

## **Fresno State balloon tracks dairies' acrid gases**

By Mark Grossi, Fresno Bee

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FRESNO -- An orange balloon floated 50 feet above California State University, Fresno's small dairy herd last week, helping in the unsavory task of gathering air samples from a plume of pungent gases.

On the ground, a gas chamber held more samples while massive Holstein and Jersey cows drooled and munched feed nearby. Researchers sweated in the barnyard stench, making sure sampling instruments worked properly.

It's not glamorous, but this is the cutting edge of air-quality science. In just the last decade, dairies have emerged as a serious source of air pollution, and there's work to do.

Fresno State is among 10 universities around the country studying every angle of the gases coming from the multibillion-dollar industry. What chemicals are in them? What can be done to limit them?

For good reason, the scientists at Fresno State are among the research leaders. The San Joaquin Valley is the nation's most productive dairy region, with about 2 million milking cows.

Until now, no researcher has used a balloon to track the gases as they move away from a dairy, said Segun Ogunjemiyo, a Fresno State geography professor and one of the lead investigators.

"Are the gases diluted as they move?" he asked. "Do they disperse? Are there other chemical reactions taking place?"

The research is important because there already has been a major misconception about dairy emissions. Five years ago, government officials thought most of the pollution gases came from cows and their waste.

But University of California at Davis this year found that the biggest dairy emission comes from feed, such as fermenting corn silage.

It is considered a significant problem. Dairies create almost twice as much reactive organic gas as cars do in the Valley, according to recent studies.

The gases cook together with nitrogen oxides from vehicles and other combustion sources, such as fires, to make ozone in the Valley, one of the nation's most polluted air basins.

Fresno State researchers are trying to determine if dairies cause problems on a regional basis, not just around the farm.

The research will help in designing rules and emission controls, say both state and Valley air-quality officials. For instance, covering feed piles more completely might help reduce gases.

Ogunjemiyo is working with Fresno State chemistry professor Alam Hasson and Steven Trabue, a federal scientist who works with Iowa State University. They obtained a \$600,000 grant from the U.S. Department of Agriculture for a three-year study in the Valley.

The money came from more than \$5 million in federal grants to the 10 universities across the country for such research. The other schools include the University of Minnesota, Ohio State University and Texas Tech University.

At Fresno State, the latest innovation is using the \$100,000 orange balloon, purchased with a previous grant from the federal National Science Foundation. It looks like a miniature airship or dirigible.

Filled with helium and attached to a nylon line, it takes instruments aloft to measure wind speed and to collect air samples for later analysis. The instruments are operated by remote control, and data are transmitted to receivers on the ground.

Hasson said the team spent the last three months setting up the work with the balloon. The researchers will go into the lab over the next several weeks and begin analyzing the gases.

One complication is that Fresno State dairy's gases mingle with emissions from traffic. So the next step will be to analyze a dairy away from the city.

"April is the next time we will be sampling," Hasson said. "There are many different kinds of dairies, so we will try to find one that is representative of many dairies."

The professors said there are 14 students involved in the research, mostly undergraduates and graduate students at Fresno State. The helpers also include Kaitlyn Sims, 16, a Buchanan High School junior.

Last week, she worked with Fresno State students Austen Scruggs, 19, Lucien Nana, 19, and Jeff Cole, 25, around the cows. They monitored air sampling at the gas collector next to the stalls.

"The feed is what we're interested in right now," said Cole.

At 2 p.m., the animal waste will be flushed out of the area, he said. It's not the best time to be standing around the cows or their waste, but the students are nonetheless interested in air samples.

Kaitlyn didn't seem to mind the work or the conditions. She said she liked the routine and being around the animals.

"The Holsteins are kind of cranky," she said. "But the Jerseys are nice."

[Bakersfield Californian Commentary, Friday, Aug. 6, 2010:](#)

### **Liberty sludge incinerator isn't a job-creating, environmentally friendly project as portrayed**

The Californian's July 27 editorial, "Sludge power? Smells like a winner," was incorrect on several points as it discussed the supposed benefits of the proposed Liberty Energy sewage sludge incinerator in Lost Hills.

First, this project does not create renewable energy. Incinerating sewage sludge does not qualify as renewable energy in California. That is why there is a tipping fee paid of \$60 to \$80 per ton to haul the stuff away.

Second, the project uses more energy than it creates. The project will incinerate a sufficient quantity of woody biomass, over 250,000 tons, that would produce up to 30 MW of electricity at any other plant such as the biomass incinerator in Delano. But, at Lost Hills, they will have to use three-fourths or more of that biomass energy to dry out the 80 percent moisture content of the sewage sludge. They will be left with a maximum 13.5 megawatts of electrical generation for export to the grid, which may be sufficient for 10,000 Kern County homes and a real loss of potential energy from the biomass that is truly renewable.

Third, the project will not create any net job increase. More people currently work at the Liberty composting plant than will work at this incinerator.

Fourth, the investment of \$200 million would build a 200-megawatt natural-gas power plant, along the lines of the one proposed for Avenal, which would emit far less total air pollution and fewer cancer-causing substances than this project. And that is not even counting the more than 120 truck trips per day this project will require.

In reality, this proposal has to be considered for what it really is: a crude method of disposing of sewage sludge that other counties are willing to pay megabucks to get rid of. We will continue to get the truck traffic for bringing the sewage sludge from Los Angeles, Orange and Ventura counties. The heavy metals, dioxins, and PCBs in this sludge will be either be released into our air or concentrated in the over 100,000 tons of ash produced annually and end up in local landfills. The project will use nearly 400 million gallons of good irrigation water annually from the California Aqueduct while Kern farmland is being abandoned because of cutbacks and drought. There will be a wastewater stream collected, but it will be so contaminated with salts and other junk from the cooling towers that it will be useless for irrigation purposes.

There is no logical reason for this "solution" to our sewage sludge problem to take place in Kern County. Energy can be obtained from the sludge through digestion and methane capture directly at the wastewater treatment plant. To avoid using landfill space, incinerators at these same treatment plants can dispose of the sludge, as is done in Europe, but no one over there pretends there is a net energy gain.

In any case, please do not believe the claim that this is a clean, renewable-energy solution to this smelly and toxic problem of industrialized society.

*Tom Frantz is a Shafter teacher and environmental activist who heads the Association of Irrigated Residents. Another View is a critical response to a Californian editorial, column or news story.*