



Biological and Botanical Treatments for Real Life Cases

- **Understanding Organics:
Livestock Management and Health**
- For Veterinarians and Extension Professionals
- Hubert J. Karreman, VMD
- University of New Hampshire
- March 7, 2007

KEYS TO ORGANIC LIVESTOCK HEALTH ISSUES

- Try to mimic mother nature as much as possible
- Prevention is especially critical
- Must jump on problems early
- Natural treatments can be labor intensive
- Realize that natural treatments may take longer to correct a condition

VETERINARY CHALLENGE

7CFR 205.238(c)(7) USDA NATIONAL ORGANIC PROGRAM

"The producer of an organic livestock operation must not withhold medical treatment from a sick animal in an effort to preserve its organic status.

All appropriate medications must be used to restore an animal to health when methods acceptable to organic production fail.

Livestock treated with a prohibited substance must be clearly identified and shall not be sold, labeled, or represented as organically produced."

A major question emerges:

What exactly is meant by an "appropriate medication" and ***who*** will say ***if and when*** it will be instituted to restore an animal to health?

Veterinarian's Oath

Being admitted to the profession of veterinary medicine, I solemnly affirm to use my scientific knowledge and skills for the benefit of society through the protection of animal health, the relief of animal suffering, the conservation of animal resources, the promotion of public health, and the advancement of medical knowledge.

I will practice my profession conscientiously, with dignity, and in keeping with the principles of veterinary medical ethics.

I accept as a lifelong obligation the continual improvement of my professional knowledge and competence.

With prohibitions on antibiotics and hormones in organic livestock healthcare:

- Which materials and modes of treatment do we draw from?
- Are there physiologic rational therapies?
- Are there management changes to be made?

When in the course of disease shall we institute antibiotic use?



When using natural treatments that stimulate or modulate the immune system, the animal tends to recover more gradually.

Infectious Disease

Approach:

- 1) Stimulate and/or modulate immune system via biologics
- 2) Use strong antibacterial phytotherapy
- 3) Use antioxidants
- 4) Use local antiseptic lavage/irrigation/poultice

PNEUMONIA

PNEUMONIA: EARLY SYMPTOMS

- Cough (dry, hack)
- Nasal discharge (clear/ a few streaks)
- Ocular wetness
- Increased rate of breathing
- Fever
- Hair coat on end/ not sleek

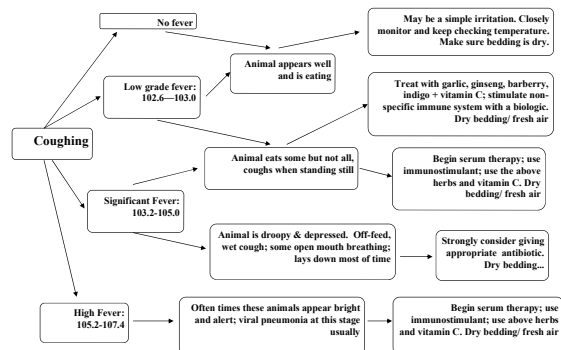


PNEUMONIA: LATER SYMPTOMS

- Cough (when sitting)
- Nasal discharge
- Some white pus from eyes
- Increased rate of breathing, with more belly involvement
- Fever and depressed
- Poor body condition and hair coat



Decision Tree for Coughing Animal



BIOLOGICAL TREATMENTS

- Serum products that have antibodies specific to *Pasteurella* (Mannheimia). **Provides antibodies & immune modulators for 10-14 days.**

• **Ex: Quatracon™, Bo-Bac-2X™, Bovi-Sera™**

- Can give 120cc SQ, IM sid x 2 days.
If IV, give slowly and have epinephrine ready

- **Immunoboost™** 5cc IV or IM increases γ -interferon (non-specific immunity); can repeat in 5-7 days



