



# Animal Welfare Institute

900 PENNSYLVANIA AVENUE, SE, WASHINGTON, DC 20003 · 202-337-2332 · AWIONLINE.ORG

October 31, 2023

Ms. Dorothy Pelanda, Director of Ohio Department of Agriculture  
Dr. Dennis Summers, State Veterinarian  
Ohio Livestock Care Standards Board  
Ohio Department of Agriculture Division of Animal Health  
8995 E. Main St. Reynoldsburg, OH 43068

Submitted via: [AGReComments@agri.ohio.gov](mailto:AGReComments@agri.ohio.gov)

**Re: Ohio Livestock Care Standards OAC 901:12-1-02, 04 and 06; OAC 901:12-3-01 to 08; OAC 901:12-4-01 to 04**

Dear Ms. Pelanda, Dr. Summers, and Other Members of the Ohio Livestock Care Standards Board,

On behalf of the Animal Welfare Institute (AWI),<sup>1</sup> we appreciate the opportunity to submit comments on the [chapters](#) of the Ohio Livestock Care Standards (OLCS) currently under review. In 2021, together with Dr. Bernard Rollin, we submitted a letter on behalf of AWI regarding the OLCS rules,<sup>2</sup> urging that they be updated to reflect the current best management practices for the care and well-being of livestock and generally accepted veterinary medical practices, as required by ORC § 904.03.<sup>3</sup> We appreciate the board's consideration of our suggestions. Upon reviewing the proposed changes to the OAC 901:12-1-02, 04 and 06; OAC 901:12-3-01 to 08; OAC 901:12-4-01 to 04, we note that additional updates to the rules are required to ensure that they comply with the requirements of § 904.03.

## 901:12-1 Euthanasia

It is unfortunate that only parts of this Chapter are being reviewed at this time. The chapter's stated purpose is to cover euthanasia, which is described in the American Veterinary Medical Association (AVMA) Guidelines for the Euthanasia of Animals: 2020 Edition as "ending the life of an individual animal in a way that minimizes or eliminates pain and distress," thus providing "a good death."<sup>4</sup> However, as discussed below, the chapter describes some killing methods associated with significant levels of pain and distress, erroneously classifying them as methods of "mass euthanasia."<sup>5</sup> In the case of airway-occluding water-based foam, this is classified by the AVMA not as a euthanasia method but as a "depopulation" method, in acknowledgment of its failure to provide a good death. The chapter also fails to mention some methods of mass killing that better protect animal welfare and might legitimately be classified as methods of humane euthanasia.<sup>6</sup>

Given the current wording of Rule 901:12-1-01 (H) Mass Euthanasia, it is evident that the initial OLCS Board, as directed by Ohio voters, intended that, even when large numbers of animals must be destroyed, animal pain and suffering is minimized. Rule 901:12-1-01 (H) also addresses authorization of alternate methods under "unusual conditions which require euthanasia of populations, such as wide spread disease eradication." The ongoing outbreak of Highly Pathogenic Avian Influenza (HPAI) appears

to be precisely this sort of situation. However, most Ohioans would be shocked and horrified by the manner in which the current language has been interpreted: in September 2022, hundreds of thousands – perhaps millions – of HPAI-exposed laying hens in Defiance County, Ohio, were permitted to be killed via ventilation shutdown (VSD) plus heat, meaning that they died over the course of several hours from the intentional induction of heatstroke.<sup>7,8</sup>

In assessing the animal welfare implications of VSD plus heat, the governmental Animal Welfare Committee of the United Kingdom recently described its pathophysiology and animal welfare implications in the following terms:

Hyperthermia and heat stress occur when the body cannot get rid of excess heat for any reason. In the case of VSD, the increases in ambient temperature and humidity cause a "thermal load" that overwhelms a bird's ability to cool itself down (hence supplemental heat can hasten death by hyperthermia). When the ambient temperature exceeds the thermal comfort zone, the birds will start to experience distress and suffering. As heat stress progresses, continuous panting alters the acidbase balance in the blood (respiratory alkalosis) and triggers a physiological stress .... Increased circulation to the skin and ... respiratory tract surface for thermoregulation results in under perfusion of other tissues/organs (e.g. kidney, liver, intestine) which leads to tissue damage and dysfunction. Panting causes dehydration and falling effective blood volume, which, coupled with circulatory changes, further compromises tissue perfusion. Acute heat stress also causes muscle damage which induces weakness and fatigue and releases myoglobin in to the circulation causing renal failure. Collectively, these extreme physiological challenges cause multiple organ failure, compromising cardiac, respiratory and cerebral function. Ultimately, death is likely to be caused by heart failure or respiratory failure, secondary to central nervous system dysfunction. This complex process may be assumed to represent a profoundly negative experience for the bird, and potential welfare harms are likely to include anxiety, fear, pain, malaise, and breathlessness.<sup>9</sup>

The World Organisation for Animal Health (WOAH, formerly known by its French acronym OIE) does not recognize heatstroke-based methods of killing as appropriate for disease control.<sup>10</sup> In response to the use of VSD plus heat in the US, WOAH has encouraged the US delegate to implement methods that meet the following requirement from the WOAH code: "When animals are killed for disease control purposes, methods used should result in immediate death or immediate loss of consciousness lasting until death; when loss of consciousness is not immediate, induction of unconsciousness should be non-aversive or the least aversive possible and should not cause avoidable anxiety, pain, distress or suffering in animals."<sup>11</sup>

If this chapter is to cover both euthanasia and depopulation, it requires revisions, including language to ensure that even in animal disasters and disease emergencies, the use of less inhumane depopulation methods (or mass euthanasia methods) is feasible. This requires better prioritization of animal welfare throughout all phases of the animal disaster management cycle, including planning and preparedness, as recommended by the ethicist on the AVMA Panel on Depopulation.<sup>12</sup>

Recommended Language:

**901:12-1-01 (H) Mass Euthanasia**

For unusual conditions which require euthanasia of populations, such as wide spread disease eradication and exigent circumstances, the director may authorize alternate methods pursuant to section 941.11 of the Revised Code. The alternate methods must minimize animal pain and suffering to the extent reasonably possible while considering the threat to human health and safety. **Methods that cause prolonged suffering, such as those that rely on inducing heatstroke, are not acceptable. Planning and preparedness for animal disasters and health emergencies must ensure the feasibility of using methods that meet the definition of euthanasia (901:12-1-01 (A)) and/or are approved by the World Organisation for Animal Health.**

901:12-1-02 Inhalant agents

This section is problematic because it bars gassing with nitrogen gas or other inert gasses,<sup>13</sup> or low atmospheric pressures stunning (LAPS),<sup>14</sup> as methods of euthanasia. The AVMA recognizes nitrogen and argon gassing as means of euthanizing and depopulating poultry, and recognizes LAPS as a means of euthanizing or depopulating poultry.<sup>15,16</sup> Gassing with carbon dioxide causes pain and distress by numerous mechanisms, including: “(1) pain due to formation of carbonic acid on respiratory and ocular membranes, (2) production of so-called air hunger and a feeling of breathlessness and (3) direct stimulation of ion channels within the amygdala associated with the fear response.”<sup>17</sup> Nitrogen, on the other hand, is a non-aversive gas comprising approximately 78% of our atmosphere. Practical ways of euthanizing or depopulating animals via exposure to nitrogen gas or via LAPS are increasingly available in the US.<sup>18</sup> These methods should be encouraged, rather than barred, by the OLCS rules.

