

AGROSECURITY

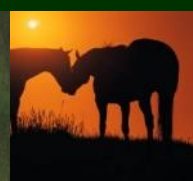
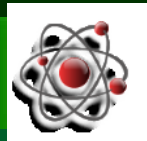
SAADRA/MSP Meeting 2013

United States Department of Agriculture:
Roles and Capabilities in Radiological Emergencies

*Contrasted with Events Following
the Fukushima Dai-ichi Radiation Release*

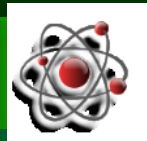
Gordon Cleveland

United States Department of Agriculture
National Center for Animal Health Emergency Management
Advisory team for Environment, Food, and Health



Advisory Team on Environment, Food, and Health

The Great Tohoku Earthquake and Fukushima Dai-ichi Nuclear Power Plant Disaster



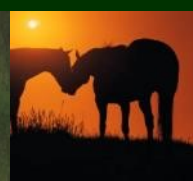
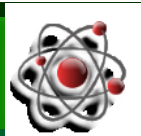
Advisory Team on Environment, Food, and Health

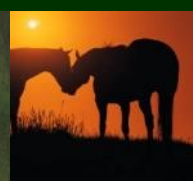
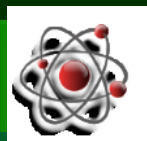
Fukushima Dai-ichi Nuclear Power Plant Disaster