Treatment

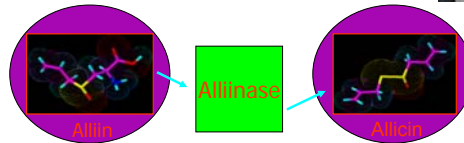
- **Vitamin C** IV or IM 250-500cc IV or 5cc IM s.i.d. (<30cc/site)
- Vitamin E and Se, **MuSe** IM or SQ (MuSe)
- Nasalgen™ or TSV-2™ (if **early**)
- Herbal Antibiotic Tincture IV – **Garlic, Ginseng, Goldenseal, Wild Indigo, Barberry**
Adult cow: 90cc loading dose and 15cc t.i.d. oral follow-up
- Herbal antibacterial powder – **garlic, ginseng root, barberry root, oregon grape root**
2 capsules bid x 5 days

Pharmacologic Actions: Garlic

- **Antibacterial inhibition:** Aerobacter, Areomonas, Bacillus, Citrella, Citrobacter, Clostridium, Enterobacter, Eschericia, Helicobacter, Klebsiella, Mycobacterium, Proteus, Pseudomonas, Salmonella, Serratia, Shigella, Staph. Strep, and Vibrio.
- **Mechanism:** via thiosulfonates (allicin) targeting RNA. Due to more lipid in gram (-) there is more ability for allicin to penetrate cell than gram (+)
Gowsala Sivam, J. of Nutrition 131: 1106S-1108S
- **Disseminated Aspergillus** (in vivo) Shadkchan J. of AntiMicrob. Ther. (2004) 53, 832-836
- "Garlic blocks quorum sensing and promotes rapid clearing of pulmonary *Pseudomonas aeruginosa* infections" Bjarnsholt, et.al. Microbiology 151 (2005), 3873-3880

Sulfur Compounds in Garlic

- Alliin (major cysteine sulfoxide in Garlic) +
- Alliinase (an enzyme in fresh, whole Garlic or correctly dried Garlic powders)
- → **Allicin, the active antibiotic compound**
- Allicin → sulfides, ajoene, dithiins, etc.



Pharmacologic Action: Ginseng

- 2 weeks after challenge with *Pseudomonas aureoginosa*, there was significant **bacterial clearance** from the lungs, **less severe** lung pathology, **lower lung abscess incidence** and **fewer mast** cell numbers in lung foci than in un-treated animals. Song, et.al. Antimicrob. Agents And Chemo. May 1997, 961-964
- **Activates PMNs** but had lower IgG levels with a decrease in IgG1 but an increase in IgG2 (correlates with TH1, cellular immunity)
- Dose used: **25mg/kg** = 12.5g / 500kg
- Antibacterial powder capsule delivers 2.8g (q.i.d.= 11.2g)

Effect of SQ Subcutaneous Injection of Ginseng on cows with subclinical *Staph aureus* mastitis

(Hu, S., et al. J Vet Med, Series B, Vol 48 Issue 7 p.519, Sept.2001)

- 8mg/kg BW/day x 6 days (4 gm/day)
- Neutrophil \uparrow phagocytosis and oxidative burst in 1 week
- Amount of **monocytes** were significantly \uparrow post-Tx than pre-Tx
- Amount of **lymphocytes** were significantly \uparrow at 2-3 weeks post-Tx
- Similar changes were **not** observed in the saline control group
- Number of ***S. aureus* infected quarters** and milk SCC tended to \downarrow in ginseng Tx cows
- Suggests that ginseng can stimulate the immune system of dairy cows.



