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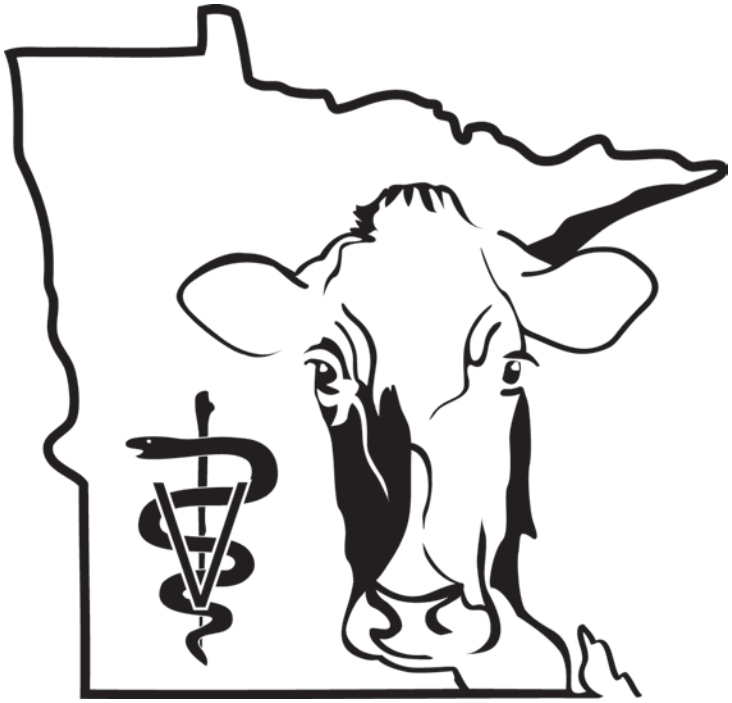

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# Organic Livestock Production: Veterinary Challenges and Opportunities

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## BACKGROUND

In 1990, the Organic Food Production Act (OFPA) was signed into law by President George HW Bush. The law was a culmination of years of diplomatic maneuvering while simultaneously launching a new era of keeping together a delicate infrastructure of very disparate groups within the organic sector. Prior to OFPA, the organic industry was a very localized, grassroots movement. There were many private certifiers of organic crops and produce that had standards created by the farmers who had originally started the certifying organizations. Soil, crops and produce were the focal points. Organic livestock production was in its nascent stages as OFPA was crafted and it is readily apparent when reading the actual law. With the passage of OFPA, the National Organic Standards Board (NOSB) was created as a mechanism to review materials to be considered for adoption by the industry as well as to advise the Secretary of Agriculture on any aspects of the Act. It should be stated here that all natural materials are allowed in organic agriculture, unless specifically prohibited, and that all synthetic materials are prohibited, unless specifically allowed via a petition process to the NOSB (which then votes on the material in question); but then the Secretary must give final approval to be added to the National List. It should be noted that the Secretary is not allowed to add or delete materials from the National List without specific proper review and voting by the NOSB. The NOSB generally holds two meetings a year and solicits public comment on any topic that is of concern to the organic industry. The Board is made up of 15 private citizens chosen by the Secretary, as per OFPA. These people represent organic industry stakeholder groups, they are: 4 farmer/producers, 3 environmentalists/ resource conservationists, 3 consumer/public affairs, 1 scientist, 2 handler/processors, 1 retailer and 1 certifier/inspector. At NOSB meetings, recommendations are formally voted on and then sent to the Secretary via the USDA National Organic Program (NOP). The USDA NOP is an agency within the Agriculture Marketing Service (AMS) and is the agency which enforces the regulatory aspects of OFPA. The specific regulations regarding organic agriculture can be found in the Code of Federal Regulations (CFR) at 7 CFR 205. The NOSB can suggest specific language changes and insertions into the Regulation on items other than materials to be added/deleted from the National List but it is up to the Secretary (via the NOP) whether or not the recommendations are officially adopted. The regulations which enabled the Act of 1990 became effective on October 21, 2002. Regulations (including materials to be added or deleted from the national List) are added and deleted within the public sphere and are always painstakingly analyzed by government lawyers within the Office of Management and Budget (OMB) prior to being written into the Federal Register (with yet further public comment period).

