

Introduction to Biological Risk Management

Dairy Producers

David L. Marshall, V.M.D.

Delaware Extension Veterinarian



Biological Risk Management (BRM)

- Overall process of awareness education, evaluation, and management
- Designed to improve disease control
 - Foreign and domestic diseases
- Provide tools to minimize risk

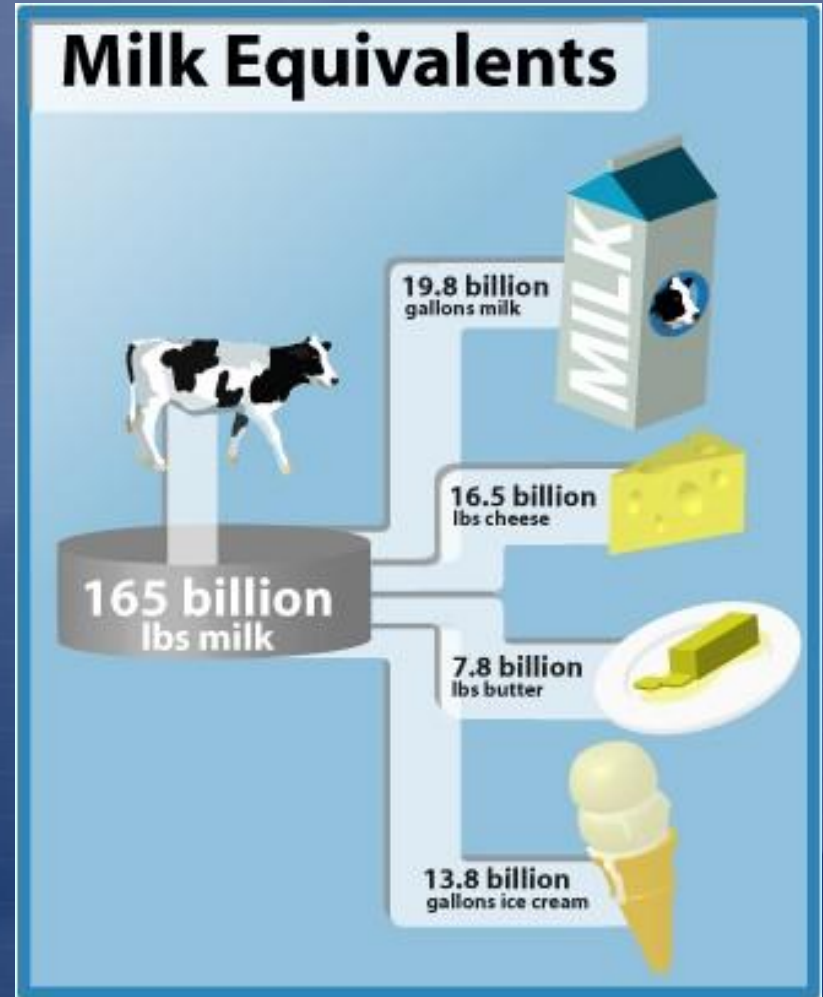
Biological Risk Management (BRM)

- Disease risk cannot be totally eliminated
 - Animal, its environment
 - Decrease exposure to disease agents
- Minimize threat to animals and humans
- No one-size-fits-all answer