Adjuvant effect of ginseng extracts on the immune responses to immunisation against S. aureus in dairy cattle
 (Hu, et. al., Vet. Immunol & Immunop., Vol. 91, Issue 1, 10 Jan 2003, p. 29-37)

- Crude ginseng extract and purified ginsenoside.
- In response to PWM, ConA and S. aureus antigens:

4 mg. crude extract gave significantly higher lymphocyte proliferation and serum antibodies than saline controls

1mg purified ginsenoside gave significant increase in milk lymphocyte proliferation and milk antibody titers



Pharmacologic Action: Berberines

- **Berberines** found in **Goldenseal** (*Hydrastis canadensis*), **Oregon Grape Root** (*Mahonia aquifolium*), **Barberry** (*Berberis vulgaris*)
- With *E. coli*, berberine sulfate **inhibits bacterial adherence** to mucosal or epithelial surfaces *in vitro*, thereby inhibiting the first step in infective processes.
- **Crude extracts inhibit growth** of giardia, entamoeba, thricomonas and leishmania better than berberine salts.
- Berberine is **not considered toxic** at doses used clinically; therapeutic dose is PO 200mg bid-qid (human), = 1g/1000 lb cow
- Antibacterial powder delivers 22g per day/cow

Immunomodulating Botanicals: Polysaccharides

- Stimulate non-specific immunity
- **Echinacea**: glucuronoarabinoxylans (glucuronic acid + arabinose + xylose) & arabinorhamnogalactans (arabinose + rhamnose + galactose) & arabinogalactans
- Others in Eleuthero, Baptisia, Calendula, Panax ginseng



Baptisia

Flow Cytometric Testing of Immunological Effects of a Phytomedicinal Combination (EquiMun) and its Compounds on Bovine Leucocytes

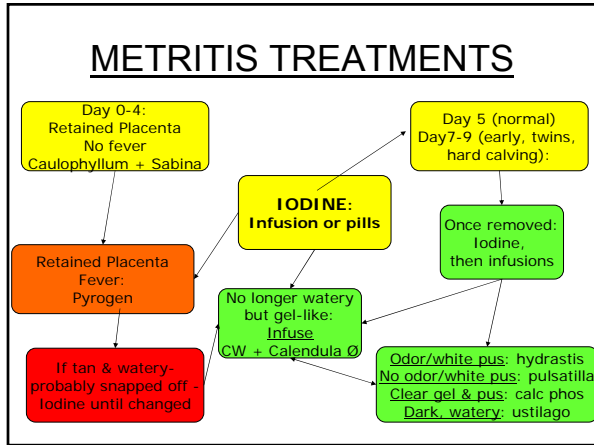
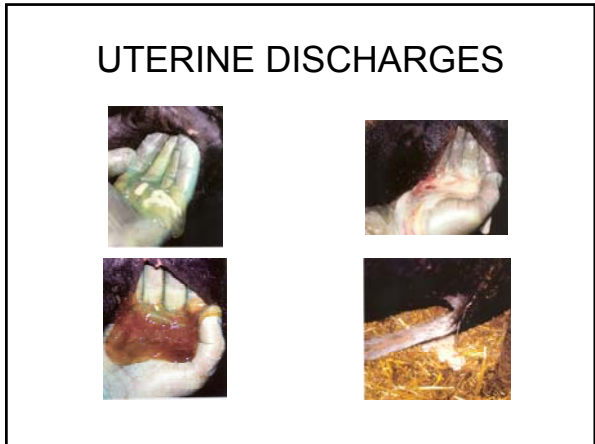
(Schuberth, et. al., J.Vet.Med. A, 49:Issue 6, p.291, Aug2002)

- **Goal of study:** establish fast, reliable and sensitive assays for the quality control of immunomodulating phytopreparations and to determine whether pharmacological compounds of phytopreparations have effects on bovine immune cells.
- EquiMun: combination *Echinacea purpura*, *Thuja occidentalis* and elemental Phosphorus
- **SUMMARY:** Flow cytometric characterization of cellular variability and shape changes of neutrophils seemed to be a suitable and reliable approach for the quality test of immunomodulating phytomedicines based on bioassays.



