well-established that short-lived climate pollutants (SLCPs) as a subset of GHGs have a higher global warming potential on a mass basis, and also break down faster in the environment. As such, reducing SLCPs provides an opportunity to "jump start" efforts to slow global warming. As the Concept Paper notes, "global action to reduce these emissions is the only way to immediately slow global warming." Implicit in this statement is that actions on SLCP, if taken only by California, will have little or no effect on a global basis. Thus, finding ways to expand actions beyond California's borders is necessarily part of any effective strategy.

The main purpose of Dairy Cares' comments on the Concept Paper is to identify what we believe are the best strategies for reducing methane, an important SLCP, both inside and outside of California. Some of our in-state recommendations can be implemented immediately, while others likely will require at least short-term research over the next one to two years to better understand their technical and economic feasibility. We also include comments to set some context for our efforts to date in reducing SLCPs, how California dairy fits into the global dairy SLCP landscape, and several systemic recommendations to ensure that efforts going forward include easily implementable incentives, and that current and future emissions reductions are accurately reflected in the inventory.

Our comments are summarized as follows:

I. **Progress to date.** California dairies have greatly reduced SLCP emissions in recent decades on a per-unit-of-milk produced basis, and are among the most efficient producers in the world in terms of enteric methane emissions.

II. **Biogas digesters.** A voluntary, incentive-based program to build dairy digesters, funded by the Greenhouse Gas Reduction Fund (GGRF), provides the single best opportunity to make significant reductions in California's dairy manure management methane emissions in the next few years, while providing significant co-benefits.

III. **Emissions avoidance.** There may be additional significant opportunities to reduce California dairy manure management methane by reducing the amount of manure stored in anaerobic conditions. These techniques may include replacing manure flush systems with scrape systems where appropriate, or improved solids separation in flush systems, and increased composting. However, short-term research over the next one to two years is needed to better understand the economic and technical feasibility for these options, to avoid or minimize cross-media environmental impacts, and if warranted, to develop appropriate incentive policies.

IV. **Methane inventory.** Significant uncertainties exist in the CARB inventory for methane from dairy sources. Scientists who are considered experts in both dairy manure management and climate issues have questioned the accuracy of the inventory. We have similar concerns about the inventory's accuracy, and its ability to capture reductions already implemented at California dairies. Inaccuracies inherent in the inventory also represent a major challenge to CARB's plan to develop a methane capture or abatement standard.

V. **Incentives.** CARB's primary strategy for incentivizing voluntary reductions of SLCPs/GHGs is an offset program. While useful, this approach has limited utility and should be expanded to allow broader incentives for hard-to-measure sources and reductions.

VI. **Regulatory alternative.** CARB notes in the Concept Paper that the Animal Legal Defense Fund has petitioned CARB to measure and control livestock emissions via the Mandatory Reporting Rule and Cap-and-Trade Regulation, and says CARB "continues to investigate this option and welcomes feedback on it as the planning process moves forward." Dairy Cares believes a voluntary, incentive-based strategy represents a superior approach, and that a regulatory approach will have the inevitable effect of causing "leakage," that is, driving dairies, cattle and their related emissions

out of the state, where California has no authority to reduce those emissions. This could result in an overall increase in emissions, not to mention significant negative economic impacts to the state, especially in rural disadvantaged communities.

Our detailed comments follow.

I. Progress to date

While the Concept Paper goes to great lengths to emphasize the contribution of methane emissions from California dairy livestock emissions to the SLCP inventory, there is no effort to characterize two critically important facts:

- Significant, dramatic reductions of methane from California dairies have already occurred, in terms of the amount of methane per gallon of milk produced, and
- As a result, California dairy cows are already considered among the world's most efficient, producing up to 100 times fewer emissions per gallon of milk than what occurs in other countries.

Methane emissions must be viewed in a global context. In the United States, dairy cattle population peaked in 1944 at 25.6 million, and has dropped since then to about 9 million dairy cattle today. Yet milk production has dramatically increased in the same period.

