

**Senate Agriculture & Natural Resources**

**03/12/2026 01:30 PM**

**SB26-123 Prohibit Ventilation Shutdown for Poultry**

**Typed Text of Testimony Submitted**

<b>Name, Position, Representing</b>	<b>Typed Text of Testimony</b>
Cara Thorsen For themselves	<p>Hello Committee members,</p> <p>My name is Cara Thorsen, and as a resident of Fort Collins, I am writing to strongly urge your support for SB26-123. Like many Coloradans, I was horrified to learn about the reality of "Ventilation Shut Down" (VSD) and VSD+. Colorado has already taken a stand to protect birds by passing a Cage Free egg law, yet we currently allow millions of birds to die inhumanely. These birds are trapped in sweltering barns for hours until they succumb to heatstroke.</p> <p>It's been proven, effective alternatives like nitrogen-based foam that are already used successfully in Europe and Canada. These methods are more reliable and significantly less traumatic for the animals and the workers tasked with carrying out these kills.</p> <p>Senator Cutter's bill offers a fair, three-year transition period for the poultry industry to modernize. We can protect our food supply and manage disease without resorting to methods that mirror cruelty. I believe Colorado should be the first state to stand up and say that "efficiency" is no excuse for this level of suffering.</p> <p>Please vote yes on SB26-123 to advance animal welfare and bring our state's depopulation methods into the 21st century.</p> <p>Sincerely, Cara Thorsen</p>
Jena Questen Against themselves	<p>Dear Senator Cutter,</p> <p>I hope this email finds you well!</p> <p>I have had the pleasure of meeting you several times by being on the Board of the Evergreen Chamber of Commerce, when you have attended out events.</p> <p>Thank you for the work you do.</p>

	<p>I am writing on the encouragement of the veterinary organization Our Honor, directed by Dr. Heath, and myself, as practicing veterinarians who have a serious concern about ventilation shut down for chickens.</p> <p>Dr. Heath is much more experienced in these things and all the correct phrasing, however, I do have a chicken (a house rooster) and practice on chickens at my veterinary hospital Aspen Park Vet Hospital in Conifer. Chickens are intelligent, loving birds capable of building deep bonds with people, and should not be discarded and left to suffocate to death by the thousands when there is a disease outbreak.</p> <p>It is also of concern how the veterinarians voice has been left out of this conversation regarding the guidelines and how this impacts their legitimacy. Additionally of concern is the number of vets who have gone on record as opposing VSD+ and the results of surveys like VIN's about veterinarians' assessment of the method (which is poor).</p> <p>Large organizations, when they take on the lives of millions of birds that can feel pain, need to be ready and prepared for how to humanely end their lives, no matter what. This method is not humane and needs to end.</p> <p>Thank you for your kind consideration to this matter, for the chickens, and for all the animals we love.</p> <p>Have a wonderful day!</p> <p>Dr. Jena Questen CertAqV</p>
<p>Barbara Robbins For themselves</p>	<p>Birds are dying in a cruel and tortuous way. Inhumane.</p>
<p>Deborah Hutchinson For themselves</p>	<p>Please support this bill. In my career as Paramedic, I have witnessed the aftermath of people that have suffocated to death. The destruction of their environment and the evidence of bodily injury resulting from physical attempts to escape are beyond description. Please do not do this to animals.</p>
<p>Hannah Breckon For themselves</p>	<p>Hello,</p>

