National Organic Standards Board
Livestock Committee
Proposed Recommendation
Species-Specific Guidance

October 14, 2011

Introduction

Animal welfare is a basic principle of organic production. As the number of farmers in the United States decline, consumer concerns for farm animal care have increased. There are numerous animal welfare organizations and methods to verify animal welfare. The Livestock Committee wishes to provide guidance that will assist producers and certifiers to improve and assess welfare on farm and assure consumers that animals are well cared for and that the organic community is leading with a focus on continuous improvement.

Background

The United States Congress anticipated the need to elaborate livestock standards in 1990 when the Organic Foods Production Act was passed. The Humane Society of the United States played a central role in advocating for the passage of OFPA. It was understood at that time that animal welfare standards would eventually be developed. Several animal health and welfare practices were described in the Preamble accompanying the NOP Final Rule. An organic livestock farmer must conform to the following list according to the Description of Regulations:

- select species and types of livestock with regard to suitability for site-specific conditions and resistance to prevalent diseases and parasites
- provide a feed ration including vitamins, minerals, protein, and/or amino acids, energy sources, and, for ruminants, fiber.
- establish appropriate housing, pasture conditions and sanitation practices to minimize the occurrence and spread of diseases and parasites.
- maintain animals under conditions which provide for exercise, freedom of movement, and reduction of stress appropriate to the species.
- conduct all physical alterations to promote the animals' welfare and in a manner that minimizes stress and pain.
- establish and maintain livestock living conditions which accommodate the health and natural behavior of the livestock.
- provide 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.
- provide shelter designed to allow for the natural maintenance, comfort level, and opportunity to exercise appropriate to the species

The NOSB was further tasked in the Preamble with creating species specific guidelines. These were to include specifics on temporary confinement, space requirements, and management guidance. The current Livestock Committee has worked with Temple Grandin, the Livestock Issues Working Group, and other individuals with specific areas of expertise toward completing this task. The Livestock Committee feels that outcome based standards best measure the health and well-being of livestock and will continue to work on those documents. The guidance documents are intended to help the program, certifiers and producers to understand and meet the regulations. These documents were written to enhance the regulations, clarify the expectation for animal welfare on organic farms and minimize the need for increased regulations.

Committee Recommendation
The Livestock Committee intends to develop species specific guidance for all species. To date, the Livestock Committee has worked with members of the organic community, certifiers, animal welfare specialists, and previous NOSB members to develop the following three species specific guidance pieces:

I. **Guidance for Assessing Animal Welfare on Organic Bison**

II. **Guidance for Assessing Animal Welfare on Organic Poultry Operations**

III. **Guidance for Assessing Animal Welfare on Organic Sheep Operations**

Committee Vote
Motion: Wendy Fulwider Second: Mac Stone
Yes: 4 No: 2 Absent: 1 Abstain: 0 Recuse: 0

Guidance for Assessing Animal Welfare on Organic Bison

Introduction

The North American Bison has undergone little modification through domestication or selective breeding. Consequently, it is still possible to compare the characteristics of today's bison to what was historically roaming the North American continent to identify the similarities to what is called typical for this animal.

Because bison remain largely undomesticated, the optimal nutritional requirements, and body conditioning will vary significantly on a seasonal basis. In addition, humane handling procedures are crucial to minimizing stress on the animals. We attempt to address those factors in this guidance document.

Bison Nutrition

General Guidance

Because bison are grazing ruminants with a four chambered stomach for feed digestion, it is easy to assume that the feed requirements for bison are similar to cattle. However, there are some significant differences in the species that require an understanding of the nutritional needs of bison.

A bison's rumen is very structured, ensuring that forage based feeds are retained for long periods of time. Bison retain feed in their digestive system longer than cattle. Longer feed retention means that bison have more time to digest the fiber in feeds such as sedges and grasses. However, when consuming alfalfa or alfalfa brome hay, there is virtually no difference in digestibility between bison and cattle because the fiber level in alfalfa based forages is typically lower than in grasses and sedges. Forages with lower fiber levels do not need to stay in the digestive tract as long to be fully digested as compared to forages with higher fiber levels.

Comparison of total tract retention time and dry matter digestibility of forages between bison and cattle

	Bison	Cattle
Total Tract Retention Time (h)	78.8	68.7
Dry Matter Digestibility (%)		
Sedge hay	64	58
Grass hay	74	62

Bison seem to naturally self-limit intake with less dry matter consumed per unit body weight than bovines. Bison also consume feed in several small meals throughout the day vs. fewer large meals observed in bovines. This habit maintains a more uniform ruminal environment and may contribute to more complete nutrient extraction by bison vs. bovines.

Protein needs to be treated entirely different in bison diets than bovines. Bison recycle nitrogen efficiently, an evolutionary response to very low protein diets from mature

grasses during several months of the year. This recycling may cause high blood urea nitrogen levels from modestly high protein levels in the diet. In some areas, many feeds contain protein levels higher than many bison producers consider optimum making it difficult to formulate diets. Eleven or 12% protein is considered the maximum from anecdotal experience.

Animals given too high protein and feed have produced rapid growth and resulted in horn, hoof and kidney problems that lead to other problems. The over-feeding of high-nutrient feed may lead to lethargic animals that have trouble moving about, and could lead to calving problems. A cow needs nine percent protein just to maintain her condition over winter and try to develop her calf. Less than that amount of protein or severe winter could result in pulling her down physically, and thus would take more time to bring her back into condition prior to breeding. The result is a late calf or no calf the following year.

Forage samples alone would indicate that the forage or feed is sufficient for the bison's need, but examining the water could show that a critical element like copper is tied up by iron and manganese and thus causes a deficiency. Molybdenum, sulfate, nitrate, calcium and sodium can also cause mineral deficiencies due to interference.
Many producers experiencing cold winter climates realize that they need to supplement with more of an energy supplement to insure that their animals have the energy to eat and be active.

Seasonal Considerations

Bison have a strong anabolic/catabolic cycle based on day length (anabolic means build up – catabolic means to tear down). All wildlife species in the northern hemispheres require this cycle for survival. It relies on the animal's ability to have a strong anabolic cycle in spring, summer, and early fall and survive nutritional deficiencies in the winter with the nutrients they stored during the anabolic cycle.

Summer grazing usually meets most bison nutrient requirements so long as carrying capacity is not exceeded and minerals are supplemented. If pasture quality and quantity is low, supplementation with hay or grains may be necessary.

It is not uncommon for bison older than 18 months of age to lose 10 to 15% of pre-winter body weight from December to April. Dry matter intake during the winter period tends to range from 1.4 to 1.8% of body weight depending on forage quality, fiber levels, metabolism and total tract retention time. In the spring to autumn, dry matter intake can be expected to range from 2.0 to 3.0% of body weight.

Nutrition and Bison Reproduction

Heifers/Cows

Bison typically mature at two years of age for both male and females. Some yearling females will breed at one year of age and give birth to a calf as they turn two years of age, but this is an exception. The nutrient intake during the pregnancy of first and second calf heifers is significantly higher than a mature cow, especially during the third

trimester. These young females must have sufficient nutrient intake to finish growing their own body in addition to finish growing a calf.

This nutrient demand will continue after the calf is born and taper off some as the calf forages on grass. Her ability to seek sufficient nutrition to grow and come into cycle during the normal breeding period is dependent on the quality of food available to her. The result is that calves are then born 45 days following the spring equinox. Normal practice is to breed females at age two with bulls that are two years or older. If a heifer does not attain sufficient size, it may be difficult for her to stand up under the weight of large mature bulls. A key concern for first and second calf heifers is to grow them to sufficient size prior to being bred to insure pregnancy each year of their lives.

A critical issue affecting pregnancy is the ability of a female to flush on highly nutrient forage or feed. Spring time usually brings forth lush vegetation that is high in nutrients. Having this available to females that have recovered from previous pregnancies will help insure a high calving percentage the following year.

Drought and high temperatures prior to and during the normal rut (breeding) period can have a negative effect on pregnancy rate. Often times, a fall green up will cause a flush in the cows that did not breed or take during the normal rut period, and the result is a late calf the next year.

Bulls

A bison male at 18 months of age will begin a lifetime cycle of winter weight loss followed by spring/summer weight gain. Mature bulls will also lose weight during the breeding season, followed by a final period in the fall to allow for weight gain.

Much like mature females, bison bulls can lose 10 to 15% of their pre-winter body weight from December to April due to a slower metabolism. During this winter period, dry matter intake will range from 1.4 to 1.8% of body weight. If grass hay diets are supplemented with grain, winter weight loss will be minimized, but compensatory gains in the spring and summer will not be as great.

During the breeding season, bulls can potentially lose 10 to 15% of body weight again. Therefore, it may be necessary to provide extra energy through supplementation to prevent too much loss of body condition. Excessive loss of body weight during breeding makes it more difficult for the bulls to regain a proper weight status prior to the start of the wintering period. It is important to ensure the bulls are of adequate body condition prior to the winter and breeding seasons. Much like the cows, thin or poorly conditioned bulls entering the winter will still lose weight and be more expensive to feed.

Body Condition and Scoring

As mentioned above, the idea body condition for bison is based upon the attributes that the animal carries in nature. Survivability and low management requirements are important characteristics.

Even though bison in commercial organic operations are selected for the meat marketplace, it is important that the commercial characteristics (size, yield, etc.) are not accomplished at the expense of sacrificing the unique genetic characteristics that allow bison to survive in a wide variety of conditions, and to calve easily. In other words, bison producers must avoid an attitude of “screw the hump, and build the rump.”