Not only are there far fewer dairy cows in the U.S. today, but the amount of methane per gallon of milk has also been reduced sharply. Modern dairy systems produce only 43 percent of the methane per gallon of milk produced compared to 1944 – that is, these emissions have already been cut by more than half.[1]

This progress has positioned U.S. dairies in general, and California dairies especially, as leaders in enteric methane efficiency. Milk production has an inverse relationship to methane production per unit of milk produced.[2] California average milk production in 2014 was 23,700 pounds of milk, well above the U.S. average and up to 20 times higher than per cow averages in developing countries. For comparison, a California dairy cow may produce up to 5 times more milk than a cow in Mexico, and up to 100 times more milk than a cow in India.[3] Cattle operations in Brazil have an almost astronomically higher carbon footprint than systems in the U.S. or the European Union due to their association with grazing versus intensified land use, as well as extensive deforestation.[4]

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[1] Capper, J.L., Cady, R.A., and Bauman, D.E., 2009, "The environmental impact of dairy production: 1944 compared with 2007," Journal of Animal Science.
[2] Gerber, P., Vellinga, T., Opio, C., Steinfeld, H., 2011, "Productivity gains and greenhouse gas emissions intensity in dairy systems," Livestock Science 100-108.
[3] http://www.caes.ucdavis.edu/news/articles/2014/01/is-livestock2019s-contribution-to-climate-change-still-being-overestimated
[4] "Brazilian greenhouse gas emissions: The importance of agriculture and livestock," Carlos Clementi Cerri et al, http://www.esalq.usp.br/scientia/docs/gas_emissions.pdf

The preceding facts should be carefully considered as CARB considers strategies to reduce methane from the California dairy sector. From a global perspective, the opportunities to reduce methane and other GHGs in livestock and dairy operations are much larger outside of California and a single-minded focus on achieving further reductions from an already very efficient industry would be myopic at best.

While there are opportunities for further reductions of emissions from California dairies – which we support, and offer strategies for pursuing below – Dairy Cares strongly asserts that such reductions must be voluntary and incentive-based. This will not only serve to recognize the significant progress already made by California dairies, but will aid in keeping them within the state, where there is a better opportunity for California SLCP-reducing policies to have an effect.

Finally, we urge CARB to continue and expand its practice of outreach and education to other nations and subnational governments regarding implementation of air pollution and climate protection strategies, with a focus on how those regions can begin to implement practices similar to those already used in California dairy operations to reduce their emissions.

II. Biogas digesters

As the Concept Paper notes with respect to dairies, "Methane emissions from manure management can be significantly reduced by capturing and destroying or utilizing methane from lagoons … and/or converting manure into renewable energy in anaerobic digesters." Dairy Cares concurs, though we strongly believe "utilizing" rather than "destroying" methane should be the goal, as methane provides a valuable renewable energy resource that can replace fossil fuel.

Dairy Cares believes that in the near term, anaerobic digesters – whether designed to capture emissions from lagoons or from manure stored in tanks – represent the best opportunity to reduce methane emissions from California dairies. This is clearly a technologically feasible option, as there are currently 19 dairy digesters in operation in California and many more worldwide (although nearly everywhere dairy digesters currently appear, they are supported by incentive funding either in the form of construction grants or subsidized rates for electricity production). Biogas collected from digesters can be used to generate electricity, can be cleaned and conditioned to be injected into natural gas transmission pipelines, or can be cleaned, conditioned and compressed to be used as a transportation fuel (identical to Compressed Natural Gas or CNG). Though technically feasible, digesters are not currently for the vast majority of family-owned dairies in the state. Of the 19 dairy digesters currently in operation, all 19 were built with significant incentive funding.

Increased continued public investment in digesters is needed before they can become economically feasible. Further, investment in digesters must be accelerated to allow construction of enough dairy digesters to meet methane reductions consistent with the state's overall goal of 40 percent reductions from 1990 levels by 2030.

Dairy Cares estimates that construction of an additional 100 to 200 dairy digesters in the state could capture and utilize between 2 and 2.5 million metric tons (carbon dioxide equivalent or CO2e) of methane annually. With an estimated 30-year project life, these projects could

collectively reduce a total of 60 to 75 million metric tons CO2e of SLCP. This scale of investment would also generate significant amounts of renewable energy:

- Up to 50 million kilowatt hours per year of electricity, or
- 500,000 MMBtu or Renewable Natural Gas annually, or
- 3.5 million diesel gallon equivalents of transportation fuel.

Other benefits include replacement of fossil fuel, ongoing energy savings for dairies and/or revenues from energy and fuel sales, temporary construction jobs and permanent operation and maintenance jobs (skilled labor) for digesters. However, none of this can be realized without additional incentive funding.