	<p>Please consider canceling death camp like slaughter methods from being used towards chickens and turkeys.</p> <p>Thank you.</p> <p>Hannah B.</p> <p>A resident of CO.</p>
<p>Carolena Larsen For themselves</p>	<p>I'm a resident of Colorado and urge the committee to support SB26-123 because it will spare chickens &amp; other birds from prolonged agonizing deaths from VSD &amp; VSD+. Please do the right thing.</p> <p>Sincerely, Mrs. Carolena Larsen Wolfmate734@gmail.com</p>
<p>Michelle Miner For themselves</p>	<p>I am a resident of Colorado and urge you to support SB26-123. Nobody including birds deserve to die agonizing and cruel deaths. This will stop and prevent birds from dying this way due to VSD and VSD+.</p>
<p>Lori Jardine For themselves</p>	<p>We the people in Colorado are not for any type of animal abuse. To let any animal suffer is barbaric. Any person who would purposely harm an animal is just plain EVIL. Do the right thing Colorado and don't let any animal in Colorado suffer at the hands of psychopaths. Animals over money, stop the abuse.</p>
<p>Taylor Richardson For themselves</p>	<p>I am a resident of CO &amp; urge the committee to support SB26-123 because it will spare chickens &amp; other birds from prolonged, agonizing deaths from VSD &amp; VSD+. PLEASE help stop this cruel and inhumane treatment of birds!!!</p>
<p>Elizabeth Gonzalez For themselves</p>	<p>As a Colorado resident, I urge the committee to support SB26-123 to prohibit the use of ventilation shutdown (VSD) and VSD+ for poultry. These methods cause millions of chickens and other birds to suffer prolonged, agonizing deaths by heat stroke and suffocation during avian flu outbreaks on factory farms.</p> <p>Animals raised for food deserve basic protections from extreme cruelty. Ventilation shutdown traps birds inside barns where heat and carbon dioxide build until they slowly die—often over many hours. This is an inhumane and unacceptable way to kill living beings who can feel pain and distress.</p>

	<p>SB26-123 is an important step toward preventing unnecessary suffering and ensuring more humane standards during disease outbreaks. I respectfully urge the committee to support this bill and end the use of ventilation shutdown in Colorado.</p> <p>Thank you for your time and consideration.</p>
<p>Melinda Marquis For themselves</p>	<p>I am a 40-year resident of Colorado and urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by ventilation shutdown (VSD), in which birds are slowly suffocated or succumb to heat stroke during cruel mass-killing practices, as wave after wave of avian flu outbreaks continue to impact massive factory farms where animals are kept for meat and eggs.</p> <p>This sort of cruelty has no place in a civil society.</p> <p>SB26-123 would end terrifying VSD slaughter methods for birds, which can leave animals writhing in pain and gasping for oxygen for hours.</p> <p>Please vote Yes!</p>
<p>Olivia Toth For themselves</p>	<p>I am a resident of Colorado, and I am urging the committee to support SB26-123 because it will spare chickens &amp; other birds from prolonged, agonizing deaths from VSD &amp; VSD+.</p>
<p>Shari DePauw For themselves</p>	<p>Please make a humane choice and support this bill so sentient creatures don't suffer.</p>
<p>Carolena Larsen For themselves</p>	<p>I am a resident of Colorado and I urge you to support SB26-123 to prohibit the suffering of chickens and other birds from VSD and VSD+. Do the right ethical thing and don't suffocate the birds. There are better humane ways. Please show kindness.</p> <p>Sincerely, Mrs. Carolena Larsen Colorado</p>
<p>Kim Shively For</p>	<p>I am a resident of Colorado and I urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p>

<p>themselves</p>	<p>Millions of birds are being slowly suffocated or succumb to heat stroke during cruel mass-killing practices called ventilation shutdown (VSD), as wave after wave of avian flu outbreaks continue to impact massive factory farms where animals are kept for meat and eggs.</p> <p>These methods came under increased scrutiny in 2020 when pandemic-related supply-chain issues and labor shortages in slaughterhouses and farms resulted in the “depopulation” of animals (i.e., killing them) via VSD. In this cruel practice, ventilation fans are turned off to suffocate the animals, and “VSD” incorporates heat, humidity, and/or carbon dioxide in the process “suffocating the animals and often inducing heatstroke.</p> <p>Chickens communicate with their unhatched chicks by softly clucking to them, have different calls to describe whether a danger is coming from land or air, can recognize over 100 faces, and feel fear and pain when deprived of oxygen.</p> <p>Please vote yes on this bill. We must stop these inhumane practices.</p>
<p>Honorable+Tiffany+A.+ Snyder+- +ret.+4-term+ Ward,+Colorado+Mayor  For themselves</p>	<p>I am a 4-term, retired Mayor of Ward, Colorado, and resident of Boulder, Colorado. I am commenting today in support of changing the current and unnecessarily cruel poultry processing practice in which millions of birds are being slowly suffocated or dying of heat stroke during cruel mass-killing practices called Ventilation Shutdown (VSD). I urge the committee to support SB26-123 because it will spare chickens &amp; other birds from prolonged, agonizing deaths from VSD. More humane methods must be used.</p> <p>Thank you for your consideration of my opinion in this gruesome matter,</p>
<p>Devra Keyes  For themselves</p>	<p>I am a resident of Colorado. I work in healthcare as well as volunteer for Humane Colorado. I fully support this bill as it will prevent prolonged suffering and agonizing deaths from VSD and VSD+. I frequently see the suffering of abused animals brought to the shelter and I strongly believe that most people would be horrified if they understood how terrible it is to intentionally inflict pain on animals when there are more humane options available for end of life.</p>
<p>Brittany Drake  For themselves</p>	<p>Ventilation shutdown is basically roasting animals alive and it is primarily used because farmers/companies don’t want to pay to keep the animals alive any longer. It serves as a quick fix to get rid of millions of animals very quickly; the problem with this approach is that it is a horribly painful and frightening experience for the birds. The animal agricultural companies who make money off of exploiting these birds are responsible for the bird’s lives; they breed them, bring them into existence and should be responsible for keeping the birds alive and healthy. Their desire to save money by killing the birds expeditiously is no excuse for the cruelty of such an act.</p>

