



# Organic and alternative animal health – Prevention

Continuing education series for veterinarians, veterinary technicians,  
extension, and other animal health professionals

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## Learning objectives

1. Describe proactive measures that can improve animal health on organic and alternative (O/A) operations regarding:
  - genetics
  - nutrition
  - cultural practices
  - vaccination
  - stress-sources, reduction, and management
  - exercise and environmental enrichment
  - vaccination
  - minimizing exposure to parasites
  - minimizing disease exposure
2. Describe the unique situation of **O/A** farmers/ranchers regarding reportable and foreign animal diseases
3. Describe the unique situation of O/A farmers/ranchers concerning cleaning and disinfection

## Introduction

“Intellectuals solve problems, geniuses prevent them”

Albert Einstein

Antibiotics are prohibited for use in USDA-certified organic livestock and poultry. Alternative farms and ranches encompass various types of operations, some of which use antibiotics and anti-parasiticsides and others that do not. Without antibiotics or conventional anti-parasiticsides, disease prevention is a top priority for organic and alternative (O/A) farmers. While concepts such as disease prevention, or biosecurity are important for any farm, they are imperative on O/A farms. The lack of ability to use various conventional treatments potentially increases the risk of disease spread if disease enters a herd through a sick animal or on a fomite, like the shoes of a visitor, and can have devastating consequences.

At the same time, O/A farms’ unique circumstances can decrease their herds’ infectious disease risks. The unique circumstances which may decrease infectious disease risk include the increased likelihood of O/A farms being smaller, keeping a closed herd, and having less human traffic of professionals with regular animal/farm contact, such as veterinarians, nutritionists, feed delivery, etc. (Pieper et al., 2014). In addition, farms that practice management-intensive grazing by allowing livestock to be outside, moving, exercising and directly on land increase

the immune system's ability to fight infectious diseases.

Regardless of the direction of the risk, due to the treatment option restrictions that come with farming in an organic or alternative way, greater emphasis must be placed on disease prevention (Sorge et al., 2016; Sorge et al., 2019). As a result, organic regulations heavily emphasize the importance of sanitation practices for disease prevention (Coffey & Baier, 2012).

In deciding what disease prevention actions to consider, livestock farmers and ranchers need to consider the risks inherent in managing their particular animals and make a plan for the risks they consider actionable. When the benefits outweigh the costs, this strategy makes sense to producers. Brainstorming and helping farmers and ranchers think through the likelihood of disease risk and its impact if the worst happens can be a valuable exercise. This is an important role veterinarians can play on O/A farms. Work with your client's goals to determine if the focus might best be targeted toward those diseases that are common OR potentially devastating, such as foreign animal diseases (FADs). Thoughtful management at key points in the movement of animals and people can greatly reduce losses. It can also prevent farmers from becoming a risk to others. These discussions, held at least annually, are important to help farmers keep their animals healthy in a changing world.

Disease prevention is a benefit of keeping an animal's immune system strong and is usually more cost-effective than treating disease. With this in mind, this chapter will emphasize practices that focus on animal health, including genetics, nutrition, and lowered stress. We will also discuss the use of vaccination and parasite prevention tools currently available for disease prevention on O/A farms and ranches (with some restrictions), the unique considerations of foreign animal disease (FADs), C&D, and emergency/disaster planning.

One of the best strategies farmers and ranchers can have is adaptability. Because each region, farm, and year are different, there aren't protocols, practices, or strict rules that apply in all situations. This gives farmers, ranchers, and vets a lot of strife as they hope to reach for a set of best practices they can find and follow. Basic principles can act as a guide, but what is needed is for both vets and farmers to stay in touch with changing situations and adapt their efforts to balance with what they are experiencing locally. Tools are available to help reduce the risks of disease introduction and spread on organic and alternative farms. Close watch over animals, their health, and productivity can help determine what tools might be needed.



*Iowa Farm, Source: N. Young*

As you may know, small farmers don't always appreciate being lumped in with large conventional farmers and the designation "producer" is not always appreciated. We also hear quite often that the word "biosecurity" does not resonate with small farmers and or O/A farmers and ranchers in general. That is the reason we talk about "disease prevention actions" or "activities" as opposed to biosecurity/biosafety principles. We also use the term farmer or rancher more often than "producer".

# 1. Focus on animal health

Not surprisingly, various interwoven elements, conditions, and practices support health and disease prevention. We present this information in that good management, husbandry, and stockmanship on all types of operations, including organic and alternative ones, is the foundation of disease prevention!

The questions presented after each section below can be used as conversation starters with your organic and alternative clients. These questions are gathered and included in this separate handout, [Animal Health Conversation Starters](#).

## Genetics

Supporting animal health through genetics includes the cultural practice of choosing livestock breeds specifically adapted to a region, climate, and forages. It also includes choosing animals that are genetically resistant to specific parasites. For example, researchers have found that breeding sheep with low fecal egg counts results in offspring with elevated natural immunity to parasites and reduced need for deworming. Ewes with lower fecal egg counts also have more IgGs passed to their lambs when nursing, and these sheep develop more antibodies in response to vaccination. Using genetics can strengthen animals' natural immunity and improve resistance to disease overall (Bowdridge et al., 2015). Practices related to genetics reflect good husbandry and improve animal health, welfare, and production. Selective culling should be considered when certain individual animals are not performing like the rest of the herd. Paying attention to the herd and only breeding from the best animals results in a better herd (Coffey & Baier, 2012).



Questions for vets, farmers, and ranchers to consider:

- What breeds do you currently have or want to have in the future?
- Is your herd closed (e.g., animals bred from within the herd) or open (e.g., replacement animals are from outside the herd)? If open, how are replacements chosen?
- How do you choose who to breed?
- Do you know what breeds are best suited to grazing (cattle), browsing (small ruminants), rooting (swine), and scratching and pecking (poultry) in your area?
- Have you considered the pros and cons of a change in your breeding plan?
- Do you practice selective culling for health traits?

## Nutrition

Good nutrition helps organic and alternatively raised livestock thrive. Good nutrition impacts fertility, milk or egg productivity, and body condition score (BCS). A healthy diet also contributes to the ability of the immune system to fight disease. Reminding O/A farmers and ranchers of the importance of good nutrition, including protein, is critical.

Nutrition can seem a complicated and overwhelming topic, but important for both animal health practitioners and farmers and ranchers who likely haven't had any formal training on the topic. Most small O/A farms/ranches raise

more than one species, complicating the picture. O/A farmers and ranchers identified knowledge of nutrition and local soil conditions as an important quality in their veterinarian (Steneroden, 2021). Ideally, small farms would have livestock nutritionists and soil scientists on their team. Until then, knowing their veterinarian recognizes the importance of nutrition and soil health, as it relates to organic and alternatively raised animals, meets an identified need.

As a place to start, knowing what nutrients are in the soil and forages and what supplements farms in the area use to make up for any deficiencies is valuable information for veterinarians to know and pass on to farmers. Soil quality can vary within communities, and livestock nutritionists often suggest analyzing pastures and soil. That way, you know what farmers and ranchers might need to do regarding their livestock's micronutrient supplementation (e.g., cobalt, zinc, iodine, manganese, iron, copper, and selenium). Knowledge of toxic plants in the area is also good information to share with farmers and ranchers. Some states may also regulate the addition of supplements to the soil for USDA-certified organic farmers and ranchers. A discussion with the organic certifier is important before taking any steps to meet identified deficiencies.

Livestock need easy access to clean water. Water is often the last thing that crosses the farmer/rancher's mind when thinking about nutrition, but it is a common problem. As an essential nutrient for life, animals must always have access to clean, fresh water. This may mean scrubbing tanks in the summer when algae forms or chipping ice off in the winter when it gets cold.

USDA-certified organic livestock have some overarching nutritional requirements. They must be fed a 100% organic diet and have a grazing requirement to fulfill this rule. Swine and poultry, who cannot get a complete diet simply by grazing/ranging, must be supplemented with organic grain or organic protein sources such as soybean meal, camelina, or rapeseed. Organic and alternative grazing/grass farming is a science and an art. The more you know and can learn about the big picture of nutrition, feed, micronutrients, forage, grazing, and soil – the greater resource you will be to O/A farmers and ranchers in your community.



*Grazing cows. Source: I. Nielsen*

Questions for vets, farmers, and ranchers to consider:

- Describe your knowledge about nutrition for the livestock you keep or treat.
- Are you aware of the predominant soil types, micronutrient needs, and forages in your area?
- Are soil and micronutrients needs for your farm/ranch an area you would like to improve on?
- Is fresh, clean water always available for your livestock?
- Are you aware of any toxic plants in your area?

