

California Cows Fail Latest Emissions Test

James Owen

for National Geographic , Tuesday, August 16, 2005

Standing around chewing the cud, cows don't look especially threatening. But dairy herds in California are the latest livestock to be branded an environmental health risk on account of their flatulent behavior.

This month government regulators issued a report identifying dairy cows as the main source of smog-forming pollutants in the San Joaquin Valley, California.

The announcement highlights growing concern over the global impact of greenhouse gases produced by cattle and other livestock.

A dairy cow annually emits almost 20 pounds (9 kilograms) of smog-forming gases known as volatile organic compounds (VOCs)-more than a car or light truck, according to the San Joaquin Valley United Air Pollution Control District.

The local government organization works to monitor and improve regional air quality.

Based on 15 separate studies, the district's figure almost doubles scientists' previous estimate for cow emissions. The finding will form the basis for stricter air quality controls on dairy farms in the area.

The San Joaquin Valley is home to a thriving dairy industry that includes some 2.5 million cattle. With more new dairy operations planned, an additional 400,000 cows are expected to arrive in the valley within the next few years.

But the dairyland is also known for its smog. Over the last six years the valley has violated the federal limit on smog levels more often than any other region in the country.

"The valley air basin harbors some of the worst air quality in the entire country, and on far too many days air quality is unhealthy," said Kelly Hogan Malay of the San Joaquin Valley Air Pollution Control District.

Tailpipe Emissions

Local environmental groups blame air pollution for health problems, such as high rates of childhood asthma, in the region. But dairy farmers say their cows are being made into scapegoats for a gas-guzzling society.

Malay says motor vehicles are a much bigger source of air pollution overall, because they emit pollutants such as nitrous oxides and carbon monoxide in addition to VOCs.

"The reason VOCs are a concern at all is because they're one of the components that contributes to the formation of ozone, which is the primary ingredient of smog," Malay said.

But VOCs aren't the only worrisome gases that emanate from livestock. Scientists say animals such as cattle and sheep are responsible for around 20 percent of global methane emissions.

Methane, a greenhouse gas, is believed to be a major driver of climate change, because it traps 21 times as much heat in the atmosphere as carbon dioxide.

"In more rural communities as much as 50 percent of the methane comes from livestock," said Jamie Newbold, professor at the Institute of Rural Sciences in Aberystwyth, Wales.

Newbold is among a growing number of scientists now investigating how farm animals influence atmospheric pollution. The field is sometimes dismissed by critics as "fart science."

"Actually it's belching, not farting, that's the problem," Newbold said. "A full-grown dairy cow can belch 400 to 500 liters [106 to 132 gallons] of methane a day."

Microbes in the animals' stomachs help ferment grass and other foods into a digestible state, producing the offending gases.

"The fermentation vessel of a dairy cow is around 100 liters [26 gallons]," Newbold said.

Humans have a far more limited capacity. When people produce methane, it's only a matter of teaspoons (milliliters), Newbold notes.

"Humans don't have that active microbial fermentation. It's to do with having a grass diet," he said.

In New Zealand, home to around 40 million sheep and 10 million cows, 43 percent of the nation's greenhouse gas contributions come from livestock, scientists say.

In Canada livestock are reckoned to produce about one percent of global methane emissions.

Escaping Profits

Such emissions aren't bad just for the environment-livestock farmers are seeing potential profits escape into thin air.

Animals that put their energies into making gas are less efficient at producing milk and meat. Fodders that limit gas emissions in cattle and sheep should make the animals more economical to farm.

"Animals under these situations become more efficient at converting feed into lean tissue or milk protein," said Karin Wittenberg, a professor of animal science at the University of Manitoba in Canada.

Researchers are currently developing a range of anti-flatulence aids. Belgian scientists found that adding certain fish oils to a sheep's diet can cut belching by almost half.

Elsewhere, Australian researchers have created a vaccine that inhibits gas-producing microbes in a sheep's gut. And high-grade alfalfa grass pastures have been found to reduce windy side effects in grazing cows.

Newbold's group at the Institute of Rural Sciences in Wales has worked to produce organic acids to prevent methane buildup in cow stomachs.

"The hope is that many of these additives will be cost-effective for farmers, because they minimize the amount of energy an animal loses through methane production," Newbold said.

"Cattle and livestock are only part of the problem," he added. "There are a lot more greenhouse gases that are produced by cars than cattle. But [cattle] do make a contribution, and they should be a part of the solution."