<p>Ian Monk For themselves</p>	<p>I am for stopping this cruel &amp; barbaric treatment of birds.</p>
<p>Jane Harbert For themselves</p>	<p>I am for this. I am against killing our precious birds who have the right to live.</p>
<p>Rachel Hemmingsen For themselves</p>	<p>We can do so much better than slowly suffocating birds who we bred to eat (or to eat their reproductive products). We create them to destroy them, which is horrible. When they're not profitable or too hard to care for, we then condemn them to a lazy execution?!</p>
<p>Rebecca Rubinson For themselves</p>	<p>I am a resident of Colorado and urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+. These are sentient beings, please help make their lives better.</p>
<p>Veronica Nelson For themselves</p>	<p>Hello,</p> <p>I am resident of CO &amp; urge the committee to support SB26-123.</p> <p>This standard will spare chickens &amp; other birds from prolonged, agonizing deaths from VSD &amp; VSD+.</p> <p>It's heartbreaking and shameful to kill any animal with such cruelty. Please support SB26-123.</p> <p>Thank you for having the courage to be better.</p>
<p>Diane Carter For themselves</p>	<p>Please band this cruel and inhumane practice!</p>

<p>Andria Ganley For themselves</p>	<p>I am a resident of Colorado and urge this committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths from VSD and VSD +</p> <p>Please be a voice for these creatures and don't allow them to so cruelly suffer, it is a simple matter of right and wrong. Letting them suffer is wrong. Do the right thing!</p> <p>Thank you 🙏💎</p>
<p>Deborah Hall For themselves</p>	<p>I am FOR the prohibit ventilation shutdown for poultry.</p>
<p>Jerily Rushworth For themselves</p>	<p>I am a resident of CO &amp; urge the committee to support SB26-123 because it will spare chickens &amp; other birds from prolonged, agonizing deaths from VSD &amp; VSD+.</p>
<p>Tatyana Stevens For themselves</p>	<p>I am a resident of Colorado and urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p>
<p>catherine balmori For themselves</p>	<p>Hello,</p> <p>I live in Denver, Colorado. I ask the committee to please support SB26-123. Please prevent chickens and other birds from torture and cruelty from death by VSD\VSD+.</p> <p>Thank you,</p> <p>Catherine Balmori</p>
<p>Evan Weger For themselves</p>	<p>I am a resident of Colorado, and I urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+!!</p>
<p>Ute Lehmann For themselves</p>	<p>Please prohibit the use of outdated VSD methods for mass-killing animals in Colorado, let's be humane to animals we cannot live without.</p>

