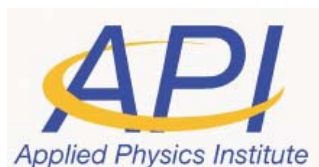


# National Milk Transport Security and Traceability Demonstration

October 9, 2008

Fayette County  
Cooperative Extension Office  
Lexington, Kentucky



# Project Summary

The U.S. Department of Homeland Security (DHS) has targeted bulk food contamination as a focus for attention because it poses a high consequence health threat to our society. Bulk milk transporters currently use accountability seal programs to secure milk during transport. The current manual methods used for securing milk during transport are labor and paper intensive and complications associated with handwritten records can occur. The bulk milk transportation sector stands to greatly benefit from a security enhancement that will both reduce recording errors and enable normal transport activities to occur while providing security against unauthorized access and the ability to trace the milk production back to the farm and herd. <sup>1</sup>The need for enhanced milk transport security was well-documented in the Volpe Institute's May 2004 report entitled "Security of Milk Transport in the United States Project". The prototype system being demonstrated today is the only public effort to address the concerns identified in this report.

In early 2006, DHS funded a \$1.5 million project titled "A Wireless Electronic Monitoring System for Securing Milk from Farm to Processor" to develop a milk transport security system. The project was funded through the National Institute for Hometown Security and involved three Kentucky universities – the University of Kentucky, the University of Louisville and Western Kentucky University. The focus of this project was to develop an integrated milk transport security system that secures bulk milk and gathers relevant security and dairy industry data during transport. Stakeholders include dairy processors, milk marketing agencies, milk transport companies and tanker manufacturers/distributors. These stakeholders were intimately involved in the development and refinement of the system.

The developed system is comprehensive and addresses the food safety, food defense and information gathering/management needs of the bulk milk transportation industry. Initial dairy industry evaluations of the system have been positive.

## Continuation Grant

DHS gave final approval for a \$1.2 million grant titled "Technology Optimization of a Milk Transport Security System." This grant will help optimize the prototype system to a point of commercial viability. The prototype system defined the requirements for a commercially viable system - the goal of the original proposed research project. The specific objectives for the continuation project include:

- Optimization of the hardware and electronics for the security monitoring system;
- Development of an enterprise quality data server system;
- Development of commercial quality web-based software and
- Demonstration of the system for a one month period.

Today's demonstration will show the prototype's potential to meet the needs of dairy processors, milk marketing agencies and milk transportation companies. We seek your input and suggestions as we proceed toward optimizing the system.

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<sup>1</sup> DOT, 2004. "Security of Milk Transport in the United States Project", U. S. Department of Transportation Report Number DOT-VNTSC-TSWG-04-01, May 2004

# The National Institute For Hometown Security

The Mission of the National Institute For Hometown Security is:

- Provide national leadership in discovering and developing community-based critical infrastructure protection solutions;
- Facilitate the commercialization of these solutions and
- Encourage the deployment of the solutions.

The challenge of assuring the security of our homeland involves protecting the citizens of the United States, the nation's critical infrastructure and key assets and, ultimately, the nation's vitality against terrorism and other threats. Successfully meeting this challenge requires commitment to traditional homeland defense practices as well as discovering, developing and implementing new technology that will underpin efficient, effective homeland security operations of the future.

The National Institute for Hometown Security (NIHS) provides an on-going, integrated program dedicated to developing new technologies and devices through qualified academic research that protect community-based critical infrastructure and facilitating the successful deployment of these technologies. By promoting collaboration among a number of institutions, NIHS offers a flexible research platform that matches research requirements with research resources. NIHS also focuses on the application of the product of research and development. Through its commercialization program, NIHS encourages technology transfer and laboratory-to-market processes that support the ultimate adoption of new technology and products.

The NIHS area of interest is community-based critical infrastructure protection. DHS defines "critical infrastructure" as systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety or any combination of those matters. NIHS is dedicated to community-based critical infrastructure because most of this infrastructure is owned and operated by the private sector. The infrastructure is not concentrated in one locale, but rather it is found throughout the nation, in metropolitan centers, in mid-size cities and in small towns or unincorporated villages.