Recommended Language:

**901:12-1-02 Inhalant agents.**

**Carbon dioxide (CO<sub>2</sub>):**

**(A) Compressed carbon dioxide (CO<sub>2</sub>) gas in cylinders or liquid CO<sub>2</sub> delivered via tanker and warmed are the only allowed source of carbon dioxide.**

**(B) Gas concentration must be maintained for at least three minutes after death in containers, and 15 minutes in whole house gassing.**

**Nitrogen (N<sub>2</sub>) or other inert gasses:**

**(A) Nitrogen concentrations of at least 98% (<2% oxygen) must be rapidly reached in containers or poultry houses.**

**Low atmospheric pressure stunning (LAPS) for poultry:**

**(A) LAPS decompression rates must be sufficiently slow, per manufacturer’s guidelines, to ensure adequate animal welfare.**

## 901:12-1-04 Physical Methods

### Section (C) Blunt force trauma

The current language of this section is inconsistent with the AVMA's Guidelines for the Euthanasia of Animals: 2020 Edition and fail to reflect the latest science about manually applied blunt force trauma as a means of euthanasia.

As currently written, the description of blunt force trauma does not distinguish between manually applied and mechanically-applied blunt force trauma. While manually applied blunt force trauma may result in instantaneous loss of consciousness when performed perfectly, it is widely recognized that (1) a high level of skill is required to perform it properly; (2) it can lead to prolonged and significant pain and distress when performed imperfectly; and (3) operators are highly prone to fatigue.<sup>19,20,21</sup> The AVMA Euthanasia Guidelines state:

“Personnel who have to perform manually applied blunt force trauma to the head often find it displeasing and soon become fatigued. Fatigue can lead to inconsistency in application, creating humane concerns about its efficacious application to large numbers of animals. For this reason, the AVMA encourages those using manually applied blunt force trauma to the head as a euthanasia method to actively search for alternate approaches.”<sup>22</sup>

Research has found that determining consciousness can be difficult when manual blunt force trauma is used as a killing method. Thus, piglets killed by this method often received repeated blows – even under controlled research conditions, over 10% of piglets received repeated blows.<sup>23</sup> In contrast, mechanically-inflicted or “controlled” blunt force trauma allows operators to have a high level of confidence that the piglet has lost consciousness. In its assessment of on-farm methods of killing, the European Food Safety Authority (EFSA), an agency of the European Union set up in 2002 to serve as an impartial source of scientific advice, has reviewed this putative euthanasia method. It notes that “In piglets, the manual delivering of a blow to the forehead with a hard object or hitting the head towards a hard surface is ... prone to error...Consequently, the probability of achieving an immediate and humane killing in all cases is low.”<sup>24</sup> In recognition that incomplete concussion leads to “pain and fear,” the EFSA does not recommend manual blunt force trauma as an on-farm killing method.

A related concern is that, under a section not currently under review, "901:12-1-05 | Acceptable euthanasia methods for specific species," blunt force trauma is listed as an acceptable method for chickens, turkeys weighing at least 15 lbs., and goats/sheep <12 lbs. While the AVMA Euthanasia Guidelines list manually applied blunt force trauma for poultry and piglets, with the caveat that those currently using this method should search for alternatives, they explicitly state that manually applied blunt trauma to the head is a method that is “unacceptable for euthanasia of cattle and small ruminants,” including neonates.<sup>25</sup>

To remedy these issues, the rules should be revised to remove reference to manually applied blunt force trauma as a euthanasia method.

### Section (H) Foam

Water-based, airway-occluding foam (sometimes called “firefighting foam”) is listed as a euthanasia method. This is problematic for two reasons. First, water-based foam, which has a medium expansion

ratio and causes death via airway occlusion, is not considered a euthanasia method by the AVMA, but rather a depopulation method for poultry. The 2019 EFSA *Killing for purposes other than slaughter: poultry* report notes that this “dense foam blocks the airways resulting in death by suffocation .... In general, death due to drowning in fluids or suffocation by occlusion of the airways is not accepted as a humane method for killing animals, including poultry.”<sup>26</sup> For this reason, neither the European Union nor the United Kingdom recognize airway-occluding foam as a method of euthanasia or depopulation; rather, they ban its use.

Moreover, this section fails to recognize another type of foam that *is* recognized by the EFSA as a means of humane depopulation and, depending on how it is utilized, might legitimately be considered a method of individual or mass euthanasia. High-expansion nitrogen gas-filled foam has a large bubble size and can be used in barns, corrals, or containers to create an anoxic or very hypoxic atmosphere around animals, causing rapid loss of consciousness. Unlike water-based foam, high-expansion nitrogen foam, when properly administered, does not block the airway or result in drowning.<sup>27,28,29,30,31,32, 33,34,35</sup> It is permitted for use in depopulation in both the European Union and the United Kingdom, and is likely to be included in the forth-coming revised version of the AVMA Depopulation Guidelines.

Recommended Language:

**(H) High expansion nitrogen gas-filled foam is a vehicle for delivering high concentrations of nitrogen (N<sub>2</sub>) gas and displacing oxygen, such that animals lose consciousness and die rapidly from anoxia, without airway occlusion or drowning. Bubble size and water content must be appropriate for the species of animal requiring euthanasia. It can be administered in barns, corrals, or containers.**

## 901:12-3 Generally

### 901:12-3-01 Definitions

#### Section (K)

Currently, the term *humane* is defined “as the care and handling of livestock that seeks to minimize distress through utilization of the standards established by this division.” This definition is problematic. It could be improved by clarifying that humane care and handling must minimize distress, rather than merely seeking to do so.

Moreover, “through utilization of the standards established by this division” should be removed, as there are few rules within the ODA 901:12 (or the codes referenced by them) that describe specific standards for livestock care and handling that result in specific practices being humane. For example, 901:12-3-03 (G) states, “Livestock management procedures as listed in rule 4741-1-13 of the Administrative Code must be performed humanely.” Rule 4741-1-13 merely lists procedures, such as “acts of tagging, ear notching, hoof trimming, deworming, branding, artificial insemination” as well as the following acts with veterinary oversight: “castration, tail docking except for dairy cattle, non-surgical dehorning.” Taken together, these rules require that these various procedures, which include infliction of third-degree burns (branding)<sup>36,37</sup> and tail amputations that may lead to chronic pain via the development of neuromas,<sup>38,39,40,41,42,43</sup> be performed humanely via utilization of specific standards, but then fail to provide the standards.

The definition of *humane* could be improved by defining it as “the care and handling of livestock that minimizes distress,” and retaining the current definition of *distress* as “occurs when livestock are

injured, sick, or in pain.” In line with advancements in the field of animal welfare to recognize the importance of positive welfare states,<sup>44,45</sup> we also suggest expanding the definition of humane as follows: “the care and handling of livestock that minimizes distress and promotes positive experiences and states.”

Recommended language:

**(K) “Humane” is the care and handling of livestock that minimizes distress and promotes positive experiences and states.**

901:12-3-03 Management

Section (B)

AWI commends the intention behind this rule, which states, “When using handling, sorting, or other devices to move livestock or for diagnostic evaluation, the devices must be used humanely.” As noted above, improving the statutory definition of humane could improve the clarity and enforceability of this rule. In addition, the rule should be improved by rewording it to recognize that handling and moving animals must be performed humanely, even when devices are *not* used.

