

# MEASURES TO PREVENT DISEASE ASSOCIATED WITH ANIMALS IN PUBLIC SETTINGS

**Clinician Outreach and  
Communication Activity (COCA)  
Conference Call  
April 21, 2011**



# Objectives

**At the conclusion of this session, the participant will be able to accomplish the following:**

- ❑ Describe outbreaks associated with animals in public settings
- ❑ List common pathogens causing outbreaks associated with animals in public settings
- ❑ Identify common animals associated with outbreaks of enteric infections involving public settings
- ❑ Discuss recommendations to minimize disease risks associated with animals in public settings

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# TODAY'S PRESENTER



**Casey Barton Behravesh DVM, DrPH, DACVPM**

LCDR, U.S. Public Health Service

Team Lead, Outbreak Response Team

Division of Foodborne, Waterborne, and Environmental Diseases

National Center for Emerging and Zoonotic Infectious Diseases - CDC

# TODAY'S PRESENTER



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Deputy State Epidemiologist  
Tennessee Department of Health  
Communicable and Environmental Disease Services

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Centers for Disease Control and Prevention





# Contact with Animals in Public Settings

- Positive benefits of human-animal contact
- Provides opportunities for entertainment and education
- Many venues encourage or permit the public to contact animals
- Millions of human-animal interactions each year



# Public Settings



- **Petting zoos**
- **County or state fairs**
- **Zoological institutions**
- **Circuses and carnivals**
- **Pet stores**
- **Animal swap meets**
- **Farm tours**
- **Livestock-birthing exhibits**
- **Educational exhibits at schools**
- **Wildlife photo opportunities**

# Animal Contact



# Public Health Concerns

- **Infectious diseases**
  - Multiple bacterial, viral, fungal, and parasitic agents
- **Injuries**
  - Bites, kicks, falls, scratches, stings, crushing of the hands or feet
- **Rabies**
  - Contact with rabid animals
  - Rabies exposures require extensive investigations
  - Post-exposure prophylaxis
- **Other human health problems**
  - Allergies

# Zoonotic Diseases

- *Escherichia coli* O157:H7
- *Salmonella*
- *Campylobacter*
- *Cryptosporidium*
- *Coxiella burnetii*
- *Mycobacterium tuberculosis*
- Dermatophytosis

# Enteric Diseases

- **Illness and outbreaks of enteric diseases are well documented**
- **Bacteria and parasites pose highest risk for human disease**
- **Many have low infectious dose**
- **Cattle, sheep, goats, poultry, reptiles, amphibians, rodents and other species**

# Animal Hosts

- **Animals carrying enteric pathogens may not exhibit signs of illness**
- **Animals can shed pathogens intermittently**
- **Stress increases shedding of pathogens**

# Populations at High Risk

- Children aged < 5 years
- Persons with waning immunity
- Persons who are mentally impaired
- Pregnant women
- Immunocompromised persons
- Older persons



# ***Salmonella* Infections**

- **Incubation period 12 to 72 hours**
- **Illness duration 4 to 7 days**
- **Acute gastroenteritis: fever, diarrhea, abdominal cramps, vomiting, bloody stools**
- **Serious illness: meningitis, bloodstream infections, joint infections**
- **Most do not require treatment other than oral fluids**
  - **May require rehydration with intravenous fluids**
  - **Antibiotics not usually indicated**

# ***Escherichia coli* O157:H7**

## **Infections**

- Incubation period 3 to 4 days (range: 1-10 d)
- Illness duration 5 to 7 days
- Fever, diarrhea, abdominal cramps, vomiting, bloody stools
- 5-10% get hemolytic uremic syndrome (HUS)
  - Develops ~7 days after first symptoms, when diarrhea is improving
  - Can lead to permanent kidney damage or death
- Most do not require treatment other than oral fluids
  - May require rehydration with intravenous fluids
  - Antibiotics not usually indicated, may increase risk of HUS

# **Outbreaks and Animal Exhibits**

- **During the last 10 years, an increasing number of enteric disease outbreaks**
- **Since 1996, 149 human infectious disease outbreaks involving animals in public settings have been reported to CDC**
- **Substantial medical, public health, legal and economic effects**

# Methods

- **Outbreak Criteria**
  - 2 or more cases caused by a related source
  - Exposure occurred in a public venue due to animal contact
- **Data sources**
  - National Outbreak Reporting System (NORs)
  - Survey of state Public Health Veterinarians, NASPHV
  - Literature search
  - Internet search
  - Information provided by state and local health departments

