Milk and Protecting it Against Agri-terrorism
Milk Transport Security
"The Tanker of Tomorrow"

NALMA and ICAR Joint Meeting
June 16, 2008

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University of Kentucky, College of Agriculture

Homeland Security Project

- National Institute for Hometown Security
  - Non-profit R & D organization
- Kentucky Homeland Security Consortium
  - Kentucky's public and private universities

Project Objective

- Develop a Milk Transport Security System that will provide assurance that the milk, milk samples and security data are securely transported between the dairy farm and milk plant.
- Demonstrate a wireless electronic security system at two milk plants and multiple dairy farms.
- Deliver the technology to the national community through collaborations, technical conferences, publications and standards.

Functional Requirements

- Provide “Secure Transport” of milk
- Operate with the current U.S. milk transport infrastructure
- Physically store the milk data and security data with the milk transport tank
- Provide redundant milk data and security data storage
- Adaptable to “differences” in bulk milk marketing and transportation systems

A Wireless Electronic System for Securing Milk from Farm to Processor

Security Protocol's attributes

- Who
- Why
- When
- Where
- What

A Wireless Electronic System for Securing Milk from Farm to Processor

System components

- Security
- Accountability
- Data gathering
- Data management
- Traceability

Terminology

- Security: something not only *is secure* but that it *has been secured*. Includes measures that prevent or deter unauthorized individuals from accessing a facility, resource or vessel.

- Accountability: the traceability of actions performed on a system i.e. the use of unique identifiers and authentications supports accountability.

- Surveillance: the monitoring of activities or behavior… verification, identification…

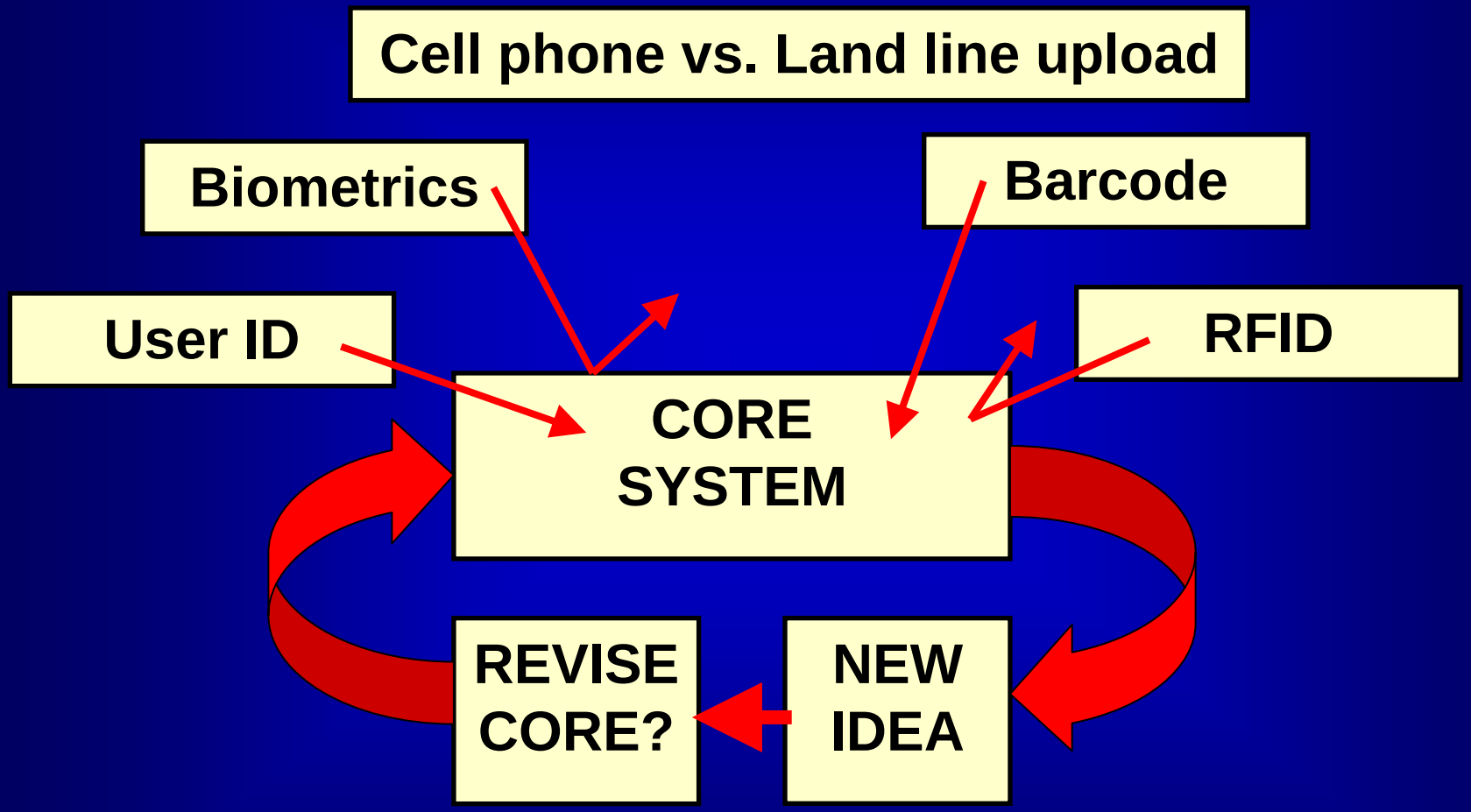
Security System Challenges

- **Adaptable**
  - Tanker designs
  - Farm and plant systems
  - Environmental stress
- **Compliant with current requirements**
- **User friendly**
- **Cost effective**

A Wireless Electronic System for Securing Milk from Farm to Processor

- **Industry input**
  - A. Wilson Trucking
  - Bluegrass Tank and Equipment
  - Dairy Farmers of America Mideast Council
  - KY Dept. Public Health
  - Slayback Milk Transport
  - Southern Belle Dairy
  - Starr Stainless
  - Winchester Farms Dairy

System Development



Approach has been broad…

- Success means
  - Enhanced security
  - Adoption
- Business rationale for adoption
  - Deter pushback
  - Added value
  - Provide means to measure value
  - Provide enhanced value, time savings, cost avoidance
  - Provide all users with more information

The Public has a great deal of interest!

CNN.com

Feds: Science paper a terrorist's road map

Health agency seeks to halt scholarly publication

Tuesday, June 7, 2005 Posted: 9:33 AM EDT (1333 GMT)

WASHINGTON (CNN) -- The federal government has asked the National Academy of Sciences not to publish a research paper that feds describe as a "road map for terrorists" on how to contaminate the nation's milk supply.

Milk trucks could be likely targets for terrorists, according to a paper on biological terrorism.

The research paper on biological terrorism, by Stanford University professor Lawrence M. Wein and graduate student Yifan Liu, provides details on how terrorists might attack the milk supply and offers suggestions on how to safeguard it.