The rule, as written, falls short of current industry animal care standards. For example, the Pork Checkoff program’s Swine Care Handbook describes the following technique for moving piglets: “Pigs should be picked up by holding them under their rib cage or by grabbing a rear leg, above the hock, and then gently setting the piglets into a cart, alleyway or pen. Before releasing a pig to the ground the pig must have a point of contact with the ground or floor before the handler lets go (i.e. a front leg).”<sup>46</sup>

Another example is the use of tail manipulation to encourage cattle to move. When excessive force is applied, a dislocation of vertebral joints occur, commonly referred to as “breaking the tail.”<sup>47,48</sup> It is well established that tail injuries in cattle are most commonly related to poor animal handling and the excessive use of tail jacking or twisting.<sup>49</sup> Experimental research has established the amount of torque required to cause vertebral dislocation (break) a cow’s tail, concluding: “The torque required to break a cow’s tail is unlikely to be applied accidentally if cattle are handled following recommended best practice.”<sup>50</sup>

The National Milk Producers Federation recognizes the connection between broken tails and inhumane animal care in the standards for its National Dairy Farmers Assuring Responsible Management (FARM) Program, which covers 99% of the US milk supply. The FARM program’s most recent Animal Care Manual includes the following language: “The tail must never be used aggressively to move a cow. Calm and appropriate handling does not harm the animal. Tails can be broken through twisting, jacking or other rough handling. This animal observation [percentage of lactating cows with broken tails] is set to detect farm-wide problems in animal handling. The widespread presence of broken tails indicates that there is or has been a handling and stockmanship breakdown.”<sup>51</sup> At present, dairy farms in which 5% or more cows have broken tails are required to develop a “Continuous Improvement Plan,” including continuing education on stockmanship and handling, if they are to maintain FARM certification.

This rule could be significantly improved with a slight modification to the language.

Recommended language:

**(B) When using handling, sorting, or other devices or techniques to move livestock or for diagnostic evaluation, the devices and techniques must be used humanely and not injure the animal.**

Section (D)

The rule regulates the use of electric prods. Unfortunately, the limitations it sets on use of electric prods are outdated and fall short of the restrictions recommended by the veterinary professional organizations and industry trade groups.

The AVMA's policy on Livestock Handling Tools states the following with regard to electric prods:

“Electrical devices (e.g., stock prods) should be used judiciously and only in extreme circumstances when all other techniques have failed. Electrical devices should never be applied to sensitive parts of the animal such as the face, genitalia, or mucous membranes.”<sup>52</sup>

The American Association of Bovine Practitioners (AABP) states “All handling of cattle and/or calves should be performed using low-stress cattle handling methods. Electric prod use should be minimal and reserved only for animals that do not respond to low-stress cattle handling methods. Electric prod use is strongly discouraged for calves less than three months of age.”<sup>53</sup>

Similarly, the North American Meat Institute (NAMI) Animal Handling Guidelines state that “Electric prods should not be used as a primary driving tool and should be used sparingly to move livestock during transport or in plants.”<sup>54</sup> These guidelines also require that “prods ... must not be used on an animal that has been identified as stressed, non-ambulatory, or disabled.” They recommend only using electric prods as a last resort in sheep because the wool insulates the shock, noting that Canadian federal regulations prohibit the use of electric prods on sheep entirely. In contrast, 901:12-3-03 (D) only prohibits the use of electric prods on nonambulatory disabled livestock.

The Pork Checkoff Swine Care Handbook and Common Swine Industry Audit (CSIA) also have stricter standards than the OLCS. The CSIA standards states “Electric prods must not be used as a primary tool for animal movement. If it is necessary to use a prod, it should be applied to the back of the pig behind the shoulder and the duration of the shock must not exceed one second. The pig should be allowed five seconds to respond before another shock is given.”<sup>55</sup> While the OLCS permit use of electric prods on pigs weighing 35 lbs. or more, pork industry standards prohibit their use on piglets as well as for moving a pig of any size out of their pen.<sup>56</sup>

Recommended language:

**(D) Only hand-held battery-operated electric prods of fifty volts or less can be used to facilitate movement of livestock and only in extreme circumstances when all other techniques have failed. Electric prods must not be used: (1) On poultry; (2) On alpacas, llamas, and equine, except for an initial diagnostic evaluation; (3) On calves less than three hundred pounds of body weight or three months of age; (4) On swine less than thirty-five pounds of body weight or any pigs being moved out of pens; (5) In sensitive areas including the eyes, ears, nose, vulva, anus, udder, or testicles; (6) On sheep; and, (7) On disabled (ambulatory or non-ambulatory) or stressed livestock.**

## Section (E)

The OLCS restriction on dragging of conscious animals is weaker and grants more exceptions than do federal regulations, veterinary professional organizations, and industry trade groups. As written, the rule prohibits only “maliciously or recklessly” dragging livestock and specifically permits “dragging an ambulatory disabled or non-ambulatory disabled livestock the minimum distance to allow movement by another method.”

In contrast, federal regulations on treatment of animals at slaughterhouses state: “The dragging of disabled animals and other animals unable to move, while conscious, is prohibited.”<sup>57</sup> This is reiterated in FSIS Directive 6900.2 on Humane Handling: “E. Category V – “Handling of Suspect and Disabled”:  
Animals unable to move may be moved while conscious using suitable equipment (9 CFR 313.2 (d) (3)).  
Dragging of conscious animals is prohibited (9 CFR 313.2 (d) (2)).”<sup>58</sup>

In its policy on Disabled Livestock, the AVMA states, “A nonambulatory animal should not be dragged or lifted by the limbs, tail, neck or ears.”<sup>59</sup> The AABP has a similar position with regard to nonambulatory cattle on farm: “Movement should not involve dragging unless it is determined to be absolutely necessary by a veterinarian and done according to an approved protocol. Dragging by the head or neck is strictly prohibited.”<sup>60</sup> The American Association of Swine Veterinarians (AASV), in its Anti-Abuse Position Statement, considers the following a willful act of neglect/abuse: “dragging of conscious animals by any part of their body except in the rare case where a non-ambulatory animal must be moved from a life-threatening situation.”<sup>61</sup>

Industry groups’ prohibitions on dragging conscious animals are significantly more strict than those in the OLCS rule. NAMI defines dragging a conscious, non-ambulatory animal as a “willful” or “egregious” act of abuse,” regardless of the distance involved.<sup>62</sup> The Cattle Care and Handling Guidelines promulgated by the Beef Quality Assurance (BQA), an industry trade group, state that “Dragging downer animals is unacceptable.”<sup>63</sup> Similarly, the Pork Checkoff Swine Care Handbook states, “Dragging of conscious non-ambulatory animals by any part of their body is not acceptable, except in the rare case where a non-ambulatory animal must be moved from a life-threatening situation. At times, an animal may become non-ambulatory and needs to be euthanized, but is positioned in a way that performing the euthanasia method is not safe for the caretaker. The caretaker may need to reposition the pig to perform the euthanasia method safely and effectively. Repositioning does not include dragging and relocating the non-ambulatory animal in the current pen or another location within the facility.”<sup>64</sup> This is reiterated by the CSIA.<sup>65</sup> The Transport Quality Assurance (TQA) Handbook similarly states that states: “It is ...strictly prohibited for handlers to drag live animals”; “The dragging of disabled animals and other animals unable to move, while conscious, is prohibited”; and “Dragging non-ambulatory animals and deliberately slamming gates on animals are also considered willful acts of abuse.”<sup>66</sup>

Recommended language:

**(E) The responsible party shall not throw, drop, or drag livestock.**

901:12-3-06 Transportation

## Section (B)

AWI commends the OLCS for drawing attention to the importance, prior to transporting livestock, of ensuring each animal is fit for travel. According to Temple Grandin, when it comes to assuring good



animal welfare during transport “the single most important issue is having a fit animal for transport.”<sup>67</sup> Unfortunately, the vagueness of the statute, coupled with the diversity of fitness for travel criteria utilized by different bodies,<sup>68,69</sup> makes it difficult for animal owners and transporters to be certain they are in compliance. Indeed, research has found that farmers, veterinarians, and livestock drivers often disagree regarding an animal’s fitness for transport.<sup>70</sup> This issue is exacerbated by the fact that OAC 901:12-4 (see below) permits transport of nonambulatory disabled livestock to slaughter plants, despite the fact that all international standards and US industry groups bar the marketing of nonambulatory livestock.<sup>71,72,73,74,75</sup>