Ashley and Electrolytes





Reproduction Treatments

- Metritis- Iodine pills and manual removal after fresh ~5 days
- Pyometra - Infuse/lavage with colostrum whey product and calendula tincture
- No Heats – Spectra 305* 10 tablets every other day until heat or until finished (6 doses)

Ingredients – *Turnera diffusa, Dioscorea villosa, Mitchellia repens, Actea racemosa, Viburnum opulus, Angelica sinensis, Oenothera biennis, Linum usitatissimum, vit B6*

- Cysts – Gently try to rupture, homeopathics, Spectra 305 (12 doses)
- *CSU proposed study to measure serum progesterone and ultrasound ovarian structural changes



BY 3-4 WEEKS FRESH, HAVE THE UTERUS IN CONDITION TO BREED BACK.

By doing the previously described treatments, this is possible the vast majority of the time.



NATURAL TREATMENT APPROACHES TO MASTITIS

(Action **must** be taken **early** in the process)

- Stimulation of the immune system
- Passive antibodies
- Botanical tinctures
- Homeopathic remedies
- Topical ointments
- Infusions

Stimulation of the Immune System

- **Vitamins** (immune support)
 - Vitamin A, D & E;
 - Vitamin B complex;
 - Vitamin C; Vitamin E and Selenium (MuSe™, MultiMin™)
- **Vaccines** (specific immune stimulation)
 - J-5™; Endovac-Bovi™; Lysigen™
 - Autogenous
- **Biologics** (general immune stimulation)
 - Immunoboost™



Enhancement of Neutrophil Function by Ultra-filtered Bovine Whey

(Roth, et. al., J. Dairy Sci. 84:824-829)

•Goal: Assess Impro product for influence on neutrophils from normal and dexamethasone treated cattle

•Calves' neutrophils *in vitro*:
Significantly ↑ random migration, cytochrome C reduction, iodination activity, antibody dependent and independent cell-mediated cytotoxicity

•Peri-parturient cows *in vivo*:
Did not alter the total or differential WBC

But **did** significantly ↑ erythrocyte count and significantly ↑neutrophil iodination activity (previously shown to be depressed in peri-parturient cows)



Intramammary Infusions – intended as antiseptic irrigation of the gland

- Hypertonic saline, 60-120 cc (strip in 1 hr.)
- Hydrogen peroxide 3%, 60-90 cc
- Boric acid 3%, 120-180cc (strip in 3-4 hrs.)
- Excell™ (not Excelen)
- PHYTO-MAST

Thymol, Glycyrrhiza, Gaultheria, Angelica, Vitamin E, Canola



Thymol

- Thymol is a powerful antiseptic (20 x stronger than phenol)
- Monoterpene
- Antifungal, Antibacterial
- Relatively non-toxic
- Can irritate mucosa, skin
- **Volatile oil:** Thymus vulgaris > Origanum vulgare > Syzygium aromaticum zones of growth inhibition for 25 common pathogens (including B. subtilis, Clostridium sporogenes, Enterococcus faecalis, E. coli, Klabsiella pneumoniae, Moraxella sp, Proteus vulgaris, Pseudomonas aeruginosa, Salmonella pollorum, Staph aureus, etc.)
Dorman and Deans, J. of Applied Microbiology 2000, 88, 308-316



Anti-inflammatory effects of intramammary infusions of glycyrrhizin in lactating cows with mastitis caused by coagulase-negative staphylococci

Kai, et. al. AJVR, Vol.64, No. 10, Oct. 2003

With low bacterial counts in milk, glycyrrhizin alone resulted in significant improvements in swelling, firmness of glands, and number of clots in milk, and decreased the SCC

The markers Lactoferrin decreased and α-lactalbumin increased as the gland recovered.

With recovery, a decrease in concentration of histamine was observed in a dose-dependent manner



Topical Ointments

- Uddermint™ (peppermint lotion or spray)
- Belladonna-Phytolacca ointment
- Calendula-Echinacea ointment
- BagBalm™ – Not allowed for organic due to oxyquinoline



Diamond

- Signalment: 4th lactation Holstein, fresh 3-4 weeks (on phone call said she was fresh 3 months)
- History: Was eating and milking well, 100+lbs/day; slowed down in last couple days
- Farmer's observations: not finishing her feed, prefers hay, dropped in milk production



