Small Ruminant Diseases

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<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2008</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broiler</td>
<td>5</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Dairy</td>
<td>10</td>
<td>2</td>
<td>80%</td>
</tr>
<tr>
<td>Layer</td>
<td>11</td>
<td>5</td>
<td>55%</td>
</tr>
<tr>
<td>Swine</td>
<td>30</td>
<td>21 (’04)</td>
<td>30%</td>
</tr>
<tr>
<td>Processors</td>
<td>11</td>
<td>9</td>
<td>18%</td>
</tr>
<tr>
<td>Cattle</td>
<td>800</td>
<td>1,100 (’07)</td>
<td>38%</td>
</tr>
<tr>
<td>Goats</td>
<td>189 (’02)</td>
<td>343 (’07)</td>
<td>82%</td>
</tr>
<tr>
<td>Sheep</td>
<td>103 (’02)</td>
<td>394 (’07)</td>
<td>283%</td>
</tr>
</tbody>
</table>

Slide adapted from G. Fukumoto
Livestock Industries in Hawaii

- Dairy ($8.8 M)
- Poultry ($8.8 M)
- Hogs ($3.7 M)
- Beef ($33.0 M)

$54 Million* Farm Gate Value

Generating $162 Million in Hawaii’s Economy

*HASS, 2012; Slide by G. Fukumoto
# Livestock Inventory

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>83,277</td>
<td>86,000</td>
</tr>
<tr>
<td>Sheep</td>
<td>19,909</td>
<td>22,376</td>
</tr>
<tr>
<td>Goats</td>
<td>5,364</td>
<td>9,169</td>
</tr>
</tbody>
</table>

NASS Census of Ag 2010
Why Small Ruminants?

- Most preferred meat in the world
- Small animals with a large market
- Good fit for small farms
- Weed/Fire fuels management
Health topics

1. Biosecurity
2. The healthy animal
3. Immunity
4. Vaccinations
5. Parasite control
6. Hoof care
7. Diseases
8. Poisonous Plants
Biosecurity
Protecting the health of livestock by preventing the introduction and transmission of disease

- Start with and buy healthy animals that are free from infectious diseases.
  - Don’t buy from farms with infectious diseases, poor management, or poor sanitation
  - Beware of free or “cheap” animals

Adapted from S. Schoenian, U. of Maryland
Biosecurity

- Limit access to farm
- Don’t share equipment or cars/trucks without cleaning them first
- Practice good sanitation management
Appearance: the healthy animal

- Alert
  Head, ears, and tail ↑
- Normal droppings
- Healthy hair/wool coat
- Normal walk and stance
- Regular cud-chewing
- Stretch upon standing, especially babies

Adapted from S. Schoenian, U. of Maryland
Appearance:
the healthy animal
Appearance: the healthy animal
Appearance: the unhealthy animal

- Droopy head and ears
- Lethargy
- Poor body condition
- Hair loss
- Pale mucous membranes
- Edema (fluid build-up)
- Runny nose or eyes
- Lack of cud chewing
- Loose stools
- Straining to urinate
- Limping (on knees)
- Hunched up
- Difficulty walking or standing
- Laying down too long
- Star gazing
- Grinding teeth

Adapted from S. Schoenian, U. of Maryland
Appearance: the unhealthy animal
Behavior

Normal
• Eager to eat
• Quick to come to feeder or in from pasture
• Normal flocking or social behavior

Abnormal
• Lack of appetite
• Slow to come to feeder or in from pasture
• Isolation from flock.
• Excessive rubbing or scratching on objects

Adapted from S. Schoenian, U. of Maryland
Immunity
The condition in which an organism can resist disease

Adapted from S. Schoenian, U. of Maryland
Resistance & Resilience
Vaccinations for sheep and goats

- Clostridial diseases
  - Soremmouth (orf)
  - Caseous lymphadenitis (CL) (int. and ext. abscesses)
  - Footrot
  - Abortion
  - *E. coli* scours
  - Pneumonia
  - Rabies
  - Autogenous

Adapted from S. Schoenian, U. of Maryland
Clostridial diseases (CD-T)

- Clostridial diseases
  CD-T toxoid

1. *Clostridium perfringens* type C
   Hemorrhagic enteritis (young)
   Struck (adults)

2. *Clostridium perfringens* type D
   Pulpy kidney disease
   “classic” overeating disease

Adapted from S. Schoenian, U. of Maryland
Giving CD-T vaccine

- Is a subcutaneous (SQ, sub-Q) injection. --under the skin
  - High on the neck
  - Over ribs
  - Axilla (armpit)

- Never in leg or loin region

- Vaccination “knots” are not uncommon

- At least 21 days before slaughter

Adapted from S. Schoenian, U. of Maryland
Pneumonia

• An issue of management
  – Stress
  – Poor air quality
    • High ammonia
    • Dust
    • Moisture
  – Sanitation
  – Transport
  – Nutrition

Adapted from S. Schoenian, U. of Maryland
Parasite control

Parasites are organisms that grow, feed, and are sheltered in a different organism while doing nothing to benefit the host.