Digesters offer additional benefits, including reduction of pathogens and viable weed seeds in manure effluent, reduction of odors, hydrogen sulfide, and volatile organic compounds. Managed properly and in cooperation with regional air and water quality permitting authorities, digesters can be constructed and operated to minimize impacts to air and water quality by properly storing, handling and land applying digester effluent, and by controlling emissions from combustion of biogas with best available control technology.

Recommendations

Dairy Cares believes the construction of a significant number of dairy digesters, and the resulting methane reductions, is achievable – but investment from the Greenhouse Gas Reduction Fund (GGRF) and other support from agencies is needed to realize this goal. There is currently insufficient funding available to build enough digesters to meet the state's goal for methane reductions, especially for rapid adoption of digesters. Policies such as Senate Bill 1122 (Rubio, 2012) have improved the outlook for electricity sales from digesters, but further incentives are still needed.

To move dairy digesters forward in California, Dairy Cares recommends:

- Significantly increasing funding from the GGRF for construction and/or performance incentives for dairy digesters. The current allocation of $11.1 million (fiscal year 2014-15) is expected to be enough to build 3 to 4 large digesters – at this funding level it will take several decades to reach the state's goals.
- The state should allocate between $30 million and $50 million in GGRF investment over a two-year period for continued construction of a dairy digester design, development and demonstration hub in Kern County. With access to several large dairy facilities closely co-located, natural gas pipelines and close access to Highway 99 and Interstate 5, this area serves as a strong candidate to develop a network of digesters and explore advanced energy uses such as truck and farm equipment fueling, pipeline injection of renewable natural gas and research and development of digester effluent for advanced fertilizer products.
- An investment of approximately $100 million annually for a five-year period (roughly 2017-2021) to build additional digesters throughout the state. This effort should include close collaboration with local air pollution control districts to ensure that any emissions

resulting from biogas combustion are minimized. Efforts should be made to encourage long-term, stable incentives for energy sales (including fuel, electricity and natural gas) and to remove risk associated with sales of renewable natural gas as a vehicle fuel. Providing this level of funding will greatly advance the technology, management logistics, efficiencies and economics of digester projects.

- CARB should examine and implement reforms in the grant funding process. Current grant programs involve a high amount of uncertainty and delay for developers. A program that streamlines funding and increases certainty for deserving projects that meet recognized parameters – modeled after the federal 1603 program ("Payments for Specified Energy Properties in Lieu of Tax Credits") would be helpful in realizing this goal.

III. Emissions avoidance

As the Concept Paper notes, methane emissions from manure management can be reduced by altering manure management, specifically by "switching from lagoon systems to solid manure management 'scrape' systems (to avoid generating methane in the first place)."[5]

It is clear doing so would in fact reduce the amount of manure stored in retention ponds (lagoons, which are temporary storage areas for manure and water until it is recycled to flush barn floors or applied to crops mixed with irrigation water). Less manure in retention ponds means reduced methane emissions, but converting flush systems to scrape on many dairies, or on a wide-scale basis, would create severe, unintended consequences. Flush systems were implemented on many dairies decades ago for a variety of beneficial reasons, including reducing labor, energy and fuel use for barn cleaning and to improve overall sanitation, which in turn reduces emissions of volatile organic compounds, ammonia and hydrogen sulfide. Cleaner barns mean improved health and well-being for animals as well as workers; cleaner barn floors resulting from flushing rather than scraping manure means floors are less slippery and less of a danger to workers and animals. Flush systems also make it possible to clean barns without physically removing animals, which reduces the chances of worker and animal injury.

Water quality and nutrient management related to scrape systems
Another critical issue related to converting from a flush to scrape system is that such a change will also change the character of the resulting flow of manure nutrients in a way that can impact water quality. Instead of being flushed to a system where solids are separated from liquids – creating some solid manure for storage and some liquid manure – all of the manure will end up in a slurry and eventually dried for storage or land application. While this will reduce methane emissions compared to a hybrid system that stores a liquid fraction of manure in the lagoon and solids (larger fibrous particles from manure) separately, there are also unintended consequences.