## Stress – sources, reduction, and management

Providing a low-stress environment supports good health and welfare for livestock and poultry. Good husbandry and stockmanship can go a long way toward alleviating stress in animals. Stressful situations increase cortisol (which stimulates the mobilization of energy to overcome the stressors) (Fustini et al., 2017). Stress increases cortisol levels in most animals (including humans), and increased cortisol levels change energy production and metabolism and cause immune suppression. Stress can come from many different sources, including the environment, handling, movement, transport, overcrowding, and predation (Coffey & Baier, 2012).



Explore each of the sections below to learn about different sources of stress.

### **Environmental Stress**

Exposure to the elements, including weather extremes of heat, cold, relative humidity, ventilation, and lighting, is a source of stress and, in extreme cases, increases mortality. Animals have adaptive mechanisms to deal with environmental stress, but it can come at the cost of lowered production and performance. In addition, some breeds are better suited to regional conditions. For example, grass-fed South Polls are much better suited to heat than grass-fed Devons). Keeping livestock and poultry as healthy as possible through the other means presented in this section (genetics, nutrition, etc.) will help them face extremes in weather as best they can when it arises. Genetics can also be used to select for thermal tolerance of livestock. The CFR provides outdoor access requirements for USDA-certified organic livestock and poultry. Providing shelter, shade, or fans when needed, change in diet, and changing feeding time or frequency are used to help animals better adapt to heat and temperature change (Renadeau 2012). Farmers and ranchers are encouraged to look at production guidelines for each line/breed they raise.

- What temperature extremes are a potential problem in your area?
- What tools or practices do you use to help prevent temperature extremes impacts on your animals?

### **Early handling, temperament, and stress**

Stressful handling encountered early in life can have a lasting impact on livestock temperament. Coupled with genetics, it can impact breeding and production. The science of early animal handling and stress goes back many years (Grandin 1989, 2017, 2021), and the research continues to identify new stressors and potential practical methods of mitigation, control, and prevention to improve livestock welfare and production (Orihuela 2021). Ongoing research in children suggests a wide range of poor health outcomes may be associated with adverse childhood events (Oh, 2018, Petrucci, 2019). Much remains unknown, but it seems a hopeful avenue of research into environmental and temperament traits to improve livestock health. (Friedrich 2015)

Questions for vets, farmers, and ranchers to consider:

- What practices or guidelines do you have for handling livestock and young stock (e.g., times a day to chore, etc.?)
- What training do you provide for animal handling for individuals working with your livestock?
- If you keep dairy animals – have you considered the time/duration of the dam with offspring?

### **Movement and Transport Stress**

Stress is also very important when moving animals on, around, and off the farm. Moving animals can expose them not only to disease but to a great deal of stress if they aren't conditioned beforehand. We tend to think that livestock only want consistency, but a variety of experiences is also important. Varied routines lead to resilient animals. First experiences with new things are especially important. Livestock are naturally curious, and when they are taught at a young age to tolerate some variation in vehicles, people who handle them, noises, or objects they might encounter, they end up less afraid of new experiences. (Grandin 2017).

Varying on farm movements – from pasture to pasture, into chutes or corrals or pens, onto trailers that will travel over roads is good practice. Walking animals through new areas helps them experience the environment and gives them time to get comfortable. Calm handling is also very important. The best thing is to prepare them for novel experiences. Create a positive experience by using feed rewards. One research study found that offering tasty feed to sheep after they leave a handling chute made them more willing to enter the chute in the future (Hutson (2014). Keep the particular species in mind, as requirements may vary. For example, poultry may require

feed withholding before transport to processing. The movement of poultry from indoors and outdoors should also be consistent and happen at dawn and dusk to reduce the stress of a change in lighting.

Another important concept in animal movement is the flight zone. Flight zones are described as when a person stands behind an animal in a certain position and moves toward the animal which causes the animal to move forward in the opposite direction. You can think of flight zones as using figurative pressure to move animals forward and relieving figurative pressure when they are moving the way you want them to move. Applying pressure and removing pressure are equally important when using flight zones. Animal behavior is guided by past experiences but also by instinct. Handler awareness of flight zones is very important in keeping grazing animals calm when moving them. Knowing how to apply figurative pressure by approaching livestock to initiate movement, and just as importantly, when to decrease the pressure once they are moving forward, is the sign of a skilled handler using flight zones to their advantage.

Training livestock to tolerate different people, vehicles and herding or driving methods will make them less stressed when encountering new people, places, and things. Whoever is driving a vehicle needs to do it safely, without abrupt movements that might cause animals to lose their footing. Studies have shown that acclimating livestock to handling facilities and transport vehicles reduced stress and improved conception rates after artificial insemination (Cooke et al. 2009). Farmers and ranchers are protecting their investment when they condition their livestock by controlling what they see, hear, and experience beforehand. (Grandin 2017).

Questions for vets, farmers, and ranchers to consider:

- What types of early-age conditioning do you do with your livestock with different people, vehicles, and noise?
- Are first experiences with transport and other potentially stressful activities handled thoughtfully and calmly?
- Are potential transporters informed on calm, safe transportation practices?
- Have you tried feed rewards with livestock around potentially stressful movement or transport events? (e.g., using a small molasses tray/container to get animals to move onto a trailer – if they've had it before. Or use any treat they like and put it inside the trailer just out of reach, so they have to sniff their way onto the trailer.
- Are all handlers aware of and using flight zone principles to move livestock? Are they aware of when to apply pressure and when to back off?

## **Predation stress**

The best way to manage predation is through an integrated approach of good husbandry and effective control methods. Small livestock (sheep and goats) are usually more affected by predation than larger animals like cows. Poultry facilities need to be predator proofed as predation usually results in death, and many birds can be affected.

To minimize losses, good fencing, lamb sheds, or secure lots can be helpful to deter predators. Promptly remove dead livestock to avoid attracting coyotes and other scavengers. Put larger livestock in rough pastures with histories of predatory problems, and use noise, light, and other deterrents. Guard animals such as llamas, dogs, and donkeys can deter predators. Fencing to keep guard dogs in and coyotes out is more important than fencing to simply keep sheep/goats in. Prevention is the best plan, but if predation has already occurred, stopping it as soon as possible is very important. Coyotes and dogs (both domestic and feral) cause most predation losses. (Prevention and Control of Wildlife Damage 1994). Call 866-487-3297 to find your state wildlife service's assistance number.

Question for vets, farmers, and ranchers to consider:



If predation is a problem on your farm/ranch, what are you using to prevent or mitigate problems?

### **Overcrowding Stress**

Overcrowding may be less of a problem with organic and alternative farms due to the requirements of certified organic farms and the preference for alternative farms for increased grazing/ranging and outdoor access. Much of the research on overcrowding is with dairy cows, but many of the principles apply to other livestock and poultry. One of the biggest risks of overcrowding in confined livestock is lameness and disease outbreaks (Cowles, 2017).

A very important thing to remember with overcrowding stress is that when facilities are overcrowded, it is harder to maintain good sanitation and, as a result, animal health. More animals mean more manure, more urine, more flies, etc.

Stressful situations increase cortisol which stimulates the mobilization of energy to overcome the stressors (Fustini 2017). Overcrowding and competition can happen for feed, water, shelter, or shade. Overcrowding at feeding areas generally leads to competition and results in winners and losers. With overcrowded cows, for instance, some may decrease the time spent feeding, while others will eat faster, affecting absorption and digestibility (Durst, 2013.) Overcrowding can alter rumination patterns, increase aggressive behavior at the feed bunk and reduce total feeding time – all these things lead to a greater risk for subacute rumen acidosis.

Moreover, overcrowding can affect animal production. Monitoring rumen fill and belly profile can be a useful technique to identify if there are any issues. In addition, rumen fill and belly profile are more important on a daily basis than body condition scoring, which is a reflection of feeding over the last month.

When it's not the grazing season, organic livestock must have outdoor access to yards, feeding pads, and feed. The area should be large enough to prevent crowding and competition among the animals for the feed provided (Coffey and Baier 2012). If animals have horns, they will need more space in a pasture and on laneways coming and going from barns or other pastures.

Stocking density, the number of animals on a specific area for a specific period of time, is one of the most important management decisions a farmer/rancher can make, regardless of whether they are conventional or alternative. For example, the NOSB has recommended ten sq feet per 220 pounds of adult dairy cow for an indoor bedded space and eight sq ft per 220 pounds of cow for an outdoor pen. See [NOSB Stocking Density 2010](#) for more species-specific examples, including poultry, sheep and goats, bison, and rabbits.

