The Battle Against Disease

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Objectives

- Discuss the spread of infections by direct means
- Discuss the spread of infections by indirect means
- Describe the methods by which parasites are spread
- Discuss sources of disease
Direct vs Indirect Transmission

- Direct Transmission
  - Direct or close contact
- Indirect Transmission
  - Vectors
  - Vehicles
  - Fomites
Routes of Transmission

- Aerosol
- Oral
- Vehicle
- Vector
  - Mechanical
  - Biological
I. Sources

A. Carrier/Reservoir Animals

1. Aerosol droplets
2. Nasal fluid
3. Ocular fluid
4. Saliva
5. Skin
6. Manure
7. Urine
8. Milk
9. Fetal fluid
10. In utero
11. Genital fluid
12. Blood
13. Carcass
B. Vectors (Live)

1. Ticks
2. Flies
3. Mosquitoes
4. Scavengers
5. People
C. Vehicles (Not Alive)

1. Instruments
   a) Needle
   b) Ear tagger
   c) Tattooer
   d) Dehorner
   e) Nose tong
   f) Knife

2. Utensils
   a) Bucket
   b) Trough
   c) Boots
   d) Clothing
D. Environment

1. Soil
2. Water
3. Food
4. Air
II. Routes of Entry

A. Susceptible Animals

1. Mouth
2. Nose
3. Eyes
4. Skin
5. Teats
6. Vagina
7. Prepuce
8. Transplacental
9. Venereal
10. Blood
III. Incubation Period

A. Long/Short

B. Exposure to Symptoms

C. Exposure to Positive Tests

D. During Incubation Period
   1. No symptoms
   2. Negative tests
E. After Incubation Period

1. Symptoms
2. Positive tests
IV. Latent Infections (Recrudescent Infections)

A. Extended Incubation Period
   1. No symptoms
   2. Negative tests

B. After Recrudescence
   1. Symptoms
   2. Positive tests
C. Injury
   1. Blackleg
   2. Malignant edema
   3. Black disease
   4. Black-neck disease

D. Diet Change/Overload
   1. Enterotoxemia
E. Flukes
  1. Redwater

F. Stress
  1. IBR/PI3/BVD/BRSV
  2. Pasteurella/Haemophilus

G. Pregnancy in Heifers
  1. Brucellosis
V. Non-Latent Infections

A. Normal Incubation Period
   1. Lepto
   2. Vibrio
   3. IBR/PI3 /BVD/BRSV
   4. Pasteurella/Haemophilus
   5. Brucellosis in Cows
VI. Stress Factors

A. Nutrition
B. Weather
C. Pregnancy
D. Calving
E. Working
F. Weaning
G. Shipping
H. Breeding
I. Walking
VII. High Risk Herds

A. Identify Sources
B. Separate Carrier/Reservoir Animals (shedders)
C. Reduce Commingling
D. Vaccinate Susceptible Animals

1. Not 100% protection
   a) No response
   b) Improper procedures
   c) Mishandled vaccine
   d) Expired vaccine
   e) Stored opened vaccines
   f) Poor quality vaccine
   g) Primary dose only
2. Long/short protection
3. Vaccinate before exposure
4. Does not prevent recrudescence in latent infections
E. Biosecurity Measures

1. Raise replacements
2. Purchase animals from clean herds
3. Test purchased animals
4. Vaccinate purchased animals
5. Isolate purchased animals
6. Restrict visitors and vehicle entries
7. Construct buffer zone fencing
Animal Disease Management (Biosecurity)

Epidemiology

- Transmission (Risk Assessments)
- Control (Risk Manipulations)

Diseased Animal (Reservoir)

- Direct Sources
  - Aerosol Droplets
  - Nasal Fluids
  - Ocular Fluids
  - Saliva
  - Skin
  - Milk
  - In Utero
  - Genital Fluids

- Entry Routes
  - Inhale
  - Ingest
  - Eye
  - Skin
  - Transplacental
  - Venereal

- Normal Incubation Period

Infected Animal (Carrier)

- Indirect Sources
  - Vectors, Vehicles
    - Blood
    - Skin
    - Ocular Fluids
    - Nasal Fluids
    - Environment
      - Aerosol Droplets
      - Nasal Fluids
      - Manure
      - Urine
      - Fetal Fluids
      - Carcass

- Entry Routes
  - Inhale
  - Ingest
  - Eye
  - Vagina
  - Prepuce
  - Teats
  - Skin

- Extended Incubation Period

Latent Animal (Carrier)

- Agent Recrudesces (Stress)

- Diseased Animal
- Infected Animal

Latent Animal