In a flush system, much of the manure nutrients, including nitrogen compounds, remain in the liquid system. As with all manure, the ultimate destination is for these nutrients to be land applied to fertilize feed crops. The advantage of storing these nutrients in liquid form is that they

[5] Concept Paper, p. 21.

may be applied in small amounts matching the crop's nutrient requirements during the growing season. This is not done with solid manure, which is only applied prior to planting of crops.

Without the ability to apply these nutrients as a liquid, many dairy farmers would be left with solid manure they are unable to use effectively and agronomically. This, in turn, would likely require them to export their manure to other farms and to use additional synthetic fertilizer to make up the difference.

Myth of water savings in scrape systems

Some advocates of converting manure flush systems to scrape have suggested this will result in water savings. This represents a fundamental misunderstanding of how water is used on a dairy. Water used for flushing manure out of barns (except for the milking parlor) is recycled water. On typical dairies, clean (potable) water is used to pre-cool milk in heat exchange systems, then that still-clean water is used to wash (and during warm weather, to cool) cows. Clean water is also used to flush the milking barn (where cows are milked) to ensure sanitary conditions in the milking area. These waters – not new clean water – are collected and recycled/reused to flush the animal housing areas (barns). Even this water is reused as irrigation water.

Thus, converting a dairy to collect manure with a scrape system rather than a flush system does not mean water will be saved – it only means that less manure is stored in water. The same amount of water will still be needed to wash the milking barn and wash cows – and will still be recycled as irrigation water.

Scrape systems can work but utility is limited

This is not to say that a scrape system could not be made to work in certain circumstances; some dairies in fact successfully operate such systems, but have made significant adjustments to address the challenges described here. These adjustments may not be desirable at other dairies, either by their operators, or in the interests of CARB or other environmental agencies when all factors are considered. As a point of fact, it would be a tragedy to forcibly convert to scrape an otherwise well-designed and properly managed dairy with a flush system and good infrastructure for delivery of liquid nutrients to crops. At minimum the significant potential for negative consequences to water quality, nutrient management, animal health and worker safety should be carefully considered and fully addressed before such a conversion.

We can envision circumstances where a conversion of flush to scrape would result in an overall benefit, including methane reductions. For example, a dairy with a lagoon that is too small for the amount of manure generated on the dairy and lack of infrastructure (e.g. not enough pumps or pipelines) to deliver the liquid manure to nearby fields could potentially implement a plan to convert to scrape, set aside areas to dry and compost manure, and plan on using some of the dry manure or compost on farm while exporting the rest for nutrient management and nutrient balance purposes. However, that dairy would still have to maintain a storage area for water used to clean the milk barn, and might still choose to flush lanes periodically after scraping to improve health and safety and reduce air emissions.

Composting
Composting of manure can play a role in partial or complete conversion of a dairy from flush to scrape. In fact, composting can play a role even if flush systems are maintained. Composting is the practice of drying manure and turning it periodically to allow contact with oxygen and to encourage microbial processes that heat and dry the manure while reducing pathogens and odors in the final product. Compost can be used on dairy crops to meet some of the nutrient requirements (though it is limited to pre-seeding use on most crops), and it can be sold to gardeners and other farmers.

Compost does not directly reduce GHG or methane emissions – however, to the degree composting results in keeping manure from ever entering the lagoon, say in conjunction with a scrape or vacuum system – it can be part of a system that reduces emissions. Further, the increased economic value of compost, compared to manure, can provide an incentive to the farmer to dry and export some of his or her dairy's manure.

Improved solids separation in flush systems
When dairies use a flush system to remove manure from barns, the flush water is usually captured prior to entering a retention pond (lagoon) in an attempt to separate large, fibrous plant cellulose materials and sands (solids) from liquids. This results in two manure-related streams:

- Solids that can be dried and stockpiled for use as bedding, compost or a pre-plant soil amendment (low in nitrogen but high in carbon), and
- Liquid that can be stored and reused to flush barns or to be added to irrigation water in a process known as "fertigation," where nutrients and water are added to growing crops simultaneously.

Separation is generally accomplished with the use of gravity catch basins (sometimes called separation basins) with small weirs or similar outflows near the top, which allow liquid to flow freely to the retention pond while solids "settle" in the basin.

While this type of system is functional and effective, its percentage of solids removal can be rather low, as low as 20 percent of the solids in the liquid stream. In these cases, many of the solids flow through to the lagoon, where they tend to settle to the bottom of the lagoon and form a sludge layer. Eventually the lagoon fills up and must be excavated.

