

Small Ruminant Health



UNIVERSITY OF
MARYLAND
EXTENSION
Solutions in your community

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Health topics

1. Biosecurity
2. The healthy animal
3. Immunity
4. Vaccinations
5. Parasite control
6. Hoof care
7. Scrapie



Biosecurity

Protecting the health of livestock by preventing the introduction and transmission of disease.



- 1 Start with and buy healthy animals that are free from infectious diseases.
 - Don't buy breeding stock from sale barns.
 - Don't buy from farms with infectious diseases, poor management, or poor sanitation.
 - Beware of free or "cheap" animals.

Biosecurity

Biosecurity is important no matter what size flock or farm you have.

- Limit acquisition of new animals.
 - Close flock, if/when possible.
 - Limit acquisitions to males for breeding.
 - Quarantine new animals for 30 days.
 - Deworm new animals with anthelmintics from two drug classes to prevent the introduction of drug-resistant worms.
 - e.g. SafeGuard® + Cydectin®
 - Quarantine show animals when they return to the farm.
 - Remember that sheep and goats share the same diseases.



Biosecurity



- Limit access to your farm.
 - Require visitors to wear plastic boots or disinfect their footwear.
- Don't share equipment or transportation vehicles without first sanitizing them.
- Don't pass diseases during shearing.
- Good sanitation and management.

The healthy animal



- Be able to recognize the healthy animal



- 1) Appearance
- 2) Behavior
- 3) Vital signs



Appearance

HEALTHY

- Alert
- Normal stool
- Healthy coat
- Normal gait and stance
- Chews cud regularly
- Stretch upon standing, specially babies.



UNHEALTHY

- Droopy head and ears
- Lethargic
- Poor body condition
- Wool or hair loss
- Pale mucous membranes
- Edema (fluid build-up)
- Runny nose or eyes
- Lack of cud chewing
- Teeth grinding
- Loose stools
- Straining to urinate
- Limping (on knees)
- Hunched up
- Difficulty walking or standing
- Recumbency
- Star gazing
- Loss of crimp in wool
- Weakness in wool fiber

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Behavior

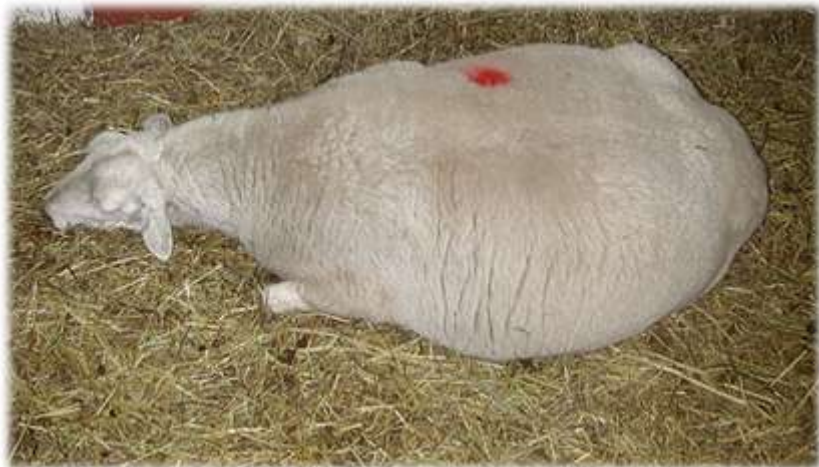
NORMAL

- 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.



Vital signs: what's normal?

