Health Strategies for Organic Dairy Farms

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Abstract

The number of dairy farms which manage their livestock as certified organic is increasing. Common animal health conditions that farmers and practitioners see often have a bacterial, viral or parasitic basis. The USDA Certified Organic program specifies livestock feed, living conditions, health care, and pasture standards as well as providing a list of synthetic inputs allowed for use for health care. With restrictions on treatments allowed, it would help farmers, technicians, and practitioners to know how to approach problems on organic farms and also to know what is allowable to use when needing to treat cases. This presentation aims to provide veterinarians and technicians with an awareness of the general philosophy towards raising animals on organic dairy farms as well as utilization of alternative therapies which are understandable to medically trained professionals.

Résumé

Le nombre de fermes laitières biologiques est en augmentation. Les problèmes de santé du bétail couramment observés par les agriculteurs et les vétérinaires sont causés par des bactéries, des virus ou des parasites. Le programme de certification biologique de l'USDA édicte les normes concernant les aliments du bétail, les conditions d'élevage, les soins thérapeutiques et les méthodes de pâturages, et fournit une liste des produits synthétiques autorisés pour soigner les animaux malades. Étant donné les restrictions liées à la production biologique, il serait utile de renseigner les producteurs, les techniciens et les vétérinaires sur la façon d'aborder les problèmes dans les fermes biologiques et sur les produits et médicaments acceptés pour y soigner les animaux. Dans cette communication, nous voulons informer les vétérinaires et les techniciens de la philosophie générale d'élevage des fermes laitières biologiques et des thérapies alternatives - de façon compréhensible pour les professionnels de la santé - qu'on peut y utiliser.

Introduction

Ideally, livestock farms are biologically alive in all their production areas: the soil biology releasing minerals and aerobically digesting organic materials applied; the crops having rich nutrient content and providing effective fiber for rumen health; and the animals being fed the crops to produce milk for harvest and returning biologically active wastes to soil to complete the life cycle. A farm that strives to enhance the soil vitality and being as self-sufficient as possible will likely be more profitable. Also, planning and achieving biodiversity within the system provides a buffer against insect and disease attack. Pests and disease can thrive in conditions where one species is continually kept. Additionally, active management is needed to not only maintain and sustain the farm's ecosystem, but more importantly to balance the nutrients leaving the farm (as milk) with any bought inputs to maintain future fertility. However, even with the goal of achieving a healthy and balanced farm ecosystem, problems will occasionally arise with individual animals and/or groups of animals.

There seems to be dramatically fewer problems when farmers mimic a natural environment as closely as possible. For example, dairy calves raised on nurse cows (Johnes free) appear to be substantially larger and robust compared to age-matched animals raised traditionally. However with such a mind set it should be realized that complete control over every input is not the goal. This also applies to achieving maximal production – in organic systems maximizing production is not usually the norm. Rather, biologically optimizing the animal to match the level of natural resources occurring locally is the usual desired outcome. Of course prevention is a critical factor. The everyday environment of the animals is extremely important to this end. Dry bedding is probably the most critical factor along with fresh air, exposure to direct sunlight, well managed pastures, appropriate shelter, and rations based on high energy forages with solid stems (high pectin). In summary, the agro-ecology of the animals' surroundings are paramount: the soil's biology, physical structure and chemical analysis, a diet consisting of well managed pastures and stored forages harvested properly, water quality and quantity, ventilation, and housing.

Multi-prong Approach to Problem Solving

Just as certain factors make up a multi-prong approach to prevention, a multi-prong approach needs to be considered when having to come up with a solution to a problem. The multi-prong approach to problem solving is characteristic of biological agriculture. It incorporates various approaches and covers a broad area, it works within the system to stimulate it, thereby allowing the system to respond and become strengthened. This is in contrast to conventional problem solving whereby a very precise solution is often implemented and this solution

needs to be a direct hit or "bulls eye". Most solutions applied in that situation are external to the system and the system may become dependent upon them.

There are three main thoughts associated with a multi-prong approach to treating animals. The first is simply that a variety of approaches for any problem will give a better chance of success. Additionally, if one of the pillars of the approaches is not working, the other pillars are still in place. In this situation each individual part of a holistic approach doesn't need to be 100% effective on its own since it is the combined effort that makes for the solution. Finally, there is less chance of resistance developing if not relying constantly on a single "silver bullet".