Diamond's Physical exam

- **General:** Temp = 101.5; hydration OK
- **Respiratory:** normal respiratory rate and lung sounds but scent of glue on breath;
- **Circulatory:** heart OK; pink oral mucous membranes; ears warm
- **Digestive:** rumen slow, no pings, firm, horse-like manure;
- **Uro-genital:** uterus OK, kidney normal size
- **Udder:** CMT OK all 4 quarters; large sore in udder cleft
- **Subjective:** appears kind of sleepy or "spacey"

Visual Observations



Multi-Stix 10 SG



Immediate treatment plan for Diamond

- IV – dextrose and calcium (electrolytes)
- PO – alfalfa meal, electrolytes and glycerin in 5 gallons water
- Dispensed – gallon of glycerin
Rx: 8 oz. bid as needed
Phytonic / Herbal Liver Tincture (Goldenseal, Celandine, Red Root)

Mona

- Signalment: 2 lactation Holstein, fresh Nov. 2005; bred about 60 days
- History and farmer's observations: she was eating fine and milking OK until the morning; hasn't touched a thing to eat.
- Physical Exam: T = 104, heart rate increased, lungs OK, rumen slow, no pings, lump on right lower jaw somewhat firm
- Presumptive diagnosis: lumpy jaw (actinomycosis)



Immediate treatment plans for Mona's lumpy jaw

- **Infectious disease – antibiotics or not?**
- Sodium iodide IV; need to repeat in 4-6 days and again 4-6 days later
 - Also used hyper-immune plasma to counteract any gram negative effects.
 - Vitamin C
 - Herbal "antibiotic" tincture 90cc in 500cc dextrose (contains garlic, echinacea, baptisia, hydrastis, barberry)
- **Anti-pyretics?** Animal is pregnant
- **Rx:** 15cc herbal antibiotic tincture 3 times daily until finished (~3 days); topical peppermint essential oil lotion

Pre-treatment 4 days later 10 days later



Steve's Farm





Clinical work-up for a certified organic cow that is off-feed: Rachel

- **What's her signalment?** Holstein, 5th lactation, fresh 1½ months.
- **Quick symptom history from farmer:** Took a while for her to "get started" this lactation, but was doing well for last 2 weeks, now off-feed.
- **Q: What's the environment and ration?** A: Autumn grazing (in at night and when bad weather), has been damp recently. Haylage, hay and grain fed.
- **Results of physical examination?**
Temp= 104.0, heart rate increased, lungs raspy/rough, slow rumen motility, slow gut motility, uterus OK, ketotic, breath OK (not fetid), oral mucous membranes good color, manure somewhat firm.
- **Ddx:** pneumonia, ileus, ketosis +/- hypocalcemia
- **Approaches to consider:** immune stimulation, immune modulation, supportive treatments



Immediate treatment plans

- **IV** – Dextrose with 3 oz. herbal "antibiotic" tincture (garlic, goldenseal, berberis, echinacea, baptisia), 2 bottles Vit C and electrolytes (CMPK)
- **SQ** – Bovi-Sera (passive antibodies) every 12 hours x 3-4 doses (or hyper-immune plasma)
- **PO** follow-up – Herbal antibiotic powder: garlic, ginseng, berberis 2 capsules bid x 5 days
- Re-exam

Follow-up on Rachel


- Colleague checked her the next day – bloody diarrhea, looking somewhat depressed – possible Salmonella, or, moldy feed ingested (fever vs. no fever)
- Farmer called following day and said Rachel was getting better and beginning to eat; manure improving
- Rachel has remained well and productive since early November until present

Minnie




Natural treatment for hot coliform mastitis

- 100cc IV hyper-immune plasma (biologic) i.e. BoviSera™
- 1-2 L. IV hypertonic saline (electrolytes)
- 30cc IV Phyto-Biotic (garlic, ginseng, goldenseal, oregon grapeberry & barberry in dextrose)
- 250-500cc IV Vit. C
- Uddermint topically



Bunny

- 13 y.o. Holstein, fresh about 3 weeks
- T = 103;
- enlarged kidney; uterus OK
- Slow rumen; pong on right; no pings
- RH quarter, dilute looking milk, CMT +++ with some swelling but not hard
- heart and lungs OK;
- humped back, head down
- bright and alert
- eats some
- DDX?