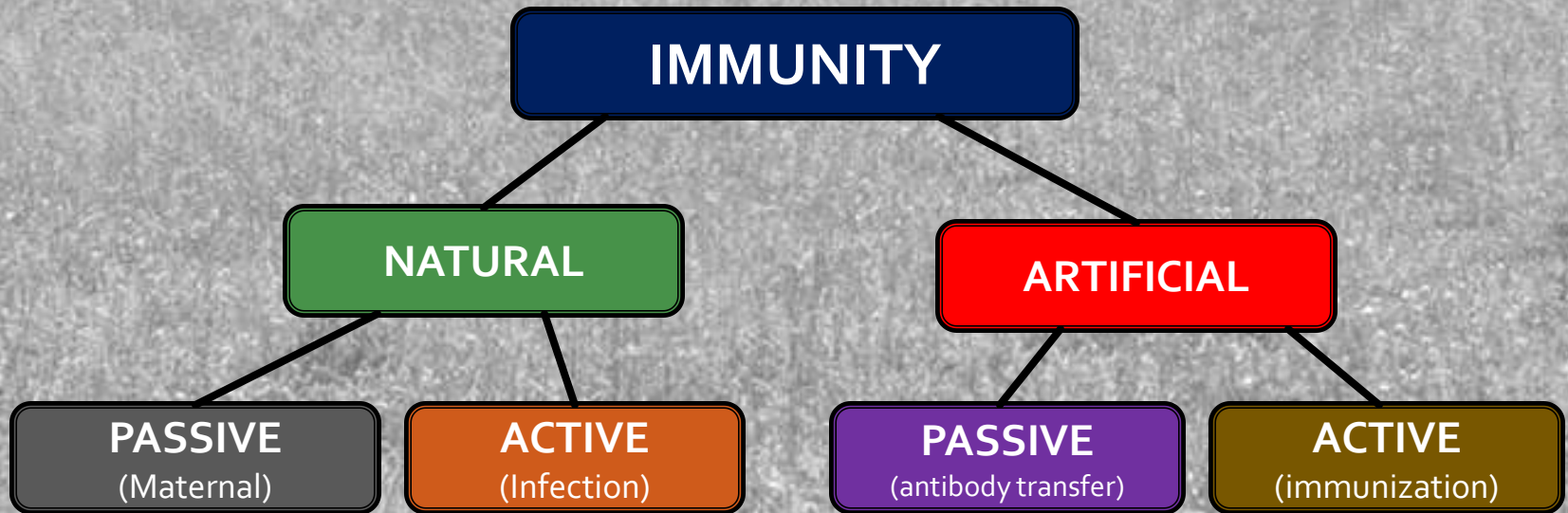
Things we can measure.

	Sheep	Goats
Rectal temperature	101.5-104°F	102-104 °F
Heart beat	70 to 80 beats per minute	70 to 90 beats per minute
Breaths	12 to 20 breaths per minute	15 to 30 breaths per minute
Ruminations	1 to 3 per minute	1 to 3 per minute
Packed cell volume	27 to 45 percent	22 to 28 percent
FAMACHA© score	≤ 3	≥ 3
Body condition (1-5)	2 to 4	2 to 4



Immunity

The condition in which an organism can resist disease.



Vaccinations for sheep and goats

A substance given to stimulate production of antibodies.



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

Clostridial diseases (CD-T)

- Clostridial diseases
CD-T toxoid
 - The enterotoxemias (n=5)
(overeating diseases)
 1. *Clostridium perfringens* type C
Hemorrhagic enteritis (young)
Struck (adults)
 2. *Clostridium perfringens* type D
Pulpy kidney disease
“classic” overeating disease
 - Tetanus



Recommended vaccination program



- Vaccinate ewes and does with CD-T toxoid 4 to 6 weeks prior to lambing and kidding.

Why?

- Provide active immunity to the ewe or doe when she is most likely to be confronted with disease challenge.
- Elevate immunity in the colostrum (first milk).

Recommended vaccination program

- ☞ Ewes and does that have never been vaccinated (or whose vaccination status is unknown) require two CD-T toxoid vaccinations (4 weeks apart) during late pregnancy.
- ✘ Do not vaccinate within 14 days of parturition.



Recommended vaccination program

- Lambs and kids acquire passive immunity when they drink the colostrum (first milk):
 - Make sure all lambs and kids consume adequate colostrum.
→ *no immunity in colostrum supplements*
 - Passive immunity starts to decline after 4 weeks of age.
 - Passive immunity is gone by 10 to 12 weeks of age.

So . . .

- Vaccinate lambs and kids with CD-T toxoid at approximately 6 to 8 and 10 to 12 weeks of age.



If dam was not vaccinated . . .



- A pre-lambing/kidding vaccination is the only way to protect lambs and kids from type C.
 - Administer type C antitoxin (and antibiotics) in the event of a disease outbreak.
- Give tetanus anti-toxin at the time of docking, castrating, disbudding, or other procedure.
 - Tetanus toxoid will not provide protection.

If dam was not vaccinated . . .



- Vaccinate lambs and kids with CD-T toxoid when they are approximately 4 weeks of age, followed by a booster 4 weeks later.
- ✦ Earlier vaccinations are not usually very successful, due to . . .
 - Immature immune system of young lambs and kids.
 - Interference of maternal antibodies.

CD-T vaccination protocol cont'd

- Vaccinate rams, bucks, mature wethers, and pets annually.
- Vaccinate feeder and club lambs and kids twice.
- If lambs or kids have been grazing for several months and are brought in for grain feeding, they should be boosted with CD-T toxoid.
- Vaccine may be less effective in goats.
 - Some advocate a CD-T toxoid booster every 4 to 6 months.



Giving CD-T vaccine

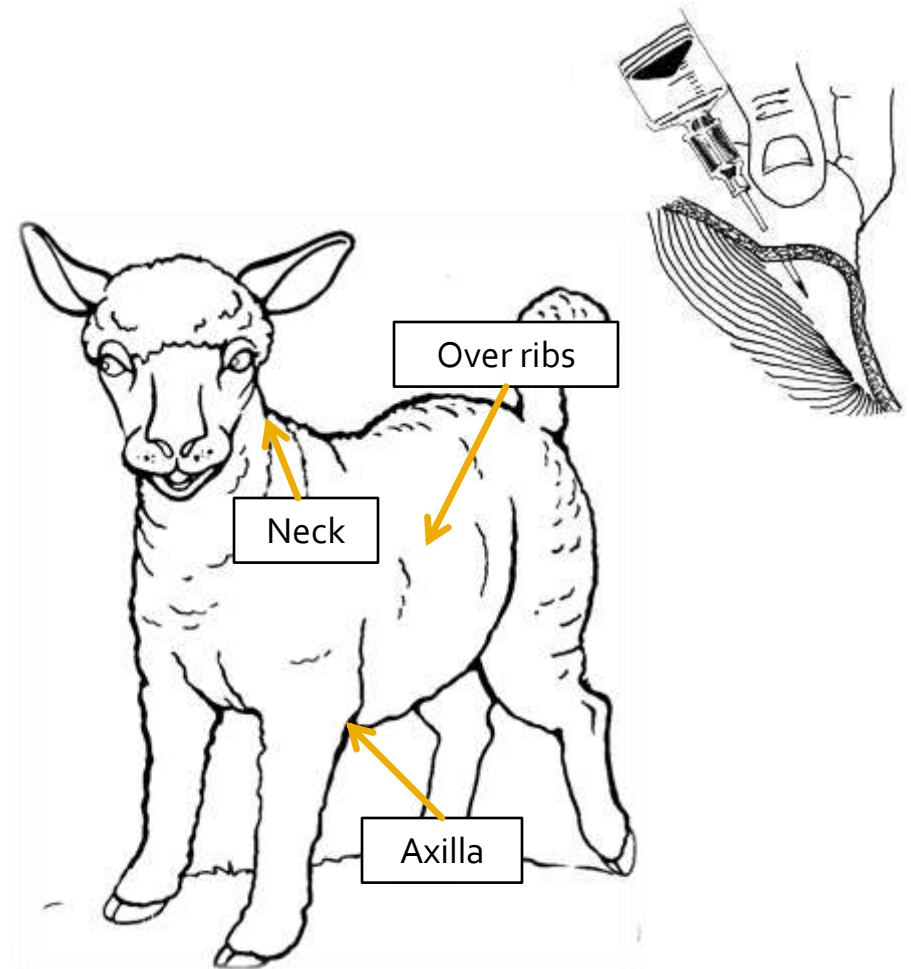
Only vaccinate healthy animals.



- Follow label instructions.
- Use clean syringes and needles.
 - A clean needle for every animal or . . .
 - Change needle every 15 to 20 animals when using a multi-dose gun.
- Use correct needle size e.g. $\frac{1}{2}$ to $\frac{3}{4}$ inch 18 gauge

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.
- 👉 21 day slaughter withdrawal.



Other vaccines for sheep and goats

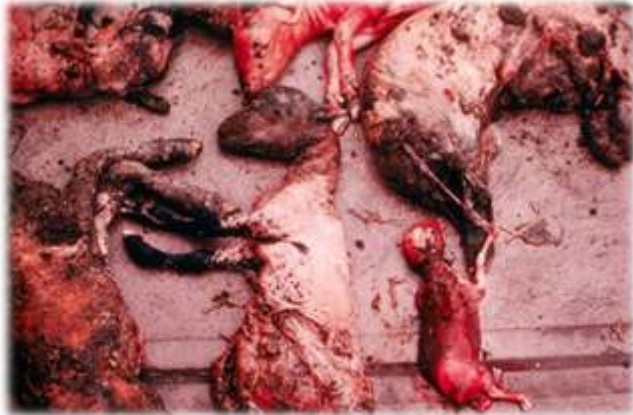
Most vaccines are approved for sheep (not all), but not goats.