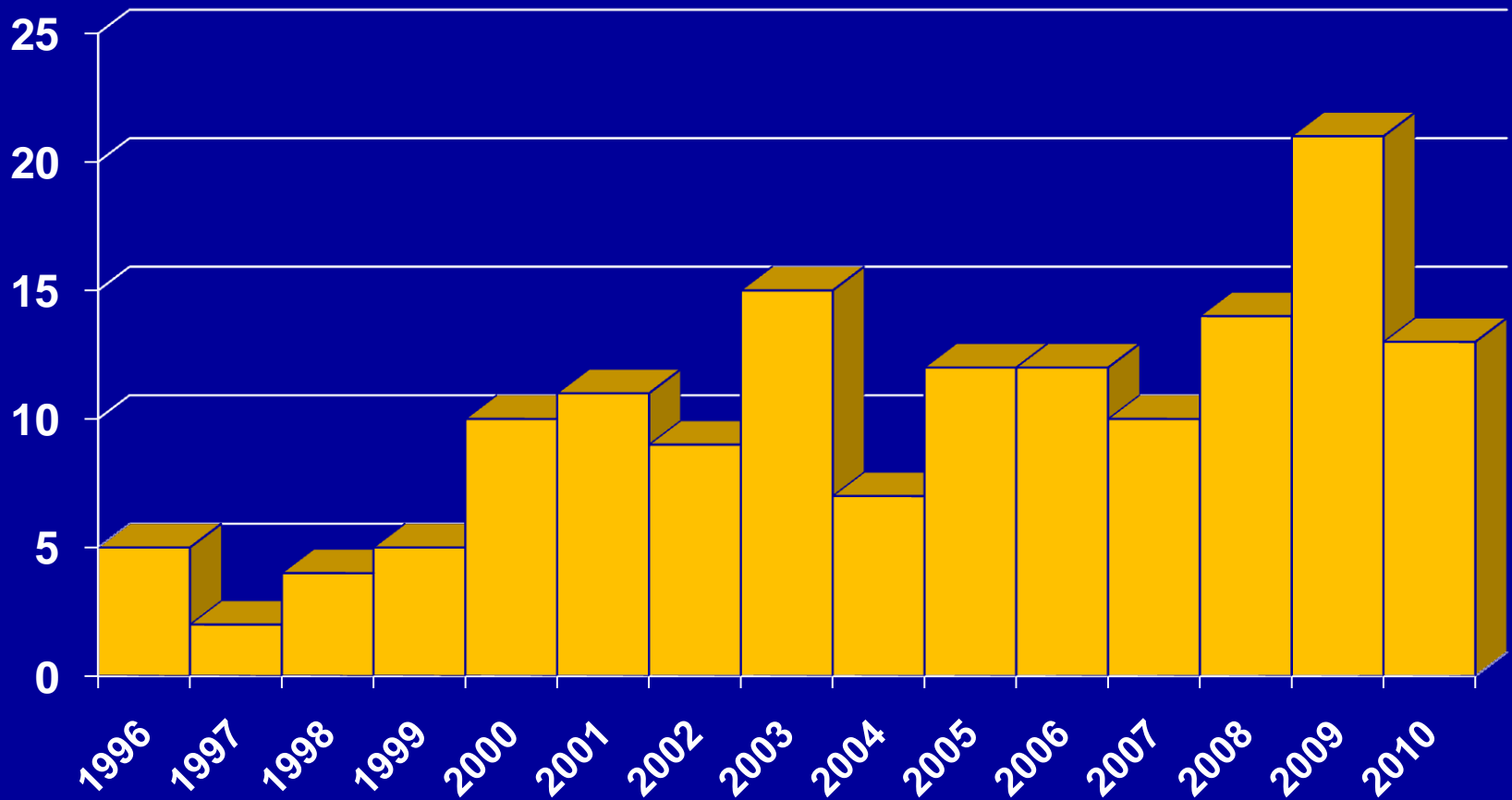
# Response Rate

- **28/50 (56%) states provided an update**
  - Majority through NORs

# Updated Line List

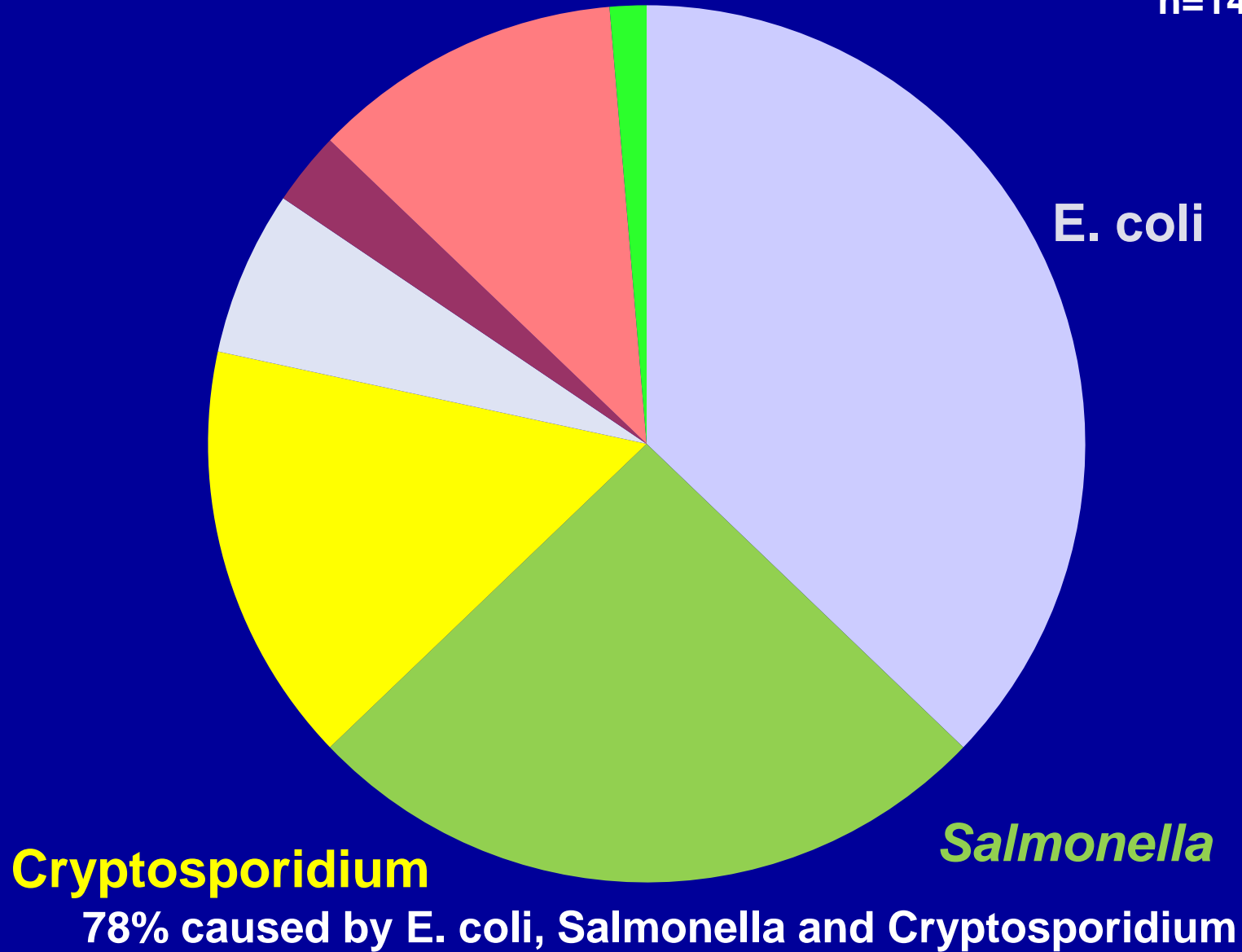
- **149** total outbreaks since 1996
  - >2,900 illnesses
  - >360 hospitalizations
- **46** new outbreaks reported
  - Majority from 2008 - 2010

# Number of Outbreaks by Year



# Number of Outbreaks by Pathogen

n=149





# Number of Ill Persons by Pathogen

<b>Pathogen</b>	<b># Ill Persons</b>	<b>%</b>
<b>E. coli</b>	<b>1,318</b>	<b>44</b>
<b>Salmonella</b>	<b>787</b>	<b>26</b>
<b>Cryptosporidium</b>	<b>370</b>	<b>12</b>
<b>Campylobacter</b>	<b>128</b>	<b>4</b>
<b>Multiple</b>	<b>92</b>	<b>3</b>
<b>Other</b>	<b>296</b>	<b>10</b>
<b>TOTAL</b>	<b>2,991</b>	<b>100</b>