1-1. 2011 off Tohoku Pacific Earthquake

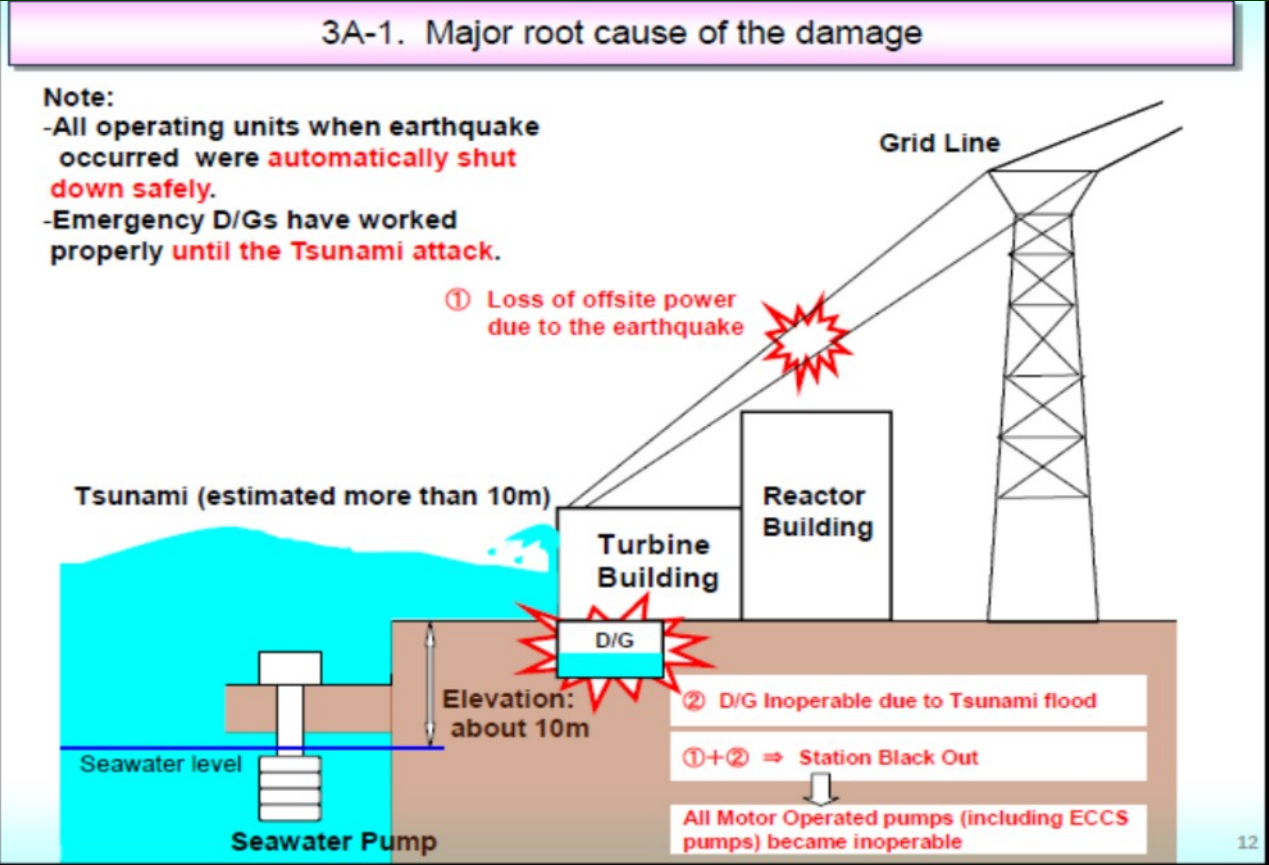


- Occurred 14:46 March 11, 2011
- Magnitude: 9.0 Mw
- Epicenter location: 38° 6''N and 142° 51''E, and 24km in depth
- It is said that the height of tsunami attacked Fukushima Dai-ichi was more than 14m



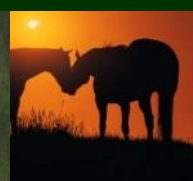
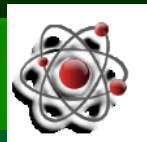
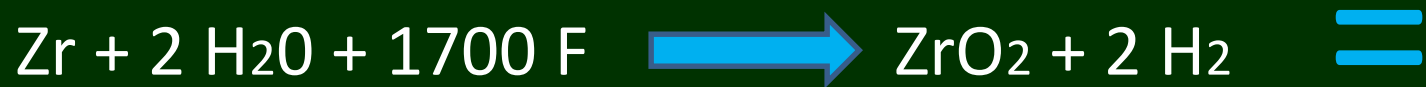


Fukushima Dai-ichi Nuclear Power Plant Disaster



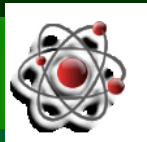
Fukushima Dai-ichi Nuclear Power Plant Disaster

- 47 foot tsunami overwhelms the protective barrier
- Emergency Diesel Generators flooded
- Reactors and spent fuel pools now have inadequate coolant (water supply)
- Cores begin to heat.
- Zirconium fuel cladding overheats giving off hydrogen





USDA



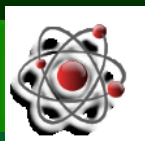
Advisory Team on Environment, Food, and Health



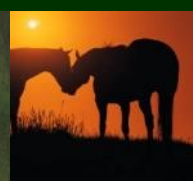
International Fund for Animal Welfare Mission



USDA



Advisory Team on Environment, Food, and Health



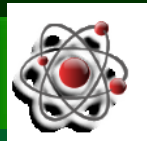
Fukushima Dai-ichi Nuclear Power Plant Disaster

National Diet of Japan, Report of the Fukushima Nuclear Accident Independent Investigation Commission (NAIIC) 7/5/2012:

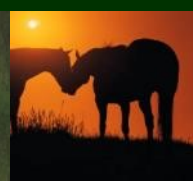


- Government had no response measures for a severe accident in place
- Power company did not have emergency response plan and had no manual or training regimens

USDA



Advisory Team on Environment, Food, and Health



In Contrast: USA

Robust Radiological Emergency Response Preparedness

National Response Framework

- Establishes a comprehensive, national, all-hazards approach to domestic incident response

National Incident Management System

- A national approach to incident management at all jurisdictional levels across all functional disciplines.

Incident Command System

- Single standardized emergency management system used by all emergency response disciplines
- Disaster response Command and Management
- Provides accurate information, strict accountability, planning, cost effective operations, and logistical support for any incident

In Contrast: USA

Robust Radiological Emergency Response Preparedness

- **NRC/FEMA:** Provides strict training regimen for plants and local and state responders.
 - RAD exercises yearly
- **Department of Energy:** Regional Radiological Assistance Program teams.
- **Department of Energy:** Center for Radiological/Nuclear Training provides technical and operational training for state regional, and local responders.



