



Animal Welfare Institute

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Submitted via email and mail

FSIS Docket Clerk
Food Safety and Inspection Service
U.S. Department of Agriculture
Room 2534 South Building
1400 Independence Ave., S.W.
Washington, D.C. 20250
fsispetitions@usda.gov

Re: Petition to Require the Use of Video Cameras to Observe the Interior of Gondolas during the Slaughter of Pigs with CO₂ to Ensure Compliance with the FMIA and HMSA

I. Summary of Requested Action

The Animal Welfare Institute, Compassion in World Farming USA, World Animal Protection, Humane Society of the United States, Humane Society Legislative Fund, and Humane Society Veterinary Medical Association hereby petition the U.S. Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS) to exercise its authority under the Federal Meat Inspection Act (FMIA) (21 U.S.C. §§ 601 et seq.), Humane Methods of Slaughter Act (HMSA) (7 U.S.C. §§ 1901 et seq.), and their implementing regulations, to require slaughter establishments to install video cameras inside gondolas used in carbon dioxide (CO₂) gas slaughter systems employed to stun and kill pigs. Such a requirement is necessary to ensure that the interiors of the gondolas, and all of the pigs inside of the gondolas, can be examined and inspected during stunning or killing, so that FSIS inspectors are able to evaluate whether the animals are being slaughtered humanely, as required by law. *See* 21 U.S.C. § 603(b) (requiring inspectors to make “an examination and inspection of the method by which amenable species are slaughtered”); 7 U.S.C. § 1901 (requiring the slaughtering of livestock to be “carried out only by humane methods”).

Specifically, as discussed in more detail in Section VI, we request that FSIS amend its CO₂ regulation (9 C.F.R. § 313.5) to include the following the language:

When carbon dioxide gas is used to anesthetize or induce death in pigs, the entire interior of the gondola holding the animals, and all of the animals inside the gondola, must remain visible to Program inspectors at all times during the

operation. To ensure such visibility, video cameras must be installed inside the gondola. The cameras must simultaneously permanently record and provide live, high-quality visual and audio feed video at all times during the operation. No live animals may enter the gondola unless these visual and auditory standards are met.

We submit this petition pursuant to Section 553(e) of the Administrative Procedure Act (5 U.S.C. §§ 551 et seq.), Section 392.5(a) of FSIS's administrative regulations regarding petitions for rulemaking (9 C.F.R. §§ 392.1 et seq.), and the First Amendment of the U.S. Constitution. AWI requests a prompt response to this petition and asks that FSIS explain in writing the basis for the action the agency decides to take in response to the petition. *See* 5 U.S.C. § 555(e). Copies of all non-legal sources of information referred to in the petition have been downloaded onto a thumb drive and mailed, along with a printed copy of the petition, to the FSIS Docket Clerk at the above address. *See* 9 C.F.R. § 392.4.

II. Petitioners

The Animal Welfare Institute (AWI), founded in 1951 and headquartered in Washington, DC, is a nonprofit charitable institution whose mission is to alleviate animal suffering caused by people. The organization fulfills this mission through public education, research, collaboration, media relations, litigation, outreach to agencies, engaging its members and supporters, and advocacy for stronger laws both domestically and internationally. AWI seeks better treatment of animals everywhere—in the wild, in research, in agriculture, in commerce, and in our communities.

Compassion in World Farming (CIWF) is an international, nonprofit organization whose mission is to attain a humane, sustainable, and equitable food system on behalf of farmed animals, nature, people, and the planet. Founded in 1967, CIWF is the oldest welfare organization dedicated exclusively to farmed animals. CIWF's team of research, policy, and business experts synthesize a range of stakeholder viewpoints as well as current scientific research on animal welfare, climate change, public health, and more to identify cross-sectional solutions to these pressing challenges. The organization is headquartered in the United Kingdom and has offices in the United States, France, Spain, Italy, Czechia, Poland, the Netherlands, and China.

World Animal Protection is a global non-profit organization that exposes destructive, exploitative, and cruel systems and provides practical and achievable solutions. For over 70 years, the organization has been rewriting the story for animals. Working across almost 50 countries with offices in 12, the organization's activities focus on: exposing cruel systems, promoting and supporting animal-friendly alternatives, influencing legislation for policy change, and campaigning to mobilize grass-roots influence. To make a positive impact for the largest number of animals globally, World Animal Protection prioritizes animals in farming and wild animals exploited for use in entertainment, as pets, and in fashion.

The Humane Society of the United States (HSUS) is a national nonprofit animal protection organization headquartered in Washington, D.C., with millions of members and constituents. The HSUS' mission is to reduce animal suffering and create meaningful societal change by actively advocating against animal cruelty, working to enforce existing laws, promoting sensible public policies, and educating the public about animal issues.

The Humane Society Legislative Fund (HSLF) works to pass animal protection laws at the state and federal level, to educate the public about animal protection issues and support humane candidates for office. Formed in 2004, HSLF is incorporated under section 501(c)(4) of the Internal Revenue Code as a separate lobbying affiliate of the Humane Society of the United States.

The Humane Society Veterinary Medical Association (HSVMA) is a professional veterinary association with a focus on animal welfare. HSVMA uses its expertise and resources to advance animal welfare via leadership, advocacy, education and service.

III. Factual Background

A. Use of CO₂ gas systems to stun and kill pigs in the U.S.

The use of CO₂ gas for stunning pigs in connection with slaughter has been permitted in the United States for more than a century.¹ Its use for killing pigs for slaughter was authorized by FSIS in 1994.² USDA data regarding the number of slaughter establishments that use CO₂ to stun or kill pigs, and the numbers of pigs stunned and killed, is not publicly available. AWI requested this data through askFSIS, but the agency declined to provide the information.³

It is clear, however, that in the United States today, “CO₂ stunning of pigs is the major method that is used in large slaughter plants.”⁴ According to unpublished data from the Pig Improvement Company, the use of CO₂ gas to stun pigs has increased dramatically in recent decades. In 1999, CO₂ was used to stun 2 percent of all pigs and 2.2 percent of pigs in establishments that slaughtered more than 4,500 pigs per day.⁵ By 2020, those numbers had risen to 86.2 percent and 96.2 percent, respectively.⁶ Today, according to FSIS enforcement records, at least 32 slaughter plants use CO₂ gas slaughter systems.⁷

According to the National Agricultural Statistics Service, in 2020 (the most recent year represented in the Pig Improvement Company report) more than 131 million pigs were slaughtered in the United States.⁸ If 86.2 percent of those pigs were slaughtered using CO₂ gas, then approximately 113.5 million pigs were stunned or killed using CO₂ gas systems in 2020. That figure is several times greater than the combined total number of cattle, calves, and sheep slaughtered in the country the same year (about 36.4 million).⁹ Because CO₂ gas is used to stun

¹ Use of Carbon Dioxide in the Humane Slaughter of Swine, 59 Fed. Reg. 21,638, 21,639 (May 26, 1994).

² *Id.*

³ See Email from Risk Management and Innovations Staff, Food Safety & Inspection Serv., to Zack Strong, Senior Staff Att’y, Farm Animal Program, Animal Welfare Inst. (Feb. 24, 2023, 4:26 PM) [hereinafter askFSIS Email].

⁴ THE SLAUGHTER OF FARMED ANIMALS: PRACTICAL WAYS OF ENHANCING ANIMAL WELFARE 136 (Temple Grandin & Michael Cockram eds., 2020) [hereinafter SLAUGHTER OF FARMED ANIMALS].

⁵ Neal Matthews et al., *CO2 Stunning: Historical Perspective*, PIG IMPROVEMENT CO. 4 (2020), <https://www.meatinstitute.org/index.php/a/GetDocumentAction/i/181685?ht=a/GetDocumentAction/i/181685>.

⁶ *Id.*

⁷ See Animal Welfare Inst., U.S. Pork Plants Using Carbon Dioxide Stunning (Mar. 22, 2023).

⁸ NAT’L AGRIC. STATS. SERV., LIVESTOCK SLAUGHTER 2020 SUMMARY (2021).

⁹ *Id.* at 8. According to the NASS data, approximately 33.5 million cattle, 600 thousand calves, and 2.3 million sheep were slaughtered in 2020. *Id.*

and kill such a large number of animals annually, it is particularly important to ensure that it is deployed in a manner that is compliant with humane slaughter requirements.

B. CO₂ stunning/killing systems

Controlled atmospheric stunning (CAS) systems, such as CO₂ gas chambers, typically work by creating environments with high levels of carbon dioxide and low levels of oxygen, which induce similar changes (hypoxia, hypercapnia) within the affected animal.¹⁰ High levels of CO₂ in the blood stream cause a drop in pH, which leads to “acidification of the brain cells result[ing] in a depression of brain activity that causes loss of consciousness”¹¹ Typically, pigs are driven into a gondola that descends into a pit, the bottom of which contains a high concentration of CO₂ (usually greater than 80 percent).¹² The pigs are then exposed to increasing concentrations of CO₂ as they descend from the loading area to the bottom of the pit. After a predetermined period, the gondola ascends and the pigs are removed from the gondolas and bled, or exsanguinated. In some systems, exposure to CO₂ is intended to cause death; in others, it is merely intended to stun the animals and death is achieved via exsanguination. In either case, pigs typically spend several minutes in the enclosed gondola, out of view of plant inspectors.¹³

FSIS humane slaughter regulations set forth specific operational requirements for CO₂ gas slaughter systems in the United States:

The carbon dioxide gas shall be administered in a tunnel which is designed to permit the effective exposure of the animal. Two types of tunnels, based on the same principle, are in common use for carbon dioxide anesthesia. They are the “U” type tunnel and the “Straight Line” type tunnel, and are based on the principle that carbon dioxide gas has a higher specific gravity than air. The tunnels are open at both ends for entry and exit of animals and have a depressed central section. Anesthetizing, or, in the case of swine, death-inducing, carbon dioxide concentrations are maintained in the central sections of the tunnels.

¹⁰ P. Rodríguez et al., *Assessment of Unconsciousness During Carbon Dioxide Stunning in Pigs*, 17 *ANIMAL WELFARE* 341 (2003); Sophie Atkinson et al., *Animal Welfare and Meat Quality Assessment in Gas Stunning During Commercial Slaughter of Pigs Using Hypercapnic-Hypoxia (20% CO₂ 2% O₂) Compared to Acute Hypercapnia (90% CO₂ in Air)* 10 *ANIMALS* 2440 (2020) [hereinafter *Animal Welfare and Meat Quality Assessment*]; AVMA *Guidelines for the Humane Slaughter of Animals: 2016 Edition*, AM. VETERINARY MED. ASS’N, <https://www.avma.org/sites/default/files/resources/Humane-Slaughter-Guidelines.pdf>.

¹¹ Merel Verhoeven et al., *Time to Loss of Consciousness and Its Relation to Behavior in Slaughter Pigs During Stunning with 80 or 95% Carbon Dioxide*, 3 *FRONTIERS VETERINARY SCI.*, 38 (2016).

¹² *Id.*

¹³ See, e.g., *Animal Welfare and Meat Quality Assessment*, *supra* note 10 (“The time of exposure during 90C stunning ranged from 193 s to 259 s (237.3 ± 11.34 s), following the recommendations of the manufacturer (Butina), which is to keep pigs in the stunning unit for no less than 180 s.”); Isabel Lechner et al., *Discomfort Period of Fattening Pigs and Sows Stunned with CO₂: Duration and Potential Influencing Factors in a Commercial Setting*, 179 *MEAT SCI.*, 108,535 (2021) (“Exposure to CO₂ is set in a way that pigs remain 160 s in >88% CO₂. Sows are prompted to a decelerated passage within 240 s remaining in >88% CO₂.”); Verhoeven et al., *supra* note 11 (In a dip-lift system, “[d]escent of the gondola took 23 s, before remaining stationary at the bottom for 300 s before ascending in 23 s. The total cycle lasted 346 s”); Sophie Atkinson et al., *Assessing Pig Welfare at Stunning in Swedish Commercial Abattoirs Using CO₂ Group-Stun Methods*, 21 *ANIMAL WELFARE* 487, 429 (2012) [hereinafter *Assessing Pig Welfare at Stunning*] (“The shortest CO₂ exposure time recorded in the paternoster systems was 238 s; indicating pigs were exposed to CO₂ concentrations higher than 80% for at least 192 s.”).

Effective anaesthetization is produced in these central sections. Animals are driven from holding pens through pathways constructed of large-diameter pipe or smooth metal and onto continuous conveyor devices that move the animals through the tunnels. The animals are either compartmentalized on the conveyors by mechanical impellers synchronized with the conveyor or they are otherwise prevented from crowding. While impellers are used to compartmentalize the animals, mechanically or manually operated gates are used to move the animals onto the conveyors. Surgically anaesthetized animals, or killed swine, are moved out of the tunnels by the same continuous conveyors that moved them into and through the carbon dioxide gas.

9 C.F.R. § 313.5(b)(1)(i).

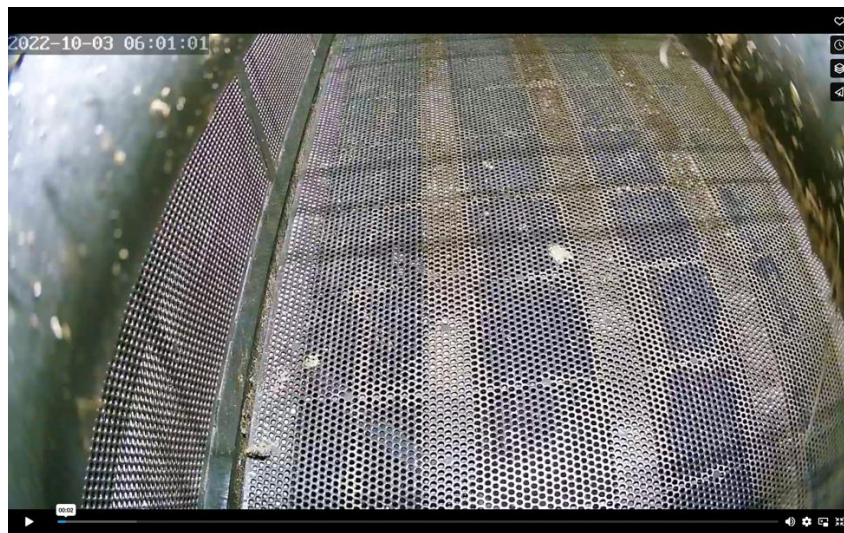


Figure 1. Interior of empty CO₂ gas system gondola at Smithfield Foods slaughter plant.¹⁴

Importantly, CAS methods, including exposure to high concentrations of CO₂, do not result in an immediate loss of consciousness, so the animals may experience negative affective states during the period between initial exposure to the gas and subsequent loss of consciousness.¹⁵ Prior to loss of consciousness, pigs may experience acute respiratory distress, hyperventilation, a sense of breathlessness, gasping,¹⁶ suffocation,¹⁷ pain due to irritation of the mucus membranes,¹⁸

¹⁴ Raven Deerbrook, *Smithfield Gas Chamber (Vernon, CA) – Key Clip Interior 1*, VIMEO 00:02 (Oct. 3, 2022), <https://vimeo.com/775646476> [hereinafter *Smithfield Key Clip Interior 1*].

¹⁵ Erik Sindhøj et al., *Review: Potential Alternatives to High-Concentration Carbon Dioxide Stunning of Pigs at Slaughter* 15 ANIMAL (2021); Sophie Atkinson et al., SWEDISH UNIV. OF AGRIC. SCIS., GROUP STUNNING OF PIGS DURING COMMERCIAL SLAUGHTER IN A BUTINA PASTEROSTER SYSTEM USING 80% NITROGEN AND 20% CARBON DIOXIDE COMPARED TO 90% CARBON DIOXIDE 37 (Mar. 13, 2015) [hereinafter *Group Stunning of Pigs*]; EFSA Panel on Animal Health and Welfare et al., *Welfare of Pigs at Slaughter*, 18 EFSA J. 6148 (2020) [hereinafter *EFSA Welfare of Pigs at Slaughter*].

¹⁶ European Food Safety Authority, *Opinion of the Scientific Panel on Animal Health and Welfare on a Request from the Commission Related to Welfare Aspects of the Main Systems of Stunning and Killing the Main Commercial Species of Animals*, 45 EFSA J. 1 (2004) [hereinafter *EFSA Opinion of the Scientific Panel*].

¹⁷ Rodríguez et al., *supra* note 10.

¹⁸ EFSA *Opinion of the Scientific Panel*, *supra* note 16. A.B.M. Raj & Neville G. Gregory, *Welfare Implications of the Gas Stunning of Pigs* 2. *Stress of Induction of Anaesthesia*, 5 ANIMAL WELFARE 71 (1996); Petra Peppel &

muscular excitation,¹⁹ fear, panic, and stress.²⁰ The duration and severity of such excitement and discomfort can vary due to a range of factors, discussed next.

C. Circumstances that can reduce pig welfare during CO₂ gas stunning or killing

A wide range of factors can negatively impact the welfare of pigs while being stunned or killed in CO₂ gas systems. These factors generally fall into two categories: those that impact the length of time it takes for the pigs to be rendered unconscious; and those that affect the excitement and discomfort levels of the pigs. Because there are so many variables that can affect pig welfare during CO₂ slaughter, it is especially important that plant inspectors be able to directly observe this slaughter method and assess whether the CO₂ gas system settings and controls are appropriately adjusted and whether humane slaughter is achieved.

i. Length of time to render pigs unconscious

Several factors can affect time to loss of consciousness. Research on CO₂ stunning and slaughter methods has reported a range of latencies to animal loss of consciousness resulting from CO₂ exposure in commercial slaughterhouses, from an average of 14 seconds to 66 seconds.²¹ One factor is the percentage of CO₂ at the bottom of the pit. For example, Verhoeven et al (2016) observed that pigs stunned with 80 percent CO₂ took an average of 47 seconds to lose consciousness, while those stunned with 95 percent CO₂ took an average of 33 seconds.²²

In addition, different plants may use different concentrations of CO₂ gas, and even when those concentrations are set at specific levels, the levels can fluctuate. For instance, environmental conditions, such as wind,²³ temperature, and humidity outside of the slaughter facility can affect the CO₂ concentration in the pit, potentially due to changes in patterns of opening and closing doors within the plant.²⁴ Exposure to lower concentrations of CO₂ than intended raises welfare concerns because it typically prolongs the time to unconsciousness and may also result in a shallower plane of anesthesia, such that pigs may regain consciousness during sticking or bleeding.²⁵

Another factor is the speed at which the gondola descends into the pit.²⁶ Increasing the speed of the conveyor could mean that animals are not rendered unconscious because the time of exposure

Fernand Anton, *Responses of Rat Medullary Dorsal Horn Neurons Following Intranasal Noxious Chemical Stimulation: Effects of Stimulus, Intensity, Duration, and Interstimulus Interval*, 70 J. NEUROPHYSIOLOGY 6 (1993).

¹⁹ EFSA *Opinion of the Scientific Panel*, *supra* note 16; Rodríguez et al., *supra* note 10.

²⁰ Rodríguez et al., *supra* note 10; Aline R. Steiner et al., *Humanely Ending the Life of Animals: Research Priorities to Identify Alternatives to Carbon Dioxide* 9 ANIMALS 911 (2019).

²¹ *Id.*; Neville G. Gregory et al., *An Assessment of Carbon Dioxide Stunning in Pigs*, 121 VETERINARY REC. 517 (1987); Lechner et al., *supra* note 13; Verhoeven et al., *supra* note 11.

²² Verhoeven et al., *supra* note 11.

²³ Temple Grandin, *Carbon Dioxide Stunning of Pigs*, COLO. STATE UNIV., <https://www.grandin.com/humane/carbon.stun.html> (last updated May 2022).

²⁴ Lechner et al., *supra* note 13.

²⁵ EFSA *Welfare of Pigs at Slaughter*, *supra* note 15.

²⁶ E.C. Jongman et al., *Pre-Slaughter Factors Linked to Variation in Responses to Carbon Dioxide Gas Stunning in Pig Abattoirs*, 15 ANIMAL 100134 (2020).

to the gas has been decreased.²⁷ Similarly, the design of the system could affect time to unconsciousness, as dip-lift systems lower pigs directly into maximum concentrations of CO₂, while paternoster (Ferris wheel-like) designs have multiple cages or gondolas that rotate more erratically through a CO₂ pit, with stops at variable intervals for loading and unloading pigs.²⁸

Grandin (2022) explained that design flaws and problems with a plant's ventilation system (such as changes in the number of fans turned on, or opening and closing doors near the chamber) can affect CO₂ concentrations.²⁹ Time of day has also been found to correlate with the length of time required to achieve loss of consciousness, and may be related to CO₂ gas concentration, the speed of the slaughter line, how long pigs waited in lairage, or other factors that vary during the day.³⁰

In addition, research has increasingly found that factors such as sex, age, pulmonary disease, breed, and genetics may affect how rapidly a pig loses consciousness upon exposure to a given concentration of CO₂.³¹ For example, the “discomfort period”—defined as “the time between the animals’ first reaction to the environment or to the gas and the observation of complete relaxation of the head of the last pig in the group within the gondola”—experienced by sows was found in one study to be longer than that experienced by slaughter weight pigs, who typically weigh about half as much, are much younger, and may be less likely to be afflicted with lung disease.³² Latency to loss of consciousness has also been found to vary with farm of origin and between slaughterhouses, suggesting that genetic differences and health conditions (such as pulmonary disease) may affect how quickly insensibility can be induced with CO₂.³³

Improper handling and inadequate attention to animal health can also affect time to loss of consciousness. One study found that increased use of electric prods in the forcing pens was associated with longer latency to loss of posture during CO₂ stunning.³⁴ Another study found that overloading of gondolas can lead to inadequate exposure to CO₂ by some pigs. In such circumstances, some pigs may fall on top of other pigs, compressing their chests and leading to inadequate inhalation of gas to cause loss of consciousness.³⁵ Further, health conditions such as lung abnormalities can also impact the effectiveness of CO₂ exposure:

Another issue that has to be examined when assessing reactions to CO₂ or other controlled atmosphere stunning methods is the condition of the lungs. In commercial market-weight pigs, observations by people working in the industry indicate that 7-8% may have severe lung lesions. Lung lesions may increase the time required to lose consciousness.³⁶

²⁷ Grandin, *supra* note 23.