NIHS is a private, non-profit 501 (c) 3 corporation. NIHS was organized in 2004 through the leadership of Kentucky Fifth District Congressman Harold "Hal" Rogers. Congressman Rogers suggested organizing the higher education institutions of Kentucky to more effectively compete for research funds and projects aimed at improving homeland security. The Kentucky Homeland Security University Consortium resulted from his efforts. NIHS is the administrative manager for the Consortium.

## Project Information

General information about the milk transport security system is available online at <http://www.rs.uky.edu/milktransport> . For more detailed information, please contact Fred Payne [fpayne@uky.edu](mailto:fpayne@uky.edu) or Chris Thompson [chris.thompson@uky.edu](mailto:chris.thompson@uky.edu) . For media and press related information, please contact Aimee Nielson [aimee.nielson@uky.edu](mailto:aimee.nielson@uky.edu) .

# Program Agenda

8:30 to 9:00 Registration and Refreshments

9:00 to 9:45 ***Opening Remarks***

Fred Payne, Food and Bioprocess Engineer, University of Kentucky

***Welcome from the University of Kentucky***

Lee T. Todd Jr., President, University of Kentucky

***Welcome from the College of Agriculture***

Nancy Cox, Associate Dean for Research and Director of the  
University of Kentucky Agriculture Experiment Station

***Comments from the National Institute For Hometown Security  
Recognition of Department of Homeland Security  
Introduction of Congressman Hal Rogers***

Ewell Balltrip, President/CEO, National Institute For Hometown Security

***Keynote Address***

Honorable Hal Rogers, Congressman, Kentucky's 5<sup>th</sup> Congressional  
District

**Discussion of Food Safety and Defense Issues**

9:45 to 10:05 ***Meeting the Food Safety Challenges of Today***

Gayle Prince, SAGE Food Safety Consultants

10:05 to 10:25 ***Food Safety and Defense: A Dairy Processor Perspective on  
Being Proactive***

Allen Sayler, International Dairy Foods Association

10:25 to 10:35 ***Food Safety and Defense: A Dairy Producer Perspective on  
Being Proactive***

Maury Cox, Kentucky Dairy Development Council

10:35 to 11:05 ***Overview of the Milk Transport Security System***

Chris Thompson, University of Kentucky

## **System Demonstration**

11:05 to 12:15 Two concurrent breakout demonstration sessions  
Concurrent sessions are scheduled for 30 minutes each

Concurrent Session A: 11:10 to 11:40

Concurrent Session B: 11:45 to 12:15

## **Outside under the tent**

### ***Milk Transport Truck Demonstration***

Brian Luck, University of Kentucky

Ryan Moore, Western Kentucky University

## **Main conference room**

### ***Handheld Computer Demonstration***

Lindsay Hopper, Western Kentucky University

Chris Thompson, University of Kentucky

**12:15 to 1:15 Lunch provided**

1:15 to 1:20 ***A Producer's Perspective on Food Safety and Defense***

Scott Williams, Southeast United Dairy Industry Association,  
Dairy Farmer Spokesperson

1:20 to 2:00 ***Database Demonstration: Product Traces, Security-Quality Reporting, Input and Output***

Fred Payne, University of Kentucky

2:00 to 2:20 ***Opportunities and Challenges for Implementation***

Chris Thompson, University of Kentucky

2:20 to 2:30 ***Future Development Efforts***

Fred Payne, University of Kentucky

2:30 to 3:00 ***Question and Answer session***

Panel

3:00 **Adjourn**

# Presenter Information

## **Ewell Balltrip - President and CEO, The National Institute For Hometown Security**

Ewell is the President and CEO of The National Institute For Hometown Security. He is the founding executive of the institute and is responsible for its overall day-to-day operation and management. He has an extensive background in executive management and leadership in the public and private sectors. Ewell has led companies as the publisher of community daily newspapers of The New York Times Company. In the public sector, he has served as executive director of the Kentucky Appalachian Commission and as the Kentucky Governor's representative to the federal Appalachian Regional Commission.

## **Maury Cox - Executive Director, Kentucky Dairy Development Council**

Maury is Executive Director of the Kentucky Dairy Development Council (KDDC). He oversees the general operations of KDDC and promotes Kentucky's dairy industry locally and nationally. He has extensive experience in the dairy industry as a producer, manager and consultant. Maury possesses a broad knowledge of dairy marketing issues and regularly cooperates with processors, transporters, allied industries, state and federal agencies, other agricultural groups and Kentucky's network of university educators.