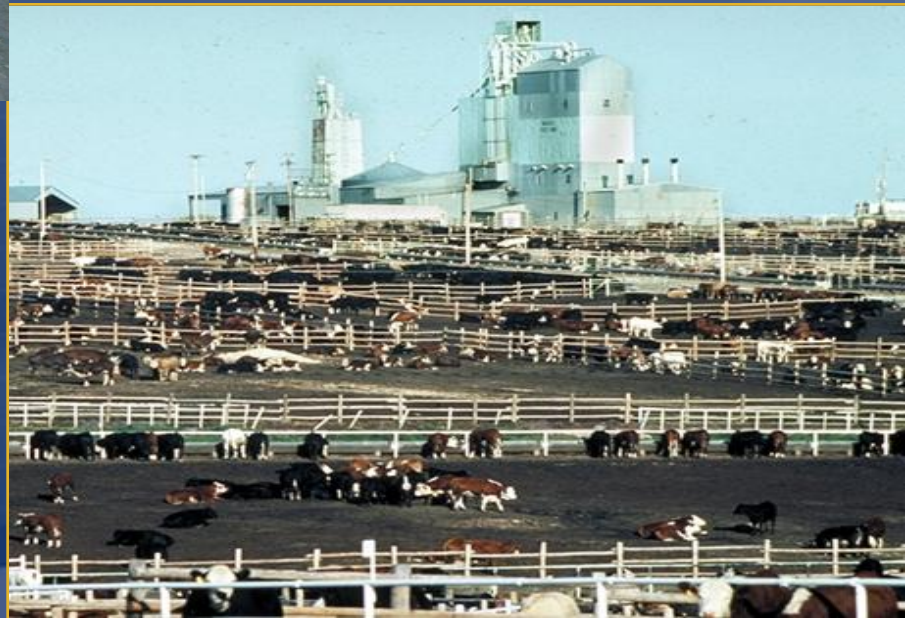


Agriculture and BRM

- Provide a safe food source
 - Healthy animals
- Milk supplies 73% of calcium in U.S. food supply



A Real Threat!!!



Components of BRM

- Risk perception
- Risk assessment
 - Routes of transmission
- Risk management
- Risk communication



Risk Perception

- Common beliefs
 - “We have always done it this way”
 - “I’ve had most everything on this farm”
 - “It’s too expensive”
- New beliefs
 - Disease outbreaks can and do happen
 - Prevention is less costly than treatment
 - Too much is financially invested to lose
 - Prevention through awareness and management

Risk Assessment

- Objective evaluation
- Identify strengths, weaknesses
 - Change over time
- Disease prediction is complicated
 - Underlying disease risks are not
 - Cattle's vulnerability is influenced by:
 - Cleanliness, stress, nutrition
 - Things that can be *managed*



Routes of Transmission



Routes of Transmission

- Spread of disease agents

- Animal ↔ animal
- Animal ↔ human



- Different routes of transmission

- Aerosol
- Direct contact
- Fomite
- Oral
- Vector-borne
- Zoonotic



Aerosol Transmission

- Disease agents contained in droplets
 - Pass through air
- Most agents not stable in droplets
 - Close proximity required
 - Infected and susceptible animals



Direct Contact Transmission

- Disease agent in animal or environment
 - Open wounds, mucous membranes, skin
 - Blood, saliva, nose to nose, rubbing, biting
- Reproductive transmission
 - Breeding
 - Dam to offspring



Fomite Transmission

- Contaminated inanimate object
- Carries agents to other animals
 - Brushes, needles
- Traffic
 - Vehicle, trailer, humans



Animal Disease Control Area
No Private Vehicles or Bicycles
Allowed Beyond This Point
You Are About to Enter a Livestock Facility
Visitors Welcome
Please pick up a brochure that explains the steps
we are taking to help protect your health and insure
your safety plus keep our livestock healthy



Oral Transmission

- Consumption of contaminated feed, water
 - Feces, urine, saliva
 - Other contaminants (ruminant protein)
- Licking/chewing contaminated environment



Vector-borne Transmission

- Insect
- Acquires pathogen from one animal
- Transmits to another animal
 - Biological vectors
 - Fleas, ticks, mosquitoes
 - Mechanical vectors
 - Flies, cockroaches



Environmental Contamination

- Disease organism in environment
 - Survive in soil, organic material
- Animals and humans can acquire agent(s) through:
 - Inhalation
 - Direct contact
 - Fomites
 - Oral consumption
 - Vectors



Disease Transmission

- Animals may not exhibit obvious signs of disease
- Awareness of all routes of transmission is essential
 - Develop strategy to minimize disease risk for dairy operation



General Prevention Steps

Overview

- Farm perimeter
- Animal identification
- Animal health
- Sick/dead animals
- Isolation/quarantine
- Supply handling
- Neonatal management



General Prevention Steps

- Limit contact with animals
 - Neighbor's livestock
 - Wildlife, birds
 - Roaming cats, dogs
- Maintain fences
- Establish biosecurity protocols for delivery vehicles, personnel
- Lock gates



Key Learning Objectives

- Biological risk management is important
- All diseases are transmitted by a few common routes
- Disease risk can be managed
- Awareness education is essential
- You play a critical role!

Questions???