Transport of cull cattle and breeding pigs who are unfit to travel is recognized as a significant animal welfare problem in North America. Research published in 2020 found that approximately 30% of cull cows sold at livestock markets had poor fitness for transport.<sup>76</sup> Other research has similarly found that cull sows and boars are at increased risk of being transported despite being unfit to travel.<sup>77,78</sup>

This rule could be significantly improved if specific fitness for transport criteria were specified. AWI recommends the rules incorporate by reference the fitness for travel standards in WOA’s code chapter on transport of animals by land.<sup>79</sup> These international standards are recognized by industry programs, such as CSIA and TQA.<sup>80,81</sup>

Article 7.3.7.3 of WOA’s Transport of Animals by Land code lays out the following requirements with regard to establishing fitness to travel:

### 3. Fitness to travel

- a) Each animal should be inspected by a veterinarian or an animal handler to assess fitness to travel. If its fitness to travel is in doubt, the animal should be examined by a veterinarian. Animals found unfit to travel should not be loaded onto a vehicle, except for transport to receive veterinary attention.
- b) Humane and effective arrangements should be made by the owner and the agent for the handling and care of any animal rejected as unfit to travel.
- c) Animals that are unfit to travel include, but may not be limited to:
  - i) those that are sick, injured, weak, disabled or fatigued;
  - ii) those that are unable to stand unaided and bear weight on each leg;
  - iii) those that are blind in both eyes;
  - iv) those that cannot be moved without causing them additional suffering;
  - v) newborn with an unhealed navel;
  - vi) pregnant animals which would be in the final 10% of their gestation period at the planned time of unloading;
  - vii) females travelling without young which have given birth within the previous 48 hours;

viii) those whose body condition would result in poor welfare because of the expected climatic conditions.

d) Risks during transport can be reduced by selecting animals best suited to the conditions of travel and those that are acclimatised to expected weather conditions.

e) Animals at particular risk of suffering poor welfare during transport and which require special conditions (such as in the design of facilities and vehicles, and the length of the journey) and additional attention during transport, may include:

i) large or obese individuals;

ii) very young or old animals;

iii) excitable or aggressive animals;

iv) animals which have had little contact with humans;

v) animals subject to motion sickness;

vi) females in late pregnancy or heavy lactation, dam and offspring;

vii) animals with a history of exposure to stressors or pathogenic agents prior to transport;

viii) animals with unhealed wounds from recent surgical procedures such as dehorning.

Recommended language:

**(B) The responsible party makes the final decision in determining livestock's fitness to travel, in accordance with the standards described in the World Organisation for Animal Health's code (Chapter 7.3, Article 7.3) and the load density. The density of a load shall be determined by the need to minimize injury and allow fallen animals to rise.**

## 901:12-4 Ambulatory Disabled, Non-ambulatory Disabled or Distressed Livestock

### 901:12-4-03 Health

As mentioned above, this section is excessively permissive when compared to international standards, recommendations by veterinary bodies, and standards promulgated by animal agricultural industries in the US.

#### Section (A)

This section deals with requirements for ambulatory disabled animals, which are defined in 901:12-3-01 (A) as "livestock capable of walking but with a physical impairment that severely limits or threatens their ability to walk." Unfortunately, the requirements are paltry when compared with the current best management practices and generally accepted veterinary medical practices upon which the OLCS are legally required to be based.

For example, the OLCS rule requires that ambulatory disabled livestock be “monitored for needed treatment.” However, any animal with a physical impairment that severely limits or threatens their ability to walk requires *actual* treatment, not merely monitoring to determine if treatment is needed. The AVMA makes this clear, stating “If an otherwise healthy animal has been recently injured, and the animal is ambulatory, it should be treated, shipped directly to a state or federally inspected slaughter plant, humanely slaughtered on the farm (where state laws permit), or euthanized. Injured, ambulatory animals should not be commingled with other animals during transport.”<sup>82</sup>

AABP agrees that any injured but ambulatory cattle who are to be transported “should not be commingled with others.”<sup>83</sup> In contrast to the OLCS rule, which permits transport for sale, AABP specifies that injured ambulatory cattle “should only be transported to a veterinary facility or for emergency slaughter at a terminal market.” For ambulatory cattle with significant injuries (as seem to be indicated by the OLCS definition of ambulatory disabled), AABP states: “Injured-ambulatory cattle with musculoskeletal injuries such as fractured limbs (broken legs) or severe lameness which renders the animal unable to bear weight on the affected limb(s) while standing or walking, are NOT fit for transport and should NOT leave the premises of origin unless being transported to a facility for veterinary attention.”<sup>84</sup>

The industry standards of the National Dairy FARM program state: “In best practice, an animal should NOT be marketed if: ... there is a reasonable chance it will become non-ambulatory at any time from leaving the farm to the slaughter facility...it has bone fractures of the limbs or injuries to the spine, it has a condition that will not pass pre-slaughter inspection at the packing or processing facility,” such as “fractures or lameness (3 or greater on the FARM locomotion scale), distended udders causing pain and ambulatory issues, [or] visible open wounds.”<sup>85</sup> (A locomotion score of 3 is defined as: “Difficulty bearing weight on a limb and may also exhibit obvious back arch or head bob.”<sup>86</sup>)

As mentioned above, the industry standards promulgated by TQA and the CSIA adopt the WOAHS fitness to travel criteria which bar transport of animals who are injured, disabled, or unable to stand unaided and bear weight on each leg.<sup>87,88</sup> TQA’s Handbook specifies that “it is the position of the National Pork Board that any pig unable to walk, is ill or significantly injured, should not be transported to market channels.”<sup>89</sup>

Recommended language:

**(A) Ambulatory disabled livestock must be: (1) Provided necessary treatment as recommended by the attending veterinarian; (2) Transported for treatment without commingling with other animals; (3) Transported directly to an inspected slaughter plant or a state custom exempt slaughter plant without commingling with other animals; (4) Slaughtered on the farm pursuant to division 901:2 of the Administrative Code, using an acceptable method of euthanasia pursuant to Chapter 901:12-1 of the Administrative Code; or, (5) Euthanized using an acceptable method of euthanasia pursuant to Chapter 901:12-1 of the Administrative Code.**

Section (B)

This section deals with requirements for non-ambulatory disabled livestock, which are defined in 901:12-3-01 (A) as “livestock that cannot rise from a recumbent position or that cannot walk.” Unfortunately, the requirements are inadequate when compared with the current best management practices and generally accepted veterinary medical practices upon which the OLCS are legally required to be based.

Specifically, the OLCS rule permits non-ambulatory disabled livestock, with the exception of cattle, to be “transported to an inspected slaughter plant or a state custom exempt slaughter plant.” This violates the AVMA policy on Disabled Livestock, which dictates various options depending on the location of the nonambulatory animal:

- *“Down livestock on a farm:*
  - If the animal is not in extreme distress and continues to eat and drink, the producer should contact their veterinarian for consultation and/or treatment and provide food, water, and appropriate shelter and nursing care to keep the animal comfortable and prevent further injury.
  - If the animal is in extreme distress and the condition is obviously irreversible, the animal should be euthanized immediately or humanely slaughtered on the farm (where state laws permit).
  
- *Down livestock at nonterminal markets (e.g., sale yard or auction)*
  - If the animal is not in extreme distress, but is disabled, treatment measures should be initiated.
  - If the animal is in extreme distress or the condition is obviously irreversible, the animal should be euthanized immediately.
  