For example, since organophosphate sprays and pesticide impregnated ear tags are prohibited in organic livestock operations, how can fly control be accomplished? If a farmer simply thinks using an allowable botanical based natural spray would work, there will be a rude awakening. Simple input substitution rarely achieves success on organic farms (it can at times, but not with flies). Instead, the farmer needs to realize the factors which encourage fly growth and take measures to minimize their habitat. In general, flies like moisture. Areas of moist bedding and manure build up must be addressed. This should be primarily accomplished by removing the damp bedding and pack materials. However, this is never fully accomplished. But by strategically placing parasitic wasps in damp corners, waterers, and congregating areas, fly pupae will be further reduced. This needs to be done periodically throughout the growing season and depending on winter conditions, these beneficial insects will survive. While these two measures get at the root cause and breeding grounds of flies, there will still always be flies around a livestock operation. To minimize the impact of flies on the livestock, tunnel ventilation works extremely well as flies cannot fly against the air currents generated. Also, rolls of sticky tape are often used as well as pheromones that attract the flies to traps. Bug-zapper lights can also be utilized in areas that the animals must walk through. There is a new fly vacuum apparatus from Australia that blows a rush of air on one side of the animals as they walk through the chamber (upon exit from the parlor) and on the other side is a strong vacuum that pulls the flies into large jars. In combination with the above approaches (but not alone), botanical fly repellants will work much more effectively. In this way, fly control clearly describes holistic problem solving in action.

Internal parasites are another example of how holistic thinking is put into action. While ivermectin is still currently allowed on dairy stock (but not beef stock), constant use of ivermectin every year on the same animal age group (usually recently weaned) will trigger an organic certifier to officially cite a producer for failing to correct underlying causes of the problem. Underlying causes of internal parasitism in young stock on organic farms include weaning at less than three months of age, animals sent "out back" and essentially forgotten, not enough feed and/or poor quality feed, poor pasture growth, infected pasture, and too many animals in a small area. These inciting causes need to be corrected before any natural means of internal parasite control will have true benefit.

Modes of Natural Treatment

Prior to the advent of commonly used antibiotics and hormones, veterinarians and farmers relied upon different classes of therapeutics. Many textbooks were written that detailed the pharmacology, toxicology, and therapeutics of substances derived from natural sources and available in commercially standardized forms. The bulwark of these therapeutics were either from a botanical, mineral or biologic basis. Their actions often were as febrifuges, antiseptics, disinfectants, analgesics, stomachics, cholegogues, counter-irritants, etc. Agents were administered topically, orally, subcutaneously, intramuscularly, and intravenously. While many treatments were empirical, others did have some measure of clinical trials associated with them, though not at all to the extent seen today. Often trials were done on small groups of animals, with pharmacologic effects recorded and doses established based on clinical observations. In organic dairy practice, biologics and botanicals are allowed for use and are used by many producers.

Biologics

Without doubt, the most commonly used biologics today are vaccines. In organic livestock, vaccines (along with preservatives) are allowed and encouraged, especially if not genetically engineered. While vaccines are the most common form of biologics available, there are many other biologics. Prior to the advent of sulfas and antibiotics, therapeutic biologics were relied upon when addressing serious bacterial disease or disease that produced toxins. All biologics are compounds derived from living organisms that usually modulate or augment the immune system. Therapeutic biologics, such as hyperimmune plasma from plasmapheresis and other immune sera from more simplified collection procedures, confer temporary passive immunity to recipients, thus giving critically needed time for the recipient's own immune system to fully overcome the challenge. Some of the diseases that were treated with therapeutic biologics include hemorrhagic septicemia (shipping fever), white calf scours, hog cholera, and equine influenza to name but a few. Human medicine used therapeutic biologics to treat diphtheria, measles, and other common infections. Biologics derived from animals and humans are considered mainstream, but currently used only sparingly and for very specific conditions, such as snake bite antitoxin,

digitalis antitoxin, and botulism antitoxin. Some biologics are sources of antibodies for common gram-negative infections. Other biologic preparations may be derived from colostrum, bacterial cell wall fractionates and, more recently, hyper-immune eggs.