<p>Colleen Smith For themselves</p>	<p>I am a rural ag area resident of Colorado and urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p>
<p>Rebecca Smudzinski For themselves</p>	<p>I am a resident of Gunnison, CO. Please support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+. These methods leave birds suffering for hours, gasping for oxygen. When VSD+ methods also include heat, humidity, and/or carbon dioxide, not only are the birds left to suffocate slowly, but it also causes heatstroke, leaving birds writhing in pain. These methods are cruel and need to stop. Please support SB26-123 and end the use of ventilation shutdown methods.</p>
<p>Mike Robinette For themselves</p>	<p>I urge you to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p>
<p>Kara Cooper For themselves</p>	<p>As a resident of Colorado I am asking you to please support SB26-123 as it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p>
<p>Leslie Barnes For themselves</p>	<p>I am resident of Colorado and urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+. Let's talk about more humane options.</p>
<p>Steffanie Garlock Jacobson For themselves</p>	<p>Hello,  I am a veterinarian from Colorado's western slope. I strongly urge you to support the bill (SB26-123) prohibiting the use of ventilation shut down (VSD) or ventilation shut down plus added heat and humidity or CO2. (VSD+). This is a form of exceedingly slow suffocation, possibly accompanied with the misery of heat and humidity, while one wallows amongst other birds similarly terrified as they inexplicably have a gradually harder time drawing a useful breath; each bird sensing their own demise and the demise of the surrounding birds as they begin staggering, bumping into each other and flailing about. It could not be a more terrifying, uncomfortable, horrible way to die. If we must kill animals, we should do it as quickly and painlessly as possible. I believe we will be judged on how we treat our feathered and furry friends. These methods are outdated and very cruel. If this is what it takes to manage poultry in this day and age of industrial, factory farms, then perhaps we should quit having such enormous, factory poultry farms altogether. At any scale, this</p>

	<p>suffocation is as inhumane as it gets. It's right up there with their practice of funneling hundreds of living, male chicks in to a meat grinder everyday.</p> <p>Thank you for your time,</p> <p>Dr. Steffanie Garlock Jacobson, DVM</p>
Nicholas Foster For themselves	<p>I wish to support this bill. Killing turkeys and chickens through oxygen deprivation is horrifically cruel. These are sentient beings and deserve to be treated better rather than gasping for oxygen while taking hours to die. I think we should all try imagine what that might be feel like. Please end this practice ASAP!</p>
Mindi Kessler For themselves	<p>Please prohibit the use of VSD as a means of mass killing as it is beyond cruel and unnecessary.</p> <p>Please support this bill 26-123.</p>
Pam Ferman For themselves	<p>I support this bill for humanitarian reasons</p>
Lindsay Cape For themselves	<p>I am a resident of Colorado, and I am urging the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p>
Karen Sinclair-Smith For themselves	<p>Killing chickens by asphyxiation is cruel, disgusting and not acceptable. Humans who would do such a horrible act are sick sociopaths and should be punished under the animal cruelty laws, to the fullest extent of the law.</p> <p>I have been a psychotherapist since 1972. I am telling you to support this bill and prevent perverted sociopaths from horrible cruelty to animals.</p> <p>Dr. Karen Sinclair-Smith, Ph. D.</p> <p>Colorado Springs</p>
Tanah Wagenseller For themselves	<p>Hello and thank you for taking the time to listen to the consistency of Colorado such as myself. Please support this bill that stops the incredible violence towards our birds. I have chickens of my own and I can wholeheartedly say they are smart and caring, and do not deserve to die in a way that is so incredibly inhumane. I urge the committee to support this bill to set a precedent for being good people and treating each other as well as animals with respect. Thank you.</p>
Ronald Eckels	<p>Chickens communicate with their unhatched chicks by softly clucking to them, have different calls to describe whether a danger is coming from land or air, can recognize</p>

For themselves	over 100 faces, and feel fear and pain when deprived of oxygen. Please pass this item.
Megan Lenington For themselves	With avian flu on the rise, culling flocks will be necessary. However we have much more humane and effective methods than suffocation. Please end this practice
Jennifer Banks For themselves	I am a resident of CO & urge the committee to support SB26-123 because it will spare chickens & other birds from prolonged, agonizing deaths from VSD & VSD+.
Christina Martinez For themselves	Good morning,  I am a resident of Colorado and I urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths from VSD and VSD+  Thank you for your consideration,  Christina Martinez
Jill Duncan For themselves	I am a Colorado resident. I am completely against allowing chickens and other birds to suffer by ventilation shutdown. This heinous practice should be banned!!!
Jessica Way For themselves	Millions of birds are being slowly suffocated or dying of heat stroke during cruel mass-killing practices called Ventilation Shutdown (VSD), as avian flu outbreaks continue to impact massive factory farms. END THE CRUELTY and Prohibit Ventilation Shutdown for Poultry!!! I am a resident of CO and I urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths from VSD and VSD+.
Vanessa Simsick For themselves	I am a proud resident of CO & urge you and the committee to support SB26-123 because it will spare chickens & other birds from prolonged, agonizing deaths from VSD & VSD+. We hope you will use compassion, progressive rationale, and moral standards in your support. Thank you.