In Contrast: USA

Robust Radiological Emergency Response Preparedness

- All states have **Radiological Response Plans**
- All states have **Radiological Emergency Preparedness teams**
 - Conference of Radiation Control Program Directors
- States provide Nuclear Regulatory Commission informed brochures to the community within the 50 mile EPZ
- **National Alliance for Radiation Readiness**
- **Advisory Team for Environment, Food, and Health**
 - Provides Protective action Recommendations based on scientifically validated information and best practices

Japan Moves Forward

Emergency Symposium on Crisis Management in Japan: Adopting Incident Command System

- Panel of ICS advocates and experts organized by Rhisso University in cooperation with members of the Government of Japan, House of Representatives

Incident Command System Overview

Using An Emergency Management System to Mitigate Disasters

Emergency Symposium on Crisis Management in Japan

September 11, 2011



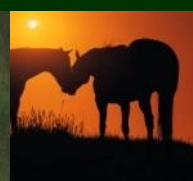
Gordon S. Cleveland
USDA APHIS VS

National Center for Animal Health Emergency Management

USDA



Advisory Team on Environment, Food, and Health



Japan Moves Forward

The International Science Symposium on Combating Radionuclide Contamination in Agro-soil Environment:

- Post-Chernobyl radioecology researchers from Ukraine, Belarus, Russia, Kazakhstan and Germany
And
- Japanese researchers and technologists developing procedures for decontaminating soils and agricultural products

農業及び土壌の放射能汚染対策技術
国際研究シンポジウム
International science symposium on combating radionuclide contamination in Agro-soil environment



要旨集

2012年3月8日[木]~10日[土]
会場：福島県 郡山市 (ユラックス熱海・ホテルハマツ)

主催 農林水産省 ISTC STCU

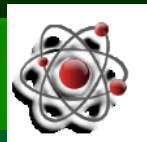
協賛 農林水産省 (DOE), (IAEA) 農業・食品産業技術総合研究機構, (NRI) 農業環境技術研究所
後援 外務省, 日本農学会, 福島民報社, 福島県立大学

Organized by:
Ministry of Agriculture, Forestry and Fisheries of Japan, International Science & Technology Center (ISTC), and
Science & Technology Center in Ukraine (STCU)

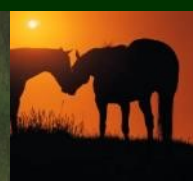
Co-sponsored by:
Fukushima Prefecture, Department of Energy, U.S.A., National Agriculture and Food Research Organization, Japan,
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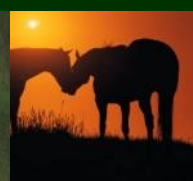
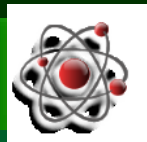


Advisory Team on Environment, Food, and Health



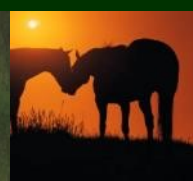
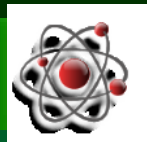
USDA Responsibilities: Nuke-RAD Incident Annex to the NRF:

- **Assists** in the planning and collection of agricultural samples
- **Assesses** damage to crops, soil, livestock, poultry, and processing facilities
- Inspects and **assists** in the disposition of agricultural animals and monitors the production, processing and storage of their products
- Provides **support** and **advice** on screening and decontamination of contaminated animals



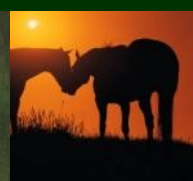
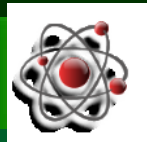
USDA's Preparedness Challenges

- **Radiological surveillance** for contaminated or irradiated animals/crops/feeds
- **Radiological decontamination** for livestock/poultry/pets/zoo animals/wildlife
- **Therapeutic countermeasures** to mitigate the effects of radionuclide contaminants ingested by animals/Euthanasia strategies if necessitated
- **Remediation strategies** for soils and crops contaminated by radionuclides