Questions for vets, farmers, and ranchers to consider:

- What is your stocking density, and do you experience overcrowding?
- What strategies do you use to prevent overcrowding?

## Exercise

Exercise positively affects human health, so why not other species? Being outdoors, free to express normal behaviors, and exercising lead to better livestock health. The ability to exercise improves muscle tone, relieves stress and boosts the immune system. This can result in improved health outcomes and smoother deliveries for pregnant animals (Coffey & Baier, 2012) and may contribute to preventing health disorders after calving, such as ketosis and hepatic lipidosis, and improved fertility in dry cows (Goselink et al., 2011). Feedlot cattle put in an exercise pen (with low-stress handling) had better weight gain. In addition, daily exercise has been shown to help dairy cows reduce the effects of heat stress. (Melgares, 2016). Improved claw health has also been found with outdoor access (Loberg et al., 2004). Ideally, O/A livestock should have the choice to be inside or outside, depending on the weather.

## Environmental enrichment for livestock

Environmental enrichment for livestock benefits not only animal welfare but productivity by decreasing behavioral issues that might be associated with poor animal health. Tail biting in pigs, mainly seen in continuous confinement operations, is a classic example. Due to the differences in how organic and alternative livestock are raised (outdoor access, etc.), providing enrichment may be less of a concern than on conventional farms. On the other hand, welfare certification programs that organic and alternative farms may want to join usually have environmental enrichment components, such as straw bales and perches for chickens, scratching posts for cattle, or wallows for pigs.



Goats. Source: N. Young

There are several farm welfare certification programs, each with its own rules. A veterinarian would have to be certified for each specific program to assist farmers in becoming certified. This is something veterinarians are being asked to do by O/A farmers and ranchers more and more under the VCPR and is an area for growth for veterinarians.

Questions for vets, farmers, and ranchers to consider:

Are your livestock/poultry allowed outdoor access and daily exercise? Ideally, they should have the choice to be inside or outside, depending on the weather.

Do you provide any form of environmental enrichment for your livestock (e.g., straw bales and perches for chickens, scratching posts for cattle, or wallows for pigs)?

## Vaccination

Veterinarians should recognize that not all O/A farmers (nor conventional producers) are keen on the routine use of vaccines. This provides a great opportunity for discussion and clear communication between veterinarians, farmers, and ranchers to learn, understand, and be sensitive to each other's views (Coffey & Baier, 2012; Marbleseed Guide for Organic Livestock Production 7th Edition).

In general, organic and alternative farmers believe that access to the outdoors, reduced stress, good nutrition through healthy soil and high-quality forage (species-appropriate diets), good sanitation, and not overcrowding – all the prevention activities discussed above, promote natural immunity and decrease the risk of disease in their animals.

As a result, some use and some don't use vaccines. In general, O/A livestock farmers often prefer to limit vaccination to disease agents that present clear threats to their animal's health and provide a greater cost-benefit ratio. Examples include vaccines for respiratory viruses and Clostridial vaccines in cattle. They also may use vaccines for specific diseases they have had in their herds or know are in the area (e.g., leptospirosis). Some believe vaccines are good for disease prevention but choose not to rely on them, believing that vaccination doesn't make up for poor management and can hide genetic weaknesses in resistance/susceptibility that would otherwise show up). Some have never vaccinated, haven't had a problem, and see no reason to start now. In a recent study, some organic dairy farmers said they were open to vaccination in the future if they have a problem but don't worry about them now (Brock et al., 2021; Karreman, 2016).

The reasons for the use and non-use of vaccines are various and complex. They include fear of side effects,

effectiveness, and safety. Some reasons for not vaccinating included displeasure at the physical act of giving vaccines, especially a series of vaccine doses. But this study also found that some had not thought about it or got around to thinking about implementing vaccine protocols (Brock et al., 2021). This makes it important to communicate about vaccination with O/A farmers and ranchers and why they may not vaccinate.

**Traditional vaccines** – Many different traditional vaccines, MLV and killed, are available for livestock. They vary in effectiveness, timing, number of doses, and necessity in a particular geographical area. Vaccines can be a confusing topic for any farmer/rancher, traditional or alternative, and warrant a full discussion if the farmer is willing. New vaccines are continuously being developed, some of which may be created using methods or materials that make their use questionable under NOP rules. This remains an evolving area of concern that should be kept in mind by veterinarians and farmers, and ranchers as they consider which vaccines to use in their herds. Some vaccines also contain antibiotics. As always, the farm's organic certifier should be consulted on any new vaccine and will be aware of appropriate current allowances or restrictions. For more information: [NOSB Livestock Subcommittee Proposal Use of Excluded Methods Vaccines in Organic Livestock Production, 16 July 2019](#).

**Autogenous vaccines** – (those vaccines made from a particular herd and highly specific to the bug affecting the herd) These act as an alternative to commercial vaccines and were heavily relied upon in the days before antibiotics. They have been seen to work well in organic herds continually challenged by, for example, staphylococcus aureus mastitis ([Karreman, Vaccination, and Organic Cow Care](#)). Autogenous vaccines are a quick alternative to commercial vaccines for novel emerging diseases or those that mutate or have high antigenic variability. However, they are only safety tested, so there is no requirement for efficacy.

**Nosodes** – Nosodes are homeopathic remedies prepared from a disease product. e.g., infected tissue, disease discharges, and causal organisms. (Schoen & Wynn, 1997). Like autogenous vaccines, they are made from diseased animals in the herd (Schoen & Wynn, 1997). The use of nosodes for immunization is controversial. Nosodes work at an energetic level, and the body's response cannot be measured in the laboratory, as can conventional vaccines' cellular and humoral responses. While nosodes have not been proven unsafe to use, their effectiveness has not yet been proven. Their use by farmers and ranchers has shown mixed results. They have been used as preventatives but may best be used at the start of a disease outbreak. Herpes, mastitis, and ringworm are diseases that farmers/ranchers, and veterinarians have had success with when using nosodes. Pink eye nosodes have also been used successfully and can be placed in the water tank (Jodarski, 2008).

Vaccines are allowed and encouraged under the National Organic Program (NOP) guidelines. If a farmer/rancher is open to discussing conventional vaccine use – this is a pivotal prevention area, and veterinarians should be closely involved in designing a vaccine program tailored to the specific farm/ranch and its disease risk. Many certifiers request that veterinarians make vaccination recommendations for O/A farmers and ranchers in the local area.

Reminding farmers and ranchers about the spread of disease off their land might be a good idea. Vaccines can do more than protect the animal being vaccinated. The fewer animals shedding pathogens into the environment, the fewer animals or people will spread disease to other areas. A good example is BVD, a very common disease in cattle that is easily spread by infected animals or people moving between farms with cattle. Regular vaccination can be an important tool in a disease prevention program that considers neighbors and one's own farm. Vaccines also help protect livestock from some diseases they share with wildlife, including brucellosis and BVD.

Questions for vets, farmers, and ranchers to consider:

- What is your plan with regard to vaccines for the species you raise?
- Do you use any alternative form of immunization?
- What are your concerns about using vaccines in your livestock?
- Do you have any questions about the use of specific vaccines in your herd?
- Have you had any diagnosed diseases that could be prevented by vaccine use?

## Minimize exposure to parasites

It's impossible to completely eliminate parasites in livestock. Preventing and controlling them relies heavily on a strong immune system and low exposure. Parasites come in many shapes and forms. For the conventional producer, a one-step pour-on is often used to take care of parasites. Organic and alternative farmers/ranchers don't have that option. O/A farmers and ranchers must use and will be most successful using a combination of methods for parasite prevention and control (integrated pest management) mentioned below and throughout this chapter.

Parasites were considered an important problem for O/A farmers and ranchers in an ISU survey conducted in 2021 (Steneroden, 2021). It's no wonder, as external and internal parasites can cause blood loss, decreased appetite, poor weight gain, and losses due to irritation (for external parasites), diarrhea, decreased milk production, reduced reproductive performance, anemia, weakness, and in some cases, death.

The Code of Federal [Regulations Part 205\(G\)](#) provides guidance for USDA-certified organic operations. More detailed and specific information can be found in the Rules and Regulations and Modalities and treatments chapters.

Overall, parasiticides on USDA-certified farms/ranches are:

- Prohibited in slaughter stock
- Limited use for lactating animals (only certain parasiticides with milk withdrawal rules).
- Allowed in emergency treatment for dairy and breeder stock
- Allowed for fiber and fur-bearing animals if used 36 days before harvest of wool or fleece represented as organic.