To avoid excessive lagoon maintenance and to improve the quality of the lagoon liquid for fertigation, many dairies have experimented with increased efficiency in separating solids from the liquid post-flush. One common technique is mechanical screen separators, which in some cases have been demonstrate to increase solids removal to as high as 65 percent.[6] Another technique called "weeping walls" has also shown similar levels of efficiency.[7]

[6] Chastain, J., 2008, "Field evaluation of a two-stage liquid-solid separation system at a California Dairy, Department of Agricultural and Biological Engineering, Clemson University.
[7] Meyer, D., Harner, J.P., Tooman, E.E., and Collar, C. 2004, "Evaluation of weeping wall efficiency of solid liquid separation," American Society of Agricultural Engineers 349-354.

Though these technologies have been used to date with an eye on other goals (improved nutrient management and pond maintenance), the increased diversion of volatile solids from the lagoon by these systems likely reduces methane emissions, perhaps significantly. However, these systems also can be extraordinarily expensive (some anecdotal estimates have put the cost of systems on large dairies in the hundreds of thousands of dollars or higher, not including ongoing labor and maintenance and value of land permanently dedicated to the system).

Research needed but can likely be accomplished in short term
At this time, there is not enough available data to evaluate any of the methane avoidance techniques identified here for cost effectiveness, and cost effectiveness is necessary in determining whether any or all of these practices should be incentivized.

Dairy Cares is prepared to work with CARB in the near term on a rapid schedule to identify research projects that could support a more thorough evaluation of these practices for decision-making purposes. Because these practices are fairly well established as being technically feasible and workable on dairies for other purposes, we believe research to evaluate these for methane reduction effectiveness could be accomplished on a much more rapid schedule than would be possible for newer or emerging technologies.

IV. Methane inventory

Dairy Cares has significant concerns with the CARB GHG inventory for dairy-related methane emissions. Dairy Cares worked with consultant Ramboll Environ in 2014 and 2015 to evaluate the CARB inventory, during which time we identified issues that we believe must be addressed for the inventory itself to maintain integrity, as well as any efforts to reduce emissions.

Specifically, while CARB relies on accepted guidelines for calculating emissions given certain conditions, it also relies on unsupportable assumptions regarding the fate and transport of (manure) volatile solids on California dairies. The inventory appears to assume that on dairies with flush systems, that all (100 percent) of excreted volatile solids are stored in the lagoon. We believe this assumption overestimates methane emissions from manure management at such dairies. Further, CARB seems to assume that across all California dairies, approximately 80 percent of manure volatile solids end up in either lagoons or slurry systems. There does not appear to be any data or peer-reviewed work to support these assumptions.

In fact, leading academic experts on livestock methane emissions have questioned the veracity of the California inventory, including Drs. Ermias Kabreab and Frank Mitloehner of the University of California at Davis. During meetings of the Short-Lived Climate Pollutant Workgroup in May 2015, both Kabreab and Mitloehner found the state's assertion that manure management emissions from dairies are higher than enteric emissions to be highly unlikely. At any rate, it is clear that additional evaluation of the current inventory is needed. In the interest of transparency, Dairy Cares suggests that CARB conduct a public workshop or workshops to explain how the dairy methane inventory is currently surveyed and calculated, and to solicit input from stakeholders and academic experts on the inventory method. Confidence in the inventory is necessary to support a robust, voluntary incentive program for reducing emissions.

Further, we found no evidence in the current inventory method that CARB accounts for, in any way, measures that dairies may have already taken to reduce emissions from manure management. CARB does not appear to collect or utilize data on solids separation methods used, whether or not composting is conducted on site, or any other data relevant to emissions produced other than whether dairies are thought to primarily manage manure via flush, scrape, slurry or dry storage. This is highly problematic in that the inventory does not appear to have the capacity for accounting for emissions reductions that are accomplished by any other means besides digesters or reduced cattle herds. Dairy Cares recommends (we discuss this further below in "incentives" section) that CARB develop an inventory method that not only is accurate enough to gain the trust of the industry and the academic community (and other stakeholders), but is robust enough to account for voluntary reductions that have already been made or will be made in the future.

V. Incentives/offsets

For sectors such as agriculture that are not covered under CARB's Mandatory Reporting Rule and Cap-and-Trade Regulation, CARB depends on voluntary measures to realize GHG reductions, incentivizing these either with investments from the GGRF or by allowing emissions reducers to use approved protocols to verify reductions toward receiving and selling (to willing buyers) offset credits.