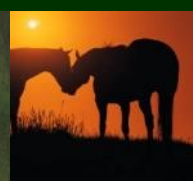
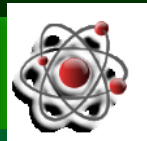
USDA APHIS NCAHEM Radiological Program Analyst: Role

- Develop robust and practicable strategies for maintaining agricultural production and a safe food supply following a nuclear or radiological release
 - **Surveillance strategies** to identify contaminated or irradiated pets, service animals, livestock and wildlife
 - **Decontamination strategies** for livestock, poultry, pets and service animals, zoo animals



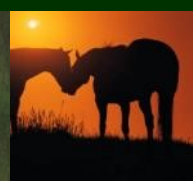
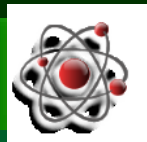
USDA APHIS NCAHEM Radiological Program Analyst: Role

- Develop robust and practicable strategies, Cont'd
 - **Remediation strategies** for soils and crops
 - **Therapeutic strategies** for the development and use of radiation prophylaxes and therapies for animals
 - **Euthanasia and carcass disposal strategies** for contaminated livestock, poultry, pets and service animals, zoo animals and wildlife and their contaminated effluent.



USDA APHIS NCAHEM Radiological Program Analyst: Role

- Maintain membership in the **Radiological Advisory Team for Environment, Food, and Health**
 - Provide agricultural subject matter expertise, support, and **Protective Action Recommendations** to federal, state, local, and tribal radiological emergency responders
 - Participate in, and provide guidance for development of, **RAD emergency exercises**



Advisory Team Duties Overview

The Advisory Team works with the Department of Energy Federal Radiological Monitoring and Assessment Center to provide scientifically validated *recommendations* concerning:

- Minimizing radiation exposure from deposition and through the ingestion pathway
- Regarding the disposition of contaminated livestock, **pets**, poultry, and foods
- Dose assessments, evacuation, reentry, relocation

The Advisory Team for Environment, Food, and Health (formerly known as the A-Team)

The goal of the Advisory Team is to provide coordinated advice and recommendations to the State, Coordinating Agency, and DHS concerning environmental, food, and health matters.

Membership is comprised principally of :

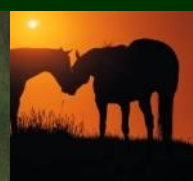


and other Federal agencies as needed

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Advisory Team on Environment, Food, and Health



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Radiological Program Analyst

Computer Simulations to Determine the Proper Portal Configuration for Livestock following Radiological Accident

J. Justina, C.M. Marianno, S.S. Chirayath

INTRODUCTION

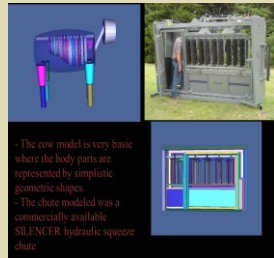
This work is the first phase of a project to develop a radiation portal monitor (RPM) for livestock. This device would be employed following a large scale accident following a release of radioactive material. The objective of this work is to employ a computer simulation to evaluate the optimal detector configuration required to detect point or surface contamination on livestock due to gamma emitting radio-isotopes. This includes the determination of the best size, placement and detection material composition. Using the results of this work a theoretical minimum detectable activity (MDA) will be determined.

Motivation for Work

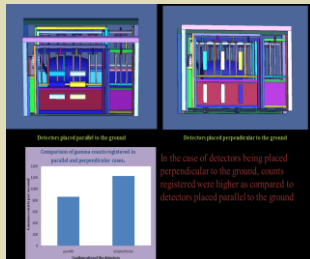
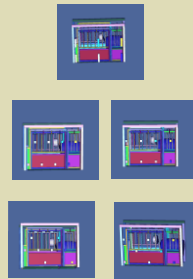
- The Department of Agriculture (USDA), through the National Response Framework Nuclear/Radiological Annex, has the responsibility of controlling, assessing and decontaminating the affected animals
- For humans, plans and equipment exist to evaluate the amount of contamination, but for household animals and for livestock plans and equipment are limited.
- Total retail value of beef consumed in the United States: \$80.6 billion (2009) (USDA)
- For a state like Texas
 - 13 million head of Cattle
 - \$3 state commodity generating \$6.9 billion in sales
 - Feedlot industry in Texas produces ~30% of the nation's beef