### General considerations for parasite prevention:

- Parasite prevention, control, and monitoring are opportunities for veterinarians to assist O/A farmers and ranchers. Taking samples (or having producers bring samples to the veterinary clinic) and analyzing them at regular intervals would go a long way in helping farmers know if their parasite prevention and control plan is working.
- A healthy immune system is critical – good nutrition, exercise, and low stress (all key elements from the Focus on Health section of this chapter) also help prevent parasites.
- Use a multi-prong approach – multiple interventions affecting animals and the environment are necessary.
- Focus on pasture conditions, housing, and sanitation that help minimize diseases/parasites.
- In wet years, parasites can maintain themselves for very long periods. Also, in the South, mild winters don't allow for the die-off of common GI parasites of ruminants. Some parasites can persist over winter in fields. For these reasons and more, managed rotational grazing is the most important thing farmers can do to manage parasites.
- Have diverse pastures with a variety of plants and provide browse.
- Susceptibility to parasites varies between cows, sheep, and goats. Multispecies grazing can help break parasite cycles. Cattle do not share parasites with sheep or goats – but sheep and goats do share parasites.
- A very important consideration in pesticide use is avoiding environmental damage to natural controls such as dung beetles and manure recyclers. For an interesting research article that discusses dung beetles, fly control,



Turkey Poults. Source: N. Young



organic crop production, and improved food safety, see [Jones 2019](#).

### Some specific considerations:

- Keep new animal additions separate from the home herd for at least three weeks to identify and prevent all disease introduction, including parasites. This is often a difficult practice for all types of farmers and ranchers, and its benefits should be stressed and reiterated often.
- Graze younger, more vulnerable animals on a fresh pasture before allowing other, older animals.
- Animals, even if parasitized, can stay ahead of actual pathology if they are fed well, even if it might mean greater feed costs.
- Because larvae are concentrated near the ground, don't allow grazing lower than 4-6 inches.
- Before allowing animals back on a pasture to graze with a different livestock species, cut it for hay, or rest the pasture for 45-60 days to let parasites die off.
- High tannin forages have been shown to reduce fecal egg counts in sheep and goats ([ATTRA Tools for Managing internal parasites in sheep and goats, 2015](#)).
- Calves "sent out back" to the same place year after year are sitting ducks for parasitism – especially if "forgotten" because of more important animal classes to care for (milking herd and neonatal animals).

### Fly prevention

- A combination of tools for fly prevention works best.
- Organic sprays are often not very effective and can be expensive.
- Keep facilities clean and dry to reduce fly breeding grounds
- Physical traps, sticky tape, and fly traps can help
- Encourage natural predators such as barn swallows and purple martins and consider predatory wasps.
- Compost manure, mortalities, and afterbirths away from the barn area
- Mimic mother nature's windy days (flies are not a problem on windy days) by having strong (effective) ventilation in barns
- Mobile chicken coops following animal-grazed areas allow chickens to scratch and peck to eat maturing parasite larvae and decompose manure paddies. But wait three days before the placement of chickens so the dung beetles can accomplish their work first.
- More ideas can come from your extension service and the [Integrated Pest Management Guide for Organic Dairies 2016](#)



*Barn, Netherlands. Source: I. Nielsen*

Certified organic producers must always check with their organic certifier before adding new products and include the plan for use in their OSP.

Questions for vets, farmers, and ranchers to consider:

- Are you using organically allowed strategies to control or prevent flies, mosquitoes, and external parasites? (Examples include: pasture rotation, multispecies grazing, dragging pastures to disperse manure piles, manure

management, sanitation, ventilation, and moisture control, screening, fly parasites, and other beneficial insects, bat conservation, purple martins, and other insectivorous birds, walk-through fly traps, sticky traps, flying insect traps, electric bug zappers, biological pesticides, diatomaceous earthy, botanical pesticides)? Do you have any concerns or questions?

- Do you monitor for internal parasites by collecting and analyzing fecal samples regularly? If you do monitoring, how well is it going?



## 2. General disease prevention

### Minimize exposure to disease

Disease prevention practices are essential for maintaining and promoting animal health. Having areas to isolate or quarantine animals, maintaining a closed herd, good cleaning and disinfection protocols, good grazing management, and limiting visitor contact with animals (particularly if visitors are livestock professionals or have been around livestock recently) help prevent disease introduction and spread in the herd (Coffey & Baier, 2012). This is an area where veterinarians can be helpful as consultants for O/A farms.



[The Livestock Project](#) has assembled several self-assessment checklists, templates, and handouts to assist O/A farmers and ranchers in preparing for disease prevention. The tools are not substantially different from those developed for conventional farms but attempt to be sensitive to the needs and desires of alternative and organic livestock and poultry farmers and ranchers.

- [Animal Health Conversation Starters](#)
- [Disaster and Emergency Planning \(the basics\)](#)
- [Step 1 Movement risks](#)
- [Step 2 Disease Prevention self-assessment](#)
- [Step 3 Disease Prevention Plan Template](#) (.docx download)
- [Foreign Animal Disease Frequently Asked Questions for organic and alternative farms](#)
- [Foreign animal disease Infographic](#)

### 3. Current practices and 2021 survey results

#### Disease prevention as currently practiced by O/A farmers and ranchers

A national study was conducted by The Livestock Project in with O/A producers to determine what they knew and practiced regarding biosecurity and disease prevention on their farms (Steneroden, 2021). The survey was conducted in the summer of 2021. There were 158 responses, well distributed throughout the US. 32% were certified organic, and the remainder practiced some kind of alternative livestock keeping. The study did not show surprising results. Similar results would likely be found when surveying conventional livestock farms. For example, biosecurity is rarely at the top of anyone's list, some practices are embraced, and others are put on the back burner.

Some results from disease prevention-related questions are provided below.

**Table 1: Practices related to disease prevention on organic/alternative operations practice, from ISU Survey 2021**

#### Percent of Farms and Ranches that Perform Disease Prevention-Related Practices and Activities

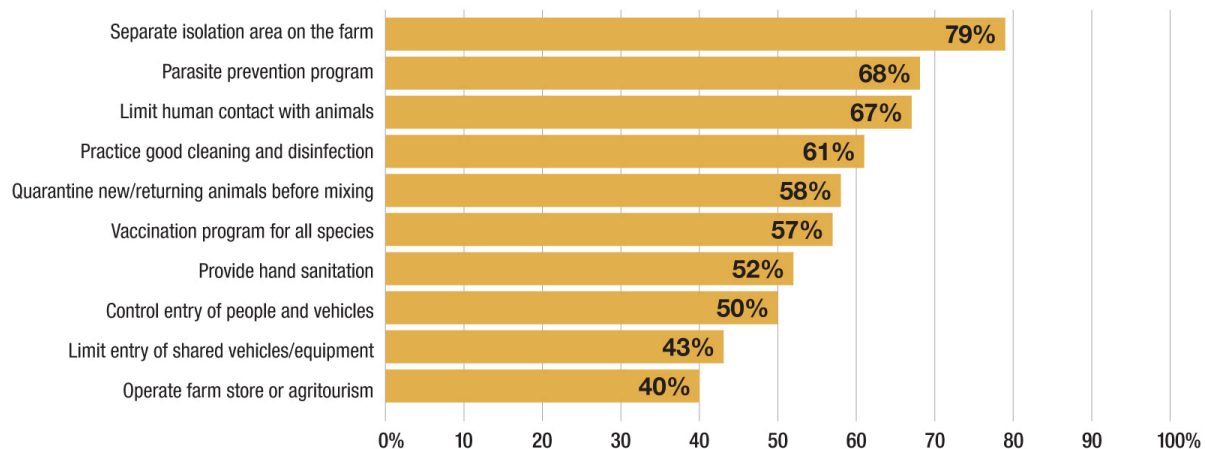


Table 1. provides results from the 2021 Iowa State University survey on ten basic disease prevention practices and their use on organic and alternative farms. Almost 80 percent surveyed have a separate isolation area on their farms; 68 percent have a parasite prevention program, and 67 percent limit animal contact. Sixty-one percent practice good cleaning and disinfection, and 58 percent separate new or returning animals before mixing them with the rest of the herd. Fifty-seven percent have a vaccination program for all species, 52 percent provide hand sanitation, and half of the respondents control people and vehicle entry into their operations. Forty-three percent limit shared vehicles and equipment entry, and 40 percent operate a farm store or conduct agritourism on their farms.