- 8-way clostridial
Covexin-8™
- Soremouth (live)
- Caseous lymphadenitis (CL)
(Case-Bac™, Caseous D-T)
- Footrot
(Footvax®, Volar®)
- Abortion
(Vibrio, enzootic, leptospirosis)
- *E. coli* scours
(vaccine or oral antibody)
- Rabies
- Pneumonia
Pasteurella sp., Nasalgen® (PI-3)
- Autogenous



Other vaccines for sheep and goats

When to vaccinate . . .



✓ If . . .

- A problem has been diagnosed in the flock.
- High risk is high.
- Required for exhibition or sale.
- Public contact with animals.

✦ If the disease is already present on the farm.

- ✦ Soremouth
- ✦ Caseous lymphadenitis
- ✦ Footrot

Parasite control

Organisms that grow, feed, and are sheltered in a different organization while doing nothing to benefit the host.



- External parasites

- Internal parasites

External (endo) parasites



- Ticks
 - Deer tick – lyme disease
 - Ked - sheep tick
 - Biting and sucking lice
 - Mites
 - Fleas
 - Flies
 - Nose bots
 - Fly strike (maggots)
-
- Diseases with insect vectors
 - Bluetongue virus
 - Cache valley virus
stillbirths and congenital abnormalities



Symptoms of external parasites



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

Treatment of external parasites



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

- Some anthelmintics
 - Macrocylic lactones only
 - Ivermectin is usually drug of choice

- Organic treatments (?)

Internal parasites (worms)

Most significant health problem affecting sheep and goats.

- Roundworms (strongyle family)
 - *Haemonchus contortus*
Barber pole worm
 - *Trichostrongylus* sp.
Bankrupt or hair worm
 - *Ostertagia* sp.
Medium or brown stomach worm

👉 Tapeworms

- Lungworms
- Protozoa
 - *Eimeria* sp. (Coccidia)
- Liver flukes
- 👉 Meningeal (deer) worm



Barber pole worm - *Haemonchus contortus*

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



Barber pole worm control:

Pasture management



- Clean, safe pastures
- Pasture rotation/rest
- Minimum grazing heights > 3 inches
- Wait until dew has lifted before grazing
- Mixed-species grazing
small ruminants ↔ cows, horses
- ← Alternative forages
e.g. *Sericea lespedeza*
- Browsing
- Proper stocking rates

Barber pole worm control: Other strategies



- Host resistance
- Zero grazing
- Good sanitation
- Nutrition
 - Protein supplementation
- Genetic selection
 - Resistant breeds
 - Hair sheep, Gulf Coast Native
 - Kiko, Spanish, Myotonic
 - Within breed selection
 - The 80-20 rule

Barber pole worm control

Developed in South Africa: FAMACHA© = FAffa MAlan CHArt

❖ Selective deworming using FAMACHA© score plus . . .

1. Body condition score
2. Coat condition
3. Britch soiling/dags

☛ Consider host resistance

- Species Age
- Status



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. Deworm all new arrivals with drugs from two chemical classes.
6. Do not dose everyone in the herd.
7. Do not dose on a set schedule.
8. Test for drug resistance.
 - FECRT - Before and after fecal egg counts
 - DrenchRite® / Larval development assay (LDA)



Coccidia

Eimeria sp. - single-cell protozoa – species-specific- 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
 - Wool breaking
 - Fever (sometimes)
 - Anemia
 - Death
- Affected animals may have tens of thousands of coccidia oocysts per gram of feces – or none!



Coccidia

Usually caused by poor sanitation and management.



- Prevention
 - Good sanitation
 - Avoid overcrowding
 - Coccidiostats* in water, mineral, or feed.
 - Bovatec® (lasalocid)
 - Rumensin® (monensin)
 - Deccox® (decoquinate)
 - Corid (amprolium)
- Treatment (Rx only)
 - Corid
 - Sulfa antibiotics

* Toxic to equine family

Hoof trimming



- Need and frequency for hoof trimming varies. . . .

- Species
- Breed
- Color of hoof
- Individual
- Diet
- Housing
- Moisture
- Terrain
- Management style

- Trim hooves with hoof or paring shears.



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.



How to trim hooves

Cull animals with chronic hoof problems or abnormal hoof growth.

- Easier to trim hooves when they are soft – after a rain.
- Clean out dirt and manure with tip of trimmers.
- Cut off tip of hooves.
- Trim side walls and heel so that they are flat and even with the sole of the foot.
- Stop trimming when you see pink.
- A properly-shaped hoof should be level with the hair line.
- You may have to trim “problem” hooves a few times to get them right.