The New York Times ON THE WEB

NATIONAL DESK | June 29, 2005, Wednesday

Paper Describes Potential Poisoning of Milk

By SCOTT SHANE (NYT) 666 words
Late Edition - Final , Section A , Page 20 , Column 3

DISPLAYING FIRST 50 OF 666 WORDS - The National Academy of Sciences published a paper Tuesday describing how terrorists could
te a protest from top federal health
"a road map for ... The article, by
ers a case study in a continuing

www.usatoday.com
USA TODAY
Life
SECTION D
Wednesday, June 29, 2005

Report sounds alarm on milk supply safety

DAILY CHECKUP

Study: Spinach scare likely to last

September's national spinach recall has shaken consumer confidence in the safety of leafy green vegetables, according to a new national survey.

Consumers are avoiding greens and questioning safety issues, months after spinach contaminated with *E. coli* bacteria killed three people and sickened nearly 200.

Plummeting spinach sales have also prompted the produce industry to seek federal oversight to assure buyers that fresh produce is safe.

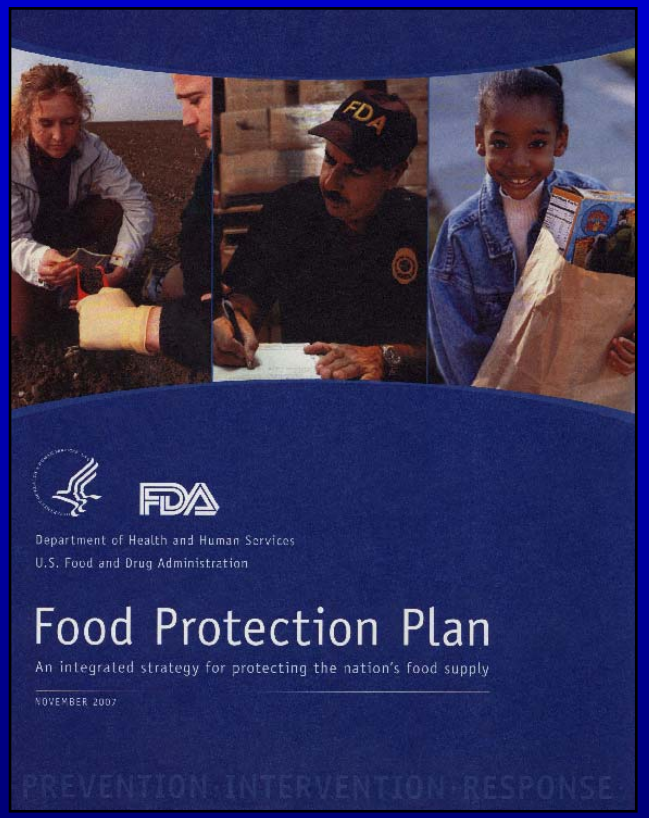
A new national survey to be released today by Rutgers University suggests the broad recall could have lasting effects on spinach and other similar vegetables.

The survey showed about 1 in 5 who were aware of the recall also stopped eating other bagged produce, and 7 percent threw out fresh produce other than spinach during the recall. More than 75 percent of respondents with spinach in their home threw it out.

More than half of the people who ate spinach before the recall hadn't returned to eating it when the survey was taken.

ASSOCIATED PRESS

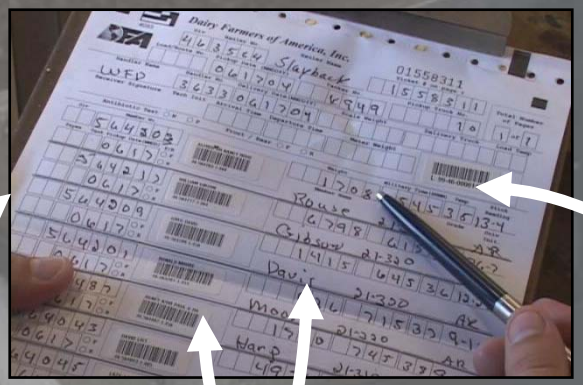
Will there be more stringent security requirements in the future?

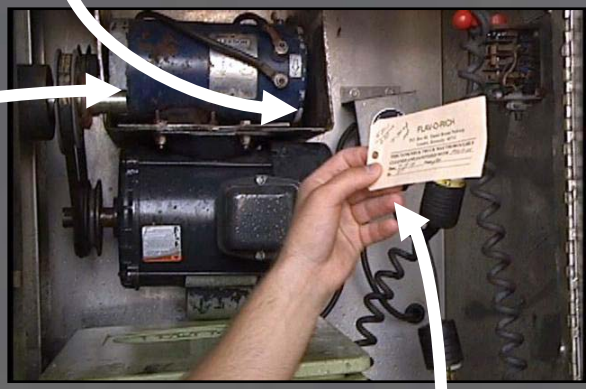


HHS Deputy Secretary Tevi Troy; FDA Commissioner Andrew C. von Eschenbach & FDA Assistant Commissioner for Food Protection, David Acheson, M.D. announce FDA's integrated strategy for protecting the food supply.