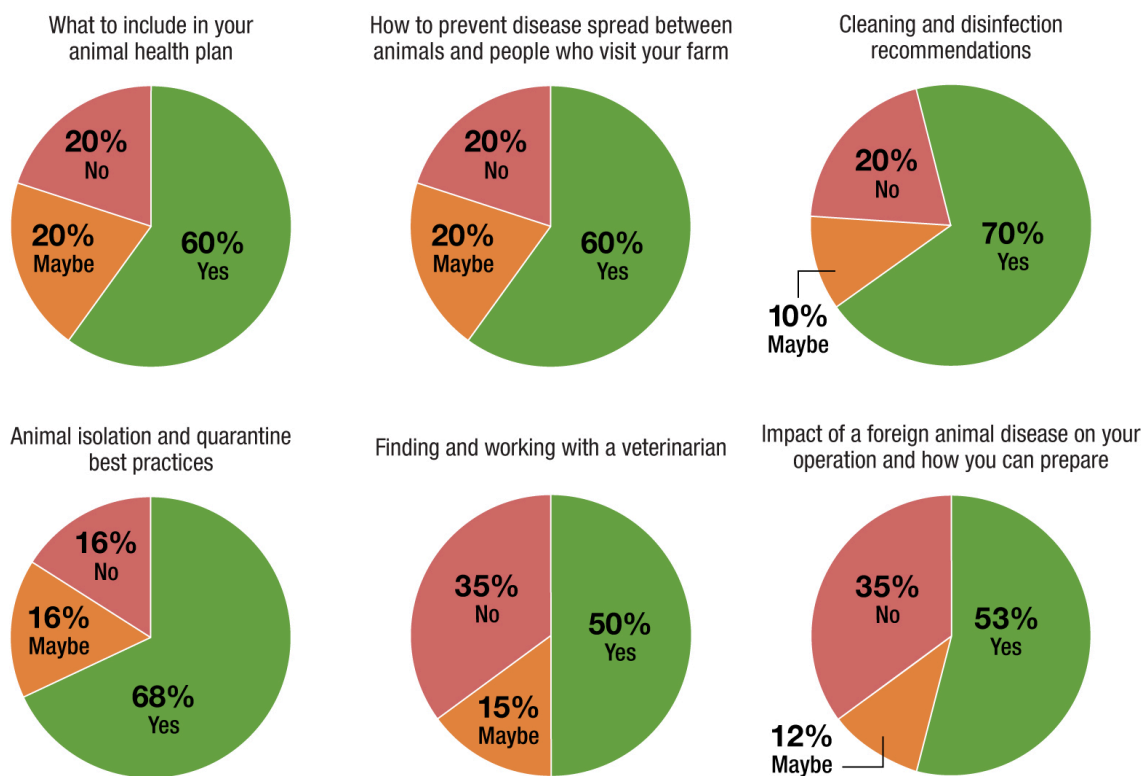
These results represent a small percentage of all the small O/A farms in the US, and as we know, conditions vary greatly between farms, regions, and types. These results are a starting point and a table to think about questions to ask when meeting with consulting with O/A operations. These questions and more are included in the Step 2 checklist.

Survey results also revealed that O/A farmers requested and could benefit from materials focused on their specific type of operation (i.e., organic or alternative vs. conventional). Some of these suggested materials have been developed by The Livestock Project to address biosecurity/disease prevention on O/A farms and are included with these materials (Step 1: Movement Risks, Step 2: Disease Prevention Checklist, Step 3: Disease Prevention Plan

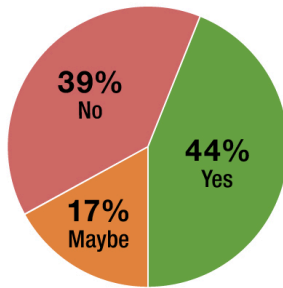
template). While not vastly different from what others have prepared for conventional small farms, these materials are sensitive to the differences between conventional and O/A farmers and ranchers' needs, goals, and philosophies and are targeted directly to some of the unique concerns of O/A farmers/ranchers. You will find links to them below.

These O/A-focused disease prevention tools/information include information on everyday biosecurity aimed at O/A farmers, disease outbreaks, reportable and foreign animal diseases (FAD), guiding organic and alternative farmers/ranchers during a FAD emergency, and the role of veterinarians on O/A farms as advisors on these disease prevention topics. The tools can be accessed on the [The Livestock Project resources page](#).

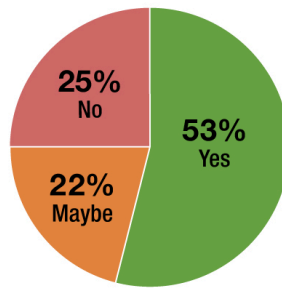
**Table 2: Results from the 2021 Survey of O/A farmers/ranchers on materials they would find useful or relevant to their operations. Response choices were Yes, No, or I don't know. The I don't know results are included here, indicating that producers may benefit from having greater knowledge of these materials.**



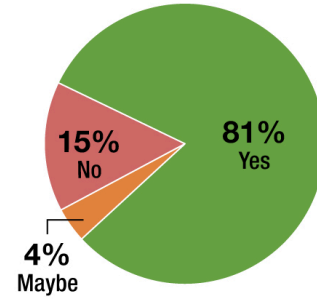
Parasite prevention and control in livestock



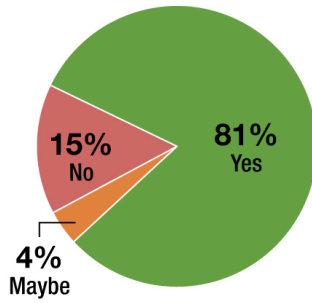
Pasture management for parasite control



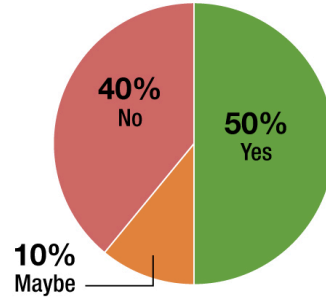
Basic husbandry practices



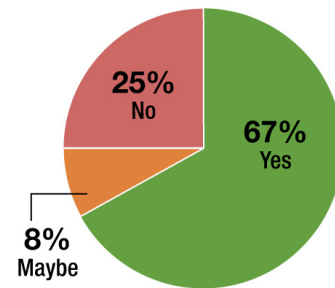
Livestock nutrition



Record keeping



Joint farmer/veterinarian meetings/trainings



## 4. Foreign Animal Disease (FADs) and organic/alternative livestock

As previously discussed, USDA-certified organic, and some alternative farmers and ranchers do not use antibiotics for their livestock or poultry. Therefore, when disease does strike, treatment options are limited. The better the basic husbandry being delivered continually and the stronger the disease prevention program, the safer the farm or ranch will be from disease entering. This is true for common, zoonotic, reportable, and foreign animal diseases (FADs).

Some reportable diseases have vaccines for certain species (e.g., rabies, anthrax, West Nile Virus, and Marek's disease). Some (but not all) FADs have vaccines that are only used during an outbreak. Some organic and alternative farmers and ranchers do not vaccinate their livestock. Unvaccinated animals are more vulnerable to disease and usually suffer more severe illnesses than vaccinated animals. For this reason, a strong disease prevention program is essential for all farms and ranches.

Stop animal movement orders, which will occur in a FAD outbreak, may impact the ability of organic and alternative livestock owners to move their animals to appropriate pastures or access feed appropriate to their farms.

During a foreign animal disease outbreak, livestock and poultry producers are responsible for preventing their animals from becoming infected and preventing infection from spreading to other farms if they become infected. Farmers can request permission not to have their animals vaccinated from the state or federal authorities in charge of the outbreak response. There isn't a simple answer to what happens if a farmer or rancher of any size doesn't want to vaccinate their livestock or poultry. It will depend upon the disease, the species affected, the outbreak's duration, and geographical scope. Any livestock producer who refuses to vaccinate their animal during a FAD outbreak could lose the ability to collect indemnity for euthanized animals. See below for a FAD FAQ and Infographic that can be displayed on the farm, so everyone knows what to do in the event of a FAD.



*Penned goats. Source: N. Young*

Stop animal movement orders, which will occur in a FAD outbreak, may impact the ability of organic and alternative livestock owners to move their animals to appropriate pastures or access feed appropriate to their farms. Awareness of some issues that could impact O/A farmers and ranchers may be important in planning efforts. FAD resources geared towards organic and alternative producers can be found below and in the resource section of [The Livestock Project](#) website.

[Foreign Animal Disease Frequently Asked Questions for organic and alternative farms](#)

[Foreign animal disease Infographic](#)

## 5. Disasters and emergency planning

Preparing for every disaster or emergency scenario is impossible, but assisting O/A clients with emergency planning is a good place to start. Thinking through the various scenarios before an event may help prevent farm, animal, and human impacts from hurricanes or blizzards, barn fires or wildfires, extreme heat, and roof collapse due to heavy snow, flood, drought, or tornado. Have your clients think about – What would we do if xxx occurred? Gathering resources, establishing roles of personnel, and having a plan prepared ahead of time, can help prevent losses. While every farm needs to do this on its own, knowing neighbors and planning with them and how they might help each other should be part of each farm plan.