Bison characteristics are usually developed and identifiable by the time they mature at two years of age. The characteristics become more pronounced with age such as the horn growth and overall size. Calves start exhibiting typical bison characteristics late in their first year of life. The more angular and triangle shaped heads, greater horn bases and growth are found on the males, while the females have smaller horns both in diameter and length.

Female bison heads are longer and narrower than the male. Female horns are typically more curved and possess less circumference and more curvature, with the horn tips curved up and inward and often times pointing at each other.

Typical bison characteristics of the Plains bison, (*Bison, bison, bison*), include long hair under the chin forming a large rounded beard, long hair on the front legs forming leggings, and a raised pelage of usually longer and lighter colored hair located over the front shoulder. The pelage extends along the back to just behind the front shoulders. The raised hump is a distinguishing characteristic as well. Calves should exhibit the development of the hump as they approach one year of age.

Wood bison, normally associated with the Canadian provinces, (*Bison, bison athabascae*) tend to have less developed beard, leggings, and an incomplete pelage. The structure of the Wood bison is taller, more moose-like in form. The incomplete development of the beard, leggings and raised pelage, and the body higher off the ground is an advantage for Wood bison, who have to endure the deep snow and ice conditions found in Canada.

The head and neck projection of the Plains bison favored grazing of the plains in more mild climates. The Plains bison’s highest point is typically found by extending a line straight up the center of the leg to a point on the back. The highest point on a Wood bison is also the hump, but it is typically projected as much as one foot forward from a line extending up the middle of the front leg to a point on the back.

Bulls that have to compete within a herd for breeding rights need to have size, muscling and strength less they be overpowered by a bull having more strength. Bison strength is a result of a wide and deep body conformation. The lack of muscle development may be attributed in part to nutrition and exercise.

Female bison need to have sufficient “spring of rib” (width and depth to provide for room for an unborn calf to grow, develop and be born). Pelvic structure is important. Females possessing a narrow pelvis or a serious drop in the top line in the last foot before the tail could very easily develop calving problems due to restriction of the birthing canal. A high tail head can also produce a problem, due to narrowing of the birthing canal to compensate for the projected high tail head.

Bison are seldom caught in a squeeze to allow a “hands on” body condition scoring system so most of the criteria used to assess the animal are visual clues.
A body condition score (BCS) of 1 indicates that the animal is very thin. A BCS of 5 indicates that it is very fat. Alberta Agriculture has developed a comprehensive guide for body conditioning scoring for bison. The table below is excerpted from that guide. The entire guide is available at:
http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex9622/$FILE/bcs-bison.pdf. The guide can also be obtained through the National Bison Association at www.bisoncentral.com.

BODY CONDITION SCORING GUIDE FOR BISON

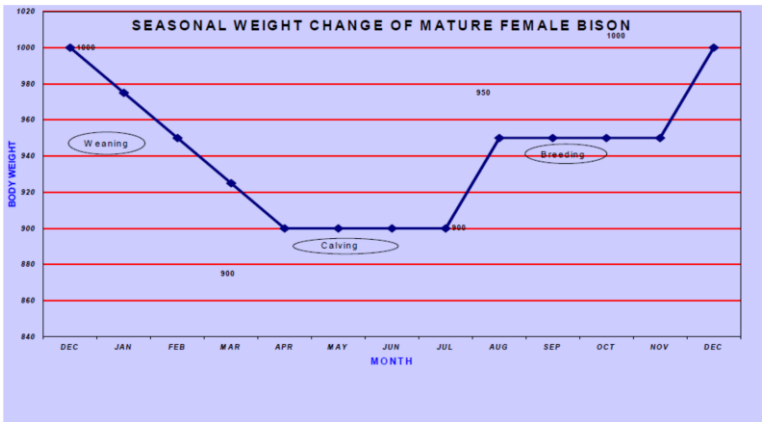
This table can be used to score bison in the field.

BCS	RIBS	SPINE (backbone)	HIP BONE	TAIL HEAD	HUMP
1 very thin	prominent in summer; many ribs visible; in winter, visible but less distinct	very sharp; angle of muscle is steep	prominent and edges are very sharp; rump muscles are caved in	devoid of fat; deep sunken depressions on either side of the tailhead; no fat palpable if bison is in a squeeze	sharp topline; narrow with flat sides when viewed from the front; sharp contrast between the hump and shoulder when viewed from the side
2 moderately thin	some ribs visible in summer and winter	evident but not sharp; angle of muscle is steep	readily seen and edges are sharp; rump muscles cave in slightly	sunken depressions on both sides of the tailhead; small amount of fat palpable if bison is in a squeeze	hump is narrow but not sharp; sides are flat when viewed from the front; distinct contrast between the hump and the shoulder
3 moderate	may be visible in summer but not sharp or distinct; edges round and covered in flesh; not visible in winter	not prominent but can be seen; angle of the muscle has a moderate slope similar to the roof of a tent	visible but not sharp; rump muscles are flat and angular	slight hollowing on either side of the tailhead; some fat palpable if bison is in a squeeze	well developed but not bulging; noticeable distinction between the hump and shoulder
4 moderately fat	may be visible in summer but not sharp or distinct; edges round and covered in flesh; not visible in winter	not readily seen; angle of the muscle has a gentle slope	barely visible; muscles are full but not bulging	slight depression in bulls and no depression in cows	full hump when viewed from the front but not round and bulging; little distinction between the hump and shoulder when viewed from the side.
5 very fat	not visible in winter or summer; covered in fat	not visible and is buried in fat; angle of muscle has little slope and is flat	covered in fat and is not seen; rump is rounded out and full	no depression (bulls) or bulging with fat (cows) on both sides of the tailhead	thick with rounded top when viewed from the front; blends into the should when viewed from the side

Source: Alberta Agriculture, "What's the Score; Bison"
http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex9622/$FILE/bcs-bison.pdf

Optimal body condition for bison varies with the seasonal weight fluctuations of the animals.

For example, the weight of mature females will vary up to 15% throughout the year. The animals' typically achieve top weight in the late fall as they graze to store fat to provide energy for both mother and unborn calf to overwinter. The females will lose up to 100 lbs. from December to April, when calving season typically begins.



The chart at right illustrates a typical weight change for mature female bison.

Most people aim to have their bison fat in the fall so that they do not require as much feed over the winter. Most experienced producers aim to have their bison lean in the spring because excess fat may lead to calving problems.

By the beginning of breeding season, the cows should be back to a moderate to good body condition to ensure optimal conceptions rates.

The best indication of overall bison health and condition throughout the season is the hair. Healthy animals have a good hair coat that is full of life that may give a producer an indication of proper nutrition.

TIME OF YEAR	IDEAL SCORE	RANGE
November	4	3-4+
April	2+	2-3
July	3+	3-3+

Bison Health

Bison are not cattle. Differences include the age to breeding (2.5 years), nutritional requirements over winter, nutrition for slaughter animals, social structure, and longevity. Bison have a relatively good resistance to many pathogens that affect cattle.

The two primary factors affecting the health of bison are environmental/nutritional considerations, and chronic stress. Paying attention to these two areas is critical

because typical livestock therapeutic drugs are not as effective in bison as in cattle. In fact, one saying in the bison business is: “A sick bison is a dead bison.”
Because bison still carry the prey/predator instinct, they will mask a sickness until seriously ill (why let the predators know your sick?). At that point, antibiotics and other therapeutic remedies will have only limited efficacy. In addition, the added stress induced to administer the treatment is so great that it often pushes the animal over the edge. This stress can be effectively eliminated by using one of the modern air-powered dart guns.

Poor environmental and feed conditions will weaken the animal’s natural immune system, and increase susceptibility for disease. A successful organic systems plan for bison must focus heavily on the ecosystem and developing systems that will provide optimal nourishment for the bison while sustaining the natural environment.

Chronic stress will have the same effect as more environmental and nutritional conditions. Bison can readily handle the acute stress that comes from a short-term perceived threat. That is the “fight or flight” response to a stimulus. They can fight or run from grizzlies or humans and when all threats are passed, go back to grazing and the adrenalin and steroid levels return to normal. However, they react poorly to extended or continuous (chronic) stress. That stress can be minimized through humane handling procedures (discussed later).

Pathogens
Bison have a strong resistance to many pathogens prevalent in other livestock. Much of this resistance is the result of the “bottleneck” that the species passed through roughly 110 years ago.

In the 1850’s, the bison population was estimated to be somewhere between 30 and 60 million animals. The domesticated livestock species introduced to the West allowed the pathogens these species carried to adapt to these new and different species. BVD, IBR, PI3, BRSV, TB, Johne’s, mycoplasma, leptosirosis, clostridia, Staph, Strep, internal and external parasites and probably pasteurella found a plethora of new ways to reproduce and spread their DNA (genes) to the demise of these native ungulates.

In the late 1800’s, bison were driven to the brink of extinction because of market hunting, war tactics against the Native Americans, and because of the introduced pathogens. Fewer than 1,000 bison survived this onslaught. The surviving animals were those bison that had a genetic resistance to these new pathogens. Testing of wild ungulate species has been undertaken for the past several decades across the western states. All wild populations show exposure to these introduced pathogens without large detrimental effects - yet these same pathogens remain of utmost importance to the livestock industry.

Today, the primary diseases affecting bison are bovine TB, brucellosis, Bovine Virus Diarrhea (BVD) and Malignant Catarrhal Fever (MCF).

Bovine Tuberculosis (TB)

Bovine Tuberculosis (TB) is a slow, progressive bacterial disease that is difficult to diagnose in the early stages. As the disease progresses, animals may exhibit emaciation, lethargy, weakness, anorexia, low-grade fever, and pneumonia with a chronic, moist cough. It usually is transmitted through contact with respiratory secretions from an infected animal. TB is a zoonotic disease meaning it can be transferred to other species, including man.