Botanicals

Most of the pharmaceutical companies were established on the basis of producing pharmaceutical grade botanical medicines. The zenith of botanicals in veterinary medicine occurred into the 1930s, just prior to when active constituents of the actives were isolated and synthesized. By synthesizing the isolated compound, the pharmaceutical companies were freed from waiting on boat loads of plant material arriving from distant lands. Without doubt, plants have pharmacologic activity and the pharmaceutical industry is still involved with bio-prospecting for new life-saving medicines of botanical origin.

Botanicals can be administered by the same routes as other medicines. For instance, in China, botanical formulations are administered intravenously to humans. Earlier generations of veterinarians used botanicals via oral, SQ and IV routes. Many botanicals are considered as Generally Recognized As Safe (GRAS) by FDA. This means that those products are allowed for human consumption. The Dietary Supplement Health Education Act (DSHEA) allows for the sale of dietary supplements over the counter if no function or health claims are made. However, FDA CVM in its November 2000 *FDA Veterinarian* explicitly stated that CVM does not view the DSHEA as applicable to animals, citing as a basis no historical usage of plants in animals as well as toxicities of a few named plants. Whether or not a certain medicine has clinical efficacy is usually of less significance to a dairy practitioner than the safety of the product entering the food chain. Keeping in mind that many plants have GRAS status for human use and that many botanicals are allowed for human use via DSHEA, it is plausible that there are potentially safe and beneficial botanicals for bovines. From the commercial dairy perspective, labeling of botanical medicines, and all prescribed medicines, is within the purview of the local veterinary practice, since the practice has the valid client-patient relationship which confers certain rights and responsibilities. Aside from the short list of absolutely forbidden substances, such as chloramphenicol and clenbuterol, the practice of medicine is broad and in the private domain between the attending veterinarian, farmer, and patient. Correct labeling of any medicine is needed to be in compliance with item 15r of the PMO.

Treatment Principals and Protocol

Just as was discussed as a holistic approach to prevention and problem solving, a multi-prong approach is also needed when treating an individual animal in the organic setting. The author has developed what may be termed as the non-antibiotic treatment of infectious disease through countless clinical cases over the course of 15 years in practice. The non-antibiotic treatment of infectious disease includes these main components: biologics to modulate the immune system; botanicals with antibacterial activity; and antioxidants and fluids (as needed to correct any circulatory disturbances). For local and/or topical problems, antiseptics are utilized for lavage and irrigation. Examples of local or topical problems include lameness such as foot rot and hairy heel wart, as well as postpartum uterine infections.

The following protocol is used for any condition for an organic animal showing systemic signs involving the respiratory, digestive or mammary system, regardless of disease name. The treatment for infectious disease problems in an adult cow is:

- 250 mL hyper-immune plasma IV
- 5 mL Immunoboost® IV
- 90 mL herbal antibacterial combination tincture (garlic, ginseng, goldenseal, wild indigo, barberry) in 500 mL dextrose IV
- 250-500 mL vitamin C IV
- Follow up with the liquid or powder form of the herbal antibacterial combination, twice daily for four days orally.

It is obvious that treating infectious disease without antibiotics can be labor intensive. While many producers and veterinarians like to use flunixin to immediately reduce fevers, it should be remembered that fever is not necessarily detrimental and is a normal part of an animal's reactive and healing process. However, a fever in a pregnant animal should probably not go unchecked. Using the aforementioned protocol, even without flunixin, usually results in an animal feeling well enough to start eating, which is without doubt a main goal in the treatment of animals which are systemically ill.

Conclusion

The described protocol has been used clinically for a number of years for treating organic dairy animals. It works well when the producer has initiated therapy early in the disease, necessary management changes were made, effective follow-up after initial treatment was delivered to the animal, and crucially, prior to irreversible changes. Treating organic livestock is not rocket science, rather it is actually back to basics and utilizes forms of medicines routinely used prior to the synthetic era. If fundamental rules of biology are not broken and the immune system is allowed to function at its optimum level, there will be less need for antibiotics and more success using alternative therapies.