



Food Safety & Manure

Turning Cow Turds Into Lemonade



Pacific Organic Residuals Symposium
Sept. 30, 2008
Michael Payne DVM, PhD

Challenges to Disposal of Livestock and Poultry Mortalities and Animal By-Products



Michael Payne DVM, PhD

University of California - Davis

Pacific Southwest Organic Residuals Symposium (PORS)

Sept. 14-15, 2010, Sacramento California

Rolling Annual Average for Farm Animal Populations - California

Species / Class	Total Number	
Dairy, cows	1.9 million	#1
Poultry Layers	18 million	
Broilers	281 million	#5
Cattle and calves	5.5 million	#10
Sheep, all	620,000	#2
Goats, all	129,000	
Hogs, all	80,000	

Value of animals & animal product sold: \$12.1 billion (2008)
Example of economic engine: dairy: \$4.5 B vs. \$47 B

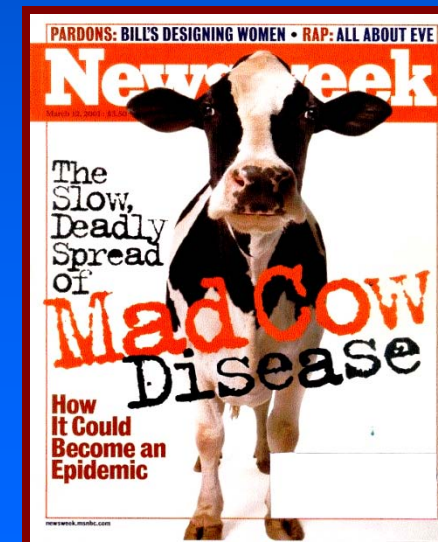
Dairy Mortality

- 90 – 105 K dairy carcasses require disposal in CA / year.
- Does not include unusual mortality events.



Unusual Disposal Events

- 1997 Hanford, Phorate, 159 dead
- 1998 Modesto, Bot Tox, 430+ dead
Rapid onset, cat carcass, milk withheld
- 1999 Turlock, Bot Tox, 150 dead
Slow onset (2 wks), $\frac{3}{4}$ milking strings
Rain damaged hay, toxin never lided, 700,000 lbs butter, 3.5 M lbs powder
Time temperature & recall issues
- 1999 State Wide, 160 tons selenium feed
rabbit, guinea pig, swine, horse, poultry
- BSE cases
2003 Washington State
2005 Texas
2006 Alabama
- 2006 Heat / humidity Event <20,000 dairy mortalities





Legal Methods of Disposal in California

- State Ag Code – Deadstock may leave farm only if transported to:
 - Rendering or rendering collection center
 - Diagnostic Laboratory
 - Crematorium
 - Out of State with receiving state's approval
- Central Valley WDR – Deadstock may not be disposed of on farm.



Rendering is currently the only legal carcass disposal option in California



In most areas of California carcasses are picked up by or delivered to rendering facilities – only four facilities process mortalities

Rendering Facilities in California



- Only 4 rendering facilities that handle animal mortality.
- All facilities operating at capacity.



Material Rendered In CA (2008, Lbs)

Fat & Bone	391,306,633
Slaughterhouse/ Custom Kill Offal	544,310,914
Restaurant Grease	321,719,901
Dead Animals	252,456,923
Poultry/Dead Birds /Offal	725,624,860
Fish/Seafood Waste	14,925,924
Trap/Interceptor Grease	87,147,531
All other	98,768,885
Total	2,436,261,571

Dead Animals Processed (Ovine, Bovine, Porcine): 534,657

Segregation of brain and spinal cords from other rendered material



**Diversion of
carcasses
(350,000)
could mean
132 M lb to
landfills
annually.**



Central Valley California 2006: June & July a heat & humidity event leads to a estimated additional 40,000 livestock mortalities, exacerbated by a rendering mechanical failure.



“July 18, 2006, 4:45 pm I received a call stating,”3 truck loads of chickens were on their way and to stay open till 1:00 am”.