Scope of Work

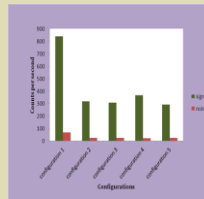
- Produce Monte Carlo N-Particle Simulations to evaluate the best configuration for a radiation detection portal
- Simulations will include:
 - Cow
 - Press Chute
 - Nal and PVT detectors
 - Concrete Pad for Background radiation
 - Point and distributed source contamination on the animal
- Data will be used to predict minimum detectable activities



The cow model is very basic where the body parts are represented by simplistic geometric shapes
The chute modeled was a commercially available SILENCER hydraulic squeeze chute



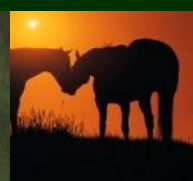
In the case of detectors being placed perpendicular to the ground, counts registered were higher as compared to detectors placed parallel to the ground.



Conclusions

- Optimal configuration of the detectors for effective assessment of contamination would be
 - Six 2"x4"x16" Nal detectors on either side of the chute
 - Placed such that the 2"x16" face is perpendicular to the ground.
 - This configuration provides very high value of signal to noise ratio

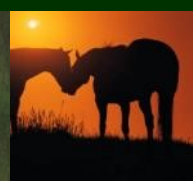
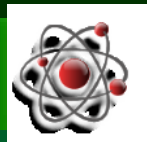
- Develops Radiological surveillance and monitoring strategies and capabilities for remediating contaminated or crops and feeds and contaminated or irradiated animals



Radiological Program Analyst



- **9** USDA APHIS Safety Officer volunteers, 4 sets of DOE compatible gear
- **12** USDA Office of Inspector General HAZWOPER Forensics Team AgERT trained, 4 RAD surveillance trained



Radiological Program Analyst

- Develops strategies for screening and decontamination of pets, companion animals and livestock
- DHS/FEMA IND Pet mass evacuation assessment and evaluation working group



Operational Topic

A methodology for decisions regarding contaminated livestock.

A Plan for the Handling of Externally Contaminated Livestock

Dayton McMillan, Thomas Johnson, Yuanqing Guo, and Alexander Brandl*

Abstract: Nuclear accidents and access to radiological weapons for terrorist organizations and countries with hostile intentions towards the United States are realistic scenarios in the current global landscape. A dispersion of radionuclides can result from a nuclear weapon detonation or from a nuclear accident occurring in facilities handling or using radioactive material, such as nuclear power reactors. Any target of a radiological dispersal device (RDD) or an attack with a nuclear weapon and the surrounding area of a reactor accident could be subject to a significant amount of fallout and radioactive contamination. Therefore, a nuclear event in close proximity to agricultural areas will cause significant concerns regarding the contamination of food products. In order to respond quickly and effectively to a large amount of contaminated agricultural products, such as livestock, a proposal and effective plan for handling and processing of these products is necessary. A protocol outlining the evaluation of and procedures for handling and processing radioactively contaminated livestock is proposed, to ensure safe animal food production and economic stability in the livestock industry in the wake of such a nuclear or radiological event. An evaluation of the suitability of the contaminated livestock is performed based on the degree of exposure, the cost of decontamination, expected demand for food products, and economic impact to the owner/producer. Important factors that impact the suitability of affected livestock are listed and analyzed to support the decision process for handling contaminated animals. *Health Phys.* 101(Supplement 3):S164-S168, 2011

* Department of Environmental and Radiological Health Sciences, Colorado State University, Fort Collins, CO 80523.



S164

Alex Brandl is Assistant Professor in the Environmental and Radiological Health Sciences Department at Colorado State University, Fort Collins. He was Head of the Operational Safety Department at Nuclear Engineering School of Tsinghua University in Beijing, China, and received his M.S. and Ph.D. degrees from the University of New Mexico. His research focuses on issues related to dosimetry, radioactivity measurements, environmental monitoring, and radiological dispersion and transport in the environment and emergency response. His email address is alexander.brandl@colostate.edu.