Free-ranging and privately owned bison in the U.S. have been free of TB for several decades. TB testing in bison has proven to be effective in diagnosing infected animals. If you are buying animals to start or augment your herd, have the bison over 12 months old tested. Many states are TB free and testing is not required, but as a precautionary measure require TB testing before purchasing.

Brucellosis

Brucellosis is a disease that has strong regulatory and economic guidelines for all states. A majority of states have been brucellosis free in livestock for many years.

The notable exceptions are the states that border Yellowstone National Park. State and federal regulatory agencies consider the Greater Yellowstone Area (GYA) an area of interaction with these wildlife species the last nidus of infection in the U.S. Brucellosis was introduced into bison and elk in the early 20th century. Once the organism was in these wildlife populations it became problematic to control. To this day 20 to 40 percent of the bison and elk in the GYA have been proven to harbor titers from exposure or infection.

Abortion is the most obvious indication of the disease in a herd. Brucellosis is a disease not spread from cow to cow, but from a birthing or abortive event where the abortive event including the aborted, stillborn, newborn calf and afterbirth are exposed to other animals. There are several tests to determine if bison are infected or exposed. These tests are, for the most part, accurate. There are cross-reactions with other organisms that can create suspects in your bison. Regulators are working on being able to identify these other organisms and incorporate them in the battery of tests for brucellosis "suspect" bison.

Calfhood vaccination for brucellosis (Bang's vaccinations) is not mandatory in many states. The vaccine (RB51) is safe for use in bison. It is not as protective against abortion or infection as in cattle, but does offer limited protection. Brucellosis is also a zoonotic disease and can be transmitted to other species including man.

Bovine Virus Diarrhea (BVD)

Anywhere in the world there are cattle, there is Bovine Virus Diarrhea (BVD). This worldwide distribution makes this disease important to cattle producers. BVD is a complicated disease to discuss as it can result in a wide variety of disease problems from very mild to very severe. BVD can be one of the most devastating diseases cattle encounter and one of the hardest to get rid of when it attacks a herd. The viruses that

cause BVD have been grouped into two genotypes, Type I and Type II. The disease syndrome caused by the two genotypes is basically the same. However, disease caused by Type II infection is often more severe in cattle. The various disease syndromes noted in cattle infected with BVD virus are mainly attributed to the age of the animal when it became infected and to certain characteristics of the virus involved.

As mentioned earlier, bison appear to be resistant to clinical manifestations from exposure. BVD has been incriminated in losses of bison placed in feedlots in conjunction with cattle. Vaccinations for BVD Type I and Type II are effective in preventing the disease in bison. I have never seen the disease in free-ranging or any captive herd.

Malignant Catarrhal Fever (MCF)

Malignant Catarrhal Fever (MCF) is a generally fatal disease of cattle, bison, true buffalo species, and deer. It is caused by viruses belonging to the Herpesvirus family. MCF occurs worldwide and is a serious problem, particularly for bison in the United States and Canada.

MCF in bison is caused by a virus called ovine herpesvirus-2 (OvHV-2). Most infections are characterized by depression, separation from the rest of the herd, loss of appetite, and in many bloody diarrhea. Unlike MCF in cattle, discharge from the eyes and nasal passages of affected bison is minimal. Animals develop a fever and may pass bloody urine. The clinical course is generally 1-7 days. Most animals die within three days of developing clinical signs. There is no effective treatment for MCF in bison. Bison older than six months, particularly if stressed by bad weather, transportation and handling are the most susceptible to infection. Large outbreaks occur in feedlots, where stress due to crowding is likely.

Studies of field outbreaks strongly suggest that sheep infected with OvHV-2 are the principal source of MCF outbreaks in bison. A strong association between outbreaks in bison and recent exposure to sheep has been documented repeatedly since 1929. In some outbreaks, however, no sheep were in the vicinity immediately prior to the first case being identified. There is no evidence that transmission occurs horizontally from one bison to another. Currently there is a study supported in part by the National Bison Association to establish whether bison-to-bison transmission is a factor in natural outbreaks.

Internal parasites

It is necessary for special attention to be given to managing internal parasites on organic bison operations. Each parasite's life cycle is different and many cycles can be interrupted by changes in management. Sometimes small changes in the way the producer pastures or feed bison may slow or stop the future spread of the parasite based on the available facilities.

If breed selection, pasture management, supplements and allowed treatments are not successful in keeping sheep parasite loads from impacting well-being, individual animals need to be given conventional treatments.

External Parasites
Ticks and lice have been identified on bison and could potentially be detrimental. Bison have a thicker hair coat and identification of lice in bison is rare. Ticks have been found on bison around the tail head. In many areas where elk and deer are infested with ticks, bison sharing the same habitat are tick free.

Physical Alterations
Consistent with the low-management approach to bison, bulls are not castrated. Nor is there any need to dehorn bison.

Bison Handling
The primary objective of any handling program is to reduce stress on the animals while assuring the safety of handlers. A bison organic systems plan must discuss how the producer will handle or move bison; how they manage them on range; how they confine and feed them; as well as how they are worked in the corral.

It is important to recognize that bison are an extremely social animal with strong matriarchal divisions. Establishing a herd with the correct social balance, and the ability for animals to express their natural behavior, is the first step in reducing stress.

Bison have a very intact social structure that has definite spacing requirements between individuals and family groups. This spacing requirement may be different for different sexes and ages of animals throughout various times of the year. Herds that generate their own replacements from offspring will develop family groups between related individuals.

The pasture environment includes the size and shape of the pastures, forage quantities and qualities available, watering sources, spatial requirements for individuals and/or family groups as well as a myriad of other considerations. Social stress will become a factor if pasture size is too small to give adequate spatial requirements for individuals or family groups for large herds. This causes discontent and disharmony within the herd, causing animals to breach fences and become difficult to handle.

Bulls will separate from the herds after breeding and only young bulls are allowed to stay with the cows and calves. Post-breeding, the bulls have been nutritionally and physically stressed and should be checked for wounds or other forms of trauma.

Corrals
Corrals and working facilities should be designed to minimize the stress on animals, and to facilitate the ability of handlers to gently apply and release pressure. The amount of space allowed for each individual animal depends upon the amount of time that the animal will be maintained in the corral. When animals are introduced into a new herd, is advisable to house those animals in the corral for several days so that the animal s can adjust to their new environment. The producer should allow a minimum of 250 sq. /ft. (preferably 400 sq. ft.) per adult animal in this type of confined situation.

Never place just one bison in a corral or pasture for extended periods. Because they are extremely social, they will experience chronic stress when isolated from the herd.

When handling bison, the producer should strive for a gentle “dance” of applying pressure, the animal moving away from the pressure and then releasing the pressure. The fact that we move into an animal’s flight zone giving it pressure and when it moves away from us, we release the pressure by either not moving with them in the same direction (by stopping) or we move in a different direction. This sets up a positive cause and effect relationship – that is we get into their flight zone putting pressure on them, and they, by moving away from us get released from the pressure.

The National Bison Association—in cooperation with Dr. Temple Grandin of Colorado State University—developed has developed a bison welfare audit form to measure several areas of working bison in the corral. That audit form is included as an attachment at the end of the Guidance Document.

Inside housing is rarely used for bison. These animals are adapted for extreme weather conditions in the outdoors. Bringing the animals inside actually increases stress.

Calving
Human interaction with calving bison should be held to a minimum. Because bison have not been bred to produce calves larger than nature intended, cows rarely need assistance in calving.

One of the most important things a bison cow needs at calving time is peace. There is no fixed rule regarding amount of space a calving bison cow needs. However, the producer can judge that space by monitoring the cow’s behavior: If she changes her behavior with the producer’s presence (such as standing up, running off or her labor arrests) she needs more space. If the other bison pester her and she cannot get away, then she needs more room.

Nature also needs the cow to be leaner to give birth effectively. A fat bison cow will have trouble giving birth, and the calf from such a cow will likely be too big and too hard to birth.

Reference Material

Alberta Agriculture (2007) "What's the Score: Bison" Body Condition Scoring Guide.

Anderson, Vern PhD (____) "perspectives on Nutritional Management of Bison Bulls Fed for Meat, Carrington Research Extension Center, North Dakota State University.

Feist, Murray (2000)"Basic Nutrition of Bison," Saskatchewan Agriculture, Agriculture Knowledge Centre, Saskatoon, Saskatchewan, CA

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USDA NRCS (2006) "Bison Body Condition." Grazing Lands Technology Institute, Fort Worth, TX

Guidance for Assessing Animal Welfare on Organic Poultry Operations

Introduction

The following is provided to aid in assessment of whether or not the requirements of **§ 205.238-241** are being met sufficiently to demonstrate adequate animal welfare conditions on organic poultry operations. In addition, this document provides further guidance to producers for improving poultry welfare. The internationally recognized "five freedoms" (freedom from hunger, thirst and malnutrition; freedom from fear and distress; freedom from physical and thermal discomfort; freedom from pain, injury and disease; and freedom to express normal patterns of behavior) promulgated by the Farm Animal Welfare Council are a useful framework for considering animal welfare.

Nutritional requirements

Poultry must be fed a wholesome diet that meets their nutritional needs and promotes optimal health. Feed should be formulated to meet or exceed the National Research Council's *Nutrient Requirements of Poultry,* and adjusted with bird age and stage of production. Feed and water should be palatable and free from contaminants. Unless using a commercially prepared complete feed, laying hens must have access to a course calcium source, such as ground limestone. Water should be fresh, potable, and clean. Feed and water delivery systems should be checked daily and kept clean and in good working order. Birds must be provided with feed on a daily basis and water should be available continuously, with the rare exception of withholding for medical treatment under the advice of a veterinarian.