Michael Franck





**Chickens Grand Total:
3,455.29 Tons
Or 6,910,580 Pounds**



**Cows Grand Total: 1,187.14 Tons
Or 2,374,280 Pounds**



Emergency Animal Disposal Working Group*

ANIMAL INDUSTRY

California Dairy Campaign
Western United Dairymen
Milk Producers Council
Alliance Western Milk Producers
CA Dairy Research Foundation
CA Cattlemen's Association
CA Farm Bureau Federation
CA Wool Growers Association
CA Pork Producers Association
CA Poultry Federation
Pacific Egg and Poultry Asso.
Foster Farms

RENDERING INDUSTRY

Baker Commodities
Darling International
Sacramento Rendering
North State Rendering

ACADEMIC

UC Riverside
UC Davis
UC School of Vet Med
UCCE - Merced
UCCE – Kings
UCCE San Bernardino
CAHFS Laboratory
WIFSS

COUNTY AGENCIES

Kern Env. Health Services
Kern County Waste Management
Fresno Dept. Community Health
Fresno Dept. of Ag
Stanislaus Public Health
Stanislaus Dept Ag/Weights/Meas
League of California Cities
Merced County Public Works
Kings County Public Health
Kings County Ag Commissioner
Fresno County Ag Commissioner

STATE & FEDERAL AGENCIES

CA Department Food & Agriculture
CA Integrated Waste Management Board
CA Ag Commissioners and Sealers Asso.
Governor's Office of Emergency Services
CA Department of Public Health
CA Air Resources Board
State Water Resources Control Board
Central Valley Water Board
San Joaquin Air Pollution Control District
USDA-APHIS

Notes

- 120 partner representatives on the roster.
- Co-chairs: CDFA & CIWMB (Dennis Wilson & Bob Holmes)
- Assistance from Cal-EPA's ERMaC (Don Johnson)
- Strong participation by CACASA (Tim Niswander) and individual counties (Kings, Fresno, Stanislaus, Kern, Merced)

* *Partial list only*



Quick links

Homeland Security Training

Education & Outreach

Research & Grants

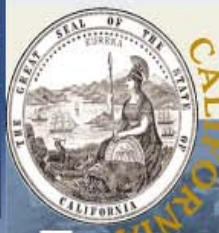
Intranet Portal

Western Institute
 for Food Safety &
 Security
 University of
 California, Davis
 One Shields Avenue
 Davis, CA 95618
 (530) 757-5700

About WIFSS

WIFSS News

Contact Us



Emergency Animal Disposal Workgroup EADW



BROWSE BY SUBJECT

- ❖ Frequently Asked Questions
- ❖ How To
- ❖ Regulatory Docs
- ❖ Review Docs
- ❖ Workgroup Docs
- ❖ White Paper
- ❖ PowerPoint Presentations
- ❖ Emergency Response Tools
- ❖ 2007 Symposium
- ❖ Site Map
- ❖ Contact Us

WELCOME TO THE WEBSITE FOR CALIFORNIA'S EMERGENCY ANIMAL DISPOSAL WORKGROUP

The Emergency Animal Disposal Workgroup (EADW) is a collaboration of more than 40 state, federal, industry and academic organizations working together to address California's livestock disposal needs. This password-protected website is one method by which the EADW members (*see current roster*) trade information and develop work products. Contained on this site are slide shows, regulatory and "how to" documents, research summaries, and tools for people responding to a livestock disposal emergency. Ways to navigate the site include clicking on the hot buttons to the right or scrolling through the subject areas on the left. You may also find specific information you need listed below. To learn more about the purpose, structure and members of the group or how to contact us, click [here](#). Thank you for visiting our website.

FREQUENTLY ASKED QUESTIONS (FAQs)

1. What are my options for disposing of dead

Hot Topics

Decision Tree

Other
Mortality
Sites

Doc Share

Current work projects and products...

- EADW established active sub-committees & funding.
- Landfill database (central valley) has been established.
- Landfill permit template language drafted with a schedule for landfill re-permitting.
- A rendering facility database is being completed.
- Discussions with RB-5 on immediate needs have been initiated .
- WIFSS developing a secure web portal for info sharing.
- OES prepared a emergency declaration review.
- Composting research completed.