- *Down livestock at terminal markets (e.g., slaughterhouse or packing plant)*
  - Animals that are down should be euthanized immediately and not taken to slaughter. However, if swine are down, and are not in extreme distress or do not have an obviously irreversible condition, they may be allowed up to 2 hours to recover. Acceptable interventions to assist swine in this recovery include rest, cooling, or other treatments that do not create violative drug residue concerns.”<sup>90</sup>

As described above, the National Pork Board, TQA industry program, and CSIA all prohibit the transport for marketing of pigs unable to walk.<sup>91,92</sup> As Temple Grandin notes in Table 1 of her journal article on evaluating transport fitness criteria of various regulatory agencies and industry groups, there is near universal agreement that being nonambulatory makes a pig unfit to be transported.<sup>93</sup> The same conclusion was reached by EFSA regarding sheep in its recent report on the welfare of small ruminants during transport.<sup>94</sup>

Recommended lan

guage:

**(B) Non-ambulatory disabled livestock must be:**

**(1) Provided feed, water, and shelter from climactic conditions, and given necessary treatments or transported for that treatment; or**

**(2) Slaughtered on the farm pursuant to division 901:2 of the Administrative Code, using an acceptable method of euthanasia pursuant to Chapter 901:12-1 of the Administrative Code; or**

**(3) Immediately euthanized using an acceptable method of euthanasia pursuant to Chapter 901:12-1 of the Administrative Code, if the animal is in distress and the condition is irreversible.**

Thank you for the opportunity to submit comments on the proposed changes to Ohio's livestock care standards. We hope this information will be helpful in updating the rules to comply with the statutory requirement that they be based on the current best management practices for the care and well-being of livestock and generally accepted veterinary medical practices, which have evolved considerably since the rules were originally written. If you would like to discuss this matter further, or request any of the scientific literature cited in this letter, please do not hesitate to contact me at [gwendy@awionline.org](mailto:gwendy@awionline.org).

Sincerely,

Gwendy Reyes-IIIg, DVM, MA  
Veterinary Medicine Consultant  
Animal Welfare Institute

Barry Kipperman, DVM, DACVIM, MSc, DACAW  
Instructor, Veterinary Ethics  
University of California at Davis School of Veterinary Medicine

Jim Reynolds DVM, MPVM, DACAW  
Professor Large Animal Medicine and Animal Welfare  
Western University of Health Sciences, College of Veterinary Medicine

---

<sup>1</sup> The Animal Welfare Institute (AWI) is a nonprofit founded in 1951 and dedicated to reducing animal suffering caused by people. AWI seeks better treatment of animals, including those used in agriculture. In furtherance of its mission to alleviate animal suffering, AWI promotes higher welfare farming systems and works to raise awareness about the issues associated with how large numbers of animals are farmed in the US.

<sup>2</sup> Reyes-IIIg, G., Reynolds, J., Kipperman, B., & Rollins, B.E. (2021, August 12). Letter to Ms. Dorothy Pelanda, Dennis Summers, and Ohio Livestock Care Standards Board.

<https://awionline.org/sites/default/files/uploads/documents/Letter-OLCS-Board-Aug-2021.pdf>

<sup>3</sup> Ohio Rev. Code. §904.03. (2010). <https://codes.ohio.gov/ohio-revised-code/section-904.03>

<sup>4</sup> AVMA (2020). AVMA Guidelines for the Euthanasia of Animals: 2020 Edition.

<https://www.avma.org/sites/default/files/2020-02/Guidelines-on-Euthanasia-2020.pdf>

<sup>5</sup> Rule 901:12-1-01 (H) Mass Euthanasia. <https://codes.ohio.gov/ohio-administrative-code/rule-901:12-1-01>

<sup>6</sup> AWI maintains a publicly accessible, continually updated reference on sources of equipment for less inhumane methods of depopulation: <https://awionline.org/sites/default/files/uploads/documents/More-Humane-Farmed-Animal-Depopulation-Methods.pdf>

<sup>7</sup> APHIS (2023). 2022-2023 Confirmations of Highly Pathogenic Avian Influenza in Commercial and Backyard Flocks. <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/avian/avian-influenza/hpai-2022/2022-hpai-commercial-backyard-flocks>

<sup>8</sup> Animal Welfare Institute. (2023). Bird Depopulations Feb. 2022–Mar. 2023 (Received in response to FOIA requests), page 12. <https://awionline.org/sites/default/files/uploads/documents/Bird-Depopulations-Feb-2022-Mar-2023.pdf>

<sup>9</sup> Animal Welfare Committee. (2023, June). Advice on emergency culling for the depopulation of poultry affected by high pathogenic avian influenza (HPAI) – consideration of ventilation shutdown (VSD).

<https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2023/09/animal->

---

[welfare-committee-advice-on-emergency-culling-for-the-depopulation-of-poultry-affected-by-high-pathogenic-avian-influenza-hpai-consideration-of-ventilation-shutdown-vs-d/documents/animal-welfare-committee-advice-for-the-emergency-culling-of-poultry/animal-welfare-committee-advice-for-the-emergency-culling-of-poultry/govscot%3Adocument/Animal%2BWelfare%2BCommittee%2BAdvice%2Bfor%2Bthe%2Bemergency%2Bculling%2Bof%2Bpoultry.pdf](https://www.woah.org/fileadmin/Home/eng/Health_standards/tahc/current/chapitre_aw_killing.pdf)

<sup>10</sup> WOA. (2022). Chapter 8.6. Killing of Animals for Disease Control Purposes.

[https://www.woah.org/fileadmin/Home/eng/Health\\_standards/tahc/current/chapitre\\_aw\\_killing.pdf](https://www.woah.org/fileadmin/Home/eng/Health_standards/tahc/current/chapitre_aw_killing.pdf)

<sup>11</sup> Eloit, M. (2022, July 22). Letter to Ben Williamson (Compassion in World Farming) from Monique Eloit, Director General of World Organisation for Animal Health.

<sup>12</sup> Anthony, R., & De Paula Vieira, A. (2022). One Health Animal Disaster Management: An Ethics of Care Approach. *Journal of applied animal welfare science: JAAWS*, 25(2), 180–194.

<https://doi.org/10.1080/10888705.2022.2040360>

<sup>13</sup> EFSA Panel on Animal Health and Welfare (AHAW), Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Depner, K., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Gortázar Schmidt, C., Miranda Chueca, M. Á., Roberts, H. C., Sihvonen, L. H., Spooler, H., Stahl, K., Velarde Calvo, A., Viltrop, A., Winckler, C., Candiani, D., Fabris, C., ... Michel, V. (2019). Killing for purposes other than slaughter: poultry. *EFSA journal. European Food Safety Authority*, 17(11), e05850. <https://doi.org/10.2903/j.efsa.2019.5850>

<sup>14</sup> EFSA Panel on Animal Health and Welfare (AHAW), More, S., Bicout, D., Bøtner, A., Butterworth, A., Calistri, P., Depner, K., Edwards, S., Garin-Bastuji, B., Good, M., Gortázar Schmidt, C., Miranda, M. A., Nielsen, S. S., Sihvonen, L., Spooler, H., Willeberg, P., Raj, M., Thulke, H. H., Velarde, A., Vyssotski, A., ... Michel, V. (2017). Low atmospheric pressure system for stunning broiler chickens. *EFSA journal. European Food Safety Authority*, 15(12), e05056. <https://doi.org/10.2903/j.efsa.2017.5056>

<sup>15</sup> AVMA. (2020). AVMA Guidelines for the Euthanasia of Animals: 2020 Edition.

<https://www.avma.org/sites/default/files/2020-02/Guidelines-on-Euthanasia-2020.pdf>

<sup>16</sup> AVMA. (2019) AVMA Guidelines for the Depopulation of Animals: 2019 Edition.