Although CARB has approved a Climate Action Reserve protocol for methane reductions accomplished by dairy digesters, the protocol is notoriously difficult and expensive to utilize. Some digester operators have reported that the costs related to validating offsets from digester project methane reductions approach, or even exceed, the market value of the offsets.

This suggests that even if formal offset protocols can be developed for other practices (such as converting flush dairies to scrape or installing improved solids separators), that it may be difficult to develop and use protocols to credit the implementing dairy as an individual – and the industry as a whole – with the reductions.

Dairy Cares suggests that CARB consider two actions related to this problem:

- Examine whether there are ways to streamline or abbreviate the validation process for offset credits issued, especially when projects are simply continuing to realize reductions at a predictable rate after their initial implementation; and
- Examine whether GGRF incentives can be used to stimulate projects that reduce small amounts of emissions in biological systems that are difficult to measure accurately and validate.

Dairy Cares notes that the San Joaquin Valley Air Pollution Control District (Air District), where approximately 85 percent of the state's dairies are located, has long experience in designing and implementing incentive programs to realize air pollution reductions, even under conditions where the exact amount of reductions are challenging to measure. We suggest that CARB collaborate with Dairy Cares and the Air District to explore whether similar incentive programs

could be designed and implemented either by the Air District with GGRF support, or at minimum within the Air District and in close collaboration with their staff.

VI. Regulatory alternative

On page 21 of the Concept Paper, it is noted that the Animal Legal Defense Fund (ALDF) has petitioned CARB to measure and control livestock emissions via the Mandatory Reporting Rule and Cap-and-Trade Regulation. CARB notes that it "continues to investigate this option and welcomes feedback on it as the planning process moves forward."

Dairy Cares believes a voluntary, incentive-based strategy represents a superior approach, and that other approaches that rely either on command-and-control regulation or prescribed management measures such as dairy digesters are doomed to failure. Either course would have the inevitable effect of causing "leakage," that is, driving dairies, cattle and their related emissions out of the state, where California has no authority to reduce those emissions. This could result in an overall increase in emissions, not to mention significant negative economic impacts to the state, especially in rural disadvantaged communities.

These approaches won't work because they significantly increase costs for California dairies – and *only* California dairies – leaving a competitive advantage to dairies in other states and countries. California has already suffered a large hit to its dairy industry, in the form of more than 500 dairies (about 25 percent of the state's total) closing over the past seven years. Meanwhile, other states have seen rapidly growing dairy industries, many of them benefitting from California dairy families transplanting their farms to other states, such as Idaho, which has grown to become the nation's third-largest dairy state in recent years. At least seven other states, including Texas, Nebraska, Missouri, South Dakota and others continue to actively recruit dairies from California.

It is well-established that anaerobic digesters, while effective at reducing methane, come with high project costs. Even a small dairy digester can cost millions of dollars to build, while larger projects can cost closer to $10 million. A regulatory approach that requires implementation of digesters rather than providing voluntary incentives will invite more dairies to leave the state rather than inviting them to remain here and take the extra trouble to reduce emissions and create renewable energy.

Similarly, ALDF's suggestion[8] that CARB should implement cap-and-trade on dairy farms because "other control measures could prove infeasible or ineffective for large dairies to implement" and such facilities could "simply buy allowances on the market" doesn't hold water. As stated in the Concept Paper, CARB's goal is, and should be, to reduce emissions of methane from manure management in California. The only way to do so will be through feasible and effective measures – not "infeasible and ineffective" measures. While Dairy Cares believes there are feasible and effective measures, such as digesters, that could and would reduce emissions if properly incentivized, ALDF's suggestion appears to be rather than trying this approach, dairies should simply be regulated. Further, even if such measures were "infeasible or ineffective" for

[8] In previous comments to CARB, and in its May 27, 2015 comment letter to CARB, see page 2.

dairies, adding the burden of additional, extremely large regulatory fees would not make the technologies more effective or feasible. Rather, it would send a signal that dairies would be better off relocating to other states where such costs do not exist – and where CARB cannot reduce their emissions. In short, regulating dairies via cap-and-trade would have exactly the opposite of the effect CARB is looking for.

