Links between wild and domestic animals - diseases and knowledge gaps

William B. Karesh DVM
# Wildlife Defined

**ANIMALS LIVE UNDER HUMAN SUPERVISION OR CONTROL**

<table>
<thead>
<tr>
<th></th>
<th>PHENOTYPE SELECTED BY HUMANS</th>
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Wild Animal ≠ Wild Species

Domestic Animal ≠ Domestic Species
• *Anas platyrhynchos*

Mallard  Rouen Domestic Duck  White Domestic Duck
• *Sus scrofa*

Eurasian Wild Pig

Domestic Pig
## African Buffalo – *Syncerus caffer*

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Water Buffalo – *Bubalus bubalis*

Asiatic Buffalo - *Bubalus amee*
American Buffalo – *Bison bison*

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African Swine Fever
African Swine Fever

- Endemic in wild suids in many parts of Africa
- Introduced to Eastern Europe (trade)
- Both feral pigs and Eurasian wild pig susceptible
- Did not become established in wild peccaries in South America (not suids)
Foot and Mouth Disease
FMD Domestic animals
FMD domestic buffalo
FMD wild animals
Foot and Mouth Disease

- Endemic in African buffalo in many parts of Africa (SAT only)
- Wide species host range – but has not been shown to persist in New World camelids, antelope/gazelle.
- Persistent infections in cervids after experimental infection.
Foot and Mouth Disease

- A, O, C, Asia 1 and SAT(3)
- SAT strains appear to be the only group adapted to wild animals: African buffalo
- A, O, C, and Asia 1 appear to be domestic cattle adapted strains
PI-3  BRSV  BVD  IBR  BT  FMD  POX

CALVES  1998 AD  1999 AD  SHEEP  GOATS
PPR domestic animals
PPR wild animals
Peste des Petits Ruminants

- In wildlife, a number of wild animals have been identified as susceptible: Laristan sheep, Dorcas-type gazelles, gemsbok and the Nubian ibex
- As with Rinderpest – no wild animal reservoir been found
Rabies Hosts

• Over 132 host mammal species
  – Domestic, human and wildlife

• Of global concern, with diverse local threats

“Because few tools are available to control infections of wildlife, measures to control diseases associated with wildlife have often resulted in harm to wildlife (e.g. culling...)”
(Cleaveland et al., 2007)
# Rabies Hosts

<table>
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<tr>
<th>Host Type</th>
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<tr>
<td>Total Host Mammals</td>
<td>&gt;132</td>
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<tr>
<td>Domestic</td>
<td>16</td>
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<tr>
<td>Wild and Human</td>
<td>116</td>
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Current as of August 2011
Common Ground

• Rabies
• FMD
• Tuberculosis
• Brucellosis
• Animal Influenzas
• Bluetongue/EHD - Orbiviruses
Common Ground

- Systems / integrated approaches
- Disease emergence
- Climate change
- Natural resource allocation
- Anti-microbial resistance
- Global animal movement/trade