No hearths in new Fresno Co. homes

Ordinance banning fireplaces in new houses to take effect next month after Tuesday supervisor vote.

By Marc Benjamin

Fresno Bee, Wednesday, August 17, 2005

New homes built in Fresno County's unincorporated areas will no longer be built with fireplaces after Fresno County supervisors approved a plan banning fireplaces in newly built homes. Supervisors voted 5-0 to approve the ordinance, the most stringent among Valley counties in the eight-county San Joaquin Valley Air Pollution Control District.

The air district enacted rules on wood-burning fireplaces and stoves last year.

The district limited the number of wood-burning heaters allowed in new homes and required a home's seller to certify that a wood-burning heater left in the home following a sale is an open-hearth fireplace, a pellet-fueled heater or an EPA-certified insert or stove. The county ordinance would approve such fireplaces in homes being remodeled or with additions in which fireplaces are part of the project.

The only exception to the rule is in areas 3,000 feet in elevation or higher. In those locations, fireplaces with a phase II certification from the federal Environmental Protection Agency will be permitted in new construction.

Wood-burning fireplaces and stoves have been determined to be a significant source of particulate pollution during winter in the Valley.

The 3,000-foot elevation rule was included in the ordinance because air flows from that elevation do not find their way back into the Valley, said board Chairwoman Judy Case.

Supervisor Phil Larson said the new rules do not affect any homeowner who now uses a fireplace on the Valley floor or in the Fresno County portion of the Sierra.

There were no written comments in opposition to the proposal and no opposition voiced against the rules at Tuesday's meeting.

In May, the board discussed the fireplace rules but supervisors wanted to receive input from business interests and residents.

During a 21-day review period, the county issued copies of the proposed ordinance revision to 139 members of the building industry, fireplace businesses and architectural firms.

The ordinance goes into effect next month.

State treasurer to push for dairy-financing moratorium

Board rejected similar proposal in January

By Jake Henshaw, Sacramento Bureau
Visalia Times-Delta, Wednesday, Aug. 17, 2005

SACRAMENTO - Treasurer Phil Angelides on Tuesday said he will renew his push for a moratorium on state-subsidized financing for dairies until new fiscal and environmental controls are adopted.

The three-member board of the Pollution Control Financing Authority, which Angelides chairs, rejected a similar proposal in January.

"It is critical that we put in place tough new financial control measures on any dairy pollution-control projects considered by the [agency] board," Angelides said in a statement.

He also outlined proposed new financial controls.

The treasurer's new effort is the latest chapter in a debate that was prompted by environmentalists' complaints and news reports last fall that at least some dairies may have used some of this special financing to move from Southern California to the San Joaquin Valley or to expand dairies there, not necessarily with improved air or water quality.

Controller Steve Westly, a board member whose representative sided with Finance Director Tom Campbell's board representative in January to defeat a moratorium, said Tuesday that he's reviewing the issue but is concerned about taking such a step.

"The treasurer has been the champion of loans for the dairy industry and one day he decides to call for a complete moratorium," Westly said. "We are concerned about going from one extreme to the other."

The issue is scheduled to come before the PCFA board at its Aug. 30 meeting, when it also is scheduled to consider a request for \$8.4 million in state tax-exempt financing by the Van Der Kooi dairy in Riverdale.

In October 2004, the PCFA board adopted a 90-day moratorium but that ended in January when the board refused to renew it despite Angelides' urging.

No dairy financing has been approved since that moratorium was lifted, said Angelides spokesman Nick Papas said.

Two Tulare County dairies -- Van Beek Brothers Partnership of Dairyland Farms in Tipton and Joe G. and Diane Airoso of Airoso Dairy in Pixley -- had applied for funding but they aren't pursuing the financing right now, Papas said.

The authority had approved 18 loans valued at \$66 million before imposing the original moratorium.

On Tuesday, Angelides proposed financial control measures that would require:

- Borrowers to provide details about project costs, an annual compliance report on its work and a certificate of completion.
- The bank handling the financing to send PCFA a final report detailing use of the money.
- Financing documents to include more details, including invoices proving that the money is spent for authorized work.

But even if these are adopted, Angelides still wants to hold off on new dairy financing until new air and water environmental rules are approved by other state agencies in 2006.

Dairies then would have to meet those new rules to qualify for financing from the PCFA under Angelides' proposal, Papas said.