Key words: operational topics, decontamination, emergency planning, fallout

INTRODUCTION

External radioactive contamination of livestock is a concern after any nuclear or radiological event. Difficulties in managing contaminated livestock after Chernobyl resulted in a massive destruction of animal stock, which subsequently created large quantities of radioactive waste that required additional handling and disposal (Fesenko 2007; IAEA 2006). High costs associated with radioactive animal waste disposal and losses of investment in livestock are deterrents for indiscriminate slaughter of contaminated animals, apart from the hygiene problem associated with the management of large numbers of animal carcasses and the practical and economic impact of such measures (IAEA 2006). In order to avoid any unnecessary disruption to food production and premature of unnecessary slaughter of livestock, emergency planning should include appropriate provisions for agricultural animals. An economically-efficient method of handling mass quantities of contaminated livestock is currently not available for the agricultural industry.

Previous studies have shown that the financial viability of radioactively decontaminated animal products is quite complex and depends on multiple factors (Grande et al. 1999). Few data are available on consumer perception and behavior after a radiological event; some information can be extracted from studies in Norway and Scotland after the 1986 Chernobyl accident (Grande et al. 1999). A general observation, however, has been that the public acceptance of various emergency countermeasures is increased when social and economic factors are considered in the design and planning of these countermeasures (IAEA 2006). Recognizing that consumption patterns, availability of alternative food sources, and cultural influences will play a major role in the post-event market, extrapolation from these data can hardly provide for sound market projections. However, the general principles to which the affected livestock will have to be evaluated can be investigated and are summarized here. Possible market values of decontaminated animal products and costs to decontaminate animals to safe levels were extrapolated based on current market prices.

MATERIALS AND METHODS

A plan for the handling of contaminated livestock was devised by review and analysis of the relevant literature, national and international

November 2011

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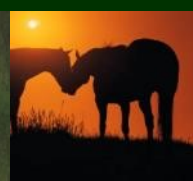
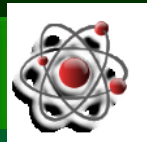
Advisory Team on Environment, Food, and Health



Radiological Program Analyst



- Collaborates with Veterinary Services Animal Care on tactics for **decontamination** of livestock, poultry, pets, service animals, zoo animals, and wildlife
- Researches **Therapeutic countermeasures** to mitigate contaminants ingested by animals
 - Ferro cyanate (**Prussian blue**)



Radiological Program Analyst

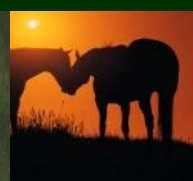
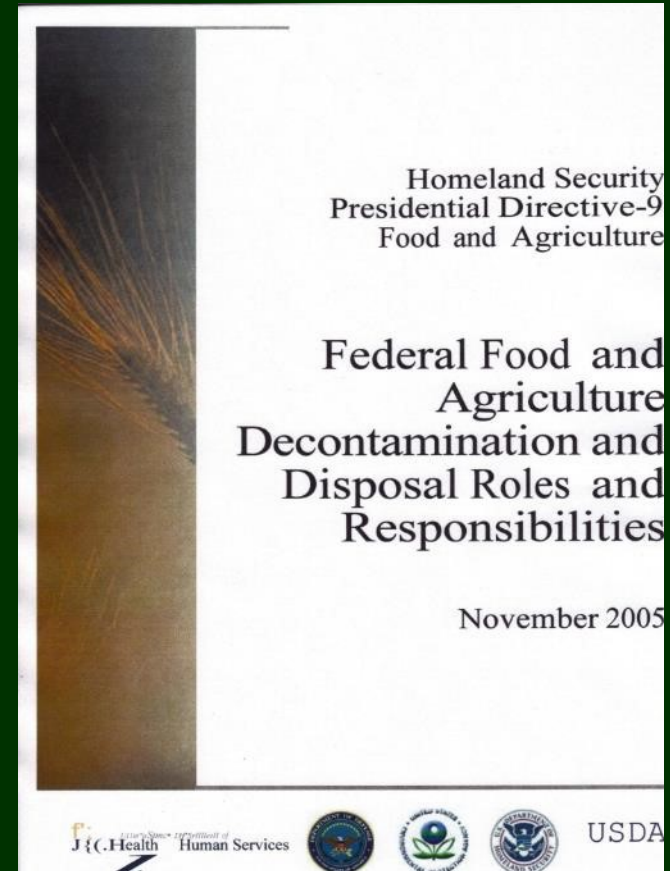
- Develops strategies for the disposition of, animal carcasses:

Call EPA!!