## **Nancy M. Cox - Associate Dean and Director, Kentucky Agricultural Experiment Station**

Nancy is the Director of the Kentucky Agricultural Experiment Station and Associate Dean for Research at the University of Kentucky College of Agriculture. She joined UK in 2001, and her duties include oversight of Experiment Station state and federal budgets. The Experiment Station manages research and education facilities at the Kentucky Research and Education Center in Princeton, the Robinson Station in Quicksand and the Eden Shale Unit in Owenton, Kentucky. Prior to coming to UK, she taught and conducted research at Mississippi State University from 1982 to 1996, then served as associate director of the Mississippi Agricultural and Forestry Experiment Station.

## **Lindsay Hopper - Senior Applications Engineer, Applied Physics Institute**

Lindsay is a Senior Applications Engineer at Western Kentucky University's (WKU) Applied Physics Institute. She received her B.S. in physics and mathematics from WKU in 2003. Her research interests are interdisciplinary, reaching across the fields of physics, astronomy, computer science, and sociology. She has worked on numerous projects at WKU, including active RFID tracking, non-destructive elemental analysis, network security, autonomous sensor networks, and social research of online groups. Her current work is the development of an online database interface as part of the milk transport security system.

## **Brian D. Luck, Engineer Associate, Department of Biosystems & Agricultural Engineering**

Brian is an Engineer Associate in the Department of Biosystems and Agricultural Engineering (BAE) at the University of Kentucky. Brian received his B.S. in BAE in 2005 and is currently pursuing an M.S. degree in the Biosystems and Agricultural Engineering (BAE) Department. Brian has experience in the development of controller area networks and in electronic and mechanical design and implementation.

### **Ryan Moore, Applications Engineer, Applied Physics Institute**

Ryan is an Applications Engineer Associate at the Applied Physics Institute at Western Kentucky University (WKU). He is the technical lead on the milk transport security project for WKU's Applied Physics Institute. He has published papers in bulk chemical analysis including explosives detection and networked radiation sensors. He is a 2005 graduate of WKU with a BS degree in Physics.

### **Fred A. Payne, Professor, Department of Biosystems and Agricultural Engineering**

Fred is a Professor in the Biosystems and Agricultural Engineering Department at the University of Kentucky and is a specialist in food and bioprocess engineering. He specializes in food engineering, directs graduate student research in the development of optical sensors for food process control and is the primary investigator on the milk transportation project.

### **Gale Prince, President, SAGE Food Safety Consultants, LLC**

Gale recently retired from The Kroger Company with 40 years for food safety experience in food manufacturing and retail food operations. He is known for his leadership in advancing food safety throughout all segments of the food industry, including the dairy industry. He is widely known for his involvement in industry and regulatory activities in addressing food safety issues. He has been called "The Dean" of product recalls having managed several thousand in his career and he is especially recognized for his knowledge of food safety and regulatory requirements.

### **The Honorable Harold "Hal" Rogers, U.S. Congressman, Kentucky's Fifth District**

Elected to Congress in 1980, Harold "Hal" Rogers is currently serving his 14<sup>th</sup> term representing Kentucky's Fifth Congressional District. In his 28<sup>th</sup> year on Capitol Hill, Rogers is the longest serving Kentucky Republican ever elected to federal office. Rogers has a reputation of using the appropriations process to affect measurable outcomes from government. Nationally, his focus is on homeland security, applying strong Congressional oversight in capital-intensive programs to secure the borders, aviation and maritime security and grant distribution to the nation's emergency responders.

### **Allen R. Sayler, VP of Regulatory Affairs and International Standards, International Dairy Foods Association**

Allen is Vice President of Regulatory Affairs and International Standards for International Dairy Foods Association (IDFA), an organization representing approximately 85% of the U.S. dairy processors as well as dairy industry suppliers. He has extensive knowledge of dairy production, processing, regulations, HACCP systems, product sampling and testing, water and wastewater treatment, drug residue screening programs and is part of the IDFA team on food defense and sustainability.

### **Christopher D. Thompson, Milk Program Coordinator, Division of Regulatory Services**

Chris has been with the Division of Regulatory Services at the University of Kentucky for 18 years and has served as Coordinator of the Milk Program for 10 years. He specializes in state and federal dairy regulatory requirements and reciprocal arrangements, dairy laboratory protocols and requirements, bulk milk transportation and dairy industry training programs.

