

Factors Affecting BRD Outbreaks In Stocker Cattle

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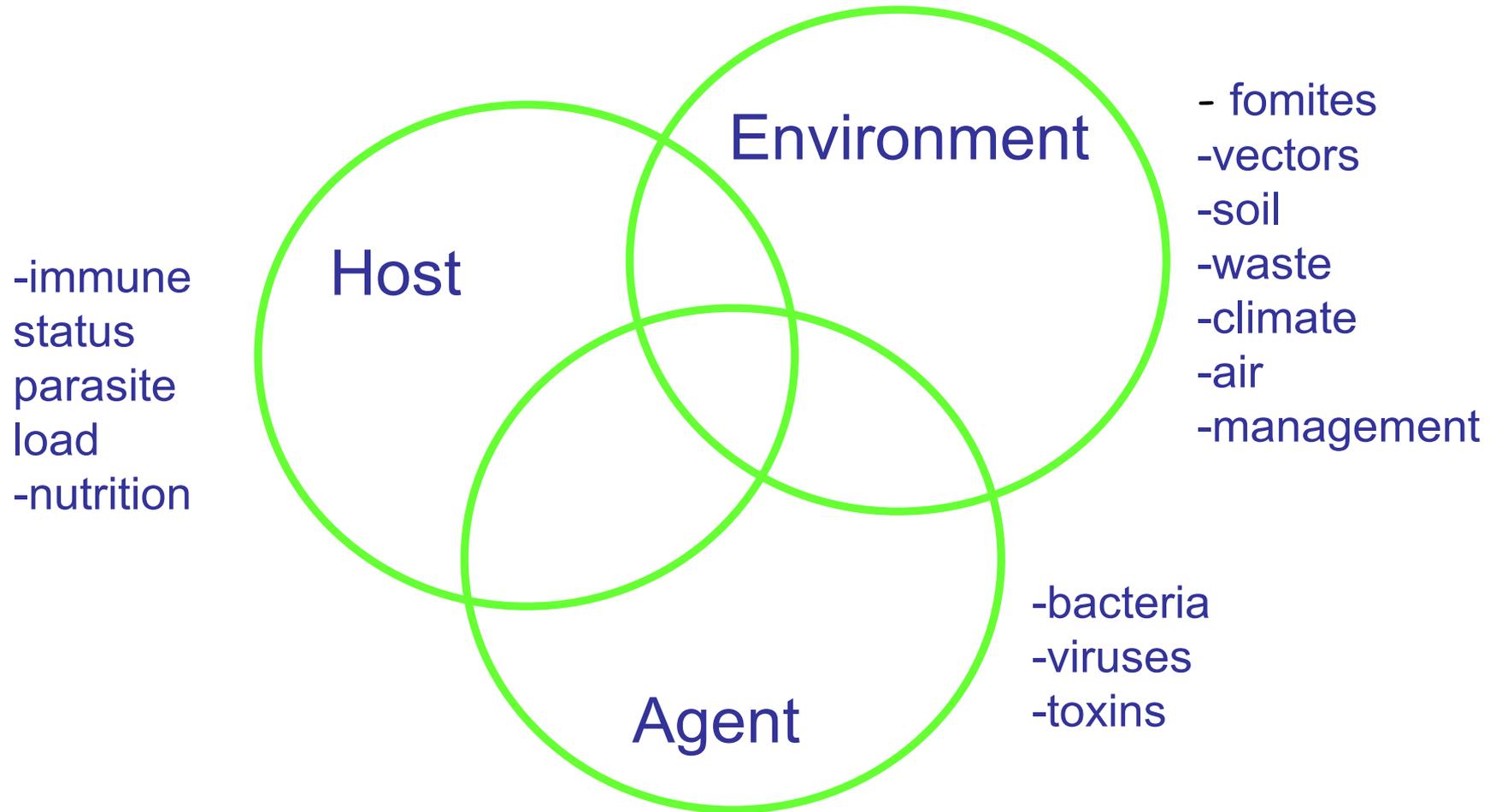
Bovine Respiratory Disease Complex

A Disease of Management

Some things you have control over and some you have no control.

Receiving Programs and Treatment Programs you have control over and they can greatly affect your profitability!