²⁸ EFSA *Welfare of Pigs at Slaughter*, *supra* note 15.

²⁹ Grandin, *supra* note 23.

³⁰ Jongman et al., *supra* note 26.

³¹ Lechner et al., *supra* note 13.

³² *Id.* at 2.

³³ Jongman et al., *supra* note 26.

³⁴ *Id.*

³⁵ EFSA *Welfare of Pigs at Slaughter*, *supra* note 15.

³⁶ SLAUGHTER OF FARMED ANIMALS, *supra* note 4, at 138.

Grandin (2022) noted that the first indication of problems with “stack pressure,” the inadvertent removal of CO₂ gas from within an open chamber or pit, is often not until conscious animals suddenly begin to emerge from the gondolas.³⁷ By that point, the problem is severe, and prior loads of pigs may have experienced increased latency to loss of consciousness unbeknownst to FSIS inspectors.

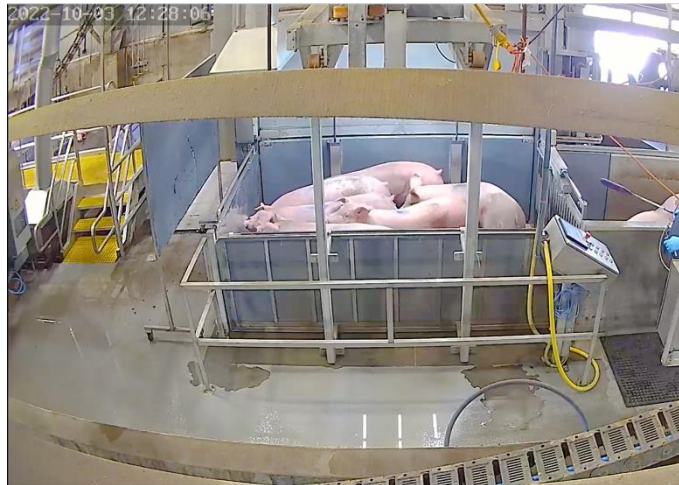


Figure 2. Pigs being positioned for loading into a CO₂ gas system gondola at Smithfield Foods slaughter plant.³⁸

ii. Levels of distress, discomfort, and excitement experienced by pigs prior to loss of consciousness

As with time to loss of consciousness, there are a number of factors that can influence levels of distress and agitation that pigs experience while being stunned or killed with CO₂. For example, individual pigs and different breeds or ages of pigs can react differently when exposed to the same quantity and concentrations of gas. Since at least 1977, researchers have understood that individual response to specific CO₂ concentrations varies widely among pigs, with some gradually becoming laterally recumbent “with very little or no struggling,”³⁹ and others showing variable degrees of excitement.⁴⁰ Aversive reactions to CO₂ gas, such as crawling and attempting to escape, have also been found to vary widely between sexes,⁴¹ and sows have been found to have a longer discomfort period than slaughter pigs.⁴²

Genetics may also affect the severity of distress and discomfort a pig exposed to CO₂ experiences. Researchers have noted that certain breeds of pigs appear to react more calmly to high concentrations of CO₂, which may in part be related to whether they carry the halothane

³⁷ Grandin, *supra* note 23.

³⁸ Raven Deerbrook, *Smithfield Gas Chamber (Vernon, CA) - Exterior 1 Hour Sample*, VIMEO 05:06 (Oct. 3, 2022), <https://vimeo.com/775389107>.

³⁹ N. H. Dodman, *Observations on the Use of the Wernberg Dip-Lift Carbon Dioxide Apparatus for Pre-Slaughter Anaesthesia of Pigs*, 133 BRIT. VETERINARY J. 71, 78 (1977).

⁴⁰ Jongman et al., *supra* note 26; Grandin, *supra* note 23.

⁴¹ Jongman et al., *supra* note 26.

⁴² Lechner et al., *supra* note 13.

gene, a gene associated with susceptibility to porcine stress syndrome.⁴³ Some research comparing pigs with a halothane-free genotype to pigs with a heterozygous halothane genotype has found that heterozygous pigs suffered more “acute stress” from CO₂ exposure, had more escape attempts when exposed to high concentrations of CO₂, and were more reactive to the initial experience of descending into the pit even when it was filled with atmospheric air.⁴⁴

Another factor that can affect pig welfare is the condition of the gas. When the temperature or humidity of CO₂ is too low, it may cause cutaneous burns or pain on inhalation.⁴⁵ This can occur due to improper vaporization of the gas or failure to accurately monitor gas temperature. Further, a drop in gas concentration can prolong induction of unconsciousness, leading to prolonged respiratory distress.⁴⁶

High sound levels, both from machinery and the screams of other pigs in the stunner, can also increase animal stress and affect the degree of excitement or distress experienced during CO₂ exposure.⁴⁷ In addition, extreme environmental temperature and humidity conditions experienced by the pigs during transport and lairage are associated with an increased proportion of animals showing “hyperactive” behaviors.

Aversive handling of pigs as they are moved toward the stunning area has also been found to increase the likelihood of an aversive reaction to CO₂ stunning.⁴⁸ This is recognized in FSIS humane slaughter regulations, which state:

The driving or conveying of the animals to the carbon dioxide chamber shall be done with a minimum of excitement and discomfort to the animals. Delivery of calm animals to the anesthesia chamber is essential since the induction, or early phase, of anesthesia is less violent with docile animals.

9 C.F.R. § 313.5(a)(2).

The European Food Safety Authority (EFSA) identifies three different mechanisms that can cause discomfort and excitement in pigs stunned or killed with CO₂ gas: “(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.”⁴⁹ These mechanisms cause a variety of behaviors commonly reported in research on this area—which would signal pig excitement and/or discomfort to FSIS inspectors—including retreat and escape attempts, crawling, jumping, muscular contractions and gasping prior to loss of posture,

⁴³ Grandin, *supra* note 23; A. Velarde, et al., *Aversion to Carbon Dioxide Stunning in Pigs: Effect of Carbon Dioxide Concentration and Halothane Genotype*, 16 ANIMAL WELFARE 513 (2007).

⁴⁴ Velarde, et al., *supra* note 43.

⁴⁵ EFSA *Welfare of Pigs at Slaughter*, *supra* note 15, at 68; EFSA Panel on Animal Health and Welfare, et al., *Welfare of Pigs During Killing for Purposes Other Than Slaughter*, 18 EFSA J. 6195 (2020).

⁴⁶ *Id.*

⁴⁷ Lechner et al., *supra* note 13.

⁴⁸ Jongman et al., *supra* note 26.

⁴⁹ EFSA *Welfare of Pigs at Slaughter*, *supra* note 15.

lacrimation (the secretion of tears), vocalization, salivation, and head shaking/lateral head movements.⁵⁰

D. Current use of video recording in pig slaughter plants

While some pig slaughter plants in the United States use video recording equipment,⁵¹ very few, if any, appear to use video cameras inside the gondolas used in CO₂ gas slaughter systems. A review of FSIS noncompliance reports since 2016 reveals that some pig slaughter plants use cameras to monitor the areas around the gondola or chamber. For example, FSIS inspectors in pig slaughter plants have recorded humane handling violations in the alleyways and push gate systems near the CO₂ stunner in the form of overuse of electric prods,⁵² inappropriate treatment of nonambulatory animals,⁵³ and overly aggressive driving.⁵⁴ In each of these incidents, the records indicate that cameras installed in the vicinity of the CO₂ chamber documented the noncompliant behavior. This suggests that cameras installed inside gondolas would be equally effective in enabling inspectors to record instances of inhumane slaughter and respond with appropriate enforcement actions. However, there do not appear to be any records indicating that slaughter facilities have installed cameras inside the gondolas themselves. Nor does there appear to be any publicly available information regarding whether any companies that operate pig slaughter facilities in the United States use video cameras or other surveillance equipment within CO₂ systems. AWI requested this information from askFSIS, but the agency declined to provide an answer.⁵⁵

By contrast, several other countries require video monitoring of CO₂ gas slaughter systems. For example, Spain requires slaughterhouses to install video surveillance systems that “cover the facilities in which live animals are found, including unloading areas, driving aisles, and areas where stunning and bleeding to death activities are carried out”⁵⁶ This includes “areas that are difficult for staff to access, including confined spaces, [and] installations that make up the stunning system”⁵⁷ Similarly, in England and Scotland, regulations require the installation of closed circuit television (CCTV) systems in slaughterhouses that provide “a complete and clear image of killing and related operations in all areas of the slaughterhouse where live animals are present,”⁵⁸ including “in areas where it is difficult for inspectors to access, for example in cramped

⁵⁰ Verhoeven et al., *supra* note 11; Jongman et al., *supra* note 26; Gregory et al., *supra* note 21; *Animal Welfare and Meat Quality Assessment*, *supra* note 10.

⁵¹ See, e.g., American Meat Institute, Comment Letter on Draft Compliance Guidelines for Use of Video or Other Electronic Monitoring or Recording Equipment in Federally Inspected Establishments (Docket Number FSIS-2010-0016) (Dec. 14, 2010).

⁵² FOOD SAFETY & INSPECTION SERV., TABLE: HUMANE HANDLING NONCOMPLIANCE RECORDS (NRS) FROM JAN-MAR, 2016 49 (2016).

⁵³ *Id.* at 28.

⁵⁴ FOOD SAFETY & INSPECTION SERV., TABLE: MOIs IN RESPONSE TO FOIA2020-259 25 (2020).

⁵⁵ See askFSIS Email, *supra* note 3.

⁵⁶ General Disposition art. 3(1) (B.O.E. 2022, 695) (Spain).

⁵⁷ *Id.* art. 4(1)(a).

⁵⁸ The Mandatory Use of Closed Circuit Television in Slaughterhouses Regulations 2018, SI 2018/556, art. 3 (Eng.); The Mandatory Use of Closed Circuit Television in Slaughterhouses Regulations 2020, SI 2020/384, art. 3 (Scot.).

killing areas and gas stunning systems.”⁵⁹ And in Israel, laws have mandated the use of CCTV in slaughter plants since 2015. Video footage is viewed by slaughter plants supervision teams and transmitted live to a central control room at the Ministry of Agriculture’s Veterinary Services to deter violations of animal welfare laws.⁶⁰ Facilities are required to install cameras that film at all times and in every area where animals are handled up to their slaughter.⁶¹ Similarly, the World Organization for Animal Health recommends that “[i]t should be possible to inspect the CO₂ chamber whilst it is in use . . .”⁶²

A recent incident in the United States illustrates how installing cameras in gondolas used in CO₂ gas systems could help plant inspectors assess whether the slaughter is humane. On January 18, 2023, *Wired* magazine published an article about an undercover investigator who placed hidden cameras inside a CO₂ gas stunning gondola in a meatpacking plant in Los Angeles owned by Smithfield Foods.⁶³ The recordings showed that, as the gondola was lowered into the CO₂ pit, “the pigs began to squeal and thrash violently around in the cage, struggling to escape and convulsing for nearly a minute before finally laying still.”⁶⁴ During this time—approximately three minutes—the pigs remained enclosed in the gondola and out of view of plant inspectors. The recordings were the first of their kind in the United States to be released to the public showing what pigs can experience during CO₂ stunning at a slaughterhouse.



Figure 3. Pigs inside of a gondola descending into the CO₂ pit of a stunning system at Smithfield Foods slaughter plant.⁶⁵

⁵⁹ DEP’T FOR ENV’T, FOOD AND RURAL AFFS., GUIDANCE ON THE MANDATORY USE OF CLOSED CIRCUIT TELEVISION IN SLAUGHTERHOUSES REGULATIONS, 2018 (UK); SCOTTISH GOV., GUIDANCE ON THE MANDATORY USE OF CLOSED CIRCUIT TELEVISION IN SLAUGHTERHOUSES REGULATIONS, 2020 (SCOT.).

⁶⁰ Press Release, Israeli Ministry of Agric. and Rural Dev., The Ministry of Agric. Is Ordering the Installation of Cameras in Abattoirs and Slaughterhouses that Will Broadcast Live to a Ministry Control Room (Dec. 27, 2015), <https://www.gov.il/en/departments/news/cameras-in-slaughterhouses>.

⁶¹ *Id.*

⁶² WORLD ORGANISATION FOR ANIMAL HEALTH, *Slaughter of Animals*, in TERRESTRIAL ANIMAL HEALTH CODE 1, 5 (2022).

⁶³ Andy Greenberg, *Spy Cams Reveal the Grim Reality of Slaughterhouse Gas Chambers*, WIRED (Jan. 18, 2023, 11:00 AM), <https://www.wired.com/story/dex-pig-slaughterhouse-gas-chambers-videos/>.

⁶⁴ *Id.*; See Raven Deerbrook, *Smithfield Foods’ Gas Chambers*, VIMEO (Jan. 18, 2023), <https://vimeo.com/showcase/10122399>.

⁶⁵ *Smithfield Key Clip Interior 1*, *supra* note 14, at 00:47.

In response, 18 veterinarians submitted an open letter to the American Veterinary Medical Association expressing concern with, among other things, the aversive reaction exhibited by the pigs in response to the gas.⁶⁶ More than 100 veterinarians have joined the letter since it was submitted.⁶⁷ Whether FSIS determines that these videos document any humane slaughter violations, the video recordings made clear that the ability to observe pigs inside the gondola during stunning offers an enhanced opportunity for observers to gauge the humaneness of the conditions inside. Requiring slaughter establishments to ensure such visibility by installing cameras inside gondolas would provide information to plant inspectors about the duration and severity of the pigs' reactions to the gas, their time to loss of consciousness, and other important details relevant to humane slaughter and proper operation of the stunning machine. Such data would augment and complement the information currently provided by exterior monitoring instruments.