With the regulations now in effect, certification agencies are required to become an Accredited Certifying Agency (ACA) in order to legally certify operations that wish to display the USDA NOP seal on their products. There are about 100 such ACAs at this time,

some of them in foreign countries. It should be remembered that OFPA was promulgated as a marketing mechanism and that many countries desire to enter the US organic market place. Additionally, since administration of OFPA was put under USDA AMS responsibility, health claims cannot officially be made (as this would be under FDA authority). In fact, in a statement read by Secretary Glickman in 2001, it was pointed out that organic foods are no better and no worse than conventionally raised foods. Indeed, the certified organic seal merely states that the *system of production* is in compliance with the regulations. Therefore, a certified organic ear of corn itself may have very low levels of detectable genetically engineered genes due to cross pollination by conventional GM corn from nearby conventional fields. While inspectors and certifiers will try to ensure there is no drift from genetically engineered crops, it is a possibility, but hopefully remote. To reiterate, it is the farm *system* which gets certified and thus its products.

## CHALLENGES

In certified organic livestock production, all forages and grains fed must be certified organic. When animals are ill, natural treatments are categorically allowed (i.e. botanicals, acupuncture, homeopathy, etc.) but only synthetics that are on the approved National List (see Figure 2: 7CFR205.603) may be used without removing the animal from the herd. With such a short list of synthetic materials to choose from, there is a strong incentive to seek alternative treatments to the standard ones which most veterinarians are acquainted with and use regularly. This is what can make for serious challenges to the practitioner that wants to do what is best for the animal but may not be able to carry out due to federal regulations governing the certified organic livestock system. However, appropriate medical care *cannot* be denied an animal in the attempt to merely retain its certified organic status (see Figure 1: 7CFR205.238(c) (7)). When considering the overall interactive picture of the farmer, veterinarian, animal, consumer and regulator, a serious question emerges: *What* exactly is meant by an "appropriate medication" (205.238(c) (7)) and *who* will say *when* it will be instituted to restore an animal to health? Conversely, if appropriate medication is denied an animal in order to maintain the animal's certified organic status, who is to initiate decertification (as required by NOP) and when? Vet? Consumer? Regulator? These are the most vexing questions for practitioners that routinely work with certified livestock operations (as the author does) since each case is unique and each farmer so different than the next in terms of knowing how to treat animals appropriately with natural treatments and when to revert to a prohibited material like an antibiotic. There is essentially no incentive to treat organic animals with "whatever it takes, doc". If anything, there is a dis-incentive due to the requirement to sell the animal if it receives a prohibited treatment. The author has spent considerable amounts of time discussing this issue with many different parties in the organic industry. Agricultural professionals tend to lean towards the potential allowance of the rare use of a prohibited material like an antibiotic, if it is administered only by the veterinarian. However, some farmers are extremely vocal about not letting any antibiotic use whatsoever due to potential abuse by large operations as well as potentially tainting the industry in the eyes of the hyper-aware consumer (though often naïve of problems that can happen with livestock).

Fortunately, it is fairly safe to say that not all conditions needing a veterinarian require materials that are prohibited in certified organic livestock production. The most commonly used synthetic medications in veterinary therapeutics are probably antibiotics and hormones. While it could be technically argued that OFPA only prohibits sub-therapeutic use of antibiotics and hormones for growth promotion (and remains silent on therapeutic use), the NOP adopted an NOSB statement from a few years ago that all antibiotics are prohibited for use in certified organic livestock. This position was in part due to public pressure to completely ban antibiotics from the organic realm with the thought that allowing their use could lead to abuse (no matter how slight). While the topic of therapeutic use of a prohibited material (like an antibiotic) is still under potential revision (possibly allowable with veterinary administration of a prohibited material i.e. antibiotic or coccidiostat in the case of a diagnosed condition in young stock that are more than 12 months away from lactation), it is safe to say that the complete prohibition on antibiotics and most synthetics will remain in place for the foreseeable future if only due to the glacial speed with which changes are made at the federal level.

However, the author, in conjunction with the two largest processors (Horizon Organic and Organic Valley), petitioned the NOSB in 2001 to allow certain non-antibiotic synthetic compounds to relieve potential pain and suffering in certified organic livestock. These are well known to veterinarians and include: butorphanol, xylazine, tolazoline, flunixin, activated charcoal, atropine, bismuth subsalicylate, epinephrine, kaolin pectin, magnesium oxide, mineral oil and propylene glycol. Some of these have New Animal Drug Approvals (NADAs) from the FDA CVM and will likely become allowed for emergency use in certified organic production. However, some of them have *never* received a NADA and it is questionable if they will be allowed. Items such as propylene glycol and mineral oil, which are widely used in conventional agriculture, have been allowed by FDA CVM via "regulatory discretion" for decades, basically having been grandfathered. However, the USDA NOP cannot place the non-NADAs into the Federal Register as "allowed" since they have never gone through the official approval process set up by the FDA. It remains to be seen which of these 12 items will officially be allowed by the USDA. These twelve items have been affectionately termed by industry insiders as the "Troubled 12" since it has been nearly 5 years since we placed the original petition and the NOSB voted to allow them.