- External parasites
- Internal parasites
Internal parasites (worms)
Most significant health problem affecting goats especially

• Roundworms, stomach worms, nematodes (strongyle family)
  – *Haemonchus contortus*  
    Barber pole worm
  – *Trichostrongylus* sp.  
    Bankrupt or hair worm
  – *Ostertagia* sp.  
    Medium or brown stomach worm

• Tapeworms

• Lungworms

• Protozoa
  – *Eimera* sp. (Coccidia)

• Liver flukes

Adapted from S. Schoenian, U. of Maryland
Barber pole worm

*Haemonchus contortus*

- Lives in the abomasum ("true" stomach)
- Sucks blood from host animal
- Produces THOUSANDS of eggs
- Clinical signs: **anemia** (pale mucous membranes), **edema** (bottle jaw), loss of body condition and weight, poor hair coat, lethargy, and death.

Adapted from S. Schoenian, U. of Maryland
Parasites mature & reproduce

Larvae eaten with grass

Eggs excreted to pasture

Larvae hatch & climb grass
Barber pole worm control

- Grazing management
- Good sanitation
- Nutrition, especially protein
- Genetic selection
  - Resistant breeds
  - Within breed selection
- Medicinal forages
Proper anthelmintic use

TREATMENT NOT PREVENTION

1. Dose according to weight.

2. Administer drugs orally (except Cydectin® injectable for goats)

3. Deposit drug into esophagus

4. Higher doses for goats (except Cydectin® injectable for goats)

5. Do not dose everyone in the herd. Treat those showing signs of heavy loads.

6. Do not dose on a set schedule

Adapted from S. Schoenian, U. of Maryland
Coccidia

*Eimeria* sp. - single-cell protozoa – normal part of gut flora

- Damages the lining of the small intestines (affects nutrient absorption)

- Symptoms
  - Diarrhea
    - with or without blood or mucous
  - Dehydration
  - Emaciation
  - Anorexia
  - Fever
  - Anemia
  - Death

- Affected animals may have tens of thousands of coccidia oocysts per gram of feces – or none!

Adapted from S. Schoenian, U. of Maryland
Coccidia

Usually caused by poor sanitation and management.

• Prevention
  – Good sanitation
  – Avoid overcrowding
  – Coccidiostats in water, mineral, or feed

Adapted from S. Schoenian, U. of Maryland
External (ecto) parasites

- Cause irritation, rubbing
- Ticks
- Biting and sucking lice
- Mites
- Fleas
- Flies
  - Nose bots
  - Fly strike (maggots)

Adapted from S. Schoenian, U. of Maryland
Signs of external parasitism

- Wool or hair loss
- Rough hair coat
- Rubbing
- Scratching
- Skin discoloration
- Skin rash
- Tail wagging
- Distress
- Foul smell (wound)
- Visible signs of maggots
- Snotty nose
- Hold nose close to the ground

Adapted from S. Schoenian, U. of Maryland
Treatment of external parasites

- Insecticides
  - Pour-on
  - Sprinkle
  - Spray
  - Dust
  ➔ Dip

- Some anthelmintics
  - Ivermectin

Adapted from S. Schoenian, U. of Maryland
1) **Foot scald**  
\(\text{(benign footrot or interdigital dermatitis)}\)

- Inflammation or reddening between the toes
- Involves one anaerobic bacteria
- Not contagious (environmental)

2) **Footrot**  
\(\text{(virulent footrot)}\)

- Infection in horny tissue of hoof
  - Separation of horn from hoof
  - Smelly
- Involves two anaerobic bacteria
- Highly contagious
- Affects bottom-line of production

Adapted from S. Schoenian, U. of Maryland
Prevention of footrot

Footrot usually walks onto the farm in the form of an infected or carrier animal

1. Only buy from flocks and herds that are footrot-free

2. Never buy animals from a flock or herd in which you observe lame animals or animals on their knees

3. Isolate new animals and observe for lameness

4. Trim hooves of new animals and apply topical treatment for footrot

5. Do not mix your sheep or goats with someone else’s

Adapted from S. Schoenian, U. of Maryland
Prevention of footrot and scald

Footrot and scald are most common during moist periods

6. Do not haul your sheep or goats in trucks or trailers that have not been properly sanitized

7. Hoof trimming

8. Walk-through foot baths (zinc sulfate)

9. Hydrated lime \([\text{Ca(OH}_2])\) in pens and yards

10. Good drainage around feeders and waterers

Adapted from S. Schoenian, U. of Maryland
Hoof trimming

- Need and frequency for hoof trimming varies.
  - Species
  - Breed
  - Hoof color
  - Individual
  - Diet
  - Housing
  - Moisture
  - Terrain
  - Management style

- Trim hooves with hoof or paring shears

Adapted from S. Schoenian, U. of Maryland
Restraint for hoof trimming

• Tip on rump (works well for sheep)

• Lift hooves while animal is standing on table (or platform) or tied to a fence. (works well for goats)

• Use restraining equipment
  – Grooming or milking stand.
  – Deck chair.
  – Work platform or station.
  – Manual or electric turn or tilt table.

Adapted from S. Schoenian, U. of Maryland
Copper Toxicity

• Most often found in show animals
  – Feed for cattle is high in copper
  – This cattle formulation has copper at toxic levels for sheep
  – High copper results in destruction of red blood cells (anemia)

Adapted from S. Schoenian, U. of Maryland
Poisonous Plants

• The dose makes the poison

• Affects animals in many ways: abortion, no conception, birth defects, skin problems, sudden death

• Prevention vs. treatment

• Allow animals to choose their food as much as possible

• Signs of poison may be caused by other problems like nutrition or illness
"It's only those who do nothing that make no mistakes.”
-- Joseph Conrad, An Outcast of the Islands (1896)
Winter rain
falls on the cow shed.
A cock crows.

--Basho