<p>Judith Newman For themselves</p>	<p>Please pass Bill SB26-123 to stop the use of VSD or similar practices. I am a resident of Colorado, and I am against this mass-killing, barbaric practice.</p>
<p>Irini Dieringer For themselves</p>	<p>I am a resident of Colorado &amp; strongly urge the committee to support SB26-123 because it will spare chickens &amp; other birds from prolonged, agonizing deaths from VSD &amp; VSD+. We are civilized country and should not engage in barbaric practices such as this.</p> <p>Thank you in advance.</p>
<p>Randie Barthlome For themselves</p>	<p>Please support this bill to end the cruel ventilation shutdown methods. I had a beloved little rescue cockatiel, whom we named Remington, who lived to be 21 years old. So beautiful, very smart and loving. There isn't enough room to tell all that he taught me. Can you imagine being in a facility where all air to you is cut off and you are left to fight and gasp for air as you flail, cry and call out? Horrific. Unimaginable cruelty to birds who are extraordinary sentient beings. I have spent most of my life in Colorado, over 50 years. Thank you for considering my request. In memory of my precious Remington. Ms Randie Barthlome</p>
<p>Chelsey Cook For themselves</p>	<p>My name is Chelsey, and I am a resident of Colorado. I am writing today to urge you to vote FOR SB26-123.</p> <p>This bill is a necessary step to end the cruel and inhumane practice of Ventilation Shutdown (VSD) and VSD+. Killing millions of birds by slowly suffocating them or causing them to die of heat stroke is unacceptable in a humane society.</p> <p>Please support SB26-123 to spare chickens and other birds from these prolonged, agonizing deaths. I strongly urge you to pass this bill.</p> <p>Thank you for your time and for considering the welfare of these animals.</p> <p>Sincerely, Chelsey Cook Fort Collins, CO</p>
<p>Heather Vasquez For themselves</p>	<p>As a resident of Colorado, I urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p>

	<p>Chickens communicate with their unhatched chicks by softly clucking to them, have different calls to describe whether a danger is coming from land or air, can recognize over 100 faces, and feel fear and pain when deprived of oxygen.</p> <p>Please do what's right and end this cruel practice.</p>
<p>Robyn Madsen For themselves</p>	<p>I am a citizen of Colorado and am urging the committee to support SB26-123 because it will spare chickens and other birds from prolonged agonizing deaths from VSD and VSD+ ... Please, we must find a better way to address the issue. Animals do not deserve this cruelty. Thank you for your time</p>
<p>Kristen Solano For themselves</p>	<p>I am a resident of Colorado and urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p>
<p>Alex Cerussi For Mercy For Animals</p>	<p>Testimony in Support of Senate Bill 26-123: The Modernizing Depopulation Act</p> <p>Dear Chair Roberts, Vice Chair Danielson, and Honorable Members of the Committee,</p> <p>Mercy For Animals, a nonprofit organization dedicated to constructing a just and sustainable food system, commends this Committee for its consideration of SB 26-123, legislation to phase out the use of "ventilation shutdown" (VSD) and VSD plus heat (VSD+) methods to depopulate birds for disease control purposes.</p> <p>Depopulation, also known as culling or on-farm mass killing, is the process of killing a complete population of farmed animals, such as a flock or a herd. Under current law, poultry owners may be required to destroy or depopulate their entire flock of poultry when one of their birds tests positive for a disease. Since early 2022, the United States has faced an ongoing highly pathogenic avian influenza (HPAI) outbreak, resulting in the mass depopulation of animals on farms.</p> <p>Depopulation via VSD and VSD+ is inhumane and ineffective. VSD+ involves sealing animal facilities and increasing temperatures, causing death via heatstroke and significant suffering over multiple hours. Further, VSD+ is not a method recognized by the World Organisation for Animal Health (WOAH) and its failure to consistently achieve 100% mortality often necessitates the use of secondary killing methods. This procedure also poses psychological risks for workers and increases the danger of disease transmission.</p>