Again, all naturals are allowed unless specifically prohibited while all synthetics are prohibited unless specifically allowed by the NOSB and the Secretary. (The only natural material specifically prohibited for livestock is strychnine c.f. Figure 2: 205.604.) Fortunately, some certifiers have looked at activated charcoal as a natural material (only to be derived from vegetable sources). Thus, activated charcoal could be allowed when considered as a natural material. Additionally, magnesium oxide is starting to be allowed as a medical treatment by some certifiers since magnesium oxide is an American Association of Feed Control Officials (AAFCO) approved mineral for feed additives and all FDA approved minerals are allowed (FDA considers the AAFCO as official). Another item, calcium borogluconate, previously petitioned and voted to be allowed by the NOSB in 11/2000, is still not officially approved by the USDA for use in certified organic livestock. However, the author, when considering general chemistry, realized that any salt dropped into solution makes for an electrolyte – and electrolytes are categorically allowed by the USDA NOP for

use in certified organic livestock. Thus, anytime the author uses a calcium product to correct hypocalcemia, it is written on the bill as having administered electrolytes. This also is a mechanism in which to administer hypertonic saline, lactated ringers solution, etc. This is being truthful and honest; it is simply calling a medicine in a more generic manner. This brings up a key point – whenever a veterinarian administers a substance, it should be written down on the bill in the most generic manner possible. This is due to certifiers being on guard for products being used in organic production that they have not heard of before. In other words, if a trade name all of sudden draws the attention of an inspector and/or certifier, they will need to review the product to see if it is OK for organic production (and rightfully so). Therefore, whenever possible, a veterinarian ought to call something by its generic name or at least put the generic category in parenthesis next to the trade name of the product to help an inspector or certifier understand its use. (See Figure 2: 7CFR205.603)

## OPPORTUNITIES

There are no ways around the NOSB/ NOP's prohibition on the use of antibiotics and hormones. Therefore, what is the practitioner supposed to use when they are indicated? Certainly, there are older veterinary text books that can be studied which give scientific information on a huge amount of plant and mineral derived antiseptics and germicides that were formerly used. By studying books just prior to the synthetic and antibiotic revolution around World War II, it is possible to glean very useful information. Botanical medicine as used in veterinary medicine was at its zenith in the 1930's. Complete physiologic, therapeutic and toxicology information, along with specific doses for the major farm animal species (horses, cattle, sheep and swine), was published. In addition, biologics such as serum therapy were routinely and effectively used. Moreover, there currently exists a vast amount of cutting edge peer-reviewed literature in immune augmentation and phytotherapy. (See PubMed and use the search words phytotherapy, bovine, immunomodulation, etc.) Phytotherapy has been recently defined as the rational, evidence based usage of plant medicine using accepted testing procedures according to Western medicine. In the author's experience, the generally good level of health experienced by organic livestock (in part due to healthy amounts of exercise while grazing and relatively high fiber diets) allows natural therapies to work well *if instituted early* during the course of the disease. Of course it also depends on what the disease is. For instance, a classic case of hardware disease (traumatic reticulo-pericarditis) is best tended to with antibiotics and a magnet. Yet by using biologics and botanicals, it is very possible to cure an animal of clinical pneumonia – if caught early. The main idea is to (1) stimulate the non-specific immune system, (2) augment the immune system with specific, passive antibodies and (3) to use botanicals with known antimicrobial and immuno-modulating effects. Using this method along with proper hygiene (dry bedding, fresh air, and good feed) appears to work in the vast majority of cases of pneumonia. Mastitis is a very common condition and can be treated effectively by natural means (via biologic and botanical immuno-modulation) - if it is not *Staph aureus*. In general, use of antiseptics, such as iodine compounds and hydrogen peroxide, are integral to working with organic livestock. Additionally, the more ways that can be used to combat a problem, the better the outcome. This is the opposite of the "silver bullet" approach. The reason for this "multi-prong" approach is so that the infectious agent is attacked from a variety of fronts and in case one of the pillars of treatment is not effective, then the other ones are still there in place. And with

all the approaches working in unison (medical and environmental manipulation), there is hopefully a better outcome for the animal. Finally, it should be noted that treating livestock with natural treatments is usually more labor intensive and that the caretaker needs to be conscious of slight changes in his/her animals, initiating treatment promptly and without delay.