# Number of Outbreaks by Setting

Setting	#	%
Fair	34	23
Farm	27	18
School (daycare, schools, university)	19	13
Petting zoo	13	9
Other*	12	8
Veterinary clinic related	5	3
Zoo	3	2
Missing	34	23
Ag education program	2	1
<b>TOTAL</b>	<b>149</b>	<b>100</b>

\*Feed store, birthing exhibit, pet store, boy's treatment facility, feed store, horse stable, pioneer trek, hospital, auction barn, day camp

# Line List Summary

- **149 outbreaks w/ animals in public settings**
  - **46 outbreaks added**
    - **Primary update source was NORS**
    - **Limitations of NORS: Incomplete, preliminary information**
  - **78% of illnesses caused by *E. coli*, *Salmonella*, and *Cryptosporidium***
  - **49% of illnesses associated with fairs, farm visits, and petting zoos**
  - **13% of settings involved daycares, schools and universities**

**How can we minimize the risk of diseases and injuries associated with animals and public settings?**



# **Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, 2011**

**John R. Dunn, DVM, PhD  
Deputy State Epidemiologist  
Tennessee Department of Health**

**The findings and conclusions in this presentation are those of the author  
and do not necessarily represent the views of the Centers for Disease Control and Prevention**

# Overview

- **Background on recommendations**
  - **National Association of State Public Health Veterinarians Committee**
- **Transmission routes**
  - **Lessons from outbreaks**
- **Compendium recommendations:**
  - **Handwashing!**
  - **Information / Education**
  - **Managing Public and Animal Contact**
  - **Animal Care and Management**
  - **Additional recommendations**
  - **Appendices**

# **Background: Recommendations to reduce risk**

- **United Kingdom 1995**
- **Canada 2000**
- **United States MMWR 2001**
- **National Association of State Public Health  
Veterinarians (NASPHV) Compendium 2003**



# Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, 2011

Centers for Disease Control and Prevention

# MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports / Vol. 60 / No. #

Publication Date

## Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, 2011

National Association of State Public Health Veterinarians, Inc.



Continuing Education Examination available at <http://www.cdc.gov/mmwr/cme/conted.html>



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

# NASPHV Compendium Committee

**Co-chairs:** John Dunn, DVM, PhD and Kirk Smith, DVM, PhD

## **Members:**

Carina Blackmore, DVM, PhD, Florida Department of Health

Louisa Castrodale, DVM, Alaska Department of Health

Ron Wohrle, DVM, Washington State Department of Health

James H. Wright, DVM, Texas Dept of State Health Services

## **Consultants to the committee:**

Marianne Ash, DVM, AVMA

Casey Barton Behravesh, DVM, DrPH, CDC

Karen Beck, DVM, North Carolina Department of Agriculture

Marla J. Calico, International Asso of Fairs and Expositions

Allan Hogue, DVM, US Department of Agriculture

Carla Huston, DVM, American Asso of Extension Veterinarians

Timothy F. Jones, MD, Council of State and Territorial Epidemiologists

Thomas P. Meehan, DVM, Association of Zoos and Aquariums

# Methods

- **Committee met at CDC, September 15-17, 2010**
- **Revision included:**
  - **Reviewing recent literature**
  - **Updating reported outbreaks, diseases, or injuries attributed to human animal interactions**
  - **Recommendations**
- **Committee members vote if necessary**
- **Publication date in May 2011**

# Major transmission routes:

**Waterborne**

**Direct contact with animals**

**Indirect contact**

# Direct animal contact



# Indirect contact



# Lessons from Outbreaks

# Lesson 1: “Don’t forget to wash your hands!”

- **Denver Zoo** Komodo dragon exhibit: *Salmonella*
  - showed protective effect of hand-washing



- **Minnesota children’s farm day camp:** Multiple pathogens
  - washing hands with soap after touching a calf and washing hands before going home were protective factors





# Lesson 2:

## Long-term contamination

**Ohio county fair outbreak**  
of *E. coli* O157:H7:

Illness linked to:

- Going to barn dance
- Handling sawdust
- Eating and drinking in barn
- Animals were exhibited during the previous week of the fair