Disease is the result of complex interactions



Host Factors

Parasites
Hydration Status
Nutritional Status
Vaccination
Status
Stress

Stress

Acute Stress - Enhanced Immune Response

Chronic Stress – Immunosuppression
Decreased Immune response to disease and vaccinations

Chronic Stress- Kills production

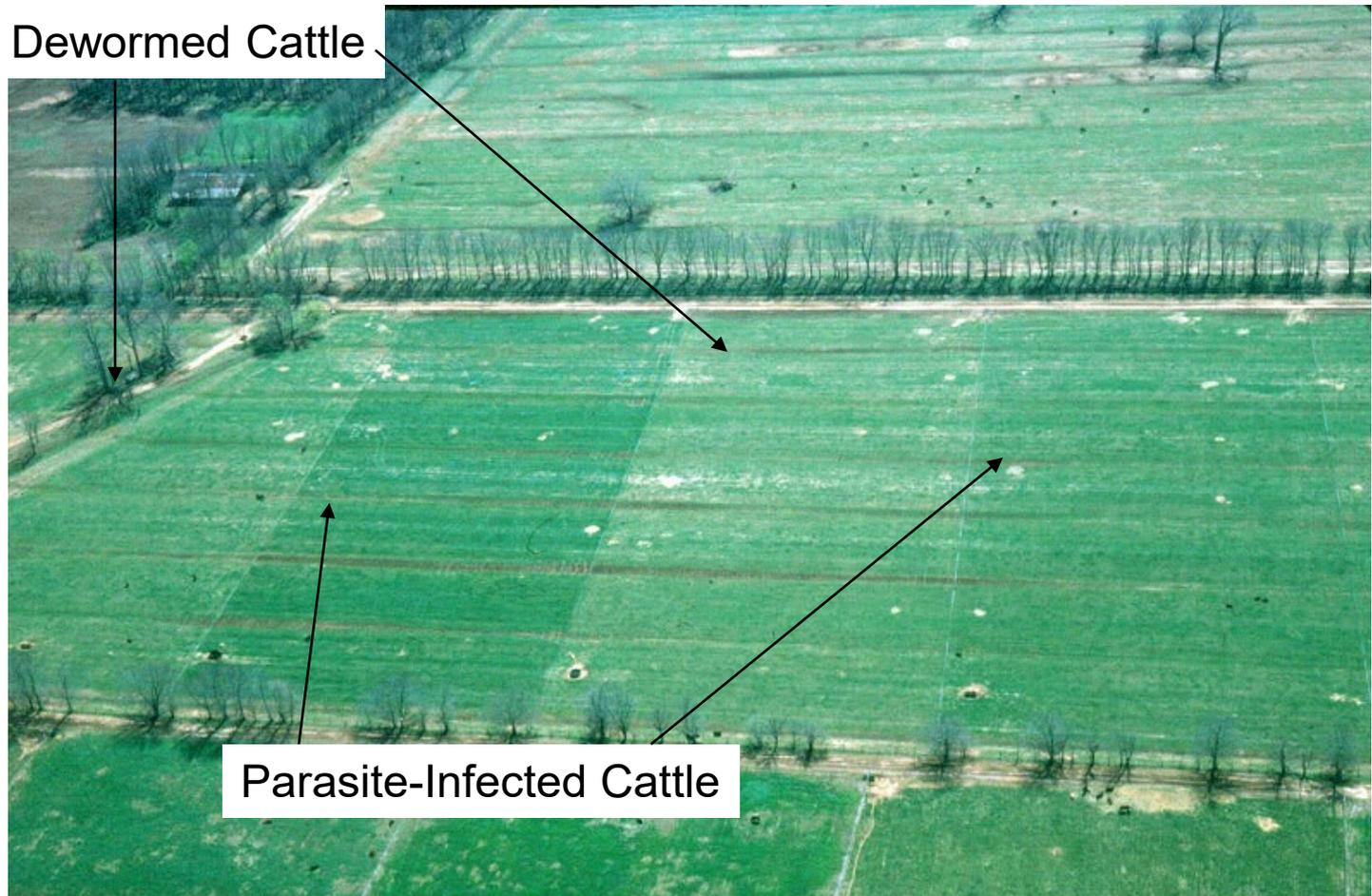
Effect of Internal Parasites on Calves

Reduce feed intake

Reduce daily gain

Impair immune function

Parasites Suppress Appetite



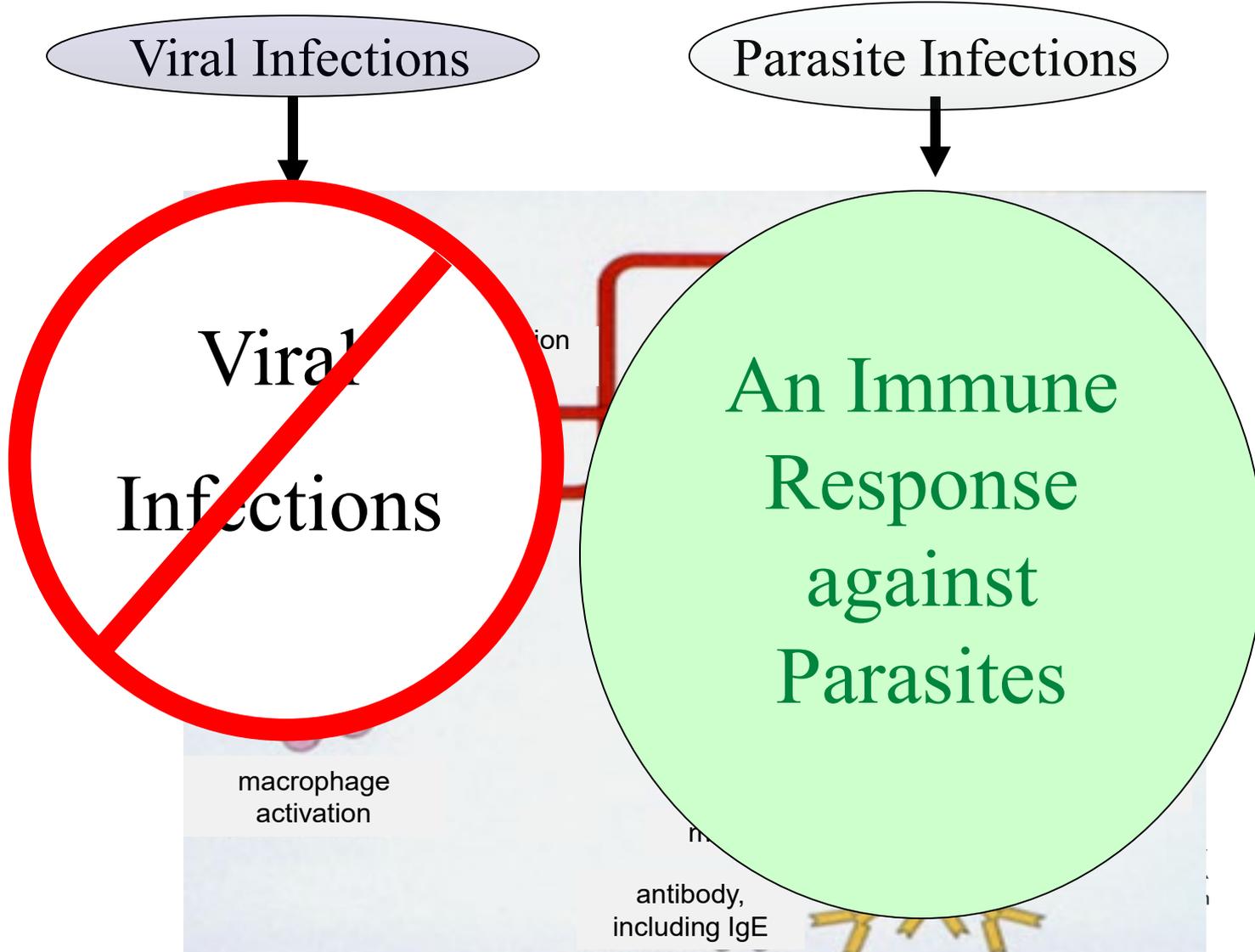
(Lou Gasbarre, USDA)

Appetite Suppression

Changes in Size of Draining Lymph Nodes after Infection with *Ostertagia*



Parasites Redirect the Immune System Response



Host Factors

Hydration Status- Dehydration of 7-8 % increased Morbidity and Mortality

Nutritional Status- Mineral deficiencies, Poor Body condition can equal less than optimal vaccination and/or disease response

Nutrition

Microbiome-Gut Flora

Protein- % in feed and quality

Microbiome and health

New evidence shows that the bacteria in the gut also interact with the immune systems, and might even influence the body's immune reaction to vaccines.

Evidence suggests that a balanced and diverse microbiome might contribute to better health overall, and a less diverse or less balanced microbiome can have a negative impact on health.

Nutrition- By Product Feeds

We can feed some WEIRD stuff!!

