

Virginia State Feed Association Cow College February 2017

Mycotoxin Management in Beef and Dairy Cattle

Randy Asher



What We Will Cover

- Do we have a mycotoxin problem?
- Can our herd problems be something else?
- Conditions that magnify a mycotoxin problem
- Determining the source of a mycotoxin problem
- Treating the problem to maintain production and reproduction efficiencies
- Managing and preventing future mycotoxin problems



Know what you are actually dealing with. TROUBLESHOOT



Our Major Challenge

- Are the symptoms related to mycotoxins, or are they the result of another existing condition?
- Am I seeing a mycotoxin-related problem in conjunction with another existing condition?
- Do I have a problem that I am blaming on mycotoxins, yet mycotoxins are not involved.



Some Common Symptoms

- Milk production drop
- Lethargic, dull rough appearance
- Increased incidence of mastitis and metritis.
- Variety of reproduction problems
- Stool variability, loose, diarrhea
- Lower than normal dry matter intakes
- Immuno-suppression (disease incidence up)



Adverse Effects of Mycotoxins

- Immunosuppression
- Increased susceptibility to diseases
- Damage to organs
- Poor reproductive performance
- Decreased feed intake, production



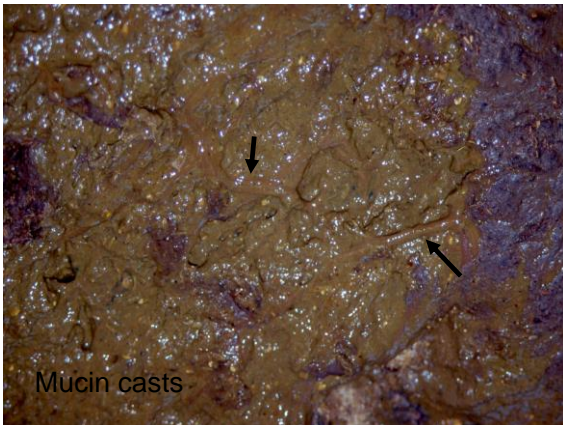
FRESH COWS HAVE A COMPROMISED IMMUNE SYSTEM

- Neutrophil Capacity at 50%
- Blood Serum vitamin E levels drop 47%
- Retinol levels drop 38%
- Zinc levels decrease by 67%
- Cu stores to the calf @ cow's expense
 - From birth to 56 days of age Cu stores in liver decreased 74% (Branum 1999)



Examples

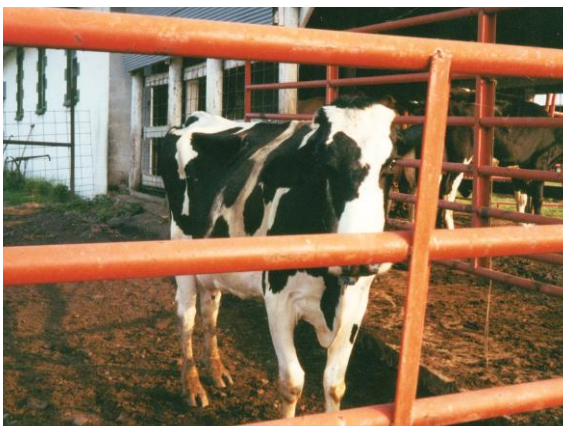
- Troubleshooting means doing the detective work in an effort to problem solve
- Rule out causes of problem one at a time
- Consider multiple number of causes contributing to the problem
- If mycotoxins are involved, we may have to fix problems other than mycotoxins to see maximum results.



Mucin casts

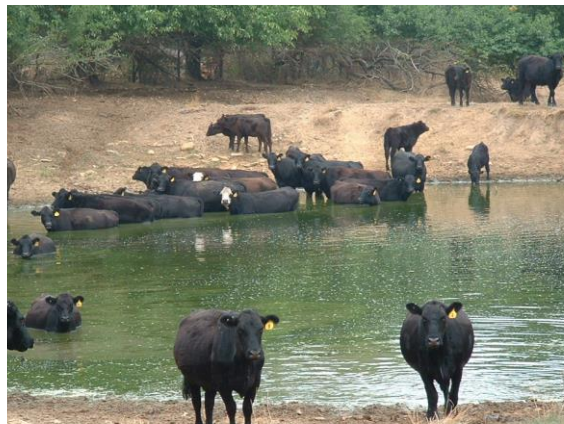
When you see this ?

- Acidosis – nutritional or feed management related?
- Winter Dysentery ? Rota, Corona, E. Coli, Salmonella ?
- Mycotoxins ? (T-2, DON, T-2 + DON, some AF)



Dull, Lethargic, Unthrifty

- Is it management?
- Is it nutritional?
- Is there a specific disease involved?
- Are the animals in herd subjected to stray voltage?
- Do we have a mycotoxin problem?
- If it is mycotoxins..acute or chronic ?



Fescue Toxicosis

- Toxins produced by *Acronemium coenophialum* have been associated with several adverse effects

- ↓ feed intake
- ↓ weight gain
- ↓ milk production
- ↓ reproductive performance
- ↑ internal body temperature
- ↑ respiration rates
- ↑ rough hair coat
- ↑ salivation




Second and Third Trimester Abortions

- Is there a disease challenge involved?
- Is it a mycotic abortion? (aspergillus, mucor)
- Are we dealing with a mycotoxin issue?



HBS


- Do we have a challenge from clostridium perfringens type A ? (i.e., haylage poorly fermented, high ash and butyric acid)
- Forage testing a must now.
- Is there a chance we have T-2 toxin altering digestive tract integrity.