November 6, 2007

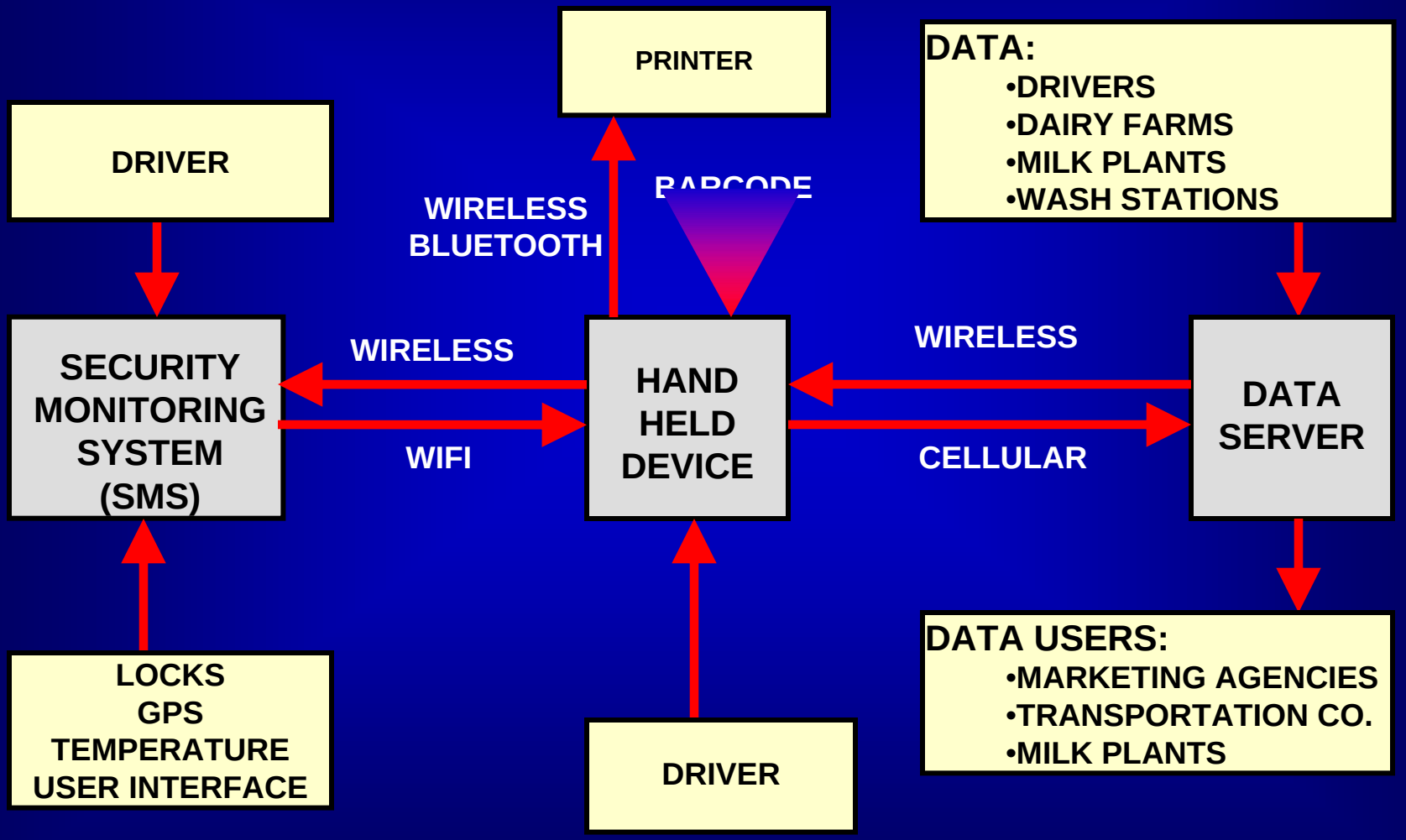
Our vision of the system operations.





Milk Transport Security System Design

Three Processors (computers)



Data entered by the Transportation Company

TABLES:

- Route
- Truck
- Hauler/Sampler
- Transport Tank
- Transport Company

Data entered by the Milk Marketing Agency

TABLES:

- Agency
- Dairy Farm
- Farm Bulk Tank
- Cargo: Grade A Milk

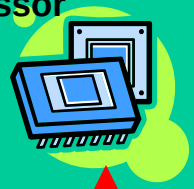
Data entered by the Milk Plant

TABLES:

- Drop-off Location
- Receiver
- Wash Station
- Wash Method

SERVER

Microprocessor from Milk Truck



- Security

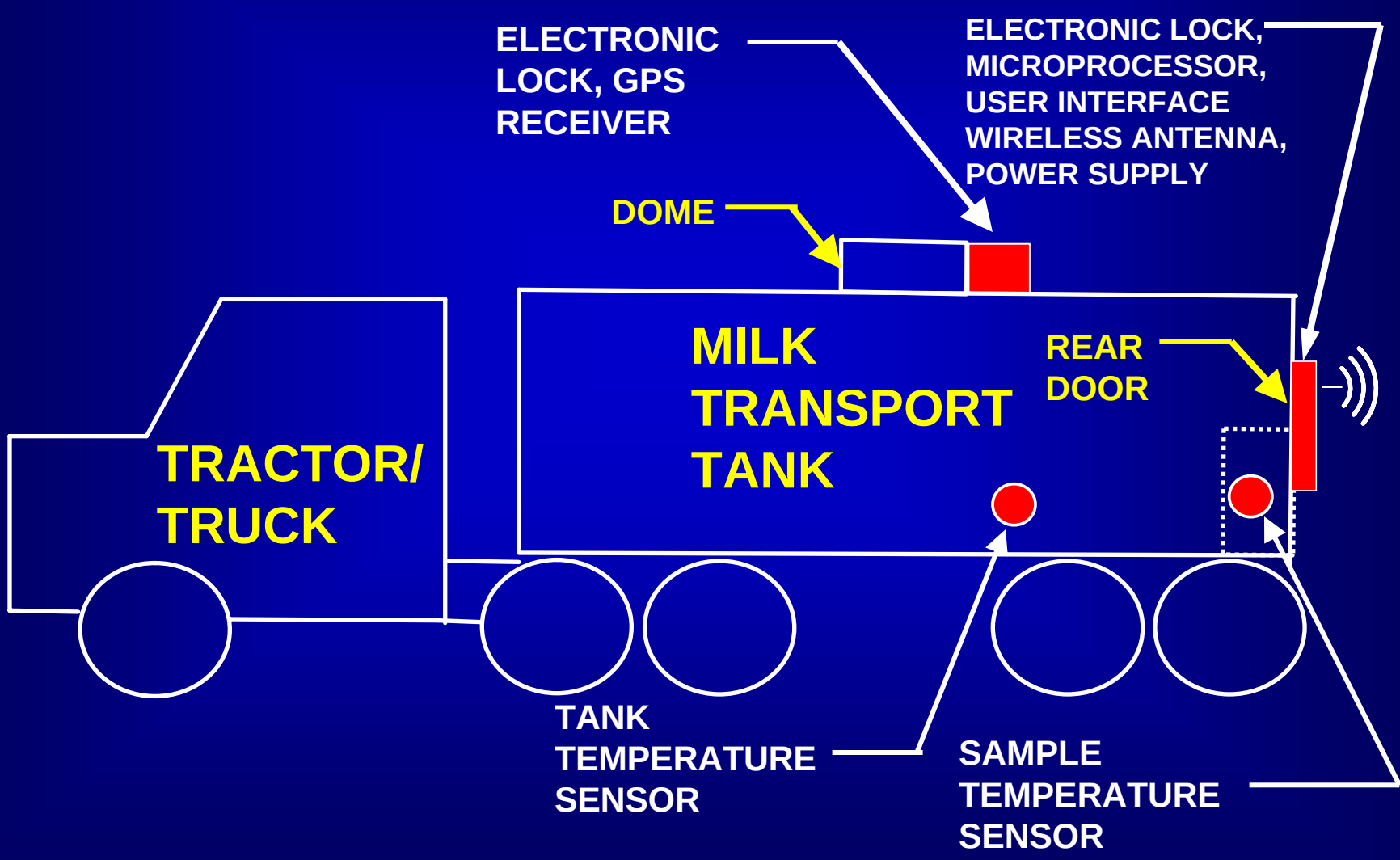
Hand held

TABLES:

- Picked up load
- Wash Tag
- Dropped of load

Data exchanged every 1-5 minutes

Security Monitoring System (SMS)