<https://www.avma.org/sites/default/files/resources/AVMA-Guidelines-for-the-Depopulation-of-Animals.pdf>

<sup>17</sup> EFSA Panel on Animal Health and Welfare (AHAW), Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Depner, K., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Gortázar Schmidt, C., Michel, V., Miranda Chueca, M. Á., Roberts, H. C., Sihvonen, L. H., Spooler, H., Stahl, K., Viltrop, A., Winckler, C., Candiani, D., Fabris, C., ... Velarde, A. (2020). Welfare of pigs at slaughter. *EFSA journal. European Food Safety Authority*, 18(6), e06148. <https://doi.org/10.2903/j.efsa.2020.6148>

<sup>18</sup> Animal Welfare Institute. (2023). More Humane Farmed Animal Depopulation Methods: Information and Sources. <https://awionline.org/sites/default/files/uploads/documents/More-Humane-Farmed-Animal-Depopulation-Methods.pdf>

<sup>19</sup> Velarde, A. & Dalmau, A. (2018). Chapter 10 - Slaughter of pigs. In M. Špinko (Ed.) *Advances in Pig Welfare*. Woodhead Publishing, pp. 295-322. <https://doi.org/10.1016/B978-0-08-101012-9.00010-1>

<sup>20</sup> Dalla Costa, F. A., Gibson, T. J., Oliveira, S. E. O., Gregory, N. G., Coldebella, A., Faucitano, L., Ludtke, C. B., Buss, L. P., & Dalla Costa, O. A. (2020). Evaluation of physical euthanasia for neonatal piglets on-farm. *Journal of animal science*, 98(7), skaa204. <https://doi.org/10.1093/jas/skaa204>

<sup>21</sup> Anderson, K. N., Deen, J., Karczewski, J., Zhitnitskiy, P. E., & Vogel, K. D. (2022). History and best practices of captive bolt euthanasia for swine. *Translational animal science*, 6(2), txac065. <https://doi.org/10.1093/tas/txac065>

<sup>22</sup> AVMA. (2020). AVMA Guidelines for the Euthanasia of Animals: 2020 Edition.

<https://www.avma.org/sites/default/files/2020-02/Guidelines-on-Euthanasia-2020.pdf>

<sup>23</sup> Whiting, T. L., Steele, G. G., Wamnes, S., & Green, C. (2011). Evaluation of methods of rapid mass killing of segregated early weaned piglets. *The Canadian veterinary journal = La revue veterinaire canadienne*, 52(7), 753–758.

<sup>24</sup> EFSA Panel on Animal Health and Welfare (AHAW), Saxmose Nielsen, S., Alvarez, J., Bicout, D. J., Calistri, P., Depner, K., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Gortázar Schmidt, C., Michel, V., Miranda Chueca, M. Á., Roberts, H. C., Sihvonen, L. H., Spooler, H., Stahl, K., Viltrop, A., Winckler, C., Candiani, D., Fabris, C., ... Velarde, A. (2020). Welfare of pigs during killing for purposes other than slaughter. *EFSA journal. European Food Safety Authority*, 18(7), e06195. <https://doi.org/10.2903/j.efsa.2020.6195>

<sup>25</sup> AVMA. (2020). AVMA Guidelines for the Euthanasia of Animals: 2020 Edition.

<https://www.avma.org/sites/default/files/2020-02/Guidelines-on-Euthanasia-2020.pdf>

- 
- <sup>26</sup> EFSA Panel on Animal Health and Welfare (AHAW), Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Depner, K., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Gortázar Schmidt, C., Miranda Chueca, M. Á., Roberts, H. C., Sihvonen, L. H., Spoolder, H., Stahl, K., Velarde Calvo, A., Viltrop, A., Winckler, C., Candiani, D., Fabris, C., ... Michel, V. (2019). Killing for purposes other than slaughter: poultry. *EFSA journal. European Food Safety Authority*, 17(11), e05850. <https://doi.org/10.2903/j.efsa.2019.5850>
- <sup>27</sup> University of Glasgow; Royal Veterinary College; Livetec; LST International. (2008). Welfare Assessment of Anoxic Gas-Foam as an Agent for Emergency Killing of Poultry; Research Project Final Report MH0143; United Kingdom Department for Environment, Food and Rural Affairs. <https://randd.defra.gov.uk/ProjectDetails?ProjectId=15445>
- <sup>28</sup> Raj, A. B., Smith, C., & Hickman, G. (2008). Novel method for killing poultry in houses with dry foam created using nitrogen. *The Veterinary record*, 162(22), 722–723. <https://doi.org/10.1136/vr.162.22.722>
- <sup>29</sup> University of Glasgow; Livetec; LST International. (2010). *Further Study to Develop a Humane Method to Kill Poultry Using Gas Filled Foam*; Research Project Final Report MH0144; United Kingdom Department for Environment, Food and Rural Affairs, 2010. <https://randd.defra.gov.uk/ProjectDetails?ProjectId=16822>
- <sup>30</sup> Gerritzen, M.A., Reimert, H.G.M., Hindle, V.A., McKeegan, D.E.F., & Sparrey, J.M. (2010). Welfare assessment of gas filled foam as an agent for killing poultry, Report 399. Livestock Research Wageningen UR. [https://www.researchgate.net/publication/275647993\\_welfare\\_assessment\\_of\\_gas\\_filled\\_foam\\_as\\_an\\_agent\\_for\\_killing\\_poultry](https://www.researchgate.net/publication/275647993_welfare_assessment_of_gas_filled_foam_as_an_agent_for_killing_poultry)
- <sup>31</sup> McKeegan, D. E.F., Reimert, H. G., Hindle, V. A., Boulcott, P., Sparrey, J. M., Wathes, C. M., Demmers, T. G., & Gerritzen, M. A. (2013). Physiological and behavioral responses of poultry exposed to gas-filled high expansion foam. *Poultry science*, 92(5), 1145–1154. <https://doi.org/10.3382/ps.2012-02587>
- <sup>32</sup> Culhane, M. (2023). Effective use of inert gas (nitrogen) for poultry depopulation requires methods that consider bird species, age, size, and sex-specific factors. Presented at AVMA Humane Endings Conference, Chicago, IL, Jan. 26-29, 2023.
- <sup>33</sup> Sparrey, J. (2021). *Depopulation of Swine by Inert Gassing Utilizing the Livetec Systems Nitrogen Foam Delivery System*; NPB #20-099. <https://porkcheckoff.org/wp-content/uploads/2022/07/20-099-SPARREY-final-rpt.pdf>
- <sup>34</sup> Williams, T. (2022, March 30). Validation and Demonstration of Utilizing High Expansion Nitrogen Foam for Large Scale Depopulation of Swine, NPB Project #21-069. Available at: <https://porkcheckoff.org/research/validation-and-demonstration-of-utilizing-high-expansion-nitrogen-foam-for-large-scale-depopulation-of-swine/>
- <sup>35</sup> Williams, T., Hill, J., Flory, G., Sparrey, J. & Hunt, L. (2023). The Utilization of Livetec Systems' Nitrogen Foam Delivery System for the Rapid, Large-scale Depopulation of Swine: Final Report.
- <sup>36</sup> Steagall, P. V., Bustamante, H., Johnson, C. B., & Turner, P. V. (2021). Pain Management in Farm Animals: Focus on Cattle, Sheep and Pigs. *Animals*, 11(6), 1483. doi:10.3390/ani11061483
- <sup>37</sup> Tucker, C. B., Mintline, E. M., Banuelos, J., Walker, K. A., Hoar, B., Drake, D., & Weary, D. M. (2014). Effect of a cooling gel on pain sensitivity and healing of hot-iron cattle brands. *Journal of animal science*, 92(12), 5666–5673. <https://doi.org/10.2527/jas.2014-7860>
- <sup>38</sup> French, N. P., & Morgan, K. L. (1992). Neuromata in docked lambs' tails. *Research in veterinary science*, 52(3), 389–390. [https://doi.org/10.1016/0034-5288\(92\)90045-4](https://doi.org/10.1016/0034-5288(92)90045-4)
- <sup>39</sup> Larrondo, C., Bustamante, H., Paredes, E., & Gallo, C. (2019). Long-term hyperalgesia and traumatic neuroma formation in tail-docked lambs. *Animal Welfare*, 28, 443-454.
- <sup>40</sup> Simonsen, H. B., Klinken, L., & Bindseil, E. (1991). Histopathology of intact and docked pigtails. *The British veterinary journal*, 147(5), 407–412. [https://doi.org/10.1016/0007-1935\(91\)90082-X](https://doi.org/10.1016/0007-1935(91)90082-X)
- <sup>41</sup> Sandercock, D. A., Smith, S. H., Di Giminiani, P., & Edwards, S. A. (2016). Histopathological Characterization of Tail Injury and Traumatic Neuroma Development after Tail Docking in Piglets. *Journal of comparative pathology*, 155(1), 40–49. <https://doi.org/10.1016/j.jcpa.2016.05.003>
- <sup>42</sup> Herskin, M. S., Thodberg, K., & Jensen, H. E. (2015). Effects of tail docking and docking length on neuroanatomical changes in healed tail tips of pigs. *Animal: an international journal of animal bioscience*, 9(4), 677–681. <https://doi.org/10.1017/S1751731114002857>
- <sup>43</sup> Kells, N. J., Beausoleil, N. J., Johnson, C. B., Sutherland, M. A., Morrison, R. S., & Roe, W. (2017). Comparison of neural histomorphology in tail tips from pigs docked using clippers or cautery iron. *Animal : an international journal of animal bioscience*, 11(7), 1222–1227. <https://doi.org/10.1017/S1751731116002500>
- <sup>44</sup> Mellor D. J. (2016). Updating Animal Welfare Thinking: Moving beyond the "Five Freedoms" towards "A Life Worth Living". *Animals : an open access journal from MDPI*, 6(3), 21. <https://doi.org/10.3390/ani6030021>