Lowenthal delays his container fees bill

By Felix Sanchez, Staff writer
Long Beach Press Telegram
Published in the la daily News
Aug. 17, 2005

LONG BEACH - A state Senate bill that would require a \$30 fee on each container passing through the ports of Long Beach and Los Angeles to pay for environmental, security and infrastructure programs has been put on hold by Sen. Alan Lowenthal.

The Long Beach Democrat, who expected the bill to be vetoed by the governor, announced Tuesday that he was delaying a vote on his Senate Bill 760, which is in the Appropriations Committee.

Lowenthal said he believes he has enough political leverage and backing for a container fee that he can broker a plan that will satisfy the maritime and transportation industries, as well as Gov. Arnold Schwarzenegger.

"I think a more collaborative proposal can be worked out. It will just take a few more months," Lowenthal said. "I have always contended that the best solutions to a problem should involve all the parties that would be affected."

The Pacific Merchant Shipping Association and the Waterfront Coalition, an organization representing shippers, transportation providers and others in the goods movement chain has blasted S.B. 760, saying it is unconstitutional because it would allow a state to assess taxes on international commerce.

Lowenthal also has started discussions about the bill with Schwarzenegger, who wants to hold his own goods-movements hearings.

Todd Campbell of the Coalition For Clean Air said if there is a possibility of building a strong coalition that can work to reduce emissions from the port and transportation system, Lowenthal's move is positive.

"If we delay it (the bill) for just a year to make sure we get it right, and we do our homework, that's fine," Campbell said. "But any longer than that and we would have very grave concerns."

Edison to Spend Millions at March

To help create a business park and air cargo hub, the power company will upgrade electrical infrastructure at the former Air Force base.

By Susannah Rosenblatt, Times Staff Writer
LA Times, August 17, 2005

In a move designed to jump start western Riverside County's economy, Southern California Edison on Tuesday announced plans to invest more than \$23 million to help transform a portion of the former March Air Force Base into a business park and air cargo hub.

The money will upgrade the old base's electrical infrastructure over a decade, allowing for redevelopment and the creation of an estimated 15,000 jobs over 10 to 15 years in the commuter-choked region.

"This is a housing-rich, job-poor area," said Lori Stone, director of operations for the March Joint Powers Authority, which is Edison's partner in the venture. "We're trying to get the folks off the freeways and back home again."

The agency, with members representing the county and the adjacent cities of Perris, Moreno Valley and Riverside, oversees development on about 4,000 acres of the closed base along the 215 Freeway.

March reduced its size in 1996, and a third of it is still used by Air Force reservists as March Air Reserve Base.

The base's overhauled electrical system will power a 1,290-acre March Business Park, with 16 million square feet of industrial and office space being developed by LNR Property Corp. In addition, the air cargo company DHL plans to open a hub on land at the former base in October, Stone said.

The plans have come under fire from nearby residents worried about potential noise and [air pollution](#) from round-the-clock flights and proposed businesses.

Advocates believe private development at the former base will revitalize an area that absorbed the loss of roughly 9,000 military and civilian jobs nearly a decade ago, bringing "more economic opportunities close to home," said Rep. Ken Calvert (R-Corona).

"The 215 corridor is very ripe for development," said John C. King, a federal account and base reuse manager at Southern California Edison.

The strip along that freeway could constitute "the next major economic area of the Inland Empire," said John Husing, an economist who studies the Inland Empire.

Husing said the area's flat, developable land and growing population was slowly attracting both blue- and white-collar businesses. Edison's investment is "one of the pieces of the puzzle that has to be put in place for the long-term success of that region," he said.

Edison hopes to attract business tenants to the park with energy incentives, said company spokesman Charles Wilson.

The Joint Powers Authority considered managing its own electric utility, but decided the financial risks were too great.

"To take on something as huge as the electrical distribution system would take a lot more resources than we have at hand right now," Stone said.

Hydrogen fuel cell solution may come from Finland

By Thomas Elias, Special to the Midway Driller
Taft Midway Driller, Tuesday, Aug. 16, 2005

Gov. Arnold Schwarzenegger wants a "hydrogen highway" in California, with fuel celled cars and trucks running around this state and refueling as easily as gasoline-driven vehicles can now.

President Bush since 2003 has wanted to spend \$1.7 billion developing hydrogen as America's next energy source.