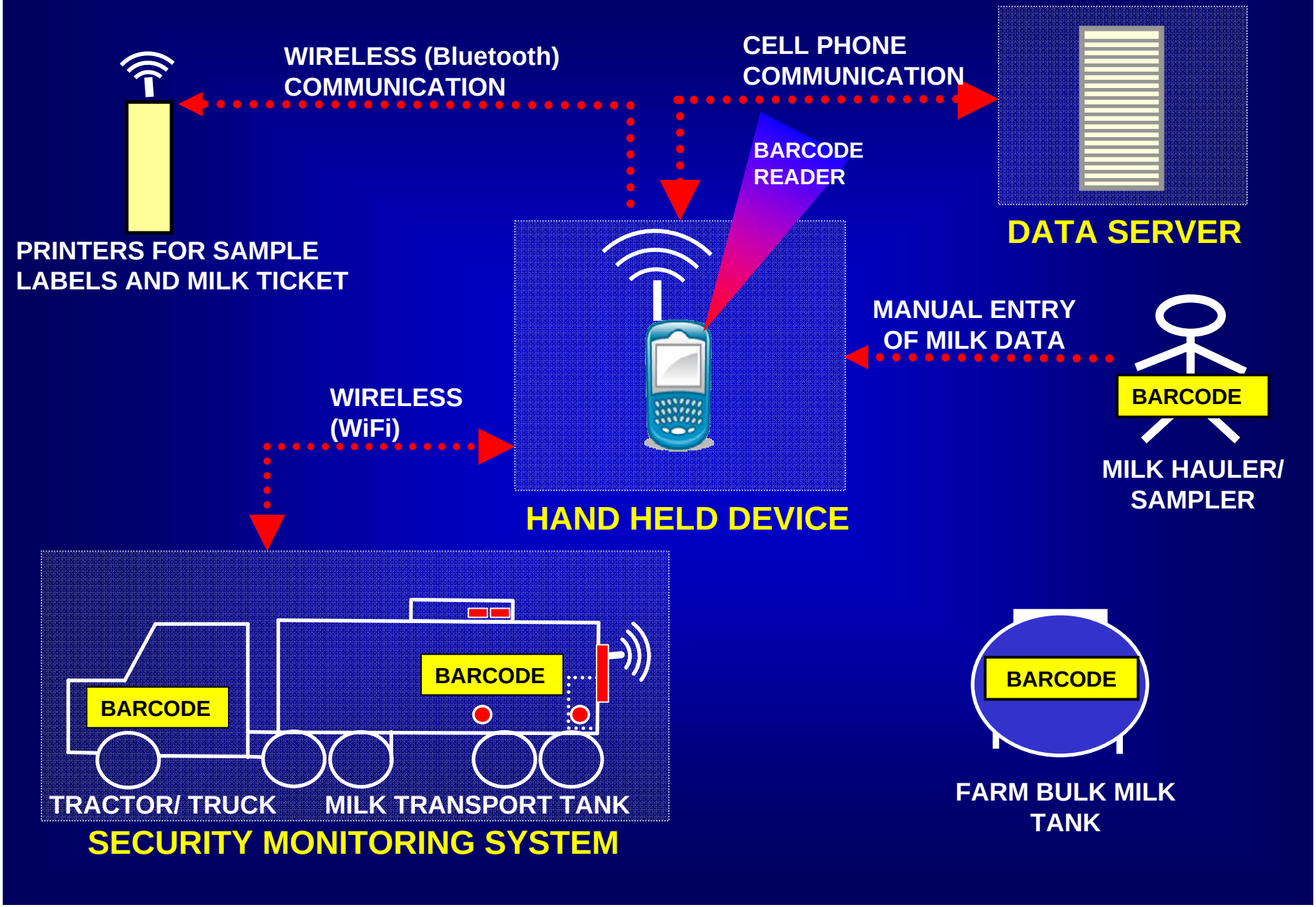


Handheld Device and Printer

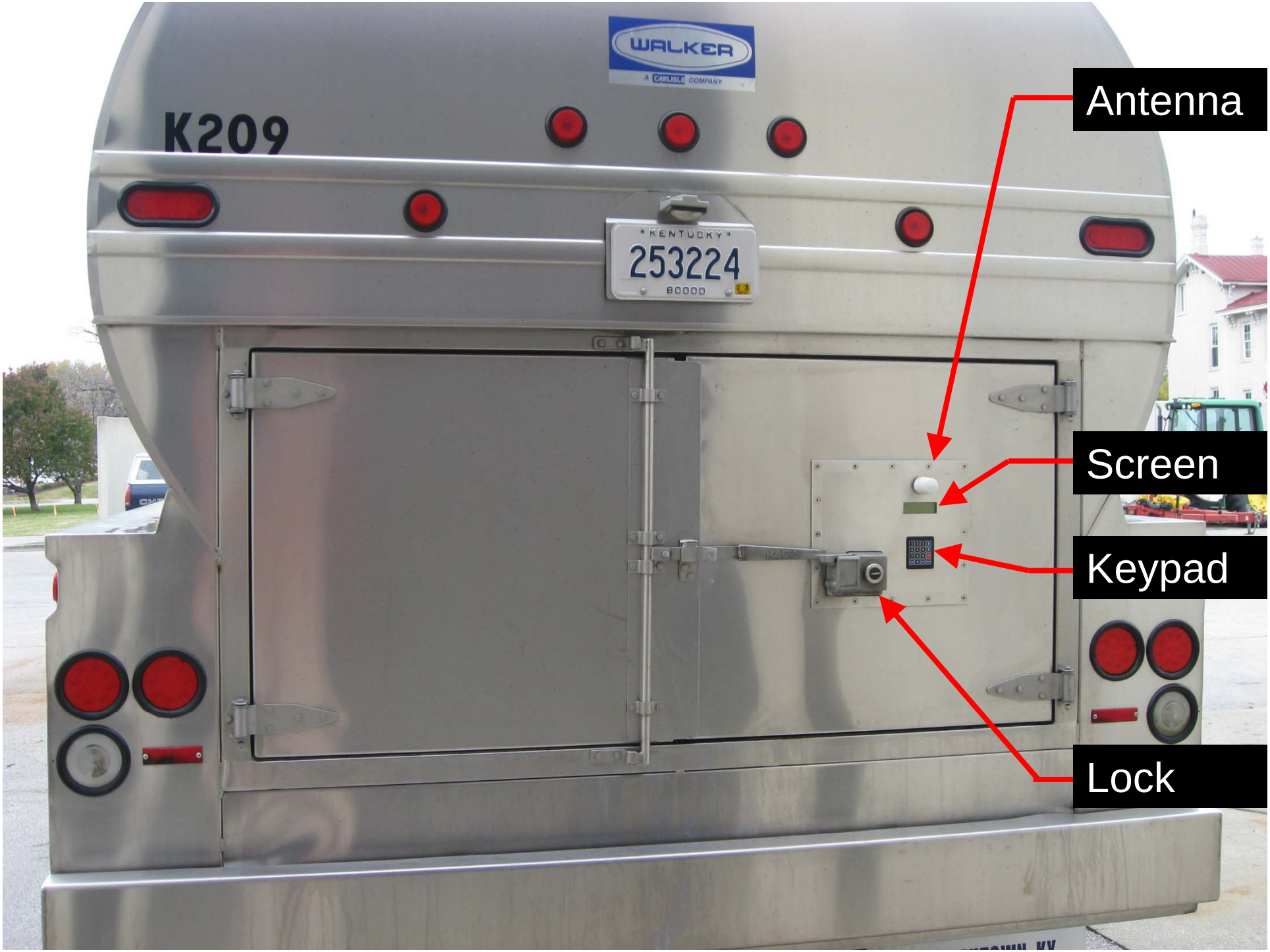
Intermec CN3

Zebra QL 220

MILK TRANSPORT SECURITY SYSTEM DESIGN

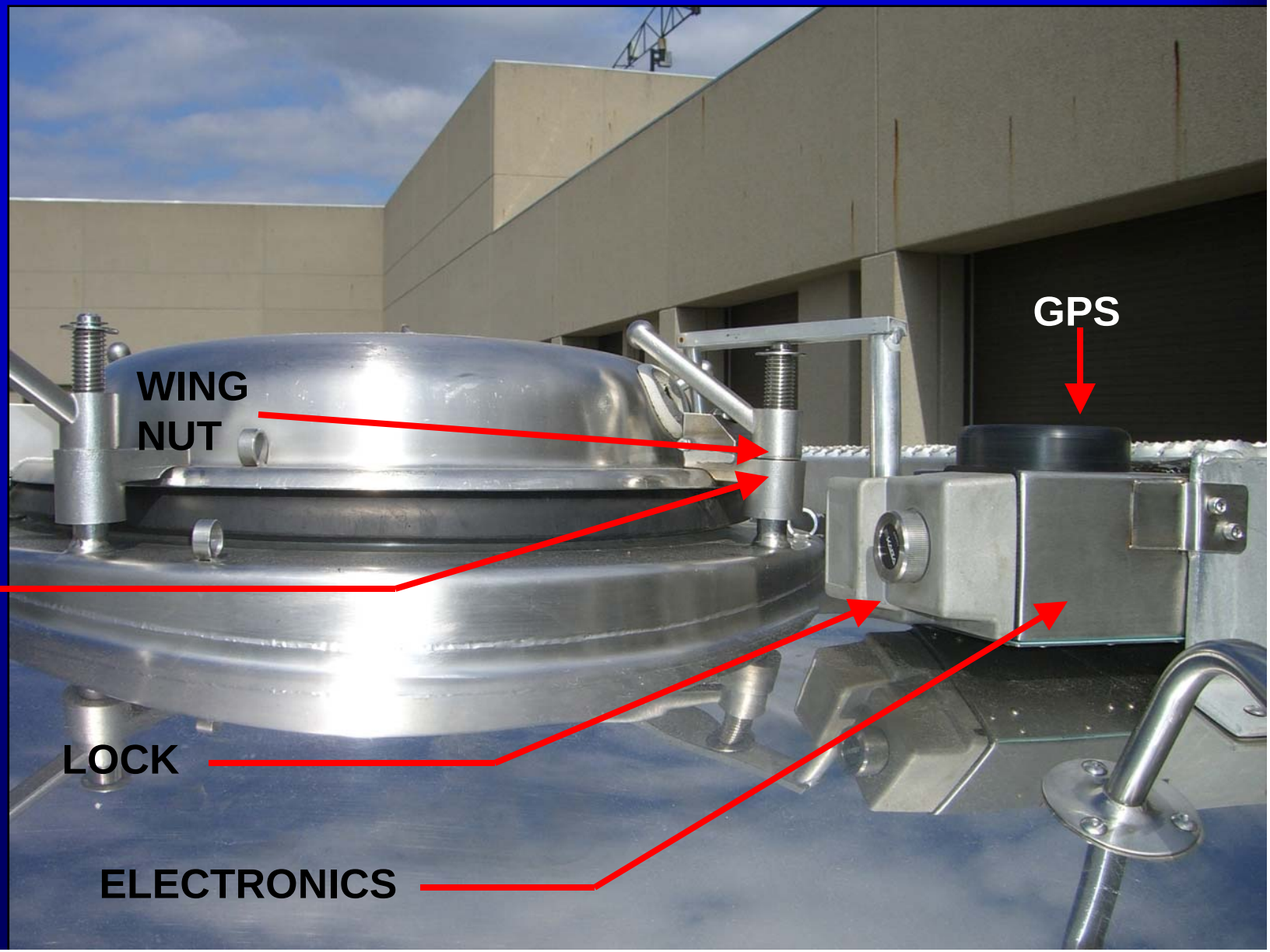


September 12, 2007 Demonstration


WALKER
A CARLISLE COMPANY
K209
KENTUCKY
253224
Antenna
Screen
Keypad
Lock

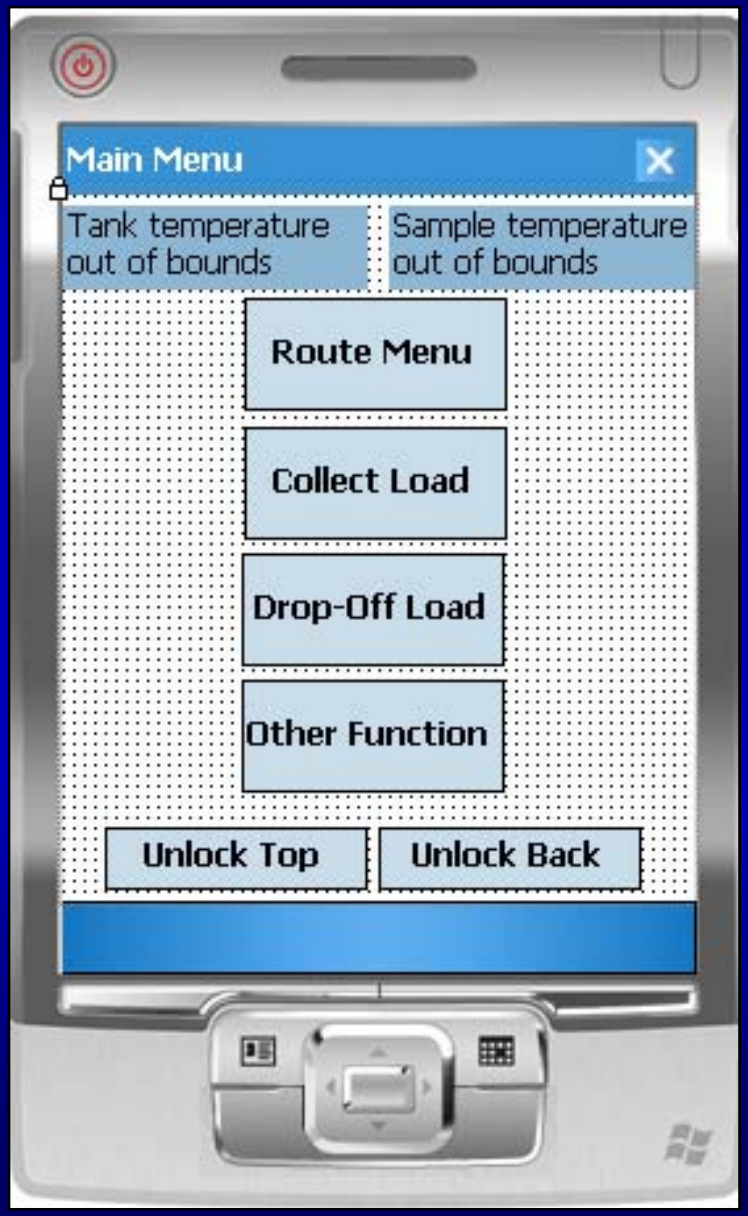

KABA
1 2 3
4 5 6
7 8 9
CLEAR 0 HELP ENTER
KABA

Dome Lock

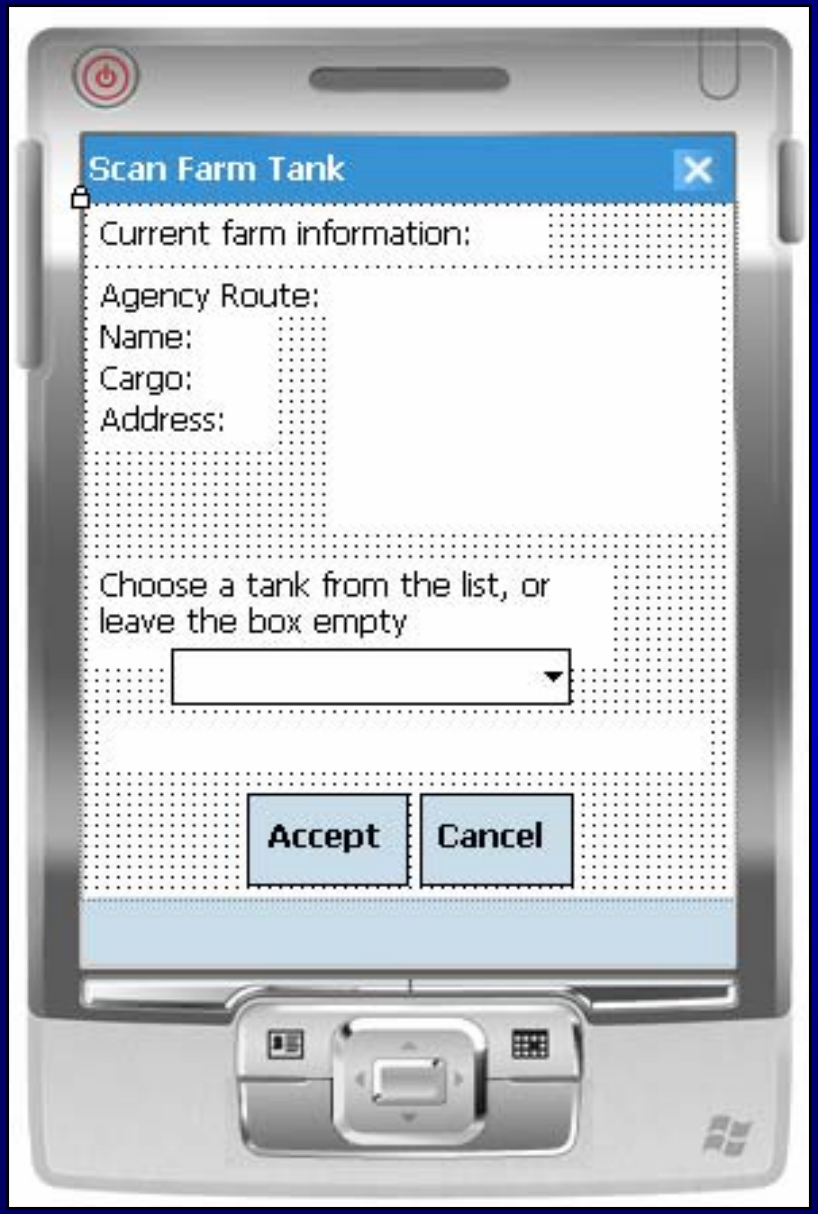


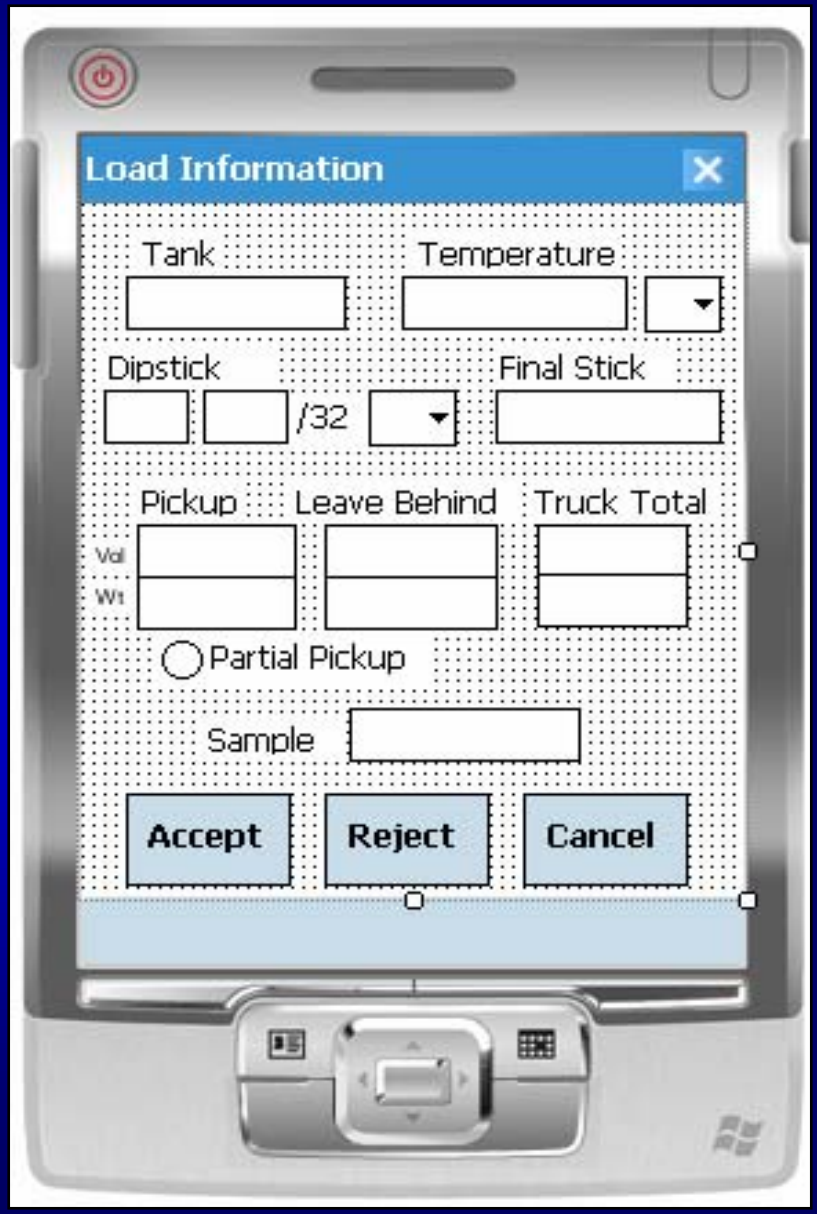
Handheld Device Screens

User friendly
and intuitive…



Handheld Device Screens





2007111605KYK209 **Bulk Milk Ticket** Page

Load No.	Transport Company	Cargo	Security Session ID No.	Wash Tag Information