FMD outbreak in South America ...

Cow Carcass Composting Research

- CDFA: \$148,000; CIWMB \$50,000; industry \$90,000
- Had to change state law





Water Studies (leachate) for Water Board



Pathogen Reduction for CDFA



Air Studies for Air District

Manure sources





Overview of work in progress

SDMS 70% moisture

Initial pile: April 2008



Subsequent piles:

Sept/Oct 2008

**SDMS
50%
moisture**



**DLS 25%
moisture**



January 2009

**SDMS
60%
moisture**

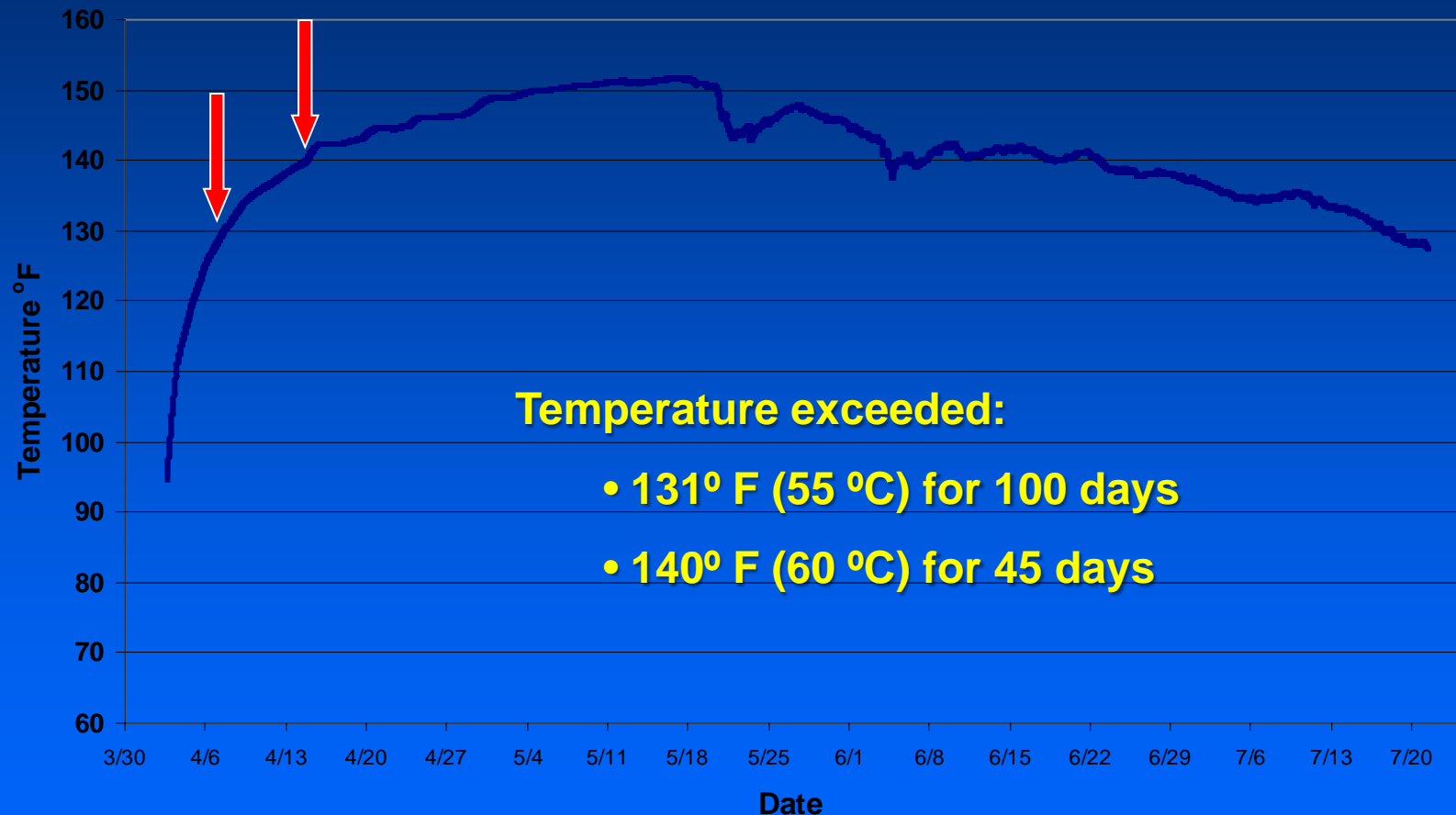


Temperature - continuous recording data loggers and manual probe



Initial Pile - Carcass Compost Temperature

(average of 8 buried thermocouples)



Peak temperature was 153° F (67°C)

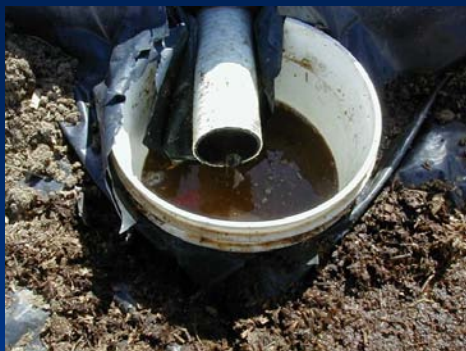
Pathogen Reduction

- A 6-log (1 million fold) reduction of inoculated pathogens.
 - Salmonella (heat resistant)
 - Total Coliforms
 - Bacillus bacteria & spores