But with only about 100 hydrogen-powered cars on California's roads today, nothing much has happened yet. This may be because the technology so far seems to be at a clumsy stage: Even when Schwarzenegger drove the first (and only) General Motors "Hydrogen Hummer" into a brand new hydrogen fueling station near Los Angeles International Airport last winter, there was no hydrogen at hand, just an empty hose no better than a movie prop.

Environmentalists love the idea of hydrogen fuel cells, which emit nothing but heat and water as byproducts of their activity. But they also complain that the process of producing hydrogen from

air or water can be dirty, requiring electricity from power plants often fueled by oil or other fossil fuels. Hydrogen fuel cells also are frightfully expensive today, in part because they are not mass produced and they are large and clunky.

In a way, this technology is where mobile telephones were 20 years ago, when car phones usually required a large apparatus stored in the trunk and most potential consumers thought the idea impractical.

It's not impractical any more, and that's in large part due to a company based in Finland. Nokia cellphones are now commonplace and the company is a household word, even sponsoring a major college football bowl game.

So it might be with a new Finnish startup company called Hydrocell Ltd.

This firm makes unique, patented hydrogen fuel cells housed in shiny metal cylinders about the size of the batons used in track-and-field relay races. Two of them attached to a small battery and an electric motor can power a bicycle at about 10 to 15 miles per hour. One four-pound cell can power a mobile telephone or a laptop computer. Four cells can move a motor scooter at 20 to 30 mph and 20 to 30 can power a car at 50 mph, depending on the size of the car.

Putting together that kind of fuel cell array would be expensive today, when Hydrocell makes the cells by hand and charges \$900 apiece for them because each unit takes 20 hours to produce.

So they're not in wide use today even in Finland, the most common use there being to power computers and other electronic equipment aboard sailboats which have no other power source when owners don't want to use outboard motors or gasoline-powered generators.

Hydrocell predicts that if and when its cells go into mass production, they'll sell for about \$50 each, meaning the full array that might replace the engine of a car would cost slightly more than \$1,000, far less than any new automotive engine brings today.

The hydrogen supply for these cells is produced electrically using solar panels.

"You could do the same with a home," says Seppo Rosvall, Hydrocell's product manager. "You could produce enough hydrogen with electricity from solar panels to power an entire house and your car. Of course, to drive long distances, there would have to be refueling stations."

So we're back to Schwarzenegger's hydrogen highway, and his tentative plan to open more than a dozen refueling stations around the state. So far, there are four. And so far, government agencies operate most fuel cell cars.

No one doubts much of the hydrogen for these cars - and for industrial fuel cell use - would have to be produced with electricity from power plants, as backyard production could never satisfy the needs of all California drivers and large businesses.

But the electricity needed to produce hydrogen doesn't have to come from local power plants. It can be produced hundreds of miles away.

"So you can have pollution free cities if you go to fuel cells," says Rosvall. "And you will stop having to pay the Arabs for oil because you will burn so much less oil and natural gas to produce the power than you do now in cars and power plants."

"The best thing about this is that hydrogen is an unlimited resource. Also you can link as many cells as you like, even 100 or more, and the more you have, the more power you will have."

The power is stored in ordinary 12-volt car batteries.

Valley dairy air debate continues

By Chip Power

Capital Press Agriculture Weekly

Friday, Aug. 5, 2005

FRESNO - The next critical date in the raging debate over how much of the San Joaquin Valley's

air pollution can be pegged to its large dairy industry appears to be Aug. 18.

Industry members reacted with disappointment and resolve this week as local air managers formalized their estimate of volatile organic gases that can be attributed to a single animal.

Quantifying gaseous emissions from cows has been a contentious issue all summer long, as the San Joaquin Valley Air Pollution Control District reviewed scientific data and, at the recommendation of Executive Director David Crow, arrived at an estimate of 19.3 pounds, fractionally down from a July estimate.

The small reduction did not bring out the applause.

“Pulling a number out of thin air,” is how Michael Marsh, chief executive officer of Modesto-based Western United Dairymen, characterized the revised estimate, issued Monday.

Kelly Malay, a spokeswoman for the San Joaquin Valley Air Pollution Control District, said in an interview with KMJ-AM radio that air managers were complying with state law that ends dairy air permit exemptions and that it evaluated the science carefully.

“We think that we have the best number available,” Malay said. “There is more study needed. So we certainly will be updating the airy emissions factor” when more study results are known.