## **Lee T. Todd Jr. - President, University of Kentucky**

Lee T. Todd Jr. became the 11<sup>th</sup> president of the University of Kentucky (UK) on July 1, 2001. He is a native of Earlington, Ky. and a graduate of UK and the Massachusetts Institute of Technology. President Todd is the sixth UK alumnus to hold the presidency. He is a former UK engineering professor; a successful businessman who launched two worldwide technology companies, both based in Kentucky and a public advocate for research, technology and an entrepreneurial economy in the Commonwealth.

## **Scott Williams - Dairy Producer and Dairy Farmer Spokesperson**

Scott is a third-generation dairy farmer from Taylorsville, Ky. and has been farming for over 30 years. He has served on the Southeastern United Dairy Industry Association's (SUDIA) Dairy Farmer Spokesperson Network (DFSN) for five years. SUDIA provides communication training and crisis management for dairy farmers through the DFSN in an effort to help promote the positive image of dairy foods. The network provides a face for the industry and highlights the positive contributions all dairy farmers are making in the community. Dairy farmer spokespersons conduct media interviews and provide counsel for projects on topics that require first-hand accounts and personal experience.

# **Project Administration, Faculty and Staff**

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Computer Science

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**Ryan Moore, Applications Engineer**

**Jon Paschal, Senior Applications Engineer**

# Expression of Appreciation

## Dairy Products

Please be sure to express your appreciation to Southern Belle Dairy and Winchester Farms Dairy for donating delicious dairy products for your enjoyment at our meeting.

## Contributions to the Project and Demonstration Meeting

Projects and events of this scale involve the contribution and assistance of countless individuals and organizations. In addition to our industry collaborators and invited speakers, we extend our gratitude to those listed below for providing assistance to our team throughout our project and in hosting this demonstration meeting. Our work could not be accomplished without their generosity and help.

### Meeting Arrangements

Dairy Products Association of Kentucky  
Department of Agricultural Communications, University of Kentucky  
Fayette County Cooperative Extension Service Office, University of Kentucky  
Kentucky Agricultural Experiment Station, University of Kentucky  
Kentucky Dairy Development Council  
Kentucky Department of Agriculture  
Southeast United Dairy Industry Association

Mark Barrow, Regulatory Services Milk Program  
Tony Bengé, Regulatory Services, Information Technology  
Cathy Buckingham, Regulatory Services Milk Program  
Phillip Dixon, Regulatory Services Information Technology  
Teri Dowdy, Biosystems and Agricultural Engineering  
Krista Greathouse, Short's Sports and Events  
Bob Hickerson, Regulatory Services Milk Program  
Bob Kiser, Regulatory Services Milk Program  
Steve McMurry, Regulatory Services Milk Program  
Becky Smith, Department of Animal and Food Sciences (retired)  
Bill Thom, Regulatory Services  
Jayne White, Biosystems and Agricultural Engineering

### Project Cooperation and Technical Assistance

Department of Homeland Security  
Eastern Kentucky University Dairy Farm  
Flav-O-Rich Dairy  
Kaba Mas, LLC  
National Institute For Hometown Security  
Rowlett Dairy Farm  
University of Kentucky, Coldstream Dairy Research Farm  
Wright Dairy Farm

John Barnes, dBi Corporation  
Matt Craft, Craft Consulting  
Steve McFadden, McFadden Electronic Service  
Martin Whelan, Transitional Products, Inc.

The many dairy farms who allowed us to test the truck on their farms.

# Notes

# Notes

We extend a special thanks to our dairy industry collaborators who generously donated their time and expertise during the planning, development and testing phases of this project.

## Dairy Industry Collaborators

- Alan Wilson Trucking, Somerset, Kentucky
- Bluegrass Tank and Equipment, Elizabethtown, Kentucky
- Dairy Farmers of America-Mideast Council, Fairlawn, Ohio
- Kentucky Department of Public Health, Milk Safety Branch, Frankfort, Kentucky
- Slayback Milk Transport, Owenton, Kentucky
- Southern Belle Dairy, Somerset, Kentucky
- Starr Stainless, Elizabethtown, Kentucky
- Walker Transport, New Lisbon, Wisconsin
- Winchester Farms Dairy, Winchester, Kentucky