	<p>Alternative methods to VSD and VSD+ exist and should be considered instead. Instead of VSD and VSD+, alternative methods should be considered. Many commercial operations in Colorado, for example, have avoided heatstroke-based depopulation methods and relied instead on carbon dioxide, which results in more rapid loss of consciousness.</p> <p>This legislation would position Colorado as a leader in safeguarding animal welfare during the ongoing HPAI crisis by transitioning to more effective, higher-welfare depopulation strategies. As such, Mercy For Animals strongly supports the phase out of the use of VSD and VSD+ methods to depopulate birds for disease control purposes and urges the Committee to support Senate Bill 26-123.</p> <p>Thank you,</p> <p>Mercy For Animals          Alex Cerussi, Senior Manager          Government Affairs &amp; Public Policy          alexc@mercyforanimals.org</p>
<p>Erin Grogan          For          themself</p>	<p>Hello. I'm a resident of Colorado. I urge you to support SN26-123, and help prevent the painful death of birds. Thank you.</p>
<p>Sarah Lane          For          themself</p>	<p>I support SB26-123 because it would prohibit one of the most inhumane methods used to kill poultry—ventilation shutdown. This practice involves sealing poultry barns, shutting off ventilation, and allowing temperatures to rise until the birds die from heatstroke, a process that can take hours and causes extreme suffering.</p> <p>Even when animals must be euthanized due to disease outbreaks such as avian influenza, they should be treated with basic humane standards. Ventilation shutdown effectively traps thousands of animals in an enclosed space where they slowly overheat and die, something most people would consider unacceptable if done to any other animal.</p> <p>More humane alternatives already exist, including controlled gas or foam methods that cause faster loss of consciousness and reduce suffering.</p> <p>SB26-123 would move Colorado toward more ethical and modern animal welfare standards by phasing out this cruel practice and encouraging the use of more humane depopulation methods. Protecting animals from unnecessary</p>

	<p>sufferingâ€”even in agricultural settingsâ€”is a reasonable expectation in a humane society.</p>
<p>ZoÃ« Sigle For themselves</p>	<p>I am a resident of Colorado, and I strongly support this bill to prohibit ventilation shutdown for poultry. Ventilation shutdown is an egregiously cruel practice of inducing heatstroke death on chickensâ€”an unnecessarily slow, physically painful, and psychologically distressing death. Chickens may suffer for hours and, in rare cases, even days before found and then killed in another manner. In the recent avian influenza outbreak, at least 6 million laying hens in Colorado were killed via VSD+. This is unacceptable and not consistent with Colorado's value of animal protection.</p> <p>I urge Colorado lawmakers to prohibit this cruel, unnecessary practice and move to alternative, less-cruel depopulation methods, such as nitrogen-based depopulation methods that "reliably produce 100% mortality and better protect bird welfare, as they cause little or no pain or distress prior to loss of consciousness." (<a href="https://usaha.org/wp-content/uploads/2025/11/2025-Res-24-AnimalWelfare.pdf">https://usaha.org/wp-content/uploads/2025/11/2025-Res-24-AnimalWelfare.pdf</a>).</p>
<p>Haley Rowan For themselves</p>	<p>As a long-time resident of Colorado and avid animal lover, I strongly and respectfully urge the committee to support SB26-123 because it will spare chickens, turkeys and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p> <p>Current VSD practices can leave animals writhing in pain and gasping for oxygen for hours before their untimely deaths. Birds are surprisingly highly intelligent and emotional creatures who are very capable of suffering; therefore, this unnecessarily cruel killing method must be put to a stop. Thank you kindly for your consideration in making our state a kinder place for animals.</p>
<p>Tammie Stevens For themselves</p>	<p>I am a resident of Colorado, and I urge this committee to vote for this bill and use their power to save countless chickens and other birds an agonizing slow, death. Please do all you can in your power to prohibit this needless suffering. Thank you.</p>
<p>Dawn Moews-Johnson For themselves</p>	<p>I'm a resident of CO &amp; urge the committee to support SB26-123 because it will spare chickens &amp; other birds from prolonged, agonizing deaths from VSD &amp; VSD+.</p>
<p>Steve Cress For themselves</p>	<p>Colorado is a state that takes pride in its stewardship of the land and its living creatures. Today, we urge the Colorado legislators to take a meaningful step in the direction of these values by banning ventilation shutdown â€” one of the most inhumane mass-killing methods used on poultry in the United States.</p> <p>Ventilation shutdown takes hours â€” studies place the time at between 1.5 and nearly 4 hours â€” with recorded temperatures inside facilities reaching extreme, torturous levels. These are not quick or painless deaths. Observed bird behaviors</p>