IV. Legal Framework

A. The HMSA and FMIA, and their implementing regulations, require FSIS to ensure that the interior of CO₂ gondolas can be observed while pigs are being stunned and killed, in order to assess whether slaughter is being conducted humanely.

FSIS has the legal authority, responsibility, and obligation to require observation of the interiors of gondolas in CO₂ systems while they are in use to stun and kill pigs to ensure compliance with humane slaughter mandates. The HMSA requires that “the slaughtering of livestock and the handling of livestock in connection with slaughter shall be carried out only by humane methods.” 7 U.S.C. § 1901. “No method of slaughtering or handling in connection with slaughtering shall be deemed to comply with the public policy of the United States unless it is humane.” *Id.* § 1902.

In turn, the FMIA requires FSIS to examine and inspect all methods used to slaughter animals to ensure their humane treatment. The Act instructs, “For the purpose of preventing the inhumane slaughtering of livestock, the Secretary shall cause to be made, by inspectors appointed for that purpose, an examination and inspection of the method by which amenable species are slaughtered and handled in connection with slaughter in the slaughtering establishments inspected under this chapter.” 21 U.S.C. § 603(b) (emphasis added). “Inspection” means actual, “organoleptic” (using the senses, such as sight and hearing) observation, during which inspectors must “pay close attention” and apply “critical appraisal.” *Am. Fed’n of Gov’t Emp.’s v. Glickman*, 215 F.3d 7, 11 (D.C. Cir. 2000).

The HMSA specifically recognizes “chemical . . . means” as one permitted method of slaughtering and handling pigs (7 U.S.C. § 1902), and FSIS regulations identify “the use of carbon dioxide gas” as an authorized form of chemical means (9 C.F.R. § 313.5). Thus, FSIS is

⁶⁶ See *Death by Suffocation Is Not a Humane Ending*, OUR HONOR (Feb. 5, 2023), <https://www.ourhonor.org/gaschambers>.

⁶⁷ *Id.*

obligated to examine and inspect—i.e., directly observe—the use of CO₂ gas to slaughter pigs to evaluate whether the animals are handled and slaughtered humanely.

To be humane, a slaughter method must be “rapid and effective.” 7 U.S.C. § 1902(a). When CO₂ gas is used, FSIS regulations require that it be administered “so as to produce surgical anesthesia in animals before they are shackled, hoisted, thrown, cast, or cut.” 9 C.F.R. § 313.5(a)(1). Further, “[t]he animals shall be exposed to the carbon dioxide gas in a way that will accomplish the anesthesia quickly and calmly, with a minimum of excitement and discomfort to the animals.” 9 C.F.R. § 313.5(a)(1). FSIS directives instruct plant inspectors to “verify that the establishment’s stunning methods are being appropriately and effectively administered, producing immediate unconsciousness in the animal.” FSIS Directive 6900.2 Ch. IV § III.H. Thus, FSIS must ensure that the use of CO₂ gas to slaughter pigs can be examined and inspected in a way that enables inspectors to verify that the process is rapid and effective, that surgical anesthesia is produced, and that the animals experience minimal distress or aversion.

B. FSIS directives and guidelines acknowledge and encourage the use of video surveillance to help evaluate whether pigs in CO₂ gas stunning systems are handled and slaughtered humanely.

FSIS directives and guidelines identify and encourage the use of video surveillance or other recording equipment as one method that could help to verify the humane slaughter of pigs with CO₂ gas. FSIS Directive 6900.2 explains that video surveillance can be employed as one element of a robust, systematic approach to humane handling and slaughter and used to help evaluate whether such an approach is being effectively implemented. FSIS Directive 6900.2, Attachment 3, at 28–29. This directive specifically suggests that use of video surveillance “of the stunning area” could help an establishment evaluate its implementation of humane handling practices by enabling employees or inspection personnel to regularly but randomly observe live video feed or regularly review a random selection of recordings. *Id.*

Similarly, FSIS Directive 5000.9 explains that video or other electronic monitoring or recording equipment can be used to establish compliance with humane handling regulatory requirements. *See, e.g.,* Directive 5000.9 § V.B. It also notes that an establishment may use either its own or a third party auditor’s video records. *Id.*

In 2011, FSIS enacted guidelines for the use of video monitoring in federally inspected slaughter establishments.⁶⁸ Of the 1,217 public comments FSIS received on the guidelines, 813 specifically requested that “video be mandated in establishments.”⁶⁹ Hundreds more were “general statements that video should be made mandatory in establishments . . . and concerns about inhumane handling.”⁷⁰ And, “[a]n additional comment was to require an accredited third party to audit mandatory video use in establishments.”⁷¹ Thus it is clear that, at the time the

⁶⁸ FOOD SAFETY & INSPECTION SERV., FSIS-GD-2011-0001, COMPLIANCE GUIDELINES FOR USE OF VIDEO OR OTHER ELECTRONIC MONITORING OR RECORDING EQUIPMENT IN FEDERALLY INSPECTED ESTABLISHMENTS (2011) [hereinafter FSIS COMPLIANCE GUIDELINES].

⁶⁹ *Id.* at 1.

⁷⁰ *Id.*

⁷¹ *Id.*

guidelines were finalized, the public strongly supported requiring the use of video monitoring in slaughter plants and wanted to see a decrease in inhumane handling practices.

Like the directives described above, the 2011 guidelines acknowledge that video monitoring can “help[] to prevent inhumane treatment” and “encourage[] industry to use this technology, particularly as part of its systematic approach to ensure that livestock are handled humanely. . . .”⁷² The guidelines instruct that “video technology should be effectively implemented to result in trustworthy and accurate information that helps to prevent inhumane treatment”⁷³ They also state that when video surveillance is used, “video cameras should be positioned and operate in such a way to allow continuous viewing of all steps from unloading to stunning.”⁷⁴

The guidance that cameras should enable “continuous viewing of all steps” in the slaughter process is especially relevant and important in the context of CO₂ gas systems, because the installation of cameras or other surveillance mechanisms in the gondolas used in these systems is likely the only way to allow continuous viewing of the stunning or killing of pigs. Unlike other slaughter methods, such as the use of captive bolt or electric current stunning, which occur in plain view, the stunning and killing of pigs with CO₂ gas occurs behind the closed doors of steel-walled gondolas, deep inside CO₂ gas chambers, rendering it impossible to observe and evaluate the welfare of the pigs inside. Thus, while the use of cameras may provide a supplementary means of monitoring and evaluating compliance with the agency’s duties to ensure humane treatment in the context of other forms of slaughter, their use is necessary for doing so in the context of CO₂ gas systems—and, indeed, may be the only means of doing so. The agency is not going to be able to offer a reasoned explanation for why this method of stunning alone is exempt from the mandatory real-time inspection requirements applicable to every other USDA-approved stunning method. *See, e.g., Level the Playing Field v. Fed. Election Comm’n*, 232 F. Supp. 3d 130, 146 (D.D.C. 2019) (When reviewing an agency decision not to initiate rulemaking, “The proper inquiry is ‘whether the agency employed reasoned decision-making’”), *aff’d*, 961 F.3d 462 (D.C. Cir. 2020).

V. FSIS Must Mandate the Installation of Cameras or other Monitoring or Recording Equipment Inside of Gondolas Used in CO₂ Gas Systems to Ensure Compliance with Humane Slaughter Requirements.