There should be enough feed and water space to prevent competition between birds. In double sided liner feed track, there should be at least 2 inches of feed space per bird, and 4 inches per bird for single sided feed track. Circular feeders should provide at least 1.5 inches of feeding space per bird.

Adjust the height of drinkers for easy access at each bird age and so that droppings do not fall into the water supply. There should be at least 1 bell-type drinker for every 100 hens and 1 nipple drinker per 12 hens. In small flocks, there should be a minimum of two drinkers.

Physical Alterations

Management methods should be implemented to reduce feather pecking and cannibalism (see "preventing injurious pecking" below). If these management strategies fail, therapeutic beak trimming using the infrared laser method should be considered for subsequent flocks. This amputation must be performed on chicks no later than 10 days of age, and is commonly carried out at the hatchery.

While not pain-free, infrared laser beak trimming is superior to the conventional hot blade trimming in that open wounds are eliminated and the method is more precise,

minimizing error and inconsistency. It also leaves a greater proportion of the beak intact.[i]

With the exception of toe trimming of turkey poults at the hatchery using infrared laser, other alterations including de-snooding, caponization, dubbing and toe clipping of birds are not permitted.

Force Molting

Forced molting by feed withdrawal is not permitted under the National Organic Program, as it causes hunger and distress. If force molting is practiced, a molt ration should be supplied that is palatable and acceptable to the birds. A molt diet is acceptable to the birds if, on average, the total amount of feed consumed per day does not differ during the molting and non-molting period. Flocks should be carefully monitored during a molt, and individual hens that are not faring well should be separated into a designated sick pen and provided with a non-molt diet. Water should never be withheld for molting purposes.

Poultry health

Poultry should be monitored for signs of stress and disease. Birds should have a healthy body condition, have good feather cover for their stage of life, and no more than 2% should have poor hygiene, lesions or other injuries. Sick or injured birds must be treated without delay or, if suffering and unlikely to recover, euthanized humanely. Producers must not withhold medical treatment from a sick animal in an effort to preserve its organic status.

Animal health plan

All poultry farms should draft and follow an animal health plan that covers the specific circumstances unique to each farm. The plan should include, at a minimum, the disease prevention strategy (such as vaccination schedules and biosecurity protocols), contingency plans for emergency situations (including failure of the power or water supply), predator exclusion steps, veterinary contacts and emergency euthanasia procedures.

Sick pens

A designated area for the treatment of injured or moribund birds should be prepared to aid recovery, by preventing competition between birds and allowing a greater level of individual care. Sick pens should be arranged for the comfort and safety of the birds during convalescence. Feed and water must be provided, with the rare exception of withholding for medical treatment under the advice of a veterinarian.

Lameness

Broiler chickens, turkeys and ducks are prone to leg problems, including angular deformities, tibial dyschondroplasia (TD), and in severe cases, ruptured tendons. These may manifest as lameness or more severe mobility impairment.

Gait scoring is a tool that can be used to assess the degree of lameness in a broiler chicken flock.[ii,iii,iv] Randomly score 100 birds individually by viewing their walking ability using the following scale:

Score 0. No detectable gait impairment
Score 1. Slight gait defect. Wobbling or uneven gait.
Score 2. Gait abnormality. Bird has impairment, but will move away from handler when approached.
Score 3. Gait abnormality that impairs function. Bird has a limp, jerky or unsteady gait and moves away from the observer when approached, but squats again within 15 seconds. Bird prefers to squat when not coerced by handler.
Score 4. Severe gait defect. Bird remains sitting when approached or nudged, but can stand or walk when placed in a standing position by a handler.
Score 5. The bird is completely lame and cannot walk. The bird may shuffle along on its hocks.

Gait score tends to worsen as birds age.[v] Birds that are suffering or are too crippled to reach feed and water should be humanely euthanized. Birds at gait score 3 and above are probably experiencing pain,[vi,vii] so ideally no birds should reach this level. However, a reasonable place to set the target for lameness is that 95% of the birds should be gait score 2 or less at seven weeks of age or older.

Broiler chickens, turkeys and ducks are also prone to contact dermatitis. When heavy birds spend excessive time lying down in wet or soiled litter, they are prone to skin lesions on the feet, legs and breast.[viii, ix,x] Focal ulcerative dermatitis is small skin lesions (commonly called “breast buttons”) that develop on the keel bone of turkeys.[xi] A reasonable place to set target levels is that no more than 5% of birds should show hock burn, breast blisters or foot pad dermatitis.

Additional producer guidance on preventing leg problems
While dietary deficiencies are one factor that can lead to skeletal deformities,[xii] genetic selection for rapid early growth rate is the major contributing factor. Rapid growth is also implicated in metabolic disorders, including ascites and Sudden Death Syndrome.[xiii] Some commercial broiler crosses are more susceptible to leg problems than others,[xiv] but slow growing broiler strains are generally less prone to these weaknesses. They are also less prone to heart and circulatory problems.[xv] The use of slow growing breeds is therefore recommended. Broiler growth should be limited to no more than 45g per day and should be achieved without feed restriction.

Other factors that can improve gait score include: increasing the daily period of darkness, lowering the stocking density, and adding whole wheat to an otherwise balanced diet. Increasing the daily period of darkness allows chickens more time to rest and less time to feed. Feeding whole wheat is thought to be effective though slowing the rate of digestion. Both of these interventions work through reducing growth rate.[xvi] The reason that higher stocking densities can lead to lameness is more complex,

involving both lack of room available for exercise and movement, as well as factors such as additional ammonia and litter moisture.[xvii,xviii,xix]

Additional producer guidance on preventing dermatitis
Dermatitis lesions are painful and create a gateway for bacterial infection. Avoid them by preventing wet, sticky, or compact litter. Use bedding with good moisture holding capacity, such as wood shavings, and keep litter dry (but not dusty), with good ventilation. Drinkers should be monitored to ensure they are not spilling over and causing wet areas in the litter. Water nipples with drip cups can reduce water spillage.[xx] Moisture and temperature of the litter increase with stocking density, so if these variables become problematic, it may be necessary to raise fewer birds in the allotted space.[xxi] Manually turning the litter can help. Floor heating systems have also been found to improve litter quality.[xxii]

Conversely, well-managed litter is a soft substrate, while outdoor environments can cause abrasion and foot-pad dermatitis if not carefully managed.[xxiii] Birds should be kept on cushioned, dry, clean surfaces outdoors. Rotate or move birds onto fresh pasture often enough to prevent the build-up of droppings and damage to the protective vegetative cover.

Feed composition affects the consistency and composition of bird droppings, and is therefore a factor influencing irritant qualities of litter. Protein, fat and salt content can all affect the levels of contact dermatitis, as can the source and type of raw ingredients. Within the limits of meeting nutritional requirements, adjustments to the diet may help improve litter quality.[xxiv]

For ducks, bell-type drinkers and open water troughs have been correlated with low levels of foot pad dermatitis. Conversely, foot pad dermatitis tends to worsen in houses with nipple drinkers. There is also evidence that increasing relative humidity and ammonia levels are associated with foot pad dermatitis of ducks.[xxv]

The health status of the flock will also affect the prevalence of contact dermatitis. Intestinal parasites, infectious disease, and poor feed quality can cause diarrhea, which will negatively impact litter friability (looseness and dryness). Prevent coccidiosis and other enteric diseases and feed good quality feed. Also strive to reduce leg problems, as lame birds will sit for longer periods of time in contact with litter.[xxvi]

Varying degrees of foot pad dermatitis on the feet of turkeys

Foot pad dermatitis and hock burns on a broiler chicken

Disease

Disease incidence is a welfare indicator. Respiratory disease may indicate poor air quality. Incidence of internal parasites can indicate management issues such as lack of sanitation and failure to rotate outdoor areas often enough.

Poultry houses must be cleaned out completely between flocks if there have been adverse health issues with the previous flock; in other cases, the addition of a clean layer of litter will help maintain a sanitary environment.

If there is a documented occurrence of a disease outbreak in the region or relevant migratory pathway, or state or federal advisory order to confine birds, then poultry must be kept indoors to reduce the likelihood of pathogen transmission.

Any dead birds must be removed daily and disposed of in accordance with state and local laws.

Additional producer guidance on management of disease risk
Disease risk should be managed by using multiple approaches, including attention to outdoor range area, good litter management indoors, adherence to an effective biosecurity plan and ensuring clean, hygienic facilities.

Overcrowded and unsanitary outdoor environments are a disease hazard. Providing a rest period in-between flocks reduces the buildup of infectious organisms and allows the regeneration of vegetation and soil. Where stocking density is high, the environmental pathogen load may be correspondingly heavy, and bird-to-bird contact will be more frequent. Providing as much space as possible is therefore important, and the stocking density guidelines set out in the organic rule are minimum space allowances—where conditions permit, the aim should be to lower stocking densities and provide as much space as possible, while balancing freedom of movement with safety of the flock, including protection from predators.

Disease risk can be reduced in barn housing by removing droppings (e.g., via a belt in aviary systems, for example) or by preventing birds from accessing heavily soiled areas (e.g., by placing drinkers on a raised, slatted platform above a manure pit). Contact with droppings—exacerbated by high stocking density and wet, cool conditions—is a risk factor for enteric disease.[xxvii] Litter that "stops working", leaking drinkers, and an inadequate ventilation system (to remove water vapor) may all increase disease risk.[xxviii,xxix] Maintain litter in friable condition.[xxx,xxxi] Introduce only healthy young birds from genetic lines resistant to intestinal parasites.[xxxii]

The build-up of parasites around the barn can be avoided with the use of mobile housing,[xxxiii] pasture rotation, reduced stocking density, and by using land with good drainage.[xxxiv,xxxv] Other methods that are helpful include regularly mowing or grazing to keep vegetation short on pasture, and removing heavily contaminated soil around the barn before introducing a new flock.[xxxvi] Gravel around the outside of permanent housing structures, by the exits where birds tend to congregate, can prevent muddy conditions in wet weather and provide additional drainage.