Jim Tillison, chief executive of the Alliance of Western Milk Producers, Sacramento, said the state air pollution control board scheduled to take up the emission estimate on Aug. 18. He said the industry was urging that a final decision be delayed.

“Our concern is that if you are dairy farmer and you base your mitigation efforts on faulty information, you might not get any benefit and could be wasting money,” said Tillison. He added that dairy operators were in favor of clean air as much as the next person.

As a bowl-shaped basin, the valley is labeled as a serious non-attainment area by the federal Environmental Protection Agency for federal ozone standards.

The region is home to 2.5 million dairy cows that are a major contributor to smog-forming gases, according to the air board.

Health advocates had called for a much higher emission estimate, while dairy industry leaders wanted one around 6 pounds.

The emission factor is the first step in regulating air quality at dairies and Tillison said that the industry was much more likely to make management practices investments if the results of their work could be better forecast.

Until recently, under state law, agricultural sources of air pollution, including large dairies, were exempted from air permitting requirements and new source emission limitations.

That changed in 2004 with the passage of a state bill.

At a recent public forum, Crow said it was likely that the air district was erring on the low side of predicted emissions and that additional research would prompt the estimate to be raised, not lowered.

According to the air district’s new reckoning, dairies in the eight-county valley region produce more than 50 tons of volatile organic compounds a day, surpassing the volume released by light trucks and cars by almost 20 tons a day.

In September 2004, the air district settled a lawsuit brought by Western United Dairymen,

Tillison's group and like-minded organizations, and agreed to certain conditions, such as reviewing scientific data.

According to that agreement, however, the dairy industry did not waive any rights to protest future decisions.

[Modesto Bee, Letters to the Editor, Wednesday, Aug. 17, 2005](#)

Blast those cows into outer space

Regarding "Dairies gear up for fight over air" quality in our Central Valley (Aug.2, Page A-1), perhaps the organization best qualified to bring this dilemma to a resolution is NASA, given its long and successful track record for management of astronaut respiration. Surely NASA scientists can apply their expertise to the area of dairy cow waste. NASA is adept at getting all the funding it wants, so this would take the monetary pain from the dairymen. Perhaps, we could send dairy cattle into space. The emissions could then be scattered more evenly, and no one valley or area could suffer the consequences. Flying cows would lend credence to the nursery rhyme, "The cow jumped over the moon." This resolution could even produce a new Milky Way.
GERTRUDE COLEGROVE
Modesto

Indulgent consumers polluting our air

There was an article on how dairies may have to pay more to do business because of air quality in the valley ("Dairies at critical juncture," Aug. 6, Page D-1). I'm not a scientist, but it seems awfully coincidental that as we have allowed uncontrolled growth, and as the demand for monster houses and gas-guzzling vehicles driven by urbanites has grown, our air quality has diminished. Dairies were in the valley long before this age of "me," where the desire to have more stuff has become more important than the air we breathe. Why aren't we hearing about additional standards, requiring vehicle adaptations, and additional taxes being levied on vehicles that use huge quantities of gas and that are not held to emissions standards? I don't think the problem in our air is the dairies; it is the gluttonous consumer culture of this valley and our country.
KIM NOLAN
Waterford

Dairymen already follow regulations

Leave the poor cows and dairy farmers alone. The dairy farmers have regulations and are kept environmentally safe. Yes, cows smell. All animal farms smell -- chickens, pigs, goats, etc. What about all the cars going down the highways and roads? Don't they cause pollution? Those cows provide all the dairy products you buy in the store each week. Other cows provide the beef you eat. No one complains about cow pollution when enjoying a good steak.
PAMELA POWELL
Turlock

[Visalia Times-Delta, Letter to the Editor, Wednesday, Aug. 17, 2005:](#)
Visalia needs more trees, less development

My letter is in response to Dawn Jones' letter dated Aug. 10. Thank you, Dawn, for your very well-written letter regarding the sad loss of so many beautiful trees in our Visalia area.

I was raised in Visalia, and it used to look like an oasis. Our air was clean, our town was surrounded by many farms, groves and orchards, and we could see the mountains daily.

Now because of "progress and development" our scenery has drastically changed.

I believe, Dawn, that our city fathers are no longer concerned about the quality of life. Everything is about quantity and dollars, dollars, dollars. I'm afraid greed drives our city now, Dawn. Developers schmooze and finagle and persuade our leaders and citizens that more is better. And so orchards are leveled, trees are removed, old farms are torn down and unwanted buildings are destroyed.

As a result we continually breathe dusty air ... and try to go on with our daily lives facing crowded, cluttered and congested situations everywhere! Our city infrastructure cannot handle this out-of-control development. Our streets and roads cannot handle the extra traffic, our schools cannot handle the increased enrollment and our services, such as hospital, fire and police, cannot handle the extra load, either.

What can we do, Dawn? We can continue to voice our concerns and opinions often, as you did so honestly and eloquently (the squeaky wheel will eventually get greased). And adults can elect responsible representatives who really have the greater good in mind. We can simply say no to more development.

Thank you, Dawn, for voicing your thoughts and for being a responsible citizen already. We adults can learn from your wisdom.

BARBARA MORGANS YOUNG, Visalia

[Letter to the Fresno Bee, Wednesday, August 17, 2005:](#)

Why don't we act in the face of rising gas prices?

Gas prices are hitting \$3 a gallon (something our leaders said would never happen). And here we are in Fresno waiting at railroad crossings with our engines idling, while freight trains rumble past at 30 mph or less.

Could The Bee publish a list of the scheduled times that trains pass through? I know many of us can go to the appropriate Web sites to find out, but many can't. Knowing this, maybe we can plan our city trips accordingly.

Also, is there a reason why in this time of record (and rising) gas prices and lack of government guidance toward renewable fuel sources we can't (as a community) decide to streamline the stoplights and detour some very much-needed money to upgrade and expand the public transit system (while cutting down on car emissions)?

I noticed this last item is at the bottom of the priority list in terms of road budgetary importance. We are the community. We can't wait for our leaders. Now is when we must act.

Joel Dyer, Fresno

[S.F. Chronicle editorial, Wednesday, August 17, 2005:](#)

FOLLOW-UP

A cleaner smog board

What we said: "The present air board has a record of delay and denial that must change... It's hard to fathom defending a system that has performed so poorly. It's time to broaden the voices and the debate over cleaning the valley's air."

- Editorial, Aug. 7, 2005.

What happened: It's the state Assembly's turn to inject energy into the workings of the stodgy San Joaquin Valley Air Pollution Control District. The 240-mile-long region has some of the nation's dirtiest, most unhealthy air, and the board routinely dodges its watchdog role. The state Senate has already approved a package of smog-board reforms embodied in SB999.

This bill would add two health experts to the smog board and make sure Fresno, Bakersfield and Stockton, the San Joaquin Valley's three biggest cities, have seats. The board, now dominated by rural county leaders, has a track record of avoidance on clean-air issues..

What's next: The Assembly Appropriations Committee is expected to approve the bill today. Next comes the bigger test, possibly next week, when all members have a chance to vote. It's important that members vote up or down -- and don't try to duck the vote by walking off the Assembly floor when the time comes..

What you can do: Tell your state Assembly member that cleaning up the Central Valley's air is vital to California's health -- and a vigilant smog board is needed. To contact your Assembly member, go to www.leginfo.ca.gov <<http://www.leginfo.ca.gov>>.

Editorial, New York Times, Aug. 7, 2005

A Malodorous Fog

Here is an axiom for farmers and consumers: Crowding animals together in large numbers always leads to problems. It turns hog manure, for instance, from a source of fertility into toxic waste. It creates enormous opportunities for disease, which tends to be warded off by inappropriate use of antibiotics. And in central California, it turns dairies, which are environmentally benign on a small scale, into major sources of air pollution - perhaps as bad as automobiles.

One of the smoggiest places in the country is the San Joaquin Valley, where one-fifth of the country's dairy cattle live - some 2.5 million animals and still growing. Local environmentalists and some local legislators argue that cow emissions - which come mostly from the front end of the animal rather than the tailpipe - have gotten out of control. There is a growing call to impose new rules that would improve air quality. The best way to do this isn't completely clear. But few, if any, of the proposed solutions would be palatable to the dairy farmers.

The San Joaquin Valley Air Pollution Control District estimates that at present each cow emits 19.3 pounds of pollutants a year in the form of gases from manure, from regurgitation and from flatulence. Defenders of the dairy farms - a large and powerful California industry - say that number is a wild overestimation. But behind the debate over the emissions measurements and their regulatory implications, there is a simple fact to contend with: the eye-stinging, nose-burning smell of cattle congestion in rural California.