# Lesson 2:

## Long-term contamination

### **North Carolina State Fair 2004 *E. coli* O157 outbreak:**

- Goat and sheep petting zoo, *E. coli* O157 isolated from soil 5 months after the animal bedding and topsoil removed
- Efforts to decontaminate failed, eventually culture negative

# Additional Health Concerns

- **Injuries**
- **Other Infections**
- **Rabies**

# Recommendations

# Recommendations for Local, State, and Federal Agencies

- Communication and cooperation between human and animal health agencies
- Distribute this report to venue operators
- Develop educational and training materials for venue operators and other interested persons

# Recommendations for Education

- *Visitors knowledgeable about potential risks are less likely to become ill*

## Venue operators should:

- Be familiar with risk-reduction recommendations
- Consult with state and local agencies and county extension agents on implementation
- Assure that staff are appropriately trained
- Assure that visitors and exhibitors receive education
- Provide information to persons arranging school field trips or classroom exhibits

# Recommendations for Education

## Venue staff should:

- Be trained and able to explain risk reduction recommendations to visitors
- Encourage compliance with risk-reduction recommendations, especially hand-washing
- Comply with local and state requirements for reporting animal bites, scratches, or other injuries.
- Assure that visitors receive educational messages

# Recommendations for Education

**To educate visitors, venue operators and staff should:**

- **Provide information about disease risks and appropriate measures to reduce risk**
- **Inform visitors which groups of people are at high risk and the precautions visitors should take**
- **Provide information before the event, and at the animal contact area entrances and exits**
- **Provide information in a simple to understand format that is age- and language-appropriate**
- **Provide information in multiple formats (e.g., signs, stickers, handouts)**



# Examples of educational signs

# IMPORTANT INFORMATION!



- Parents make sure children do not put their hands in their mouths
- Do not eat or drink while in the animal barns
- WASH HANDS after leaving animal area

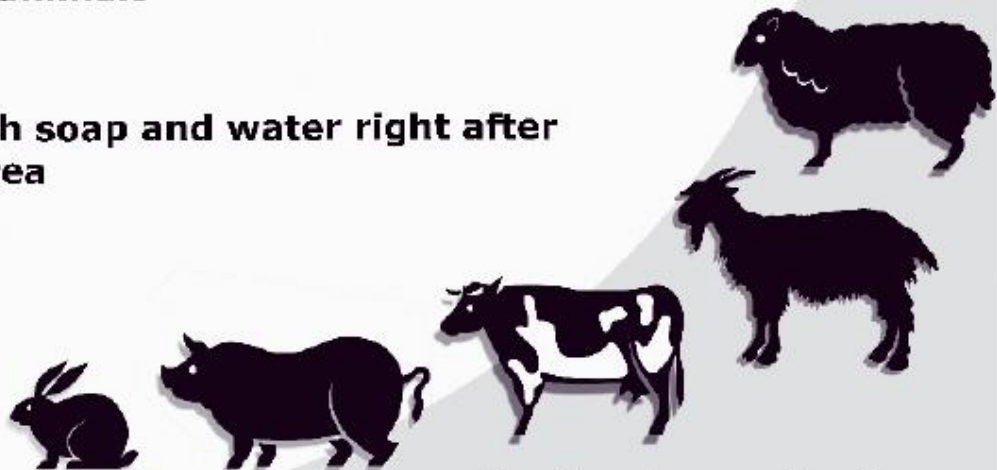
BACTERIA AND INFECTIONS ARE CARRIED BY ANIMALS

**K**now that animals carry germs that can make people sick

**N**ever eat, drink, or put things into your mouth in animal areas

**O**lder adults, pregnant women, and young children should be extra careful around animals

**W**ash your hands with soap and water right after visiting the animal area



**How to be Safe Around Animals!**



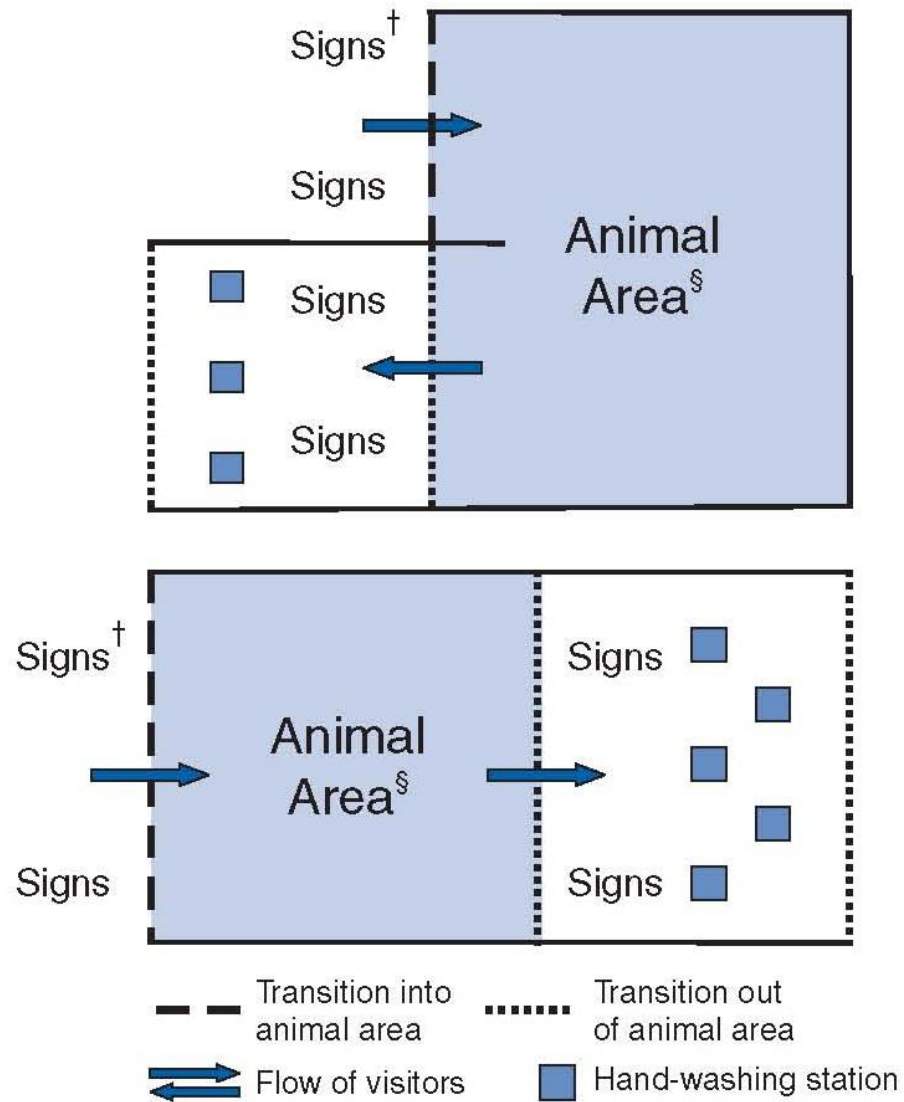
# Recommendations for Managing Public and Animal Contact

- **Contact with animals should occur in settings where measures are in place to reduce the potential for injuries or disease transmission**
  - **Design: minimize risky contacts, particularly with manure, facilitate hand-washing**
  - **Double barriers: prevent contact with animals or contaminated surfaces**
  - **Temporary exhibits**

# Designs for Managing Public and Animal Contact Should Consider:

- **Non-animal areas**
- **Animal areas**
- **Transition areas**

FIGURE. Examples of designs for animal contact settings, including clearly designated animal areas, nonanimal areas, and transition areas with hand-washing stations and signage



# Non-animal areas

- **Animals not permitted, except service animals**
- **Food and beverages can be prepared, served, and consumed**
- **Hand-washing signs and facilities provided where food or beverages are served**

# Animal Areas



- **Exclude food and beverages**
- **Exclude toys, pacifiers, “sippy cups”, baby bottles, and smoking**
- **Remove manure and soiled animal bedding promptly avoiding spillage**
- **Supervise children closely to discourage hand to mouth activities, contact with manure, and contact with soiled bedding, supervise hand-washing**
- **Use barriers between public and animals in petting zoo areas to reduce excessive contact and contamination of clothing**

# North Carolina State Fair, 2004



- High risk group (<5 yrs)
- High risk setting



# Animal Areas (continued)

- Do not use animal areas for public (non-animal area) activities
  - **“Lesson 2”** – long-term contamination
- If used for a public event, animal areas should be cleaned and disinfected