Hoof diseases

Bacterioido nodusus (in hoof) + *Fusobacterium necrophorum* (in soil and manure) = Footrot

1) Foot scald (benign footrot or interdigital dermatitis)

- Inflammation or reddening between the "toes"
- Involves one anaerobic bacteria (*F. necrophorum*).
- Not contagious (environmental)



2) Footrot virulent footrot

- Infection in horny tissue of hoof
 - Separation of horn from hoof
 - Smelly
- Involves two anaerobic bacteria
- Highly contagious.



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



Prevention of footrot and scald

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

Image from Alabama Extension



Image from Irish Lime

7. Hoof trimming.
8. Walk-through foot baths (zinc sulfate).
9. Hydrated lime $[\text{Ca}(\text{OH}_2)]$ in pens and yards.
10. Absorptive pads saturated with zinc sulfate.
11. Good drainage around feeders and waterers.
12. Zinc sulfate or zinc oxide in the mineral

Treatment of footrot and scald

- Hoof trimming to remove overgrowth and expose bacteria.
- Foot bathing/soaking (zinc sulfate)
- Antibiotics (long-acting)
- Topical treatments
 - a) Oxytetracycline + alcohol
 - b) Penicillin + alcohol
 - c) Dr. Naylor's Hoof and Heel
 - d) Kopertox
 - e) Iodine
- Vaccination (Footvax[®], Volar[®])
- Isolation
- Culling
- Selection



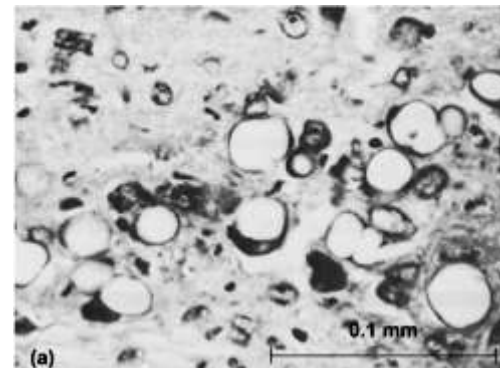
Scrapie

Most common in blackface sheep; rare in goats.

- Always fatal, brain-wasting disease of sheep and goats.
- Member of family of diseases called transmissible spongiform encephalopathies (TSE).
 - Bovine spongiform encephalopathy (BSE)
--Mad cow disease
 - Chronic wasting disease (CWD) in deer and elk.
 - Classical and new variant Creutzfeldt-Jacob disease in people (CJD and nvCJD)
- Caused by a prion (?).



Image source: McGraw Hill's Access Science



Scrapie



- Primary mode of transmission is via infected placenta.
Female → her offspring, other offspring
~~Male transmission~~
- 2 to 5 year incubation period.
- No cure or treatment.
- Live tests (lymph tissue)
 - Third eye lid
 - Rectal biopsy
- Symptoms are variable
 - Neurological and behavioral
 - Scratching and rubbing → scrapie

Scrapie eradication

78 confirmed cases in U.S. in FY2009

■ Traceability

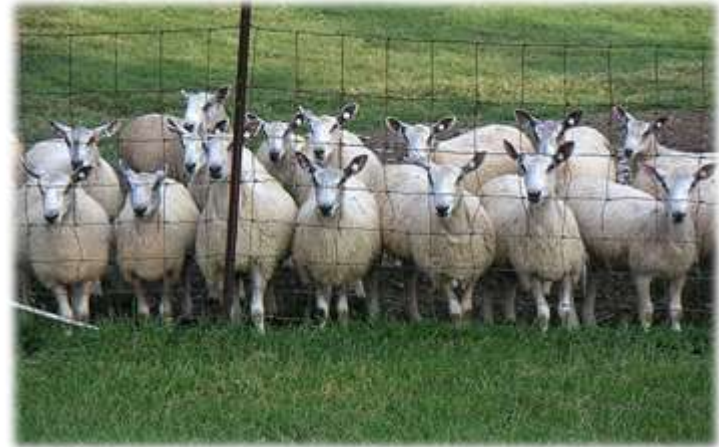
- Mandatory identification of sheep and goats entering commerce (leaving farm of birth).
 - Free ear tags and applicator from USDA APHIS.
 - Premise ID + individual animal ID
- Call toll free 1-866-USDA-TAG.



<http://www.eradicatescrapie.org/>

Scrapie eradication

- Voluntary scrapie flock certification program.
- Genotyping at codons 171, 154, 136
 - R – resistant
 - Q - susceptible



Keeping animals healthy and productive

- Biosecurity
- Sanitation
- Good management
- Balanced rations
- Genetic selection
- ~~Drugs~~

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Thank you for your attention.