FSIS must require slaughter establishments to install video cameras inside gondolas to enable plant inspection personnel to observe the stunning or killing of pigs during CO₂ gas operations in order to evaluate whether they are slaughtered humanely. As discussed above, the agency has the legal responsibility and obligation to examine and inspect all methods used for slaughter, including the use of CO₂ gas. Further, the agency’s own directives and guidelines identify the benefits of using video records to ensure compliance with humane handling and slaughter requirements, and FSIS already recommends that industry use video surveillance technology.

Because it is used to stun and kill such a large number of pigs each year, CO₂ gas appears to be the most widely employed livestock slaughter method in the United States. Yet, it may be the

⁷² *Id.* at 3, 5 (emphasis added).

⁷³ *Id.* at 5.

⁷⁴ *Id.* at 1 (emphasis added).

least observed. Without some sort of monitoring equipment, slaughter plant inspection personnel cannot watch what is occurring within the gondola during the several minutes while the pigs are being gassed. They cannot determine how long it is taking the pigs to lose posture or become unconscious, or how the pigs are reacting to the gas prior to loss of consciousness. This impedes inspectors' ability to assess whether there may be operational problems that need to be addressed—such as improper gas concentrations, temperature, or humidity, overloading of the gondola, or improper gondola speeds—or whether system settings may need to be adjusted to accommodate variation in the pigs' age, sex, breed, health, or genetics, any of which could influence how rapidly and effectively they are stunned and killed. If FSIS inspectors are unable to determine whether stunning and/or slaughter are occurring rapidly, effectively, and with minimal distress or discomfort, the agency is failing to meet its legal obligations to examine and inspect all methods used for slaughter and to ensure that those methods are humane.

While CO₂ slaughter systems are typically equipped with a CO₂ meter or a sensor alarm to alert personnel when CO₂ levels have deviated from the desired range, research on the use of these systems under commercial conditions has indicated potential problems with this equipment. For example, one study found that the control panel reported a higher CO₂ level than determined by the researchers.⁷⁵ Another study noted that the thresholds that triggered sensor alarms to sound varied widely between slaughter operations; in some cases, sensor alarms sounded when CO₂ levels dropped to 5 percent less than the desired concentration, and in others, they did not sound until the sensor recorded a drop of 14 percent.⁷⁶ Another study acknowledged that, “[a]lthough the stun machine registered a CO₂ concentration higher than 90% CO₂, air draughts, cold gas, or excess water in the stun-pit base, may have reduced individual CO₂ consumption thus preventing proper stunning in some pigs.”⁷⁷

These studies indicate that FSIS regulations requiring “instruments which sample and analyze carbon dioxide gas concentration within the chamber throughout anesthetizing operations” (9 C.F.R. § 313.5(b)(3)) are not sufficient to constitute an accurate “examination and inspection” (21 U.S.C. § 603(b)) or reliably gauge whether stunning or killing is occurring humanely. To properly observe the slaughter process and make a determination about its humaneness, inspection personnel must also be able to actually see what is occurring inside the gondola. They must be able to use their own eyes and ears to “pay close attention” and apply “critical appraisal” to the stunning or killing procedure. *Am. Fed’n of Gov’t Emp.’s*, 215 F.3d at 11.

Moreover, even when the instruments are working correctly, it is not clear that they are monitored consistently. For example, in a 2020 humane handling noncompliance record concerning a Swift Pork Company establishment, an FSIS inspector expressed concern about whether the CO₂ monitoring equipment was being checked consistently:

At 21:17 while looking through some of the record sheets for some of the livestock SOP checks, I noticed that only the first 3 hour checks of the CO₂ time and concentration checks were done, which would have been up to 18:30. The 4th & 5th hours were not; and that none of the 2nd period checks were recorded as at

⁷⁵ Gregory et al., *supra* note 21.

⁷⁶ Lechner et al., *supra* note 13.

⁷⁷ *Assessing Pig Welfare at Stunning*, *supra* note 13, at 493.

this time it was the beginning of the 3rd period. When I checked again at 00:28, every time check up to that point was filled in as checked. This again raises questions on [sic] to the accuracy of the records; are they being checked at the proper frequency or just marked complete if they are missed.⁷⁸

This record underscores the importance of ensuring that plant inspectors are able to actually observe the interior of the gondolas during the stunning and killing of the pigs to verify that they are being slaughtered humanely, rather than relying on equipment and instrument checks alone. As researchers working in this subject area have commented, “Slaughterhouse operators commonly have well established animal welfare controls at the pre-stunning phase as well as at the time of slaughter, however the period during the actual stunning process in the gondolas usually receives less attention.”⁷⁹ This is likely due to the inability to see the pigs during this period. This may also help explain why, over the past decade, as the number of slaughter establishments that use CO₂ gas to stun and kill pigs has increased, the number of enforcement actions taken by FSIS in response to egregious violations related to the stunning of pigs has decreased—from 37 percent of all enforcement actions in 2013 to 27.8 percent of enforcement actions in 2022.⁸⁰

Inspectors cannot take enforcement actions where they cannot see the subject of the potential enforcement action. Here again, FSIS is not going to be able to reasonably explain why enforcement measures dependent on inspectors’ observations that the agency deems required and important for other stunning methods are somehow dispensable when CO₂ gas stunning is used.

Inexplicably, the use of CO₂ gas appears to be the only approved slaughter method that plant inspectors are not able to directly observe. FSIS’s humane slaughter regulations, directives, and compliance guidelines indicate that for the three other approved stunning methods (captive bolt, electrical, and gunshot),⁸¹ direct observation of the stunning procedure by inspectors is necessary to fully assess the humaneness of the method. For example, when captive bolt stunners, electrical stunners, and firearms are used, inspectors must ensure that the device operators accurately direct or place the stunning instrument to produce immediate unconsciousness.⁸² The only way for inspectors to assess whether the devices are being operated accurately, or producing immediate unconsciousness, is to actually watch the operator’s use of the device. It would be nonsensical to suggest that FSIS inspectors could somehow evaluate how accurately the devices were operated, or how quickly unconsciousness was produced, without being able to directly observe the stunning procedure.

⁷⁸ FOOD SAFETY & INSPECTION SERV., NONCOMPLIANCE RECORD: SWIFT PORK COMPANY (2020).

⁷⁹ Lechner et al., *supra* note 13.

⁸⁰ *Humane Handling Enforcement*, FOOD SAFETY & INSPECTION SERV., <https://www.fsis.usda.gov/inspection/regulatory-enforcement/humane-handling-enforcement> (last updated Apr. 10, 2023) (excluding from its analysis violations involving the stunning of suspect or condemned pigs for the purpose of euthanasia).

⁸¹ See 9 C.F.R. §§ 313.15, 313.16, 313.30.

⁸² See, e.g., 9 C.F.R. §§ 313.15, 313.16, 313.30; FOOD SAFETY & INSPECTION SERV., FSIS DIRECTIVE 6900.2, REVISION 3: HUMANE HANDLING AND SLAUGHTER OF LIVESTOCK (2020) 24–25 [hereinafter FSIS DIRECTIVE 6900.2]; FSIS COMPLIANCE GUIDELINES, *supra* note 68, at 16–17.