- 
- <sup>45</sup> Mellor D. J. (2016). Moving beyond the "Five Freedoms" by Updating the "Five Provisions" and Introducing Aligned "Animal Welfare Aims". *Animals : an open access journal from MDPI*, 6(10), 59. <https://doi.org/10.3390/ani6100059>
- <sup>46</sup> Pork Checkoff. (2018) Swine Care Handbook 2019. <https://library.pork.org/?mediald=B75B3A6A-75B3-441B-9A316C342353D356#>
- <sup>47</sup> Olsen, H. E., Anderson, K. N., Creutzinger, K. C., & Vogel, K. D. (2023). Broken tails in Holstein dairy cattle: A cross-sectional study. *JDS communications*, 4(4), 265–268. <https://doi.org/10.3168/jdsc.2022-0254>
- <sup>48</sup> Laven, R. A., & Jermy, M. C. (2020). Measuring the torque required to cause vertebral dislocation in cattle tails. *New Zealand veterinary journal*, 68(2), 107–111. <https://doi.org/10.1080/00480169.2019.1685019>
- <sup>49</sup> Cook, N.B. (2018). Chapter 2 - Assessment of cattle welfare: Common animal-based measures. In C.B. Tucker (Ed.), *Advances in Cattle Welfare*. Woodhead Publishing, pp 27-53. doi.org/10.1016/B978-0-08-100938-3.00002-4
- <sup>50</sup> Laven, R. A., & Jermy, M. C. (2020). Measuring the torque required to cause vertebral dislocation in cattle tails. *New Zealand veterinary journal*, 68(2), 107–111. <https://doi.org/10.1080/00480169.2019.1685019>
- <sup>51</sup> National Milk Producers Federation. (2020). Farmers Assuring Responsible Management Animal Care Reference Manual 2020-2022, p. 29. [https://nationaldairyfarm.com/wp-content/uploads/2021/12/FARM\\_Animal-Care-4-Manual\\_Abbreviated\\_FINAL\\_112921\\_No-appendix.pdf](https://nationaldairyfarm.com/wp-content/uploads/2021/12/FARM_Animal-Care-4-Manual_Abbreviated_FINAL_112921_No-appendix.pdf)
- <sup>52</sup> AVMA. (n.d.). Livestock handling tools. <https://www.avma.org/resources-tools/avma-policies/livestock-handling-tools>
- <sup>53</sup> AABP. (2019). Transportation and Fitness-to-Travel Recommendations for Cattle. [https://www.aabp.org/Resources/AABP\\_Guidelines/transportationguidelines-2019.pdf](https://www.aabp.org/Resources/AABP_Guidelines/transportationguidelines-2019.pdf)
- <sup>54</sup> Grandin, T. (2021). Recommended Animal Handling Guidelines & Audit Guide: A Systemic Approach to Animal Welfare. [https://meatinstitute.org/sites/default/files/original%20documents/Animal\\_Handling\\_Guide\\_English.pdf](https://meatinstitute.org/sites/default/files/original%20documents/Animal_Handling_Guide_English.pdf)
- <sup>55</sup> National Pork Board. (2023). Common Swine Industry Audit .p. 15. <https://go.porkcheckoff.org/l/775063/2022-12-23/2yxc5b>
- <sup>56</sup> Pork Checkoff. (2018) Swine Care Handbook 2019. <https://library.pork.org/?mediald=B75B3A6A-75B3-441B-9A316C342353D356#>
- <sup>57</sup> 9 CFR 313.2 (d) (2))
- <sup>58</sup> FSIS Directive 6900.2 (pg 14): [https://www.fsis.usda.gov/sites/default/files/media\\_file/2020-07/6900.2.pdf](https://www.fsis.usda.gov/sites/default/files/media_file/2020-07/6900.2.pdf)
- <sup>59</sup> AVMA. (n.d.) Disabled livestock. <https://www.avma.org/resources-tools/avma-policies/disabled-livestock>
- <sup>60</sup> AABP. (2020). Care and disposition of non-ambulatory and injured ambulatory cattle. [https://aabp.org/Resources/AABP\\_Guidelines/non-ambulatory2020.pdf](https://aabp.org/Resources/AABP_Guidelines/non-ambulatory2020.pdf)
- <sup>61</sup> AASV. (2021). AASV Anti-Abuse Position Statement. <https://www.aasv.org/aasv/position-anti-abuse.htm>
- <sup>62</sup> Grandin, T. (2021). Recommended Animal Handling Guidelines & Audit Guide: A Systemic Approach to Animal Welfare. P. 12, 85 [https://meatinstitute.org/sites/default/files/original%20documents/Animal\\_Handling\\_Guide\\_English.pdf](https://meatinstitute.org/sites/default/files/original%20documents/Animal_Handling_Guide_English.pdf)
- <sup>63</sup> BQA. (2019). Cattle Care and Handling Guidelines. <https://www.bqa.org/Media/BQA/Docs/cattle-care-handling-guidelines-2019-revised.pdf>
- <sup>64</sup> Pork Checkoff. (2018) Swine Care Handbook 2019. <https://library.pork.org/?mediald=B75B3A6A-75B3-441B-9A316C342353D356#>
- <sup>65</sup> National Pork Board. (2023). Common Swine Industry Audit, p. 13. <https://go.porkcheckoff.org/l/775063/2022-12-23/2yxc5b>
- <sup>66</sup> National Pork Board. (2015). Transport Quality Assurance Handbook Version 5. <https://d3fns0a45gcg1a.cloudfront.net/sites/all/files/documents/TQA/2014-Version5/TQAHandbookV5.PDF>
- <sup>67</sup> Grandin, T. (2001). Perspectives on transportation issues: The importance of having physically fit cattle and pigs. *Journal of Animal Science*, 79(E-Suppl), E201–. <https://doi.org/10.2527/jas2001.79E-SupplE201x>
- <sup>68</sup> Grandin T. (2016). Transport Fitness of Cull Sows and Boars: A Comparison of Different Guidelines on Fitness for Transport. *Animals : an open access journal from MDPI*, 6(12), 77. <https://doi.org/10.3390/ani6120077>
- <sup>69</sup> AABP. (2019). Transportation and Fitness-to-Travel Recommendations for Cattle. [https://www.aabp.org/Resources/AABP\\_Guidelines/transportationguidelines-2019.pdf](https://www.aabp.org/Resources/AABP_Guidelines/transportationguidelines-2019.pdf)
- <sup>70</sup> Dahl-Pedersen, K., Foldager, L., Herskin, M. S., Houe, H., & Thomsen, P. T. (2018). Lameness scoring and assessment of fitness for transport in dairy cows: Agreement among and between farmers, veterinarians and livestock drivers. *Research in veterinary science*, 119, 162–166. <https://doi.org/10.1016/j.rvsc.2018.06.017>



- 
- <sup>71</sup> WOA. (2022). Chapter 7.3 Transport of Animals by Land. [https://www.woah.org/fileadmin/Home/eng/Health\\_standards/tahc/current/chapitre\\_aw\\_land\\_transpt.pdf](https://www.woah.org/fileadmin/Home/eng/Health_standards/tahc/current/chapitre_aw_land_transpt.pdf)
- <sup>72</sup> [https://nationaldairyfarm.com/wp-content/uploads/2021/12/FARM\\_Animal-Care-4-Manual\\_Abbreviated\\_FINAL\\_112921\\_No-appendix.pdf](https://nationaldairyfarm.com/wp-content/uploads/2021/12/FARM_Animal-Care-4-Manual_Abbreviated_FINAL_112921_No-appendix.pdf)
- <sup>73</sup> BQA. (2019). Cattle Care and Handling Guidelines. <https://www.bqa.org/Media/BQA/Docs/cattle-care-handling-guidelines-2019-revised.pdf>
- <sup>74</sup> National Pork Board. (2023). Common Swine Industry Audit. <https://go.porkcheckoff.org/l/775063/2022-12-23/2yxc5b>
- <sup>75</sup> National Pork Board. (2015). Transport Quality Assurance Handbook Version 5. <https://d3fns0a45gcg1a.cloudfront.net/sites/all/files/documents/TQA/2014-Version5/TQAHandbookV5.PDF>
- <sup>76</sup> Stojkov, J., von Keyserlingk, M. A. G., Duffield, T., & Fraser, D. (2020). Fitness for transport of cull dairy cows at livestock markets. *Journal of dairy science*, 103(3), 2650–2661. <https://doi.org/10.3168/jds.2019-17454>
- <sup>77</sup> Millman, S.T. (2016, May 31). Caring for compromised swine – an assessment swine marketed through buying stations and development of fitness for transport guidelines – NPB #13-261. <https://www.porkcheckoff.org/wp-content/uploads/2021/02/13-261-MILLMAN-ISU.pdf>
- <sup>78</sup> Grandin T. (2016). Transport Fitness of Cull Sows and Boars: A Comparison of Different Guidelines on Fitness for Transport. *Animals : an open access journal from MDPI*, 6(12), 77. <https://doi.org/10.3390/ani6120077>
- <sup>79</sup> WOA. (2022). Chapter 7.3 Transport of Animals by Land. [https://www.woah.org/fileadmin/Home/eng/Health\\_standards/tahc/current/chapitre\\_aw\\_land\\_transpt.pdf](https://www.woah.org/fileadmin/Home/eng/Health_standards/tahc/current/chapitre_aw_land_transpt.pdf)
- <sup>80</sup> CSIA, page 22 “Pigs that are unable to walk or significantly injured consistent with TQA’s list of fitness for transport must not be transported.”
- <sup>81</sup> National Pork Board. (2015). Transport Quality Assurance Handbook Version 5. P 35. <https://d3fns0a45gcg1a.cloudfront.net/sites/all/files/documents/TQA/2014-Version5/TQAHandbookV5.PDF>
- <sup>82</sup> AVMA. (n.d.) Disabled livestock. <https://www.avma.org/resources-tools/avma-policies/disabled-livestock>
- <sup>83</sup> AABP. (2019). Transportation and Fitness-to-Travel Recommendations for Cattle. [https://www.aabp.org/Resources/AABP\\_Guidelines/transportationguidelines-2019.pdf](https://www.aabp.org/Resources/AABP_Guidelines/transportationguidelines-2019.pdf)
- <sup>84</sup> AABP. (2020). Care and Disposition of Non-Ambulatory and Injured Ambulatory Cattle. [https://aabp.org/Resources/AABP\\_Guidelines/non-ambulatory2020.pdf](https://aabp.org/Resources/AABP_Guidelines/non-ambulatory2020.pdf)
- <sup>85</sup> National Milk Producers Federation. (2020). Farmers Assuring Responsible Management Animal Care Reference Manual 2020-2022, p 70. [https://nationaldairyfarm.com/wp-content/uploads/2021/12/FARM\\_Animal-Care-4-Manual\\_Abbreviated\\_FINAL\\_112921\\_No-appendix.pdf](https://nationaldairyfarm.com/wp-content/uploads/2021/12/FARM_Animal-Care-4-Manual_Abbreviated_FINAL_112921_No-appendix.pdf)
- <sup>86</sup> <sup>86</sup> National Milk Producers Federation. (2020). Farmers Assuring Responsible Management Animal Care Reference Manual 2020-2022, p. 103. [https://nationaldairyfarm.com/wp-content/uploads/2020/09/FARM\\_Animal-Care-4-Manual\\_Layout\\_FINAL\\_091520\\_SinglePages.pdf](https://nationaldairyfarm.com/wp-content/uploads/2020/09/FARM_Animal-Care-4-Manual_Layout_FINAL_091520_SinglePages.pdf)
- <sup>87</sup> National Pork Board. (2023). Common Swine Industry Audit, p. 25. <https://go.porkcheckoff.org/l/775063/2022-12-23/2yxc5b>
- <sup>88</sup> National Pork Board. (2015). Transport Quality Assurance Handbook Version 5. <https://d3fns0a45gcg1a.cloudfront.net/sites/all/files/documents/TQA/2014-Version5/TQAHandbookV5.PDF>
- <sup>89</sup> National Pork Board. (2015). Transport Quality Assurance Handbook Version 5. <https://d3fns0a45gcg1a.cloudfront.net/sites/all/files/documents/TQA/2014-Version5/TQAHandbookV5.PDF>
- <sup>90</sup> AVMA. (n.d.) Disabled livestock. <https://www.avma.org/resources-tools/avma-policies/disabled-livestock>
- <sup>91</sup> CSIA page 22 “Pigs that are unable to walk or significantly injured consistent with TQA’s list of fitness for transport must not be transported.”
- <sup>92</sup> National Pork Board. (2015). Transport Quality Assurance Handbook Version 5. <https://d3fns0a45gcg1a.cloudfront.net/sites/all/files/documents/TQA/2014-Version5/TQAHandbookV5.PDF>
- <sup>93</sup> Grandin T. (2016). Transport Fitness of Cull Sows and Boars: A Comparison of Different Guidelines on Fitness for Transport. *Animals : an open access journal from MDPI*, 6(12), 77. <https://doi.org/10.3390/ani6120077>
- <sup>94</sup> EFSA Panel on Animal Health and Welfare (AHAW); Nielsen SS, Alvarez J, Bicout DJ, Calistri P, Canali E, Drewe JA, Garin-Bastuji B, Gonzales Rojas JL, Gortázar Schmidt C, Michel V, Miranda Chueca MÁ, Padalino B, Pasquali P, Roberts HC, Spooler H, Stahl K, Velarde A, Viltrop A, Winckler C, Earley B, Edwards S, Faucitano L, Marti S, Miranda de La Lama GC, Nanni Costa L, Thomsen PT, Ashe S, Mur L, Van der Stede Y, Herskin M. Welfare of small ruminants during transport. *EFSA J.* 2022 Sep 7;20(9):e07404. doi: 10.2903/j.efsa.2022.7404. See Table 15.