Bunny Treatment

- IV – electrolytes, 500cc dextrose, 90 cc antibiotic tincture, 100cc hyperimmune plasma, 500cc vitamin C
- Follow-up SQ BoviSera, magnet, PhytoMast
- **PHYTOMAST:**
- Contains: Gaultheria, Glycyrrhiza, Thymol (10%) Radix *Angelica sinensis*, Radix *Angelica dahurica*, vitamin E, Oleum *Brassica campestris* q.s.
- Available in 15cc infusion tubes
- Dose: 1 tube q12h x 4 d.



Dora



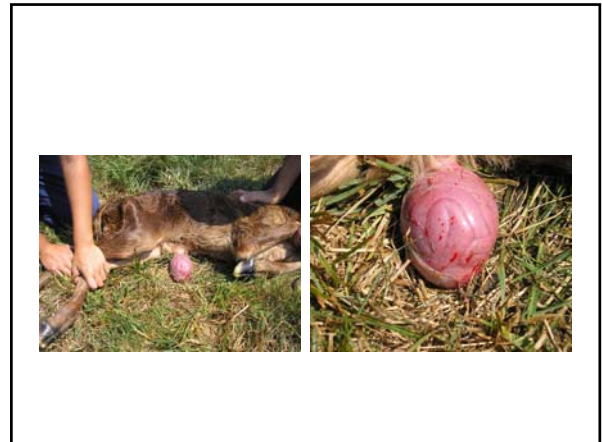
2 situations where antibiotics are needed sooner than later:

- Peritonitis (generalized)
- Bone infections

Joanne

New Years Special





**Message to AABP-L posted on Feb.20
in thread "Organic Treatments for Pneumonia"**
(re-printed by permission of author, a veterinarian in Vermont)

Here's what we are seeing in our neighborhood of practice: organic farms purchasing conventional therapy products, using them on their cows and not removing the cows from the herd. The majority of our organic herds are doing this. We as veterinarians are put in a terrible ethical dilemma. I would much prefer a more moderate approach like they apparently have in Great Britain. The current restrictive climate in the U.S. produces an inclination for producers to cheat or respond very late in using conventional therapy while their livestock suffer slow deaths. Any chance that the NOSB might bend?

Response from my colleague to my alarm

Hi Hue, I think the NOSB regulations are overly restricting and encourage fraud. In the case I spoke to you about, it was, indeed, the perfect storm of circumstances, many of which could have been prevented with some attention and good husbandry. But that isn't what we always see in the field.

Some Organic Farmers may...

Reflexively believe that everything natural is "better"
(and natural treatments won't have any bad side effects)

Be undiscerning and gullible

Passively resigned to everything being God's Will

and therefore.....

Allow pain and suffering (God's Will) to a degree
and duration from which most organic
consumers would cringe

E-mail from farmer on Monday night (March 5th) in response to me not wanting to get involved with a case over the internet

Dr. Karreman, I know you can't diagnose over the phone or internet. Maybe I need to milk a zillion cows so I can afford to move you up here. you asked: Any reason why I don't get a vet in to look at her? Well... the answer I'd expect to get from Dr. N. is (imagine a gruff voice) "Hm, she looks sick. Here's some antibiotics." That isn't terribly helpful. Maybe I need to try the other vet who with her husband was interested in information on going organic at the county dairy day last month. At least I think I can communicate more easily with her.



So, for that farmer and all like him/her.....

**THANK YOU FOR ATTENDING
THIS MEETING**



Penn Dutch Cow Care



- www.penndutchcowcare.org
- penndutch@earthlink.net
- 717-529-0155
- **Students and veterinarians are always welcome to ride along!**