General disaster and emergency planning information for all small farm types is included in the attached handout that can be downloaded and given to farmers: [Disaster and emergency planning for small farms and ranches](#).

### Specific weather/climate-related considerations

#### Feed considerations

Finding the right feed to fit a particular O/A program in case of a feed shortage, weather event, or other emergencies can be difficult for organic or alternative farmers. These farmers/ranchers may keep extra feed on hand when possible and keep a list of additional feed suppliers that carry organic feed (considering the current long-term drought conditions in the West, this may be easier said than done.)

#### Cold weather

What shelter might you use during a blizzard? Can you provide shelter with hay bales or other natural windbreaks, and can you get the animals close enough to feed and water to provide for them? If not, do you have access to heavy equipment to move feed and water (Hain, 2022)?

Providing enough high-quality feed is paramount. And doing a good feed inventory at the beginning of the cold season can help with decision-making about resources and animal numbers and planning before resources get thin or expensive (Hain, 2022).

Good ventilation is also important in winter. Poor air quality is a more likely cause of pneumonia than cold (Hain, 2022).

Winter can be especially challenging for organic farmers because farms and other facilities only rely on part of the year barns may be old or not be designed well. There might also be a tendency to overstock. Conventional wisdom says to not overstock more than 10-20% (based on the idea that not all cows will eat at the same time, and some will be resting, etc.), however, for O/A farms, there should be the principle of NOT overstocking to satisfy the herbivorous instinct to all eat at the same time.

For animals, conditions of cold and wet can be a bigger problem. Bedding and providing coats for new calves and additional heat sources to vulnerable species like chicks or piglets. Give animals time to acclimate to cold so they can grow thick coats (Hain, 2022).



## Extreme heat

If your region is susceptible to extreme heat, the three most important things to consider are shade, airflow, and water (to drink and/or soak).

Shade for organic and alternative livestock outdoors can be natural or manmade. Some farms use managed grazing in their woodlots and silvopasture areas during extreme heat. Mobile shelters can also be used and are becoming more available. Some farms use spray misters to mist over cattle instead of shade (this also keeps manure in the pasture rather than having animals in the woods and leaving manure where it doesn't benefit the pastureland). Strategic use of farms and housing during the hottest part of the day or outdoor access during the night can help but not so much for poultry. Care must be taken because it defeats the purpose if it becomes too crowded under the shade. Sometimes shade also impedes airflow, which is also not good. Take care with bedding; bare dirt is better because it absorbs heat. Silvopasture systems (integration of trees and forest in grazing areas) are growing in use and help provide natural shade.



*Pasture mister with mobile shade (built on an old hay elevator frame using shade cloth. Designed by Kevan Jahnke, Organic Valley Cooperative.*

Water consumption is most important in extreme heat situations. Cattle should be no more than 800 yards from water sources to drink when needed. Water or mud for wallowing for pigs and provide relief from the heat. Potential contamination of running waters such as rivers or streams is important. How could you scale up water supplies or access to tankers to bring in water fast during an extreme heat event? Irrigation pumps for river water can supply water in an emergency.

In an open environment, it's cooler, 8 feet off the ground. Having hills cows can stand on can help. Airflow/wind – sprinklers and fans can also provide cooling using evaporation. In hotter climates, breeding away from black cattle to more heat-tolerant types. Cattle with previous health events, such as respiratory diseases, can decrease the ability of cows to dissipate heat.

No matter the emergency or disaster, having an emergency plan helps prevent additional damage and stress. These plans can help you, emergency personnel, farm workers, and family react quickly in the face of an emergency. Planning for different emergencies will benefit your farm and livestock, so consider creating multiple plans that fit your region and farm. In addition to the emergency planning resources below, check out the [Disease Prevention Plan](#) created by The Livestock Project, which can benefit any livestock farm.

## 6. Everyday disease prevention tools

The Livestock Project has created a suite of tools to help organic and alternative livestock farmers, ranchers, and veterinarians who work with them. They are introduced below and can also be accessed on [The Livestock Project Website](#).



### Step 1 – Movement risks

Items moving on and off operations can bring disease. Recognizing movements can help farmers/ranchers prevent them. It's not only the risk itself but how often the movement type occurs that leads to acceptable or unacceptable risk. As with all disease prevention actions, taking them a step at a time, picking on or two to start. Movements can include animals and animal products. Including manure, milk, eggs, and compost. Deliveries – which may or may not stop other farms with animals or delivery like mail and packages. Personnel – these can be people with or without animal contact. Trash or equipment. The Movement risks document can help farmers and ranchers consider actions to prevent disease introduction or spread via these routes.

Download the [Movement risks assessment tool](#)

### Step 2 – Assessing disease prevention O/A farms

Checklists can help identify areas that could be troublesome concerning disease introduction. It can help point out what farmers are doing well and areas where they might be able to reduce risk. Categories include protecting the herd/flock by limiting those people and vehicles, and equipment that can enter, monitoring the herd/flock and good husbandry, having good C&D protocols, protecting people who enter, including those who might be coming for

agritourism, animal movement, carcass disposal manure management, etc. and wildlife rodent and other animal control and feed and water considerations. A disease prevention plan is another way to think about your operation and how it will adapt to its unique situation and prevent disease introduction and spread.

Download the [Disease prevention assessment checklist](#)

## Step 3 – Disease Prevention Plan

Disease prevention actions are needed daily to help ensure the health of your animals. Disease prevention actions also protect people from diseases that spread from animals to humans. Disease prevention plans don't have to be complex to work. Your plan should address how disease could enter or spread on your farm or ranch and describe actions to prevent it. This template is customizable by replacing the bracketed text (that looks like this [text]) with information specific to your property. Attach a labeled premises map to the end of this plan. Use this disease prevention template to write a disease prevention plan. Once written, manage disease prevention actions and train others about what is needed.

## Foreign Animal Disease Frequently asked questions and Infographic

To help all small farmers and ranchers increase their awareness of FADs and the potential impact on their farms and ranches, review the FAD FAQ. The [FAD Infographic](#) that can be posted and referred to in case of a question or if an outbreak occurs is also included.

- [Step 1 Movement risks](#)
- [Step 2 Disease Prevention self-assessment](#)
- [Step 3 Disease Prevention Plan Template](#) (.docx download)
- [Foreign Animal Disease Frequently Asked Questions for organic and alternative farms](#)
- [Foreign animal disease Infographic](#)



## 7. Cleaning and disinfection (C&D) for organic and alternative farms and ranches

Cleaning and disinfection are vital parts of disease prevention. Disease can threaten the productivity and profitability of small farms and the safety and trust of consumers and clients. On conventional farms, various synthetic compounds are available to kill microorganisms. Organic and alternative farmers are restricted in what can be used. This section will discuss C&D, what to clean, how to clean, and what products can be and are commonly used in organic and alternative production.

### The Basics

There is a difference between cleaning, sanitizing, and disinfecting surfaces!

- Cleaning removes visible debris (e.g., manure, feed, body fluids, dirt) from surfaces
- Sanitizing, the next level up, reduces bacterial contamination on objects and surfaces
- Disinfection inactivates or destroys most pathogenic germs on inanimate surfaces.



### What should be cleaned and disinfected?

The most important things to clean and disinfect are areas where animals are housed and the items they come in contact with – especially ill animals and isolation areas!

Pens, stalls, and handling equipment.

- Vehicles and trailers used for animal transport – clean and disinfect them between uses and before leaving or returning to the farm.
- Heavy machinery used in animal areas, such as tractors or skid steers, used in animal areas.
- Footwear – clean shoes/boots after leaving animal areas, especially where sick animals are kept (e.g., isolation areas). Have boot-cleaning areas near exit points to make this easier to do. Wash, scrub, and rinse boots to remove visible manure or mud before applying the disinfectant.
- Tools used for the C&D process, such as buckets, brushes, brooms, etc.

## How to clean and disinfect

Table 1: Cleaning steps

Step	Details
Dry clean	Manually remove all visible dirt, manure, or debris. Use shovels, manure forks, brooms, and brushes to remove as much as possible. This is a very important step. When present, these materials can make disinfectants ineffective.
Wash	Wash the item or area with soap or a detergent using warm water. Use warm water (110oF) if possible.
Rinse	Rinse the item or area with clean water to remove soap or detergent residue, which can inactivate some disinfectants.
Dry	Allow the item or area to dry completely, or sit for 5-10 minutes to allow water to drop off. Excess water can dilute your disinfectant, making it less effective.