-----	Slayback Milk Transport	Grade A Milk	2007111605KYK209	K209; Winchester Farms Dairy - Winchester, KY; 56123; 2007-11-15 14:10:50 John Smith
Route No. -----	**Tanker No.** K209	**Pickup Truck No.**	**Delivery Truck No.** -----	

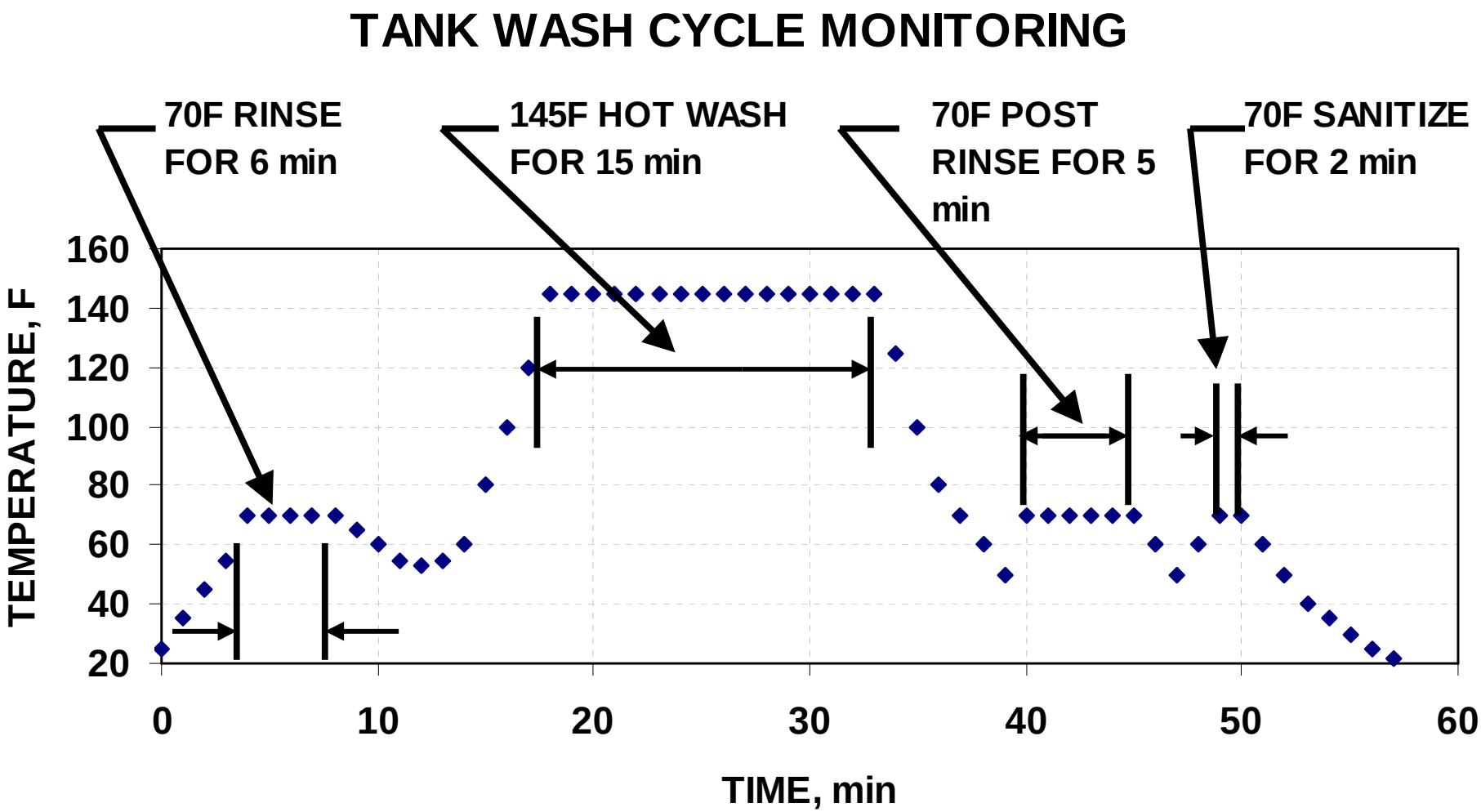
Marketing Agency	Div.-Producer No.-Tank Name									
	465645161613 Billie D Hotfil	Grade	Grade A Milk	Pickup Date	11-16-2007	Gauge Reading	11 16/32 IN	Temp 36	Hauler Name Brian Luck	
		BTU	21320	Military Time	06:41:56	Weight	1,374	Comments No Comments		
	465643171714 Richard D Webster	Grade	Grade A Milk	Pickup Date	11-16-2007	Gauge Reading	27 20/32 IN	Temp 38	Hauler Name Brian Luck	
		BTU	21320	Military Time	07:13:14	Weight	6,302	Comments No Comments		