Another less-than-credible claim made by ALDF is that CARB needs to use cap-and-trade to "account for" emissions from manure management and enteric fermentation. Although CARB currently accounts for these emissions via its inventory, Dairy Cares maintains that the inventory will indeed require additional research and peer review to verify its accuracy and account for emissions and emissions reductions as facilities. However, the approach suggested by ALDF is unworkable, as it would require measurement of emissions at individual dairies. This is not practical, because dairies are highly complex biological sources with highly variable emissions. Measuring emissions from even a single facility would require an academic-level research effort, and is not practical on an individual scale. For this reason, as with all air emissions from dairies in California, research is used to formulate Emissions Estimating Methodologies (EEMs) that can be used to estimate emissions from facilities and the overall basis. This need not be done – and would be impractical to do – on an individual dairy basis, as ALDF suggests.

Similarly, ALDF's contention that "cap-and-trade offers an approach to account for livestock worldwide industry emissions" is also patently false. A system that is unworkable even in California's relatively sophisticated dairy industry would be even more impractical in most parts of the world. Simply put, dairy emissions are better estimated at the regional level, although effective EEMs that consider more industry data than CARB currently uses are needed.

Also unsupportable is ALDF's claim that the ability of dairies to sell offsets from manure management in the carbon market somehow "proves" that "livestock emissions can be regulated in cap-and-trade." This is patently false. The only approved protocol only measures the amount of methane utilized by a dairy digester. Using this protocol, therefore, is only effective on those dairies where digesters have been constructed – 19 dairies out of 1,500 in California. ALDF falsely conflates the fact that it is "feasible to integrate livestock industry emissions with the cap-and-trade program" with it being feasible to regulate the same industry. This argument also holds no water, as voluntary programs such as forestry projects to sequester carbon and generate offsets are part and parcel of, or "integrated" into, cap-and-trade. However, this does not mean forestry projects should be regulated. Further, voluntary out-of-state projects are also integrated by cap-and-trade, but do not necessitate regulation.

ALDF criticizes CARB for suggesting it is considering "potential regulation" (Concept Paper, p. 21-22), and suggests any efforts should be mandatory, not voluntary. "ARB has tried voluntary compliance with the livestock industry, and it has failed," ALDF opines. This is also a ridiculous argument on its face. First of all, the term "voluntary compliance" makes no sense; absent a specified guideline and target for the dairy sector, there is nothing to "comply" with. More to the point, voluntary incentives have in fact worked extremely well. California has already constructed 19 dairy digesters, despite major challenges in developing the technology. Incentive funding has been snapped up as it has become available, and the technology has continued to advance as funding has been available. <u>The only thing slowing down further development of</u>

biogas digesters at this point is access to adequate incentive funding. Importantly, with the implementation of the GGRF investment program, significant new funding can become available, potentially (and we hope, realistically) greatly in excess of previously available funding. ALDF seems to be suggesting that rather than stepping on the gas and accelerating project development through incentives, we should instead step on the brake and shut down the industry, driving dairies to other states.

Dairy Cares does agree with ALDF on one important point – animal welfare is of the utmost importance and should be considered in any strategy CARB pursues. Dairy Cares agrees this is very important in both investigation of methods to reduce enteric methane emissions and in consideration of methods to reduce manure management-generated methane. We will continue to work closely with CARB and stakeholders to ensure this ethic is realized.

Conclusion

Once again, we thank you for the opportunity to make these comments. Dairy Cares recognizes the importance of proactive efforts by our member organizations to promote and achieve reductions of dairy-generated methane, and we are committed to working with you to achieve that goal in a way that also protects the important benefits that dairies bring to the Golden State.

Sincerely,

Program Coordinator

C: Charles "Chuck" Ahlem, Chairman, Dairy Cares
Michael Boccadoro, Executive Director, Dairy Cares
Paul Sousa, Environmental Services Director, Western United Dairymen
Kevin Abernathy, Director of Regulatory Affairs, Milk Producers Council
Lynne McBride, Executive Director, California Dairy Campaign
David Cranston, Greenberg Glusker
Mike Tollstrup, California Air Resources Board
Patrick Nevis, Governor's Office of Permit Assistance
Carla Sanchez, Special Assistant to California Department of Food and Agriculture Secretary Karen Ross, Climate Change Projects
Dr. Ermias Kabreab, University of California at Davis
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