**FIGURE 1: USDA National Organic Program Regulations**

**§ 205.236 Origin of livestock.**

(a) Livestock products that are to be sold, labeled, or represented as organic must be from livestock under continuous organic management from the last third of gestation or hatching: Except, That, (1) Poultry. Poultry or edible poultry products must be from poultry that has been under continuous organic management beginning no later than the second day of life;
(2) Dairy animals. Milk or milk products must be from animals that have been under continuous organic management beginning no later than 1 year prior to the production of the milk or milk products that are to be sold, labeled, or represented as organic, Except, That, when an entire, distinct herd is converted to organic production, the producer may:
(i) For the first 9 months of the year, provide a minimum of 80-percent feed that is either organic or raised from land included in the organic system plan and managed in compliance with organic crop requirements; and
(ii) provide feed in compliance with § 205.237 for the final 3 months.
(iii) Once an entire, distinct herd has been converted to organic production, all dairy animals shall be under organic management from the last third of gestation.
(3) Breeder stock. Livestock used as breeder stock may be brought from a nonorganic operation onto an organic operation at any time: Provided, That, if such livestock are gestating and the offspring are to be raised as organic livestock, the breeder stock must be brought onto the facility no later than the last third of gestation.
(b) The following are prohibited:
(1) Livestock or edible livestock products that are removed from an organic operation and subsequently managed on a nonorganic operation may be not sold, labeled, or represented as organically produced.
(2) Breeder or dairy stock that has not been under continuous organic management since the last third of gestation may not be sold, labeled, or represented as organic slaughter stock.
(c) The producer of an organic livestock operation must maintain records sufficient to preserve the identity of all organically managed animals and edible and nonedible animal products produced on the operation.

**§ 205.237 Livestock feed.**

(a) The producer of an organic livestock operation must provide livestock with a total feed ration composed of agricultural products, including pasture and forage, that are organically produced and, if applicable, organically handled: Except, That, nonsynthetic substances and synthetic substances allowed under § 205.603 may be used as feed additives and supplements.
(b) The producer of an organic operation must not:
(1) Use animal drugs, including hormones, to promote growth;
(2) Provide feed supplements or additives in amounts above those needed for adequate nutrition and health maintenance for the species at its specific stage of life;

(3) Feed plastic pellets for roughage;
(4) Feed formulas containing urea or manure;
(5) Feed mammalian or poultry slaughter by-products to mammals or poultry; or
(6) Use feed, feed additives, and feed supplements in violation of the Federal Food, Drug, and Cosmetic Act.

**§ 205.238 Livestock health care practice standard.**
(a) The producer must establish and maintain preventive livestock health care practices, including:
(1) Selection of species and types of livestock with regard to suitability for site-specific conditions and resistance to prevalent diseases and parasites;
(2) Provision of a feed ration sufficient to meet nutritional requirements, including vitamins, minerals, protein and/or amino acids, fatty acids, energy sources, and fiber (ruminants);
(3) Establishment of appropriate housing, pasture conditions, and sanitation practices to minimize the occurrence and spread of diseases and parasites;
(4) Provision of conditions which allow for exercise, freedom of movement, and reduction of stress appropriate to the species;
(5) Performance of physical alterations as needed to promote the animal's welfare and in a manner that minimizes pain and stress; and
(6) Administration of vaccines and other veterinary biologics.
(b) When preventive practices and veterinary biologics are inadequate to prevent sickness, a producer may administer synthetic medications: Provided, That, such medications are allowed under § 205.603. Parasiticides allowed under § 205.603 may be used on
(1) Breeder stock, when used prior to the last third of gestation but not during lactation for progeny that are to be sold, labeled, or represented as organically produced; and
(2) Dairy stock, when used a minimum of 90 days prior to the production of milk or milk products that are to be sold, labeled, or represented as organic.
(c) The producer of an organic livestock operation must not:
(1) Sell, label, or represent as organic any animal or edible product derived from any animal treated with antibiotics, any substance that contains a synthetic substance not allowed under § 205.603, or any substance that contains a nonsynthetic substance prohibited in § 205.604.
(2) Administer any animal drug, other than vaccinations, in the absence of illness;
(3) Administer hormones for growth promotion;
(4) Administer synthetic parasiticides on a routine basis;
(5) Administer synthetic parasiticides to slaughter stock;
(6) Administer animal drugs in violation of the Federal Food, Drug, and Cosmetic Act; or
(7) 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.