The same is true of CO₂ stunning. FSIS regulations and directives require that the CO₂ gas must be administered so as to accomplish anesthesia “quickly and calmly, with a minimum of excitement and discomfort to the animals.”⁸³ The only way for inspectors to fully assess whether the CO₂ is administered correctly and renders the pigs unconscious quickly, calmly, and with a minimum of excitement and discomfort, would be to actually observe the stunning procedure as it is occurring inside the gondola. It would be illogical to suggest that inspectors can somehow determine how quickly the anesthesia takes effect, how calmly the pigs behave, or how uncomfortable the pigs become, without actually observing the pigs in the gondola during the gassing procedure.

FSIS offers no explanation in its regulations, directives, or guidelines for why it requires inspectors to directly observe the stunning process when captive bolt, electrical stunners, and firearms are used, but not when CO₂ is employed. Accordingly, the agency’s disparate treatment of these stunning methods is arbitrary and unlawful. See 5 U.S.C. § 706(2)(A); *see also, e.g., Transactive Corp. v. U.S.*, 91 F.3d 232, 237 (D.C. Cir. 1996) (“A long line of precedent has established that an agency action is arbitrary when the agency offered insufficient reasons for treating similar situations differently.”)

It is also contrary to the advice of renowned animal behaviorist Temple Grandin, who has long called for the use of video cameras to observe pigs while they are being stunned or killed with CO₂ gas. She has explained that the nature of the CO₂ gas systems in use today often does not permit outside observation:

Assessment of the pigs’ reactions in large commercial CO₂ machines will require the use of video cameras installed in the pit. In a typical large machine, the gondolas travel through the CO₂ on a continuous conveyor, similar to a skinny Ferris wheel. Viewing the pigs when they reach the bottom of the deep pit is extremely difficult, because the next gondola blocks the view. . . . All types of CO₂ or other controlled atmosphere stunning should be monitored with video cameras.⁸⁴

Grandin has also emphasized the importance of observing pigs during the induction phase, before they lose consciousness: “To evaluate gas stunning, a system should have either windows or video cameras so that the . . . pigs can be viewed during the induction phase before they fall over and become insensible.”⁸⁵ “To determine if there is a welfare problem, the reaction of pigs **before** they fall over (loss of posture) should be observed.”⁸⁶

Thus, to ensure FMIA and HMSA compliance, it is necessary for FSIS inspectors to observe (by both watching and listening to) pigs within the gondolas. This will permit inspectors to assess whether the slaughter is occurring humanely and take action when delays in loss of consciousness or avoidable excitement and discomfort are observed, rather than only when the

⁸³ 9 C.F.R. § 313.5(a)(1); FSIS DIRECTIVE 6900.2, *supra* note 82, at 24.

⁸⁴ SLAUGHTER OF FARMED ANIMALS, *supra* note 4, at 138, 141.

⁸⁵ IMPROVING ANIMAL WELFARE 141, 191 (Temple Grandin, ed., 3d ed. 2020).

⁸⁶ Grandin, *supra* note 23 (emphasis in original).

problem is severe enough that conscious pigs are emerging from gondolas or stunned pigs regain consciousness during sticking or bleeding.

VI. Request for Rulemaking

As discussed above, the FMIA and HMSA, and their implementing regulations, authorize and require FSIS to inspect and examine all methods by which livestock are slaughtered—including the use of CO₂ gas—in order to evaluate whether slaughter is performed humanely. *See, e.g.*, 7 U.S.C. § 1901; 21 U.S.C. § 601; 9 C.F.R. § 313.5. Moreover, FSIS directives and guidelines recognize the benefits of video surveillance, and even encourage industry to implement camera monitoring technology. Yet, in many or most slaughter establishments, such systems have not been adopted, and plant inspectors are unable to observe—and therefore unable to inspect and examine—the interiors of gondolas while stunning and killing is occurring, as required by law. Accordingly, we respectfully request that FSIS amend its CO₂ slaughter regulation (9 C.F.R. § 313.5) as follows (revisions in red):

§ 313.5 Chemical; carbon dioxide.

...

(3) Gas. Maintenance of a uniform carbon dioxide concentration and distribution in the anesthesia chamber is a vital aspect of producing surgical anesthesia. This may be assured by reasonably accurate instruments which sample and analyze carbon dioxide gas concentration within the chamber throughout anesthetizing operations. Gas concentration shall be maintained uniform so that the degree of anesthesia in exposed animals will be constant. Carbon dioxide gas supplied to anesthesia chambers may be from controlled reduction of solid carbon dioxide or from a controlled liquid source. In either case the carbon dioxide shall be supplied at a rate sufficient to anesthetize adequately and uniformly the number of animals passing through the chamber. Sampling of gas for analysis shall be made from a representative place or places within the chamber and on a continuing basis. Gas concentrations and exposure time shall be graphically recorded throughout each day's operation. Neither carbon dioxide nor atmospheric air used in the anesthesia chambers shall contain noxious or irritating gases. Each day before equipment is used for anesthetizing animals, proper care shall be taken to mix adequately the gas and air within the chamber. All gas producing and control equipment shall be maintained in good repair and all indicators, instruments, and measuring devices must be available for inspection by Program inspectors during anesthetizing operations and at other times. **When carbon dioxide gas is used to anesthetize or induce death in pigs, the entire interior of the gondola holding the animals, and all of the animals inside the gondola, must remain visible to Program inspectors at all times during the operation. To ensure such visibility, video cameras must be installed inside the gondola. The cameras must simultaneously permanently record and provide live, high-quality visual and audio feed video at all times during the operation.**^[87] **No live animals may enter the gondola unless these visual and**

⁸⁷ Although FSIS Directive 5000.9 suggests video cameras that provide live feed video do not create recordings, *id.* § VII.A, there are video cameras that can do both simultaneously. *See, e.g., Protect Plans*, Ring,

auditory standards are met. An exhaust system must be provided so that, in case of equipment failure, non-uniform carbon dioxide concentrations in the gas tunnel or contamination of the ambient air of the establishment will be prevented.

VII. Conclusion

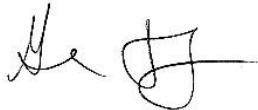
As detailed above, under the FMIA and HMSA, and their implementing regulations, FSIS has the authority and legal obligation to inspect and examine all methods of slaughter—including the use of CO₂ gas to stun and kill pigs—to assess whether they are being employed humanely. However, it appears that the interiors of most, if not all, gondolas used in CO₂ gas slaughter systems in the United States are currently entirely unobservable while they are in use. To ensure that slaughter plant inspectors are able to determine whether the slaughter of pigs by CO₂ is being conducted humanely, as they are required to do by law, FSIS should amend its CO₂ regulation. The amendment should require the installation of video cameras inside the gondolas to make certain that the interiors of the gondolas, and all animals they are holding, remain visible and observable at all times, including during stunning and killing.

Thank you for considering this petition.

Sincerely,



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Gwendolen Reyes-Illg, DVM, MA
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Dena Jones
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<https://ring.com/protect-plans> (including in an explanation of Ring’s Protect Plans that the “Video History for up to 180 Days” feature allows users to “[a]ccess recorded videos of every motion and Live View event for your home’s Ring devices, for up to 180 days”); Email from Darryl Villafior, Worldeyecam, to Zack Strong, Senior Staff Att’y, Farm Animal Program, Animal Welfare Inst. (Mar. 30, 2023, 12:22 PM).



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Enclosure: Copies of all non-legal sources of information cited to in this petition have been downloaded onto a thumb drive that has been submitted via mail along with a printed copy of the petition.