Biosecurity is a strategic plan to prevent the introduction of harmful pathogens. A good biosecurity plan will minimize disease risks and protect flocks. To prevent the spread of disease, limit movement between flocks and outside visitors. Always start with the youngest birds on the farm when doing daily chores and inspections to avoid carrying pathogens from older flocks to younger flocks. Microorganisms, such as coccidiosis for example, can be spread on vehicles and equipment, so designate specific tools and equipment for each poultry house or farm area. Transport crates should be cleaned between uses. Visitors should not enter a poultry farm if they have recently visited other flocks, unless they wear protective, disposable outerwear at both locations and ideally change clothes and shoes and shower between farms.

Mortality rates (deaths, culls)
Mortality rate is a key indicator of poultry welfare. Low mortality is also important for the economic viability of a poultry or egg production enterprise. A reasonable place to set the target for mortality is 3-5%. Birds must be protected from predators.

Additional producer guidance on lowering mortality rates
A low mortality rate is the hallmark of a well-managed poultry farm. Mortality spikes can be caused by a number of different problems, including disease outbreaks, cannibalism, and excessive losses due to predation. It is vital that producers take steps to prevent each of these outcomes, as they are all serious welfare and economic problems.

When poultry are given outdoor access, they become targets for many types of predators including coyotes, opossums, hawks, owls, and domestic dogs, to name a few. Predation is a welfare issue, as birds may suffer when attacked, are not necessarily killed quickly, and flocks can become fearful and reluctant to use outdoor areas if they are threatened by repeated attacks. To protect free-range flocks from nocturnal predators, birds must be secured in a fully enclosed coop, barn, mobile chicken house or other safe facility at night, *without fail*. Depending on the predator pressure at individual farm sites, further steps may be necessary; perimeter fences can be dug deep in the ground to prevent predators from digging underneath, and an overhang at the top of the fence will help prevent animals from climbing over. Electric fencing can further discourage ground predators, and overhead netting may be necessary to protect hens from aerial predators. Do not permit repeated heavy losses.

Preventing Injurious Pecking
Injurious pecking, including feather pecking and cannibalism should be managed so that severe outbreaks do not occur.

Additional producer guidance on management of injurious pecking
Feather pecking and cannibalism are common behavioral abnormalities of poultry, usually most problematic in large flocks of laying hens, but also sometimes seen in other poultry such as turkeys, ducks and pheasants. Severe feather pecking can lead to denuded plumage and eventually to cannibalism.[xxxvii,xxxviii] Outbreaks of cannibalism are unpredictable, and once they begin, are very difficult to stop. Prevention is the best approach.

Beak trimming is commonly used as a prophylactic measure to prevent feather pecking and cannibalism. Beak trimming is usually effective in significantly reducing cannibalism and subsequent mortality,[xxxix,xl] although occasional outbreaks do occur in beak trimmed flocks. Beak trimming as a solution is not ideal though, as it is a painful procedure. Further, the beak tip is highly innervated and contains abundant sensory receptors;[xli,xlii] cutting off the beak tip thus impairs sensory function. Welfare can be improved by controlling cannibalism using alternative means.

Dietary deficiencies have been linked to increased incidence of pecking damage,[xliii] especially protein deficiencies,[xliv,xlv] so the first step in preventing injurious pecking is to ensure that the feed is nutritionally complete. However, outbreaks of feather pecking still often occur in flocks that are fed to their nutritional requirements. There are a variety of other factors involved.

Successful control of feather pecking and cannibalism requires an integrated approach that includes consideration of three main factors: early-life experiences, the environment and genetics.[xlvi]

Feather pecking and cannibalism are not aggressive acts—rather, science demonstrates that these are foraging pecks that have been re-directed toward feathers.[xlvii,xlviii,xlix] In natural conditions, domestic fowl spend over 50% of their active time in foraging related activity.[l,li] Studies have shown that hens will choose to forage for feed on the ground in loose substrate rather than eat identical food freely available from a feeder.[lii,liii] Thus, the natural urge to forage remains strong, even when full feed is provided. The acquisition process itself—including seeking, investigating, and manipulating feed items—is nearly as important as the act of consuming the feed itself.[liv]

Pecking preferences are formed early in life, and these are learned through experience.[lv] Therefore, providing appropriate pecking and foraging substrate from day one[lvi,lvii] is a critical factor shaping adult pecking preferences. Scientific research has demonstrated that early access to loose litter—such as wood shavings, sand and straw—is an important first step in reducing feather pecking, cannibalism and subsequent mortality.[lviii,lix,lx, lxi,lxii,lxiii] Conversely, studies also show that the absence of loose-litter[lxiv] and poor litter quality are risk factors for plumage deterioration due to feather pecking.[lxv] Scattering grain or feed into loose litter for young chicks can also be beneficial.[lxvi]

Lack of perches during early rearing is another important risk factor for feather pecking on organic farms.[lxvii] Early access to perches can decrease cloacal cannibalism by giving potential victims a safe place to avoid hens who would peck them from the floor.[lxviii,lxix,lxx] Young birds must learn how to successfully navigate perches by gaining experience with them from a young age, which shapes their cognitive spatial abilities.[lxxi] Pullets should have access to perches elevated above 35 centimeters at no later than four weeks of age.[lxxii,lxxiii] Higher perches are generally better, [lxxiv] although they must be constructed and arranged in a way that allows easy access, or else hens can miss a landing, fall and become injured (see section on providing perches for laying hens in indoor housing below).

Feather pecking often begins to appear in affected flocks shortly after moving pullets from the rearing to the laying house. When transferring pullets, there are many potential stressors including changes in light intensity, diet, house layout and access to the outdoors. Stress can be partially alleviated by matching the rearing and laying

environments as closely as possible.[lxxv] Do not change the feed or lighting program at the same time pullets are moved into the laying house.

Since cannibalism is thought to have a hormonal basis, the risk of cannibalism may be reduced by using lighting programs that delay the age at which hens first begin to lay eggs to after 20 weeks of age.[lxxvi] Flocks that begin laying eggs before 20 weeks of age have approximately four times the risk for vent pecking as compared with flocks that begin laying at a later age.[lxxvii]

When feather pecking outbreaks occur in adult hens, lowering the light level is a commonly used intervention. While somewhat effective, the problem with dimming the light is that, like beak trimming, the underlying cause of the problem is not addressed. To truly attend to the welfare issue, the natural early motivation of a hen to forage and peck should be channeled appropriately into desirable adult pecking behavior, as discussed above.

Feed form is also important for attracting and sustaining foraging related pecks and regulating appetite. Studies show that a mash diet is better than pelleted feed for reducing feather pecking and cannibalism.[lxxviii,lxxix] The small particle form takes longer to consume, sustaining foraging related pecking behavior for a longer period of time as birds pick out individual feed particles.[lxxx] A diet high in insoluble fiber has also been shown to help to reduce and control cannibalism,[lxxxi] and millrun, oat hulls, rice hulls, and lucerne meal are effective sources.[lxxxii] Additional foraging enrichments such as maize, barley-pea silage, carrots,[lxxxiii] straw[lxxxiv,lxxxv] seeds in suet, and cabbage leaves[lxxxvi] have been shown to attract interest and reduce the tendency to perform injurious pecking.

Most importantly, it has been repeatedly demonstrated in scientific studies that flocks making good use of an outdoor range area (where more foraging and exploring opportunities are provided for them) are significantly less likely to feather peck and cannibalize flock mates.[lxxxvii,lxxxviii,lxxxix,xc,xci,xcii,xciii] One study found that when at least half the flock was observed outdoors during good weather, there was a five-fold decrease in the risk of feather pecking. On these farms, it is likely that hens are directing their pecking behavior at appropriate foraging substrate, rather than at each other.[xciv] Therefore it is essential to provide attractive outdoor areas and encourage hens to go outside (see section on outdoor access below).

If possible, time the introduction of pullets into the laying house so that they will have good weather when the doors are first opened to permit outdoor access. If inclement weather prevents them from using the range area when they are young, it may be difficult to encourage them out when they grow older.[xcv]

Other risk factors that have been associated with injurious pecking include:
- Restricting access to portions of the indoor litter area;[xcvi]
- Restricting access to the outside range area;[xcvii]
- Changing the diet three or more times during the laying period;[xcviii,xcix]

- Using lights inside the nest boxes;[c]
- Use of bell drinkers;[ci,cii]
- Inadequate number of drinking places;[ciii]
- Reduced indoor temperature (below 68º F);[civ]
- Not keeping cockerels with the hen flock;[cv] and
- Dietary deficiencies.[cvi]

Feather pecking, cannibalism, and the associated mortality have genetic components, which means that these traits can be selected against in breeding programs.[cvii,cviii,cix,cx] Different hen strains vary in their propensity to exhibit injurious pecking behavior.[cxi] It is therefore critical to source hens that exhibit low levels of feather pecking behavior. Because breeding efforts to control cannibalism are ongoing, it is difficult to pinpoint lasting recommendations on specific genetic lines. If a severe outbreak occurs, consider using a different supplier, switch to a different hen strain, or use a different breed or hybrid altogether.

For more information on managing feather pecking without beak trimming see:

"A guide to the practical management of feather pecking & cannibalism in free range laying hens" at:
www.defra.gov.uk/publications/files/pb10596-feather-pecking-050309.pdf

Newberry RC. 2003. Cannibalism. In: Perry GC (ed.), Welfare of the Laying Hen, Poultry Science Symposium Series, 27 (Wallingford, U.K.: CABI Publishing, pp. 239-58).

Indoor Living Conditions

Housing must protect birds from the elements, maintain a comfortable temperature, provide ventilation and allow birds to exercise and conduct natural behavior. Cages are not permitted. Bedding indoors provides comfort, insulation, and pecking and scratching opportunity. However, it must be maintained in clean, dry condition. Slatted-floor systems are useful under watering areas to prevent wet litter.

The indoor climate must be modulated for light, temperature, and air quality to provide a comfortable environment for the birds. Lighting should provide for an 8 hour rest period daily. Indoor temperatures must not be so warm that birds pant or so cold that they huddle together. Ventilation must be adequate to prevent the buildup of ammonia. Ammonia levels should generally be less than 10 ppm. Ammonia level testing must be documented and ammonia levels must be at or below 25ppm. General levels can be tested using ammonia test strips and if excessive ammonia is noted a second test using passive dosimeter or gas detection tubes should be conducted. Dust should also be kept to a minimum.

Layers should be provided with nest boxes—at least one box per 5 birds is recommended. If community nest boxes are provided, there should be at least 9 square feet of nesting space for every 100 hens.

Laying hens must also be provided with perches—at least 6 inches of elevated perch space per hen is suggested. There must be enough perch and/or flat roost space for all hens to simultaneously rest off of the floor at night. Turkeys can be provided with elevated platforms and ramps in addition to or instead of perches.[cxii]

Poultry must be provided with dustbathing areas. Preferred substrates include sand, wood shavings and peat. On outdoor range areas, chickens usually create their own preferred dustbathing locations in loose, dry dirt. Dustbathing balances oil levels in the feathers,[cxiii,cxiv,cxv] and helps keep the plumage in good condition.

Ducks should have access to water for bathing and head dunking in addition to water for drinking. Water related activity is part of the natural behavior of waterfowl. At a minimum, ducks should be able to dip their heads and splash their feathers with water. This behavior will help keep their nostrils, eyes and feathers clean.[cxvi,cxvii] Troughs are often used to provide an open water source and these can be situated on grids or slats over a drainage channel to prevent adjacent litter from becoming wet. Nipple drinkers do not permit ducks to wet their eyes or feathers, and can lead to poor eye and plumage cleanliness.[cxviii] Open water sources should be cleaned daily.

Additional producer guidance on providing perches for laying hens in indoor housing
Perches are an important enrichment in indoor housing for laying hens. The foot of a hen is anatomically adapted to close around a perch,[cxix,cxx] and this is the natural resting position for chickens. Perch use maintains bone volume and bone strength,[cxxi,cxxii,cxxiii] and can serve as a refuge for subordinate hens to avoid aggressive interactions with more dominant hens.[cxxiv] Research demonstrates that hens are highly motivated to perch at night.[cxxv,cxxvi,cxxvii] When given a choice, hens often prefer to roost on higher perches as opposed to those that are closer to the floor.[cxxviii,cxxix]

Bumblefoot is a bulbous swelling of the footpad caused by a localized infection.[cxxx] Some hen breeds are more susceptible than others, and the condition is associated with poor hygiene and poor perch design.[cxxxi,cxxxii] The use of plastic perches or the commonly used soft wooden perches measuring 25 mm (0.98 in) in width are thought to contribute to poor foot health, as manure and moisture are able to accumulate on the structure's top where the birds' feet rest.[cxxxiii] Incidence of bumblefoot can be reduced by providing hens with hardwood perches that are approximately 1.5 inches in diameter with a flattened top[cxxxiv,cxxxv] and by limiting walking exposure to mud and manure.[cxxxvi]

Hens selected for egg production are prone to osteoporosis and subsequent bone fractures.[cxxxvii,cxxxviii,cxxxix] These often go undetected unless hens are palpated by an experienced veterinarian. The way perches are arranged inside the poultry house can have an effect on the incidence of bone fractures. Research suggests that the upper limit on a hen's ability to jump from one perch to another is about three feet,[cxl] and

angles greater than approximately 45º can be difficult to navigate.[cxli] At a minimum, hens need approximately 6 inches of perch space to take-off, and 6-9 inches to land.[cxlii] Perches should be large enough for hens to maintain stable footing, about 1.5 inches in diameter.[cxliii,cxliv] These general requirements may differ depending on the size and previous experience of the hen, so adjustments may be necessary for individual flocks. Injuries are more likely to occur if perch design and layout require hens to jump beyond their natural capabilities.[cxlv]

Providing perches at a young age can also help reduce the risk of floor eggs,[cxlvi] as pullets must be skilled at flying up and down in order to access elevated nest boxes.[cxlvii]

Outdoor Access and Living Conditions

Outdoor access must be provided to all poultry, with the following exceptions:

- Pullets younger than 12 weeks of age.
- Broiler chickens younger than 4 weeks of age.
- Outdoor temperatures below 50ºF.
- Other inclement weather such as heavy snow, sleet, rain, wind or extreme heat that would endanger the health or welfare of the animals.

Pullets must be provided outdoor access by 12 weeks of age, when weather permits. As a guide, doors for outdoor access should be at least 14 inches high, spaced uniformly and provide direct access to the outdoors. Total door opening should be at least 6 feet/1000 birds.[cxlviii] Once layers are accustomed to going outdoors, a brief confinement period of no more than 5 weeks to allow for nest box training is permitted. Broiler chickens must be provided outdoor access by 4 weeks of age, provided that they are fully feathered and weather permits.

Enclosed spaces that have a solid roof overhead (sometimes called “porches” or “winter gardens”) do not meet the definition of outdoor access and cannot be included in the space calculation of outdoor access.

Additional producer guidance on outdoor access

Outdoor areas for poultry should be fully vegetated, where possible. Grasses, legumes, and other forage provide interest and enrichment to poultry, who consume not only greens, but also insects, grubs, and seeds. However, high traffic areas tend to become denuded of vegetation, so steps must be taken to keep outdoor areas in good condition. Rotate the use of range areas by taking flocks off of pasture to prevent the buildup of infectious organisms and allow the re-growth of vegetation. Fields can also be rotated

between species with different parasite spectrums, such as cattle and poultry. Harvested crop fields also make good poultry runs.

Layout is important for attracting hens to use outdoor space. There should be plenty of exits from the hen house, and they should be easily accessible and large enough for several hens to pass through simultaneously. Since hens are prey animals, they are naturally wary of overhead predators, and will sometimes avoid open range if some sort of cover is not provided. Cover, either artificial or natural structures, should therefore be provided.[cxlix] Natural cover can take many forms, including tall plantings of vegetation, bushes, and trees,[cl] however, large swaths of thick undergrowth can actually attract ground predators if fences don't exclude them. Maize plantings and low pollard willows (*Salix*), for example, have worked on organic farms to attract hens outdoors.[cli] In "tree-range" production, the outdoor area is planted with short trees, such as orchard varieties. Flocks with canopy cover from trees are more likely to have better plumage condition at the end of lay than those without canopy cover.[clii]

Artificial structures that provide shelter, shade, and security can also be constructed.[cliii,cliv] Cover made from a wide variety of wood, plastic or recycled materials, in designs both low to the ground and high enough to include perches, have been innovated by producers with success. Camouflage nets are another option.[clv] If artificial cover is portable, it can be moved to different range areas to encourage more even distribution of the flock, preventing buildup of contamination over highly frequented areas.

For more information see: Fanatico, A. 2006. Alternative poultry production systems and outdoor access. Available through the National Sustainable Agriculture Information Service at: www.attra.ncat.org

Space Allowances

Poultry housing must be sufficiently spacious to allow all birds to move freely, stretch their wings and engage in natural behavior. Perching areas and nest boxes may not be used in the calculation of floor space. Slatted/grated floors may be considered floor space. Mobile poultry units require the same amount of indoor space per bird but allow the house to be moved so birds always have access to fresh vegetation.

Livestock Species	Indoor Space	Outdoor Runs and Pens
Chickens		
Laying hens and breeders	1.5 sq ft / bird	2.0 sq ft / bird
Pullets	5 lbs / sq ft	5 lbs / sq ft
Broilers	5 lbs / sq ft	5 lbs / sq ft
Other poultry		
Turkeys and Geese—breeding, laying, or meat birds (pounds)	7.5 lbs / sq ft	2 lbs / sq ft
Ducks-meat	5 lbs / sq ft	2 lbs / sq ft
Ducks-laying hen	2 lbs / sq ft	1 lbs / sq ft
Ducks—breeder	3.3 lbs / sq ft	1 lbs / sq ft

Humane Handling of Poultry
Poultry should be handled quietly and firmly, with care taken to avoid unnecessary distress and dislocated or broken bones during catching and loading for transport. Poultry catching should be scheduled to minimize the time to slaughter as well as climatic stress during catching, transport and holding. Birds should not be picked up by the neck or wings.

Transport is a stressful experience,[clvi,clvii] as birds are subjected to noise, vibration, motion, overcrowding, feed and water deprivation, social disruption, and potential temperature extremes.[clviii,clix,clx] Aim to reduce these stressors and comfort the birds wherever possible. Transportation units should provide space enough that all birds can lie down at the same time and none are on top of each other. Birds must be protected from heat and cold. Delivery of poultry for slaughter should be scheduled such that they are not deprived of water for longer than 12 hours.