# Transition Areas Between Non-animal and Animal Areas

- **Establish transition areas**
  - One way visitor flow is preferred
  - Designated as clearly as possible
- **Entrance transition areas**
  - Post signs informing visitors that they are entering an animal area
  - Instruct visitors not to eat, drink, smoke, place their hands in their mouth, or use bottles or pacifiers while in the animal area
  - Exclude strollers, food, and beverages, establish storage or holding areas
- **Exit transition areas**
  - Post signs instructing visitors to wash their hands.
  - Provide accessible hand-washing stations for all visitors, including children and persons with disabilities
  - Position venue staff near exits to encourage compliance

# Entrance transition areas



## For Your Safety

**DO NOT** bring these items into the animal area



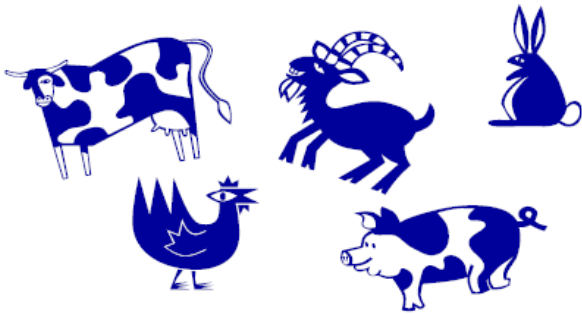
Please watch your children

**Wash your hands** as soon as you exit!

**Exit transition areas**

# Touch

## Tocar

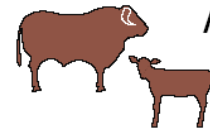


# Wash

## Lavar



### ANIMAL HANDLING SAFETY TIPS



After Petting Animals,  
Wash Your Hands!



## ALWAYS



Use **SOAP** and **WATER**.

**RUB** hands together for **20** seconds.

**WASH** backs of hands, lower forearms,  
wrists, between fingers, and under fingernails.



**DRY** hands with a clean paper towel.



### CONSEJOS DE SEGURIDAD PARA TOCAR A LOS ANIMALES



Después De Tocar A Los Animals  
¡Lave Sus Manos!



## SIEMPRE



Use **AGUA** y **JABÓN**.

**FROTE** sus manos por **20** segundos.

**LAVE** atrás de las manos, los antebrazos, las  
muñecas, entre los dedos y debajo de las uñas.



**SEQUE** las manos con una toalla de papel limpia.





**What else should be present in the exit transition areas?**



# Animal Care and Management



## **Veterinary care:**

- **Screening for diseases is not recommended**
  - **Intermittent shedding**
  - **Limitations of laboratory tests, culturing fecal specimens or other attempts to identify**
- **Antimicrobial treatment of animals cannot reliably eliminate infection, shedding of enteric pathogens, or prevent reinfection**

# Appendices:

- A. Animals in Public Settings: Guidelines for Venue Operators and Staff Members**
- B. Suggested Sign or Handout for Visitors to Petting Zoos**
- C. Hand-Washing Recommendations to Reduce Disease Transmission from Animals in Public Settings**
- D. Guidelines for Visiting And Resident Animals In Schools**

# What can you do?

- **Be familiar with NASPHV Compendium recommendations**
- **Consider transmission of infectious agents from animals in patients- zoonoses**
- **Order a culture for diarrheal disease**
- **Consult state public health officials and report suspected transmission routes or outbreaks**
- **Provide education to patients and parents regarding risks and preventive measures associated with animal contact**



# Centers for Disease Control and Prevention Atlanta, Georgia

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Those who participate in the COCA Conference Calls and who wish to receive CE credit/contact hours and will complete the online evaluation by **May 28 2011** will use the course code **EC1648**. Those who wish to receive CE credits/contact hours and will complete the online evaluation between **May 29, 2011** and **Apr 28, 2012** will use course code **WD1648**. CE certificates can be printed immediately upon completion of your online evaluation. A cumulative transcript of all CDC/ATSDR CE's obtained through the CDC Training & Continuing Education Online System will be maintained for each user.



Thank you for joining!  
Please email us questions at  
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A-Z Index A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

## Emergency Preparedness and Response

### Emergency Preparedness & Response

- Specific Hazards
- Preparedness for All Hazards
- What CDC Is Doing
- What You Can Do
- Blog: Public Health Matters
- What's New

## Measures to Prevent Disease Associated with Animals in Public Settings

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**Date:** Thursday, April 21, 2011

**Time:** 2:00 - 3:00 pm (Eastern Time)

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Communicable and Environmental Disease Services
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LCDR, U.S. Public Health Service  
Acting Team Lead, Outbreak Response Team  
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