	465643181816 Betty Heaton	Grade	Grade A Milk	Pickup Date	11-16-2007	Gauge Reading	17 20/32 IN	Temp 37	Hauler Name Brian Luck	
		BTU	21320	Military Time	07:52:04	Weight	2,210	Comments No Comments		
	465643161616 James E Logan	Grade	Grade A Milk	Pickup Date	11-16-2007	Gauge Reading	8 13/32 IN	Temp 38	Hauler Name Brian Luck	
		BTU	21320	Military Time	08:27:07	Weight	543	Comments No Comments		
	465643091913 Donald C Clark	Grade	Grade A Milk	Pickup Date	11-16-2007	Gauge Reading	9 3/32 IN	Temp 35	Hauler Name Brian Luck	
		BTU	21320	Military Time	09:07:48	Weight	1,405	Comments No Comments		
	465643121216 Howard A. Rowlett	Grade	Grade A Milk	Pickup Date	11-16-2007	Gauge Reading	118/3 CM	Temp 36	Hauler Name Brian Luck	
		BTU	21320	Military Time	09:26:25	Weight	10,234	Comments No Comments		
	462284441417 John L Fischer	Grade	Grade A Milk	Pickup Date	11-16-2007	Gauge Reading	39/8 CM	Temp 39	Hauler Name Brian Luck	
		BTU	21320	Military Time	10:11:57	Weight	2,804	Comments No Comments		
	465643041416 Douglas S King	Grade	Grade A Milk	Pickup Date	11-16-2007	Gauge Reading	15 20/32 IN	Temp 37	Hauler Name Brian Luck	
		BTU	21320	Military Time	10:27:18	Weight	2,440	Comments No Comments		
	465648091918 Mckee Farm 1	Grade	Grade A Milk	Pickup Date	11-16-2007	Gauge Reading	35 11/32 IN	Temp 38	Hauler Name Brian Luck	
		BTU	21320	Military Time	11:07:50	Weight	10,477	Comments No Comments		