Birds must be fit for transport before being loaded for slaughter. Due to the stress involved, animals must be healthy enough to withstand the rigors of the journey. Birds exhibiting obvious signs of poor health, weakness or injury are not fit for transport. These birds should be euthanized using the most humane method available.

Inspectors should discuss procedures for poultry catching and loading with the producer and must observe poultry being caught and loaded for slaughter at the annual inspection and note percentage of birds with broken/dislocated legs/wings.

Additional producer guidance on humane handling of poultry
Low-stress handling is as important for poultry as it is for livestock. Although commonly carried this way, research shows that birds react with a significant stress response when picked up and held upside-down by the legs, as this is a physiologically abnormal

posture for chickens.[clxi] Handling, crating and loading for transportation, have been identified by researchers as major sources of stress and trauma.[clxii] Bruising and injuries are well-documented, and these are not only welfare problems, but can also result in carcass downgrading and economic loss to producers.[clxiii, clxiv,clxv,clxvi,clxvii] Ideally, all poultry should be handled individually, upright, and carried gently using two hands.

Catching and carrying turkeys can also cause bruises and injuries. Turkeys can be driven or herded into transport crates instead, which reduces stress levels.[clxviii]

Euthanasia and Depopulation

Individual birds who are ill or injured, are suffering, and are unlikely to recover, should be euthanized without delay. All euthanized and depopulated birds must be confirmed dead before disposal. No live birds should be found on dead piles.

Permitted methods include:

- Hand held electrical or percussive stunning using an instrument designed for the specific size/age of the species, followed by neck cutting;
- Cervical dislocation by stretching the neck to sever the spinal cord and cause extensive damage to the major blood vessels.
- Barbiturate overdose administered by a licensed veterinarian (with special considerations noted below)
- Decapitation
- Carbon dioxide or a mixture of nitrogen and argon gases, delivered in an appropriate container at acceptable concentrations.

Acceptable gas mixtures include:

- a minimum of 2 minutes exposure to any mixture of argon, nitrogen or other inert gases with atmospheric air and carbon dioxide, provided that the carbon dioxide concentration does not exceed 30 percent by volume and the residual oxygen concentration does not exceed 2 percent by volume; or
- a minimum of 2 minutes exposure to argon, nitrogen, other inert gases or any mixture of these gases in atmospheric air with a maximum of 2 percent residual oxygen by volume.

Methods that are not permitted include, but are not limited to:

- Suffocation
- Blow to the head by blunt instrument
- Equipment that crushes the neck including killing pliers or burdizzo clamps
- Carbon monoxide
- Neck wringing (holding the head while swinging the body in a circular motion)
- Maceration in a wood chipper

Additional producer guidance on euthanasia and depopulation

The term euthanasia is derived from Greek words meaning "good death" and is applied to the killing of an animal with minimal pain and distress.[clxix] Animals that are suffering must be euthanized in a timely manner, and should not be left for extensive periods, over a weekend, for example.

Barbiturate injection or inhalant anesthetics administered by a veterinarian are the ideal methods for a limited numbers of hens, as they most closely meet the goals of killing with minimal pain and distress. However, these methods have not been widely used on farm settings due to cost and convince issues associated with culling large numbers of birds. Producers should also be aware that drug residues associated with the use of barbiturate injections will prevent the use of carcasses for human consumption, and dead birds must be disposed of carefully, because residues could also be unwittingly consumed by other animals eating the carcass or could become an environmental pollutant. Dead poultry should be disposed of in a way that does not attract wildlife.

Research demonstrates that inhalation of an inert gas (including argon and nitrogen) is probably painless, as they are colorless, odorless gases and birds do not demonstrate aversive reactions with initial exposure. In carefully controlled behavior experiments, turkeys and chickens are willing to enter a chamber filled with inert gas in order to access food.[clxx,clxxi] Argon and nitrogen can be used to kill chickens on the farm. Containerized gas killing systems have been developed for culling large numbers of birds,[clxxii] and these can be built on either a large or small scale, depending on the needs of individual producers. Such a system is the most humane method for killing large numbers of chickens on the farm that researchers have identified to date.

The use of CO_2 is problematic as there are both physiological and behavioral lines of scientific evidence suggesting that CO_2 may be unpleasant and possibly very distressing to inhale, as it is an acidic gas, pungent at high concentrations.[clxxiii,clxxiv]

Exhaust fumes from an idling car engine are an unacceptable source of carbon monoxide, due to problems with production of other gases, inadequate gas concentration, and gas temperature.

While purpose-build macerators are sometimes used to kill unwanted chicks at hatcheries, using a wood chipper to dispose of a spent laying-hen flock is never acceptable.

It is extremely important to confirm that all animals are dead before disposal. When depopulation is performed on large flocks, depending on the methods used, it can be difficult to ensure that birds are actually dead and not simply lying still or unconscious. There is a very high potential for birds that are not dead, but are severely injured, to suffer greatly. Each bird must be methodically checked, and dead piles must be examined carefully for any sign of movement. A backup method of euthanasia must be in place to kill any birds that recover. Careful attention to this step in the euthanasia process is essential to ensuring a humane end for farmed poultry.

Slaughter of Poultry
All slaughter facilities must be audited yearly. Organic certifiers can use documentation from other third-party animal welfare audits that have been performed and should do additional auditing as necessary.

Slaughter establishments must also perform self-audits on a weekly basis. Self-audits ensure that animal welfare standards are being upheld, identify problems that may arise within the facility or with individual staff members, and identify specific farms that may be shipping problematic animals to the slaughter plant. These problems may be due to animals' genetics or handling; slaughter facilities are encouraged to contact the producers of problematic animals so that these problems can be addressed in the future.

In electrical water-bath stunning systems, birds must be shackled by both legs. Birds with broken or dislocated wings should be humanely killed before being shackled.

Stunning
Poultry must be rendered unconscious by stunning, or killed before being bled by simultaneous severance of both carotid arteries or by decapitation. Bleeding without stunning requires a high level of operator competency to avoid causing pain and missing cutting of both carotid arteries. A very sharp blade or knife of sufficient length is needed so that the point of the knife remains outside the incision during the cut; the point of the knife should not be used to make the incision. The incision should not close over the knife during the throat cut. Decapitation may be achieved by manual or automatic means.

Decapitation must be performed using a sharp instrument which achieves the complete severance of the head from the body by cutting all the major vessels of the neck and the spinal cord with a sharp instrument. All mechanical and automatic instruments used in this method shall be sharp and inspected frequently for sharpness. The poultry slaughter establishment shall ensure that all instruments and equipment are maintained so that they function effectively. All birds (100%) should be dead before they enter the scald tank.

For inspector assessment, 99% of the birds must be rendered insensible by the stunning method chosen. Arched neck and wings tucked in are visible signs of effective stunning.

Additional producer/processor guidance on stunning for slaughter
Electric stunning: The disadvantage of electric stunning for poultry is that birds must be shackled and hung upside-down before they enter the stunner. Care must be taken to avoid pre-stun electrical shocks. Amperage must be high enough that birds lose consciousness and are not merely paralyzed. The electric current shall be administered so as to produce effective surgical anesthesia or death with a minimum of excitement and discomfort. The current necessary to produce an effective stun changes depending

the species and electrical frequency. These are outlined in the World Organization for Animal Health, Terrestrial Animal Health Guide, Chapter 7.5, Slaughter of animals (available at: www.oie.int/index.php?id=169&L=0&htmfile=chapitre_1.7.5.htm), and the minimum currents are as follows:

- Broiler chickens and spent laying hens, 100 milliamperes per bird
- Turkeys, 150 milliamperes per bird
- Ducks and geese, 130 milliamperes per bird

For high frequency settings of 200-400 Hz, the minimum current needed to stun chickens is 150 milliamperes. For frequency settings of 400-1500 Hz, the minimum current is 200 milliamperes. For turkeys, frequency settings of 200-1500 Hz require a 400 milliampere currency setting.

These are minimal settings, and higher current levels better ensure that more birds will be effectively rendered unconscious.[clxxv]

Gas stunning: Acceptable gas mixtures include argon, nitrogen, and low initial levels of CO_2 in one of the following combinations, as described by the World Organization for Animal Health:

- a minimum of 2 minutes exposure to 40 percent carbon dioxide, 30 percent oxygen and 30 percent nitrogen, followed by a minimum of one minute exposure to 80 percent carbon dioxide in air; or
- a minimum of 2 minutes exposure to any mixture of argon, nitrogen or other inert gases with atmospheric air and carbon dioxide, provided that the carbon dioxide concentration does not exceed 30 percent by volume and the residual oxygen concentration does not exceed 2 percent by volume; or
- a minimum of 2 minutes exposure to argon, nitrogen, other inert gases or any mixture of these gases in atmospheric air with a maximum of 2 percent residual oxygen by volume.

To avoid unnecessary stress and trauma due to handling, chickens should remain in their transport crates while being conveyed through the gas tunnels. Gas concentrations must be monitored for precision at all times. An alarm system is necessary to indicate malfunctions.

Bleeding

Once stunned, birds should be bled without delay to ensure that consciousness is not regained. Bleeding shall be accomplished by severing both carotid arteries or by decapitation. Sufficient bleeding time (at lest 30 seconds, 60 seconds for gas stunning, and approximately 2 to 3 minutes for electric stunning resulting in cardiac arrest) shall be allowed to prevent the unacceptable condition known as “red skins” or “cadavers” which may occur with insufficient bleeding. For inspector assessment, 99% must be

effectively cut by hand or by the bleed machine. Remaining birds must be cut by a backup person.