Cereal, Candy, Yogurt, Potato Chips, Veggies, Whiskey Slop, Gin Trash, Wet Distillers, Dried Distillers, Honey buns,

Can We Say “Ruminal Acidosis”

One consequence of feeding excessive amounts of rapidly fermentable carbohydrates in conjunction with inadequate fiber to ruminants is subacute ruminal acidosis, characterized by periods of low ruminal pH, depressed feed intake, and subsequent health problems

“Ruminal Acidosis”

Ruminal epithelial cells are not protected by mucus, so they are vulnerable to chemical damage by acids. Low ruminal pH leads to rumenitis, erosion, and ulceration of the ruminal epithelium. Once the ruminal epithelium is inflamed, bacteria may colonize the papillae and leak into the portal circulation. These bacteria may cause liver abscesses, which may eventually lead to peritonitis around the site of the abscess. **If the ruminal bacteria clear the liver (or if bacteria from liver infections are released into circulation), they may colonize the lungs, heart valves, kidneys, or joints. The resulting pneumonia, endocarditis, pyelonephritis, and arthritis are often difficult to diagnose antemortem**

Environment

Pen Space
Bunk Space
Water Access &
Quality
Working Facilities

Environment

Pen Space -300-500 sq ft/per calf

Bunk Space- 18-22 inches/calf

Feed on a Schedule- within 15 min of scheduled time every day

Water Access & Quality

Make sure calves have Access to Water

Check Water quality

Do not share waters between pens

Clean Troughs as needed weekly daily

Environment

Working Facilities- Poor facilities or poorly kept facilities increase stress and stress kills production

See more lameness, stiff cattle – which leads to decreased feed intake

Walk daily and repair as needed

Environment-(Over Crowding)

Every operation has an optimal # of calves that can be handled in a day/week.

Limiting Factors-Labor, Pen Space, Facilities

Over Crowd or Exceed That Number, and Chances of a Self Induced BRD WRECK are Greatly Increased

Disease Agents

IBR
BRSV
BVD I&II
PI3
Corona virus
Influenza D
Pasteurella
Histophilus

Disease Agents

IBR, BRSV, BVD I&II,- actually cause clinical disease

PI3, Corona virus, Influenza D – Primary infection allows other pathogens to colonize the lung

Pasteurella, Histophilus Mycoplasma-can be primary agent but most of the time secondary to viral infection

Need to Routinely Necropsy Deads

Acute deads more valuable than chronic for Dx information

Designing a Vaccination Program

Goal: Provide enough immunity for disease challenge & not kill production

Vaccination Programs

Design using the KISS program

Allow animals to rest, fill and rehydrate before vaccination

Few hours to 48 hrs. depending on the stress and hydration status of the calf

Handle Vaccine properly;

Check & Monitor refrigerator temp

Mix only what you will use in hour

Use cooler chute side to keep vaccine cool and in the dark

Use Vaccines labeled for SubQ administration

Vaccination Programs

Use a MLV viral vaccine that has trial work done in stocker cattle

Use Clostridial (Blackleg) vaccines designed to be low stress- Can reduce feed intake 30 days or more

Limit Gram negative vaccines in receiving programs
Endotoxins

BRD OR Endotoxins

Clinical signs

Increased temp

Increased respiration rate

Depression

Weakness

Anorexia

Frothing +/-

Diarrhea +/-

Common Gram Negative Diseases

E. Coli

Salmonella

Moraxella Bovis

Pseudomonas

Pasteurella Multocida

Fusobacterium

Necrophorium

Haemophilus

Leptospirosis

Campylobacter

Actinobacillus

Mannheimia Hemolytica

Klebsiella

Brucellosis

Endotoxin Sources

Gram neg. diseases

Gram neg. vaccines

Any product with fetal calf serum.

Clostridial vaccines

Viral Vaccines

Environment-dust from pens

Endotoxins & Stress

Higher stress level → greater effect of endotoxin on the animal

- Weaning & processing
- Dehydration
- other infections present (viral or bacterial)
- Vaccinations
- temperature extremes
- high humidity

Endotoxin stacking-environment (dust), pasteurella pneumonia, vaccines

Endotoxins

If animal survives the initial episode

- neutrophil function may be reduced for several hours to days
- animal is actually immunocompromised.

Immunocompromised animal may then develop an infection secondary to this episode

- or an incubating infection may be allowed to explode to a fatal infection.

Many of these animals become chronics.

Endotoxins In Vaccines

Temperature can also affect adjuvants

- which can affect endotoxins in vaccine

ALOH-tends to bind endotoxin

- However when frozen it clumps and binding effect is decreased and more free endotoxin is released.

Endotoxins

Rules of Thumb

Dairy cattle: no more than two gram negative vaccines given at one time

Beef: no more than three at one time if not stressed

Stressed cattle or stockers: one or no gram negative vaccines at processing.

Endotoxins

Rules of thumb

Do not give vitamin shots with gram negative vaccines

- carriers may emulsify vaccine adjuvant
- cause quicker or larger release of endotoxins leading to adverse events.

When dealing with gram negative vaccines always error on the side of caution.