Table 2: Disinfection steps

Step	Details
Prepare and Apply	<p>Always prepare disinfectants according to product label instructions. Products differ in the formulation. Some products are ready to use, and others require dilution. Different concentrations may be required depending on the targeted microorganism. Only use EPA-registered products.</p> <p>Spray, soak, mist, or wipe on disinfectant. It depends on the product and where it is being used. Pay attention to cracks and crevices.</p>
Contact time	Let the disinfectant sit and work (contact time). Items and areas must remain wet with the disinfectant for the entire contact time to kill the germs. (this step is often overlooked).
Rinse	Most disinfectants must be rinsed off as they may be toxic to animals. Others may be safe. Read the product label for instructions.
Dry	When possible, let the area or item dry before allowing animal contact.

## What can and can't be used for cleaning and disinfection on USDA-certified organic and alternative farms

[The National List of Allowed and Prohibited Substances](#), specifically section 205.603, governs what can and can't be used on certified organic livestock farms. As a general rule, it allows the use of non-synthetic ("natural") substances (e.g., acetic acid, borax) and prohibits the use of synthetic substances (those formed by chemical processes by humans) on USDA-certified organic farms. Regarding cleaning and disinfectant products, some exceptions to the general rule are listed in the table below. Always remember that *all products used on USDA-certified organic farms, including those used for cleaning and disinfection, must be approved by the organic certifier and listed in the producer's Organic Systems Plan (OSP)*.

### Natural substances/products

Non-synthetic, or what might be called "natural substances for cleaning and disinfection (e.g., \*vinegar, borax, etc.) are allowed. No natural products or substances are prohibited in the National List. Detergents used for cleaning do not have to be organic but must be listed in the organic system plan and approved by the organic certifier.

### Synthetic substances/products

Synthetic substances are prohibited unless specifically allowed.

**Table 3: Synthetic cleaning and disinfection substances allowed in organic livestock production. [CFR 205.603](#)\***

Substance	Usage
Alcohols	Ethanol as a disinfectant and sanitizer only. Isopropanol, as a disinfectant only.
Chlorhexidine	Medical procedures under veterinarian supervision. Also allowed for use as a teat dip when alternative germicidal agents and/or physical barriers have lost their effectiveness.
Chlorine materials**	
<ul style="list-style-type: none"> <li>Calcium hypochlorite</li> <li>Chlorine dioxide</li> <li>Hypochlorous acid***</li> <li>Sodium hypochlorite</li> </ul>	As a disinfectant or sanitizer as applicable.
Hydrogen peroxide	As a disinfectant, sanitizer, or medical treatment as applicable.
Elemental Sulphur	Treatment of livestock and livestock housing
Iodine	Disinfectant, sanitizer, or medical treatment as applicable.
Peroxyacetic/peracetic acid	Sanitizing facilities and processing equipment
Phosphoric acid	As an equipment cleaner, provided that no direct contact with organically managed livestock or land occurs)

\* Some states (e.g., California) may have stricter rules than what is contained in the CFR. The organic certifier will be the best resource for appropriate cleaning and disinfection products and guidelines.

\*\* Disinfecting and sanitizing facilities and equipment. (Residual chlorine levels in the water cannot exceed the maximum residual disinfectant limit under the Safe Drinking Water Act). (4 mg/L or four parts per million (ppm) 2023)

\*\*\* Generated from electrolyzed water.

## Using vinegar (acetic acid) for C&D on organic and alternative farms

Household vinegar (usually white vinegar) sold in the US is a 5% solution and is considered non-toxic and non-irritating. Acetic acid can be applied by spraying, misting, or immersing an item in a diluted solution. Acetic acid has poor activity in the presence of organic material (e.g., dirt, hay, hair, etc.) Acetic acid solutions can be used on food and non-food contact surfaces. Recommended contact time on clean, dry surfaces is 10 minutes for non-porous surfaces (metal, plastic, glass, and any painted or sealed material).

**A 1 to 1 solution ( 1 part vinegar to one part water) can be put into a spray bottle and used for general cleaning.**

Soapy water rinse, or a few drops of essential oils (lemon, peppermint) can help mask the strong smell of white vinegar. The solution must be mixed fresh daily and is corrosive. ***Do not mix vinegar with bleach, as toxic fumes can be generated.***

## Using bleach on organic and alternative farms

Liquid chlorine bleach is effective, inexpensive, and readily available. Bleach solutions are commonly used for disinfection on organic, alternative, and traditional farms.

Bleach is a diluted mix of water and sodium hypochlorite. In the US, the standard concentration of household bleach is 5.25-6.15% sodium hypochlorite. Ready-to-use spray bleach and wipes have a (much lower concentration of bleach). For general disinfection, liquid bleach will need to be diluted further before use.



**For general disinfection, a 1:50 dilution (0.1%) is created by adding 1/3 cup of bleach to 1 gallon of water.**

Bleach solutions should be made fresh each day that you use them. If they become contaminated with organic debris, change them more often. Bleach is rapidly inactivated by organic material (dirt, hay, feces, etc.), light, heat, some metals, and some cleaning applicators (e.g., paper towels, cotton, wool, bamboo). Use a microfiber cloth or synthetic mop, or sponge if possible. Fresh solutions should be prepared daily or when visibly soiled. ***Do not mix bleach with acids, including acetic acid (vinegar) or ammonia, as toxic fumes can be generated.*** Test strips are available to measure the chlorine in your diluted bleach solution. More concentrated bleach solutions of 8.25% exist in some countries. Always check the label before mixing using.

When mixing and applying bleach solutions:

- Wear eye protection and a mask or face shield if spraying the solution.
- Avoid skin exposure by wearing rubber gloves, long sleeves, and pants.
- Mix and use outdoors or in a room with good ventilation.
- Wash hands thoroughly with mild soap and water after use.
- Shower at the end of the day.

## 8. Key take-aways and resources

### Key takeaways

- Without antibiotics or conventional anti-parasiticides, raising healthy animals and keeping them healthy is the top priority for organic and alternative livestock farmers and ranchers.
- Organic and alternative farms currently practice disease prevention just as conventional farmers do.
- Organic and alternative farms may face unique challenges with regard for foreign animal disease outbreaks.
- Veterinarians and other animal health professionals can play a vital role in disease prevention and animal health on organic and alternative operations.

### Helpful resources

#### Courses

For in-depth information on prevention measures, rules and regulations, communication tips, and management tools used in organic and alternative production, continue reading the following chapters:

- Prevention and organic/alternative animal health
- Rules and regulations associated with organic and alternative livestock
- Communication considerations for working with organic and alternative livestock clients
- Treatments and practices for organic and alternative livestock

#### Handouts included with this chapter

- [Animal Health Conversation Starters](#)
- [Disaster and Emergency Planning \(the basics\)](#)
- [Step 1 Movement risks](#)
- [Step 2 Disease Prevention self-assessment](#)
- [Step 3 Disease Prevention Plan Template](#) (.docx download)
- [Foreign Animal Disease Frequently Asked Questions for organic and alternative farms](#)
- [Foreign animal disease Infographic](#)

#### Websites

- [Code of Federal Regulations: National Organic Program](#)
- [NOP Handbook for Certifying Agents and Operations](#)
- [Practical guide to working with organic farms](#)
- [Understanding and Implementing the NOP Pasture Rule](#)
- [USDA Guide for Organic Producers](#)

#### Livestock stress

- [Low-Stress Cattle Handling Presentation](#), Temple Grandin
- [Low-Stress Cattle Handling](#), 2018 Canadian Center for Health & Safety in Agriculture
- [Livestock Behavior, Design of Facilities & Humane Slaughter](#), Temple Grandin
- [Understanding Flight Zone and Point of Balance for Low-Stress Handling of Cattle, Sheep & Pigs](#), The Natural Farmer

## Cattle Movement and Flight Zones

- [Understanding Flight Zone and Point of Balance for Low Stress Handling of Cattle, Sheep, and Pigs](#)
- [Video Collection](#)
- [Temple Grandin – General Cattle Handling \(Lecture/Video\)](#)
- [Understanding the Flight Zone – National Dairy FARM Zone Video](#)
- [Flight Zone and Point of Balance](#)
- [How to Move a Cow Using Correct Body Language](#)

## Cleaning and disinfection resources:

- [National List of Allowed and Prohibited Substances](#)
- [USDA – Organic Regulations for C&D](#)
- [USDA-Organic: The Use of Chlorine Materials in Organic Production and Handling](#)
- [Cleaning and Disinfecting in Organic Poultry Production](#)
- [CFSPH Cleaning and Disinfection Resources](#)
- [HFHA – Cleaning and Disinfection Tips](#)
- [Biosecurity for Organic Livestock Producers](#)
- [NDSU- Chlorine Bleach Safety](#)
- [Clorox: How to Make Disinfecting Solution with Bleach](#)
- [Health: Why You Should Not Mix Bleach and Vinegar for Cleaning](#)
- [NSF: Reliable Scientific Tips for Cleaning with Vinegar](#)

Thank you!