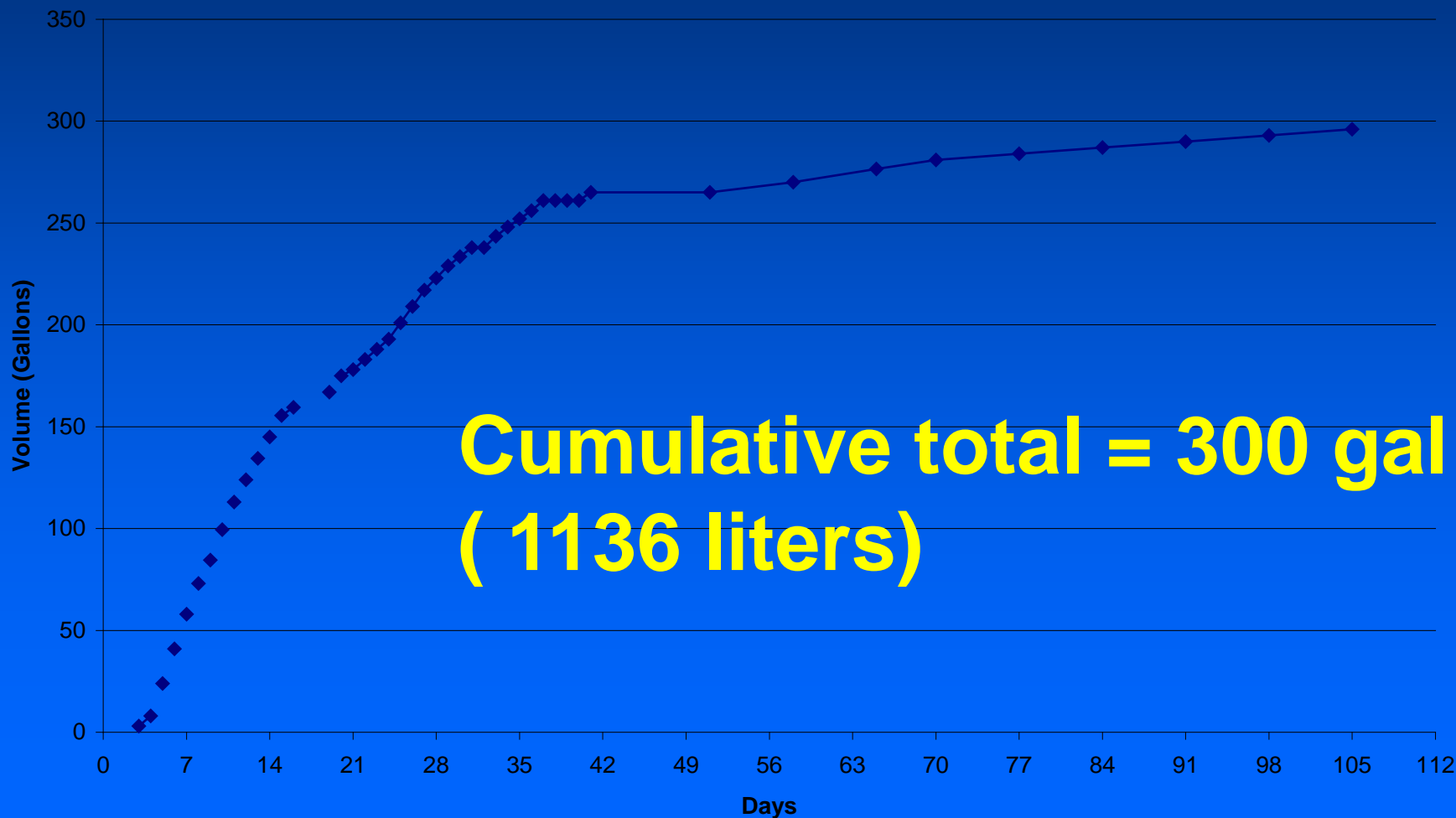


Improved leachate collection system





Initial Pile Leachate Volume (Gallons)





Leachate analyses

	April 2 to 15	April 16 to end
pH	7.2	8.5
Conductivity (Ec)	12,650	8,380
Nitrate-N mg/L	1.0	1.0
Ammonium-N mg/L	789	1,001
TKN mg/L	1,130	1,105
Phosphorus (P) mg/L	108	23
Potassium (K) mg/L	1,960	1,130



Dr. Chuck Schmidt and Tom Card

Surface Isolation Flux Chamber

Canisters containing
air samples



Methods: Air Emissions



- US Environmental Protection Agency protocols
- Surface isolation flux chambers
- Reactive organic gases (VOC) and ammonia
- Multiple locations on piles with and without cows
- Five separate days: 2, 7, 14, 38 and 66
- Performed by C.E. Schmidt, PhD.
- Sample analysis by Almega Environmental Lab

VOC and Ammonia Emissions

- Slight elevation of VOC and NH_3 with addition of carcasses to composting manure.
- Emissions are low compared to composting of green waste.



Decomposed carcass after 17 weeks



Weighing bones and remaining tissue





Finally finished!

Madera County Cow Mortality Aug. 23 2009









Town Hall Meeting

TUESDAY, AUGUST 25, 2009 6 - 8:00 PM

“Cows in Fresno River”
Coarsegold, CA

Coarsegold Community Center
35540 HWY 41
Coarsegold, CA 93614

*Hosted by Madera County Supervisor, Tom Wheeler District 8
in coordination with Madera County Environmental Health Department*

Work To Remove Cow Carcasses Halted, Neighbors Getting Angry

Thirty five cows ran off a hill and plunged to their deaths in the bed of the Fresno River. Now almost a week and a half has passed since the incident and neighbors are getting agitated.



HOME

Enter search phrase

SEARCH

SEE IT ON TV? CHECK HERE

LOCAL

Dead Cattle in the Fresno River Feared to be Health Threat

Monday, August 17, 2009

Story Media

Top Stories





Conclusions

- Never waste a perfectly good crisis.
- The rendering industry is essential to the economic and environmental health of California.
- Various stakeholders have legitimate concerns, but it is in their best interests to understand cross-media concerns.
- Regulations are essential for environmental protection but they can and do sometimes prevent taking action most protective of the environment.
- Many hands make light work.
- There are few problems where significant progress can't be made if you have the right, well meaning people at the table.





Tim Niswander, Kings County Ag Commissioner



Michael Payne
530-304-9306 (cell)
mpayne@ucdavis.edu