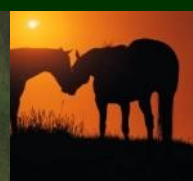
“This document describes the general Federal roles and responsibilities for decontamination and disposal in response to animal, crop, and food incidents.”

“Radiological incidents are not addressed.”*



NCAHEM ACTIVITIES

- International Expert Meeting on Decommissioning and Remediation after a Nuclear Accident
 - Stakeholder Buy-in
 - Decision Tool



NCAHEM ACTIVITIES

- Dairy Crisis Communications Drills
- Water Environment Research Foundation
- EPA Wide Area Wide Area Recovery and Resiliency Program (WARRP) Technical SME Workshop

2013 DAIRY INDUSTRY FOOD SAFETY CRISIS DRILLS

June 5-6, 2013

June 5 – Drill Kick-Off, 5:30 – 7 p.m. ET
June 6 – Drill, 7 a.m. – 4 p.m. ET

Washington, D.C.

Hilton Alexandria Mark Center,
Alexandria, Va.

Fire drills, tornado drills, evacuation drills... Government agencies regularly practice these to prepare for disasters. Likewise, the dairy industry must test its response given the potential impact such incidents could have on food safety.

Dairy Management Inc. (DMI) has developed a new crisis drill scenario that will test the dairy industry's longstanding crisis response plan in this context – a natural disaster strikes and dairy food safety is called into question.

Government participation in this drill is essential. One of the guiding principles of dairy's crisis response plan is to follow the government's lead. We need your department or agency to work alongside members of the dairy supply chain to determine how best to address and communicate about the situation at hand. In the drill, a tornado devastates a community, leaving farms, processing facilities and a nuclear power plant damaged in its wake. Radiation leaks from the plant and is detected in the local food supply, triggering food safety concerns on a national level and a massive communications challenge for both the dairy industry and the government.

Why You Should Attend

The session is open to representatives from state and federal government, dairy industry leaders from across the supply chain and third-party subject matter experts. Government participants will:

- Work side-by-side with dairy industry and fellow government representatives to share and discuss response and communication plans
- Share perspectives with other government officials on their roles and responsibilities during a large-scale food-safety crisis
- Test your media interview skills, if applicable
- Experience how social media will shape public perception and industry response – and how your department or agency can contribute to the conversation
- Familiarize yourself with industry and government resources that support readiness and response

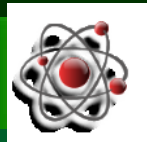


Sign Up Today!

You can register for the Northeast Region Dairy Industry Food Safety Crisis Drill via the drill [microsite](http://sites.redwoodeditor.com/dmi-crisis-training/) (<http://sites.redwoodeditor.com/dmi-crisis-training/>). Registration is open until May 10. Sign up early – space is limited and fills quickly!

"Coordination and cooperation between the dairy industry and the government are paramount to the industry's crisis response plan. This drill will give us an opportunity to practice and plan in advance so we're better prepared when a crisis hits."

– David Pelzer, Senior Vice President of Strategic Communications, DMI



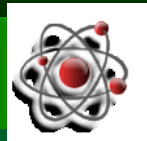
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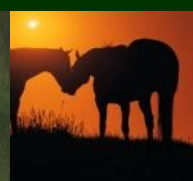
Research

- Livestock Decontamination: Colorado state University
- Fungal Gel Decontamination: Aberdeen Proving ground
- USDA Agricultural Research Service: phyto-mitigation
Crop Selection, soil remediation
- Portable, scalable, large animal monitoring: Texas A & M University
- Segmented Gate technology for contaminated soil and agricultural product segregation
- Wildlife Services Research center: NaNO_2 humane euthanasia

USDA



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MOST CRITICAL LESSON
LEARNED?

PREPAREDNESS IS ESSENTIAL!!



QUESTIONS?



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