The inspector will monitor condition of carcasses exiting the scald tank. Birds exiting the scald tank should not show signs that they entered it alive. "Red skins" with uncut throats indicate that they entered the scalding water alive, and those with cut throats could possibly have entered before becoming unconscious.

For poultry, the percentage of chickens with broken or dislocated wings should not exceed 2%, with zero being the goal. No broken legs should be noted.

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Guidance for Assessing Animal Welfare on Organic Sheep Operations

Introduction

The following is provided to aid in assessment of whether or not the requirements of **§ 205.238-241** are being met sufficiently to demonstrate adequate animal welfare conditions on organic sheep operations.

Nutritional Requirements

Body condition scoring of sheep

Because wool covering makes visual examination of sheep body condition more difficult than with other species of livestock, body condition scoring may be helpful in determining whether the nutritional requirements of the ewe flock are being met and also in assessing the health status of sheep.

Estimated external fat cover is used as a base for estimating body condition. The fingertips are used to palpate fat cover over and around the vertebrae in the loin region. The best area to palpate is just behind the last rib. The spinal column has a vertical process at the midpoint of the back and a transverse process horizontal to the back and just below the loin. The prominence of these two points, or their lack of prominence due to fat cover, is helpful when estimating body condition. The recommended scoring system uses body condition scores ranging from 0 to 5. A condition score of 0 indicates extreme emaciation; a score of 5 represents excessive obesity. A condition score of 2.5-3 is considered as a medium fat-condition score for a healthy ewe at breeding and starting into the late gestation stage of pregnancy. If, within a “uniform” group or flock, several or more ewes differ from the majority in body condition score it may mean they are parasitized, diseased, aged (lacking teeth) or have other non-nutritional problems. As a rule, no more than 5% of the ewe flock should be below target body condition scores for the stage of production.

Scoring:

1. Feel for fullness of muscle and fat cover. (illustration)
2. Feel for the spine in the center of the sheep’s back behind the last rib and anterior to the hipbone. (illustration)
3. Feel for the tips of the transverse processes. (illustration)

Target body condition scores based on stage of production

Dry Ewe	1.5-2.0
Breeding	2.5-3.0
Early Gestation	2.0-2.5
Late Gestation*	2.5-3.0
Early Lactation*	3.0-3.5
Late Lactation, Weaning	2.0-2.5

*Add .5 to the target score for ewes expecting or nursing twins.

Body Condition Score 0: Sheep is extremely thin, unthrifty and weak. Skeletal features, such as backbone, shoulder blades and ribs, very prominent. Wasted muscle tissue evident. Eye socket is prominent and sunken. May be humped back and isolates self from flock.

Body Condition Score 1: Sheep is extremely thin, unthrifty but agile. Skeletal features are prominent with no fat cover. No apparent muscle tissue degeneration. Has strength to remain with the flock.

Body Condition Score 2: Sheep is thin but strong and thrifty with no apparent muscle structure wasting. No evident fat cover over the backbone, rum and ribs, but skeletal features do not protrude.

Body Condition Score 3: Sheep are thrifty with evidence of limited fat deposits in fore rib, over top of shoulder, backbone, and tail head. Hipbone remains visible.

Body Condition Score 4: Moderate fat deposits give the sheep a smooth external appearance over the shoulder, back, rump, and fore rib. Hipbone is not visible. Firm fat deposition becomes evident in brisket and around the tail head.

Body Condition Score 5: Sheep are extremely fat with the excess detectable over the shoulder, backbone, rump, and fore rib. Excess fat deposits in brisket, flank, and tail head regions lack firmness. Sheep appear uncomfortable and reluctant to move about. Quality fleeces are generally found.

Other areas of importance in providing adequate nutrition to sheep:

- Sheep need to be provided with enough roughage in the diet to ensure proper rumen function. After weaning, 70% of daily dry matter fed should be long fiber roughage/forage.
- There should be sufficient access to forage when fed that all sheep have sufficient access to meet their nutritional requirements within 24 hours.
- If supplementary concentrates are fed, all animals in a group should be able to eat at the same time.
- Ewe lambs should not be bred unless they have reached 70% of their mature body weight. If ewe lambs are bred to lamb before they are 18 months of age, they may need to be fed separately from the ewe flock to ensure adequate nutrition during gestation.
- Lambs should not be weaned before 5 weeks of age. Early weaned lambs need a high-protein ration and should not be put on forage only.
- If culling does not remove older sheep with damaged or missing teeth from the flock, attention should be given to providing sufficient feed of a type these sheep can eat and digest.

Sheep Health

When managed in a pasture-based or range system as required by organic production, with attention to suitability of species, and selective breeding for desirable traits, sheep can require few health inputs, require little lambing intervention, operator- or veterinary-provided health treatment and yet display optimal health.

Internal Parasites

It is necessary for special attention to be given to managing internal parasites on organic sheep operations. If breed selection, pasture management, supplements and allowed treatments are not successful in keeping sheep parasite loads from impacting well-being, individual animals need to be given conventional treatments. Lambs are more susceptible to parasites than ewes.

Lameness

Sheep hooves should be examined periodically or at least once yearly, and trimmed if necessary. 95% of the sheep should walk with no obvious limp. Animals with chronic or infrequent trimming management will be seen grazing on their knees and often will have grass stains on their knees. To simplify assessment, sheep can be classified as either lame or not lame. On a 5 point lameness scoring system, sheep that score as 3, 4, or 5 would be classified as lame.

Score 1. Completely normal walking
Score 2. No obvious limp, but may have slight gait abnormalities.
Score 3. All sheep that walk with an obvious limp. Sheep with a score 3 are able to keep up with their flock mates when the group is walking.
Score 4. All sheep that walk with an obvious limp and refuse to bear their full weight on one or more legs. Score 4 animals are not able to keep up with their flock mates when the group is walking.
Score 5. All sheep that have great difficulty walking. Score 5 sheep are barely able to walk.

Physical Alterations

Tail docking should only be done if needed for prevention of fly strike. When necessary, tail docking should be performed by suitably trained and competent individuals on lambs that are between 24 hours and 14 days old. Tails should not be docked shorter than the distal end of the caudal tail fold.

If castration is necessary to avoid breeding by ram lambs, banding should be done by suitably trained and competent individuals on lambs that are between 24 hours and no more than 30 days old.

Sheep Living Conditions
Flocks may be managed with only natural shelter, depending upon climate, breed and lambing season. If sheep are housed or fed in lots, conditions should be such to maintain a cleanliness score or 1 or 2 for 95% of the flock.

Cleanliness Scoring
Fleece maintenance is necessary to prevent manure from accumulating on the back end, rear legs and tail if present. The presence of manure in the fleece is an indicator of poor management that can lead to low conception rates and harbor external parasites. Messy rear ends may be due to washy forage growth or may be from untreated internal parasite loads. Excessive wool growth is problematic for newborn lambs to find the nipple and receive the valuable colostrum.

Score 1. The entire sheep is clean except its feet and lower half of the legs. Animals on lush green pastures may have some soiling of the rear legs..
Score 2. Both the upper and lower legs are soiled and the body/breast and sides are clean.
Score 3. Both the legs and belly are soiled.
Score 4. The legs, belly and sides of the body are soiled.
95% of the sheep should have a cleanliness score of 1 or 2.

Space Allowances
If sheep are confined in buildings or lots during the non-grazing season, the following minimum space allowances should be met. Because the standards require outdoor access for organic livestock unless weather conditions would be injurious to animal health, and because sheep tend towards respiratory difficulties when confined unless ventilation and moisture control is optimum, it is important than confinement of sheep to buildings be of a temporary nature—for treatment of illness, or shelter due to inclement weather, winter lambing or post-shearing—and that outdoor access be provided as soon as possible.

Livestock	**Indoor Floor Space**	**Outdoor Space**
Sheep and goats (pounds)	**Square feet / animal**	**Square feet / animal**
Sheep and Goats	16.0	30.0
Nursing lamb or kid	4.0	8.0

For ewes with lambs add 5 square feet for lambing percentages over 170%. Ewes lambing in confinement should be provided with a dry, bedded area for lambing and should be checked at least 3 times daily during lambing time for lambing difficulties or unclaimed lambs. Lambing jugs (pens) as small as 16 square feet in area may be used for up to three days for a ewe and her lamb(s) to separate them from the rest of the flock for a period of bonding and observation.

Pasturing Sheep

Important factors in managing sheep on pasture:

- Pastures need to be rotated and rested to minimize parasite infestation.
- Sheep need to be protected from predation.
- If electronet fencing is used, it should be kept properly energized.
- Sheep on pasture should be checked at least twice/day during lambing, once/day otherwise.

Humane Handling of Sheep

Sheep should be handled quietly and firmly, with care taken to avoid unnecessary pain or distress. Sheep should not be caught by the fleece, or lifted or dragged by fleece, limbs, ears or tail. Electric prods should not be used on sheep.

Mortality Rates in Sheep Production

In assessing the level of animal welfare that is met on an organic sheep operation, mortality rates and causes should be examined and considered. Mortality in sheep production is generally looked at in terms of lamb mortality before and after weaning and ewe mortality.

Lamb mortality rates are impacted by the prolificacy of the ewe breed (multiple births=higher mortality rate) and lambing conditions. The primary causes of neonatal lamb death are starvation and hypothermia. A lamb survival rate of 95% at weaning is considered to be a goal by many sheep producers.

Similarly, a death loss of 5% or less in weaned lambs or ewes is considered to be indicative of good management. Weaned lambs in organic systems are impacted most greatly by parasites or predation. The mortality rate of ewes is affected by culling rate; if older ewes are kept on the farm, the mortality rate could be higher.