Product Endotoxin Levels

Sample Identifier	Endotoxin Concentration	Percentage Change from Base
Once PMH[®] IN	40,900 EU/mL	base
Vista Once[®] SQ	46,600 EU/mL	+14%
Product A	63,450 EU/mL	+55%
Product B	238,250 EU/mL	+583%
Product C	387,000 EU/mL	+946%

From Once PMH[®] IN: Endotoxin TSB 51 2014 under approval review



Developing Treatment Protocols

Antibiotic Drug Classes

ANTIBACTERIAL DRUG ACTIONS

A. BACTERICIDAL.

BACTERIA ARE KILLED.

B. BACTERIOSTATIC.

BACTERIAL MULTIPLICATION IS INHIBITED.

C. POST ANTIBIOTIC EFFECT (PAE).

BACTERIA ARE CRIPPLED.

allow immune system to more efficiently clean it up

Chemical Classes of Approved Veterinary Antibiotics

Beta Lactams - penicillins and cephalosporins(Exceede)

Tetracyclines - chlortetracycline, oxytetracycline(LA300)

Macrolides - erythromycin, tilmicosin, tulathromycin(Zueprovo, Draxixin, Zactran)

Sulfonamides- sulfadimethoxine, sulfachlopyridazine, trimethoprim and combination sulfas

Aminoglycosides - gentamicin, neomycin

Aminocyclitols – spectinomycin,

Lincosamides – lincomycin, clindamycin,

Fluoroquinolones –(Baytril, Adovcin,)

Phenicol – florfenicol (Nuflor,Resflor)

Treatment Protocols

Base on Science

Work with your Veterinarian to develop and monitor

Necropsies, Culture and Sensitivities, Response to treatments

Use drugs with broad spectrum of activities

Use Banamine at 1st pulls

Bovine Respiratory Disease Complex

The Most Common Finding of BRD Wrecks?

Getting Behind in Pulling and Treatment of BRD in the Cattle?

Temp and Treat

Temp and Treat at Processing

If the temp is 104°F or greater then move to 1st line treatment drug and skip Metaphylaxis drug.

Goal is to Identify sick cattle early in the disease process

Feed and Pull cattle 1st thing in the morning. Observing cattle for fill and watching cattle rise and come to feed can be very instrumental in identifying sick calves. **Treat as soon as possible after pulling.**

Records

“You don’t know where you are going if you don’t know where you have been”

“You can’t measure what you don’t record”

A lot of us have CRS Syndrome and/or selective memory

Records that need to be kept

Source: or origin of cattle

Treatments: pen or group and individual:

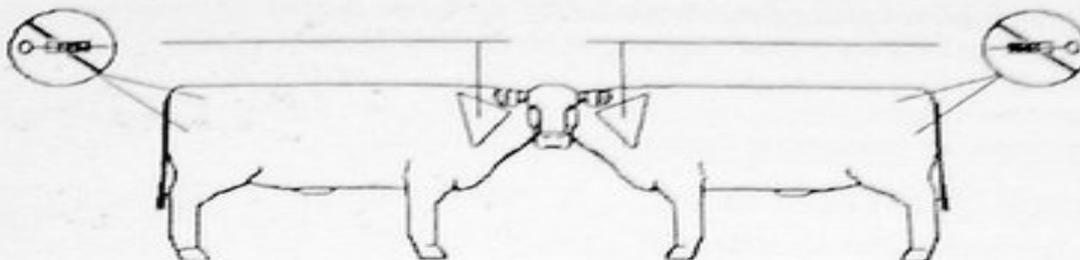
best if recorded at chute side

Drug Tracker Software

PROCESSING RECORD

Date

Cattle Group



All records should be maintained for at least two years.

Site*	Product	Lot#	Exp. Date	Company	Dose	R O A *	WD Time	Initials of Processor

* = Location from map

**=Route of Administration

Producer's Name: _____

Address: _____

City/State/Zip: _____ Phone: _____

Comments: _____

Diagnostics

Necropsies-

The dead can be very telling
not just the bug but the age of the lesion
Pyers patches
tracheal lesions
mycoplasma lesions

Nasal Swabs

Before Antibiotic Treatment Best
Deep Nasal Swabs

Culture and Sensitivity

ANTIMICROBIAL THERAPY

MATCH:

“THE DRUG TO THE BUG” ;
IS RELATIVELY EASY.

MATCH:

THE PROPER DRUG AND TX REGIMEN TO THE SICK
ANIMAL(S);

PTI's

Ancillary TX's (Something more than a shot and a prayer)

IS THE REAL CHALLENGE.

Thank you Questions