**§ 205.239 Livestock living conditions.**
(a) The producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and natural behavior of animals, including:
(1) Access to the outdoors, shade, shelter, exercise areas, fresh air, and direct sunlight suitable to the species, its stage of production, the climate, and the environment;

(2) Access to pasture for ruminants;
(3) Appropriate clean, dry bedding. If the bedding is typically consumed by the animal species, it must comply with the feed requirements of § 205.237;
(4) Shelter designed to allow for:
(i) Natural maintenance, comfort behaviors, and opportunity to exercise;
(ii) Temperature level, ventilation, and air circulation suitable to the species; and
(iii) Reduction of potential for livestock injury;
(b) The producer of an organic livestock operation may provide temporary confinement for an animal because of:
(1) Inclement weather;
(2) The animal's stage of production;
(3) Conditions under which the health, safety, or well being of the animal could be jeopardized; or
(4) Risk to soil or water quality.
(c) The producer of an organic livestock operation must manage manure in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, heavy metals, or pathogenic organisms and optimizes recycling of nutrients.

**FIGURE 2: § 205.603 Synthetic substances allowed for use in organic livestock production.**

In accordance with restrictions specified in this section the following synthetic substances may be used in organic livestock production:
(a) As disinfectants, sanitizer, and medical treatments as applicable.
(1) Alcohols.
(i) Ethanol-disinfectant and sanitizer only, prohibited as a feed additive.
(ii) Isopropanol-disinfectant only.
(2) Aspirin-approved for health care use to reduce inflammation.
(3) Biologics-Vaccines.
(4) Chlorhexidine - Allowed for surgical procedures conducted by a veterinarian. Allowed for use as a teat dip when alternative germicidal agents and/or physical barriers have lost their effectiveness.
(5) Chlorine materials - disinfecting and sanitizing facilities and equipment. Residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act.
(i) Calcium hypochlorite.
(ii) Chlorine dioxide.
(iii) Sodium hypochlorite.
(6) Electrolytes-without antibiotics.
(7) Glucose.
(8) Glycerine - Allowed as a livestock teat dip, must be produced through the hydrolysis of fats or oils.
(9) Hydrogen peroxide.
(10) Iodine.
(11) Magnesium sulfate.
(12) Oxytocin - use in portparturition therapeutic applications.
(13) Paraciticides. Ivermectin - prohibited in slaughter stock, allowed in emergency

treatment for dairy and breeder stock when organic system plan-approved preventive management does not prevent infestation. Milk or milk products from a treated animal cannot be labeled as provided for in subpart D of this part for 90 days following treatment. In breeder stock, treatment cannot occur during the last third of gestation if the progeny will be sold as organic and must not be used during the lactation period for breeding stock.
(14) Phosphoric acid - allowed as an equipment cleaner, Provided, That, no direct contact with organically managed livestock or land occurs.
(b) As topical treatment, external parasiticide or local anesthetic as applicable.
(1) Copper sulfate.
(2) Iodine.
(3) Lidocaine - as a local anesthetic. Use requires a withdrawal period of 90 days after administering to livestock intended for slaughter and 7 days after administering to dairy animals.
(4) Lime, hydrated - as an external pest control, not permitted to cauterize physical alterations or deodorize animal wastes.
(5) Mineral oil - for topical use and as a lubricant.
(6) Procaine - as a local anesthetic, use requires a withdrawal period of 90 days after administering to livestock intended for slaughter and 7 days after administering to dairy animals.
(c) As feed supplements - Milk replacers without antibiotics, as emergency use only, no nonmilk products or products from BST treated animals.
(d) As feed additives.
(1) DL - Methionine, DL-Methionine - hydroxy analog, and DL-Methionine - hydroxy analog calcium - for use only in organic poultry production until October 21, 2005.
(2) Trace minerals, used for enrichment or fortification when FDA approved.
(3) Vitamins, used for enrichment or fortification when FDA approved.
(e) As synthetic inert ingredients as classified by the Environmental Protection Agency (EPA), for use with nonsynthetic substances or a synthetic substances listed in this section and used as an active pesticide ingredient in accordance with any limitations on the use of such substances.
(1) EPA List 4 - Inerts of Minimal Concern.
(f)-(z) [Reserved]
[65 FR 80657, Dec. 21, 2000, as amended at 68 FR 61992, Oct. 31, 2003]

**§ 205.604 Nonsynthetic substances prohibited for use in organic livestock production.**
The following nonsynthetic substances may not be used in organic livestock production:
(a) Strychnine.