Load Summary for Load -----, ---, K209

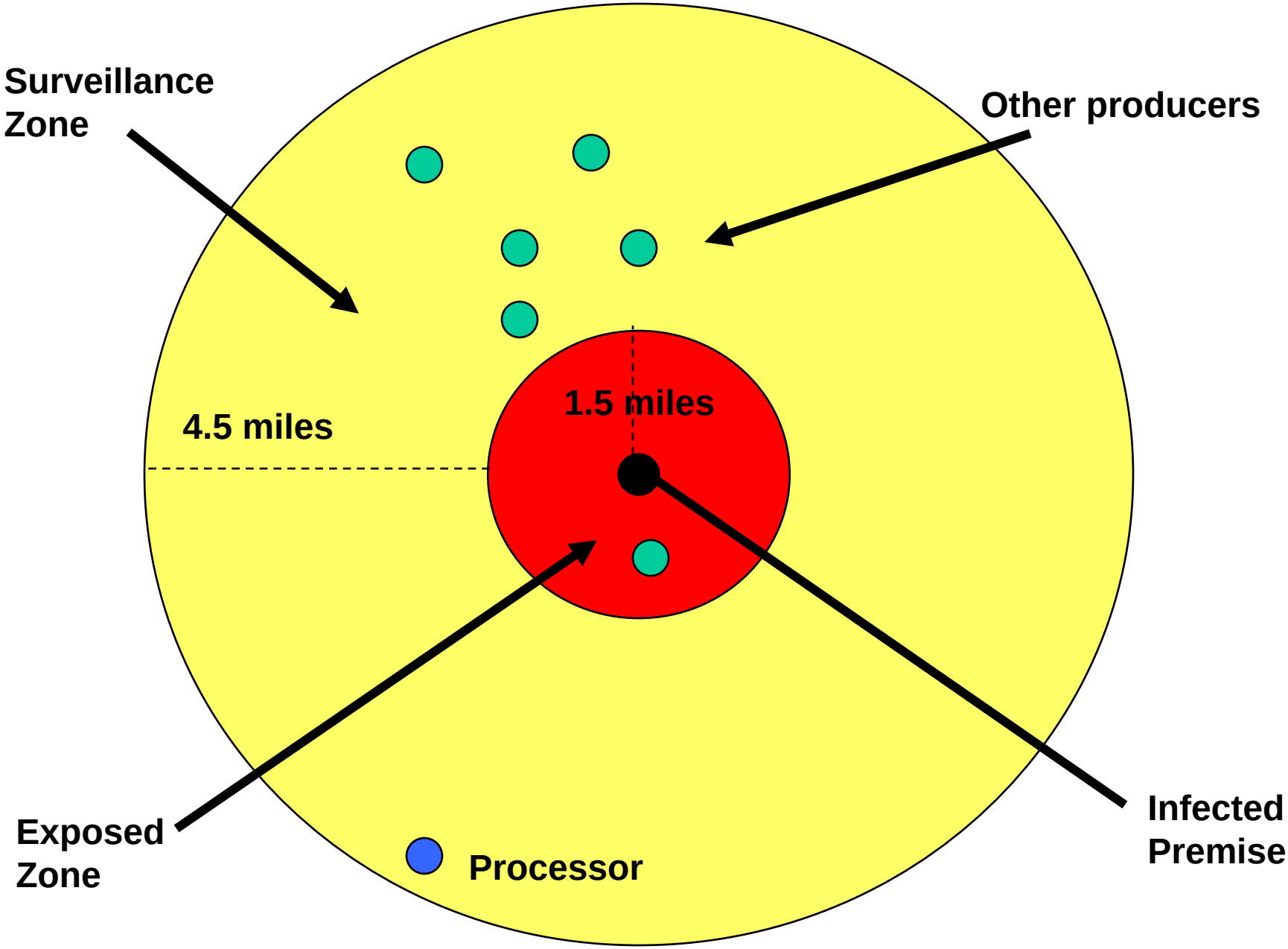
Meter Weight -----	Scale Weight 37,700	Accumulated Milk Weight 37,789	Difference -89
Pickup Date 11-16-2007	**Delivery Date** 11-16-2007	**Arrival Time** 13:17:21	**Departure Time** 15:03:25	**Load Comments:** No comments.
Delivery Location Winchester Farms Dairy (WFD)	**Antibiotic Test** Negative	**Appearance/Odor** Accepted	**Load Temp.** 36	
Hauler1 Name Brian Luck	**Hauler 1 Permit No.** H21-999-8	**Hauler 1 License No.** 9998	**Hauler 1 Signature** Signature image here.	
Transport Driver Name ----- -----			**Transport Driver Signature** Signature image here.	
Receiver Name John Smith	**Receiver Permit No.** S21-999-7		**Receiver Signature** Signature Image here.	

Additional uses

- Quality control
  - Tanker cleaning
  - Sample care
- Communications
  - Potential to enhance compliance
  - Field Services
  - Special precautions
- If data is collected, it can be tracked, utilized…


TANK WASH CYCLE MONITORING
70F RINSE FOR 6 min
145F HOT WASH FOR 15 min
70F POST RINSE FOR 5 min
70F SANITIZE FOR 2 min
TEMPERATURE, F
160
140
120
100
80
60
40
20
0
10
20
30
40
50
60
TIME, min

Quarantine Area for FMD



Project Schedule

- Collaborators Meeting, January 26, 2006
- Collaborators Meeting, September 9, 2006
- System Defined, January 1, 2007
- Bench Scale System, May 26, 2007
- Prototype Installed August 4, 2007
- Prototype Demonstration, September 12-13, 2007
- Field Test 1 October/November 2007
- Field Test 2 February/May 2008
- Testing Complete June/July 2008
- ***The Demonstration Meeting October 9, 2008***
- Project Completion December 31, 2008

Demonstration Meeting

Thursday, October 9, 2008

Lexington, Kentucky

KEENELAND

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