Low Feed Intakes

16 Contributing Factors

- Too much grain
- Not enough forage
- Poorly fermented silages
- High NPN or soluble protein
- Limited water intakes
- Dirty feedbunks
- Finely chopped forages
- Reduction in chewing, rumination
- Ration imbalanced
- Minerals out of balance
- Inadequate feedbunk space
- Over-conditioned cows
- Not enough being fed
- High butyric acid levels
- Moldy feedstuffs
- Mycotoxins




Low Milk Production

13 Possible Reasons

- Not peaking properly
- Low persistency
- High incidence of mastitis
- Fresh cows lack energy in diet
- Over-conditioned cows
- Nutrient deficiencies and/or imbalances (protein & energy)


You can think of a few more

- Feed delivery (frequency and consistency)
- Low dmi's
- Days in milk?
- High somatic cell counts
- Disease challenge
- Stray voltage
- Mycotoxins




Conditions that Magnify a Mycotoxin Problem

- Stress (environmental, overcrowding, comfort)
- Disease Challenge
- Diet
- Stray Voltage



Determine the Possible Sources of a Mycotoxin Problem



- Fermented Feedstuffs (silage, haylage, baleage, high moisture corn, grasslage)
- Purchased commodities
- Purchased forages
- Purchased feed ingredients
- Stored commodities on farm



Crop Stress





Field Checks



Treating the Mycotoxin Problem

- Utilize a mycotoxin adsorbent
- Address problems encountered such as immune system suppression
- Address problems such as poor reproductive performance
- Has digestive tract integrity been compromised?




Managing a Mycotoxin Menace Through Nutrition

- May need to utilize organic trace elements to improve the status of the immune system, reproductive performance, hair and hoof health (30-40% of tm's in organic form)
- Increased vitamin A levels
- Increased vitamin E levels
- May need additional protein and energy in the diet



Managing the Mycotoxin Menace With Feed Additives

- Buffers – maintain protozoal numbers and rumen pH
- Mold Inhibitors - in tmr to reduce possible further mold growth
- May use mold inhibitors on face and top of bunkers to prevent mold growth and subsequent mycotoxin formation
- Digestive enzyme additives – aid in digestion (mycos may have altered beneficial microflora)
- Microbial feed additives – to help aid in rumen and digestive tract function
- Utilize mycotoxin adsorbent



Manage Factors that Magnify Problem

- Stress – reduce stress at every opportunity
- Do not overcrowd cows
- Manage environmental factors – bedding, air quality, water quality, noise, cow flow, etc.

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Manage Factors that Magnify Problem (cont...)

- Disease Challenges
- Diet (properly balanced diet)
- Stray Voltage

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Preventing (managing) Future Mycotoxin Problems

- Pre-harvest
- Harvest
- Post-harvest
- Storage
- Feedout

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Pre-harvest Control Strategies

- Soil Prep (are we in no tillage? crop rotation?)
- Plant variety selection – Mold resistant? Adapted to geographical area.
- Plant variety selection – insect resistant?
- Herbicide application timing

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Harvest Control Strategies

- Harvest timely – delayed harvest may increase contamination
- Early harvest of AF contaminated grain may prevent further contamination
- Harvest at proper moisture levels when possible

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Harvest Control Strategies (cont.)

- Proper combine adjustment – prevents excessive kernel damage
- Excessive kernel damage=predisposition to further infection during storage
- For corn silage, maintain proper TLC



Storage (grains)

- Dry grains before storing if needed
- Clean storage bins prior to storage
- Clean auger pits prior to usage



Storage of Fermented Feeds

- Upright silos – clean and airtight
- Bunker silos and piles – fill, pack and cover rapidly. Make sure pack is adequate.
- Cover - completely, cover tight



Side, top, and exposed face of a bunker spoils

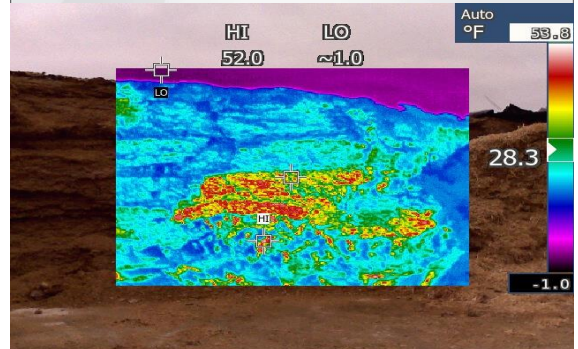


Feedout – fermented feedstuffs

- Remove adequate amount off of face
- Pull back only needed amount of plastic
- Remove from face in manner to minimize face disruption
- Keep face as smooth as possible
- Monitor face for hotspots



IR Camera



Use All Available Tools and Resources

- Infra-red camera
- Lab reports
- Bunker Densities
- Temperature Probes



Use Lab Reports To:

- Diagnose Production Problems Associated with Poor Quality Feedstuffs
- Determine Possible Causes of Reproduction Problems
- Identify Possible Causes of Health Problems



Lab Reports

- Mold and Yeast Counts
- Mold Identification
- Mycotoxin Screen
- Fermentation Profile
- Nitrate Tests
- Nutrient Analysis



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TESTING

- HPLC – favored for sensitive reliable results
- ELISA – Antibodies may cross react. Antibody can be mistaken for toxin presence
- Blacklight – may get false positives or negatives



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Know what you have to deal with and keep them on track



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Keep 'Em Healthy



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The Big Picture!



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Mold and Mycotoxin Info

- www.knowmycotoxins.com
- Cast Manual
- Mycotoxin Bluebook



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