Remember to return to the course home page to complete this chapter's quiz. After passing the 10-question multiple-choice quiz, you can collect your Certificate of Completion to earn 2.0 RACE-approved CE credit.



*Iowa farm. Source: N. Young*

# Acknowledgements

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# References

## Bibliography

Behar, H., Langworthy, L., Nelson, J. (2016). The Guidebook for Organic Certification (A. Alwell, Ed. 7th ed.). Midwest Organic & Sustainable Education Service.

Board, N. O. S. (2019). Formal Recommendation: Use of Excluded Method Vaccines in Organic Livestock Production.

Bowdridge, S. A., Zajac, A. M., & Notter, D. R. (2015). St. Croix sheep produce a rapid and greater cellular immune response contributing to reduced establishment of *Haemonchus contortus*. *Vet Parasitol*, 208(3-4), 204-210.

<https://doi.org/10.1016/j.vetpar.2015.01.019>

Brock, C. C., Pempek, J. A., Jackson-Smith, D., Weaver, K., da Costa, L., & Habing, G. G. (2021). Organic dairy producer experiences and decisions related to disease prevention and treatment. *J Dairy Sci*, 104(5), 5867-5880.

<https://doi.org/10.3168/jds.2020-19621>

Coffey, L., & Baier, A. H. (2012). Guidebook for Organic Producers (1st, Ed.). National Center for Appropriate Technology ATTRA Sustainable Agriculture.

Committee, N. O. S. B. L. (2010). Animal Welfare Discussion Document: Stocking Density. National Organics Standards Board Animal Welfare Discussion,

Cooke, R. F., Arthington, J. D., Araujo, D. B., & Lamb, G. C. (2009). Effects of acclimation to human interaction on performance, temperament, physiological responses, and pregnancy rates of Brahman-crossbred cows. *J Anim Sci*, 107(12), 4125-4132. <https://doi.org/10.2527/jas.2009-2021>

Cowles, K. (2017). 3 risks of heifer overcrowding and how to fix them.

Durst, P. (2013). Are your cows overstocked?

Friedrich, J., Brand, B., Schwerin, M. (2015). Genetics of cattle temperament and its impact on livestock production and breeding – a review. *Archives Animal Breeding*, 58(1), 13-21. <https://doi.org/https://doi.org/10.5194/aab-58-13-2015>

Fustini, M., Galeati, G., Gabai, G., Mammi, L.E., Bucci, D., Baratta, N., Accorsi, P.A., Formigoni, A. (2016). Overstocking dairy cows during the dry period affects dehydroepiandrosterone and cortisol secretion. *Journal of Dairy Science*, 99(1), 620-628. <https://doi.org/https://doi.org/10.3168/jds.2016-11293>

Goselink, R. M. A., Gosselink, J.M.J., van Houwelingen, K.M., Ouweltjes, W., Lenssinck, F.A.J. (2011). Report 447: Zwangerschapsgymnastiek voor melkvee.

Grandin, T. (1989). Behavior Principles of Livestock Handling. *The Professional Animal Scientist*, 5(2), 1-11. [https://doi.org/https://doi.org/10.15232/S1080-7446\(15\)32304-4](https://doi.org/https://doi.org/10.15232/S1080-7446(15)32304-4)

Grandin, T. (2017). Temple Grandin's Guide to Working with Farm Animals: Safe, Humane Livestock Handling Practices for Small Farm. Storey Publishing, LLC.

Grandin, T. (2020). Improving Animal Welfare (3rd ed.). CABI.

Grandin, T., Hutson, G. D. (2014). Livestock Handling and Transport (T. Grandin, Ed. 4th ed.). CABI International.

- Hain, M. (2022). Managing Animal Welfare in the Face of Climate Change. *Organic Broadcaster*, 30(4), 4-6.
- Hale, M. (2015). Managing Internal Parasites in Sheep and Goats.
- Hygnstrom, S. E., Timm, R. M., Larson, G.E. (1994). *The Handbook: Prevention and Control of Wildlife Damage*. University of Nebraska-Lincoln.
- Jodarski, G. (2008). Vaccination of Organic Livestock: Goals and strategies for a first rate vaccination program.
- Jones, M. S., Wright, S.A., Smith, O.M., Besser, T.E., Headrick, D.H., Reganold, J.P., Crowder, D.W., Synder, W.E. (2019). Organic farms conserve a dung beetle species capable of disrupting fly vectors of foodborne pathogens. *Biological Control*, 137, Article 104020. <https://doi.org/https://doi.org/10.1016/j.biocontrol.2019.104020>
- Karreman, H. J. (2016). *Four-Seasons Organic Cow Care: Natural Treatments for Year-Round Herd Health and Productivity*. Acres U.S.A.
- Loberg, J., Telezhenko, E., Bergsten, C., & Lidfors, L. (2004). Behavior and claw health in tied dairy cows with varying access to exercise in an outdoor paddock. *Applied Animal Behavior*, 89(1-2), 1-16. <https://doi.org/10.1016/j.applanim.2004.04.009>
- Melgares, P. (2016). Research from Kansas State University shows that daily exercise helps dairy cows reduce effects of heat stress. Kansas State University.
- Oh, D. L., Jerman, P., Silverio Marques, S., Koita, K., Purewal Boparai, S. K., Burke Harris, N., & Bucci, M. (2018). Systematic review of pediatric health outcomes associated with childhood adversity. *BMC Pediatr*, 18(1), 83. <https://doi.org/10.1186/s12887-018-1037-7>
- Orihuela, A. (2021). Review: Management of livestock behavior to improve welfare and production. *Animal*, 15 Suppl 1, 100290. <https://doi.org/10.1016/j.animal.2021.100290>
- Petrucelli, K., Davis, J., & Berman, T. (2019). Adverse childhood experiences and associated health outcomes: A systematic review and meta-analysis. *Child Abuse Negl*, 97, 104127. <https://doi.org/10.1016/j.chiabu.2019.104127>
- Pieper, L., Sorge, U., Godkin, A., DeVries, T., Lissemore, K., Kelton, D. (2014). Management Practices and Their Potential Influence on Johne's Disease Transmission on Canadian Organic Dairy Farms — A Conceptual Analysis. *Sustainability*, 6(11), 8237-8261. <https://doi.org/https://doi.org/10.3390/su6118237>
- Renaudeau, D., Collin, A., Yahav, S., de Babilio, V., Gourdiene, J. L., & Collier, R. J. (2012). Adaptation to hot climate and strategies to alleviate heat stress in livestock production. *Animal*, 6(5), 707-728. <https://doi.org/10.1017/S1751731111002448>
- Rutz, D. A., Waldron, K.J. (2016). *Integrated Pest Management Guide for Organic Dairies*. New York State IPM Program.
- Shoen, A. M., & Wynn, S. G. (1998). *Complementary and Alternative Veterinary Medicine Practices and Principles* (1st ed.). Mosby.
- Sorge, U. S., Moon, R., Wolff, L. J., Michels, L., Schroth, S., Kelton, D. F., & Heins, B. (2016). Management practices on organic and conventional dairy herds in Minnesota. *Journal of Dairy Science*, 99(4), 3183-3192. <https://doi.org/10.3168/jds.2015-10193>
- Sorge, U. S., Yamashita, S., & Pieper, L. (2019). Bovine veterinarians' perspective on organic livestock production in the USA. *Vet Rec*, 184(12), 384. <https://doi.org/10.1136/vr.104799>



# Glossary

## **C&D**

Cleaning and disinfection

## **CRP**

Conservation Reserve Program

## **FAQ**

frequently asked questions

## **FDA**

Food and Drug Administration

## **flight zone**

The area surrounding an animal that if encroached upon by a potential predator or threat, including humans, will cause alarm and escape behavior.

## **MLV**

modified-live virus

## **nosode**

A preparation of substances secreted in the course of a disease, used in the treatment of that disease.

## **O/A**

Organic and/or alternative

## **plain community**

Amish and conservative Mennonites

## **VCPR**

Veterinarian-Client-Patient Relationship