	<p>during the process include open-mouth breathing, rapid respiration, flailing, escape attempts, and vocalizations “ unmistakable signs of prolonged suffering and terror.</p> <p>Research suggests that animals subjected to heatstroke-based depopulation are likely to experience pain, anxiety, nausea, and heat distress for a prolonged period prior to losing consciousness. This is a slow, agonizing death “ conducted entirely out of public view, often on hundreds of thousands of birds at a time.</p> <p>Proponents argue that speed during disease outbreaks justifies the method. But humane alternatives exist. Nitrogen whole-house gassing, for example, displaces oxygen and typically renders birds unconscious within seconds to under a minute, and is considered acceptable as a form of euthanasia.</p> <p>Colorado should require that producers engage in more humane options rather than defaulting to a method that even its own proponents acknowledge causes suffering.</p> <p>Industry guidance itself acknowledges that ventilation shutdown is not considered humane, yet its use has expanded dramatically during recent avian influenza outbreaks and pandemic-era supply chain disruptions. Healthy animals posing no disease risk have been killed this way simply because processing plants were overwhelmed “ a troubling expansion of a practice that was always meant to be a last resort.</p> <p>Colorado has the opportunity to lead the nation by drawing a clear ethical line: no bird raised in this state should be made to suffer an agonizing death lasting hours when faster, less painful alternatives exist.</p>
<p>Sarah Lundberg For themselves</p>	<p>Ventilation Shutdown is a cruel and inhumane way to manage avian populations. Per PETA research VSD suffocates the affected animals, often involving heat, humidity, and carbon dioxide. Research also shows that these animals experience fear and pain, as well as grief. They should not be subjected to torturous deaths.</p>
<p>Dina Fitzpatrick For themselves</p>	<p>As a resident of Colorado I am urging support of SB26-123 to prohibit outdated VSD methods for mass-killing of poultry.</p>
<p>Debra Guendelsberger For themselves</p>	<p>As a Colorado resident, I am urging Colorado lawmakers to end cruel ventilation shutdown methods that slowly suffocate or bring about heat stroke in mass-killing practices that target millions of birds. These VSD methods are utilized as wave after wave of avian flu outbreaks continue to impact massive factory farms where animals are confined for production of meat and eggs.</p> <p>The system of factory farming is a cruel and abusive type of farming that creates the problem in the first place. Packing animals into small, enclosed spaces without access to the outdoors is unnatural. Further, it is an unhealthy practice that sets the stage for diseases to develop and transmit in epidemic surges. Humans create this problem of avian flu epidemics that is then dealt with by employing further inhumane</p>

	<p>atrocities, such as VSD, which are terrifying for animals and can leave birds writhing in pain and gasping for oxygen for hours.</p> <p>These VSD methods came under increased scrutiny in 2020 when pandemic-related supply-chain issues and labor shortages in slaughterhouses and farms resulted in the “depopulation” of animals (i.e., killing them). In this cruel practice, ventilation fans are turned off to suffocate the animals, and “VSD+” incorporates heat, humidity, and/or carbon dioxide in the process “suffocating the animals and often inducing heatstroke.</p> <p>Chickens not only communicate with their unhatched chicks by softly clucking to them, but also have different calls to describe whether a danger is coming from land or air. Chickens and turkeys can recognize over 100 faces, and feel fear and pain when deprived of oxygen.</p> <p>The Senate Bill SB26-123 is being considered in Colorado and would prohibit the use of outdated VSD methods for mass-killing of animals. I urge the committee to support SB26-123 because it will spare chickens and other birds from prolonged, agonizing deaths caused by VSD and VSD+.</p> <p>Your support of Senate Bill SB26-123 is the first step in the journey to return to a more humane system of farming. I implore the committee to support this bill to begin reconciling the gap between the treatment of animals and a healthy farming system in Colorado.</p>
<p>Robin Hood For themselves</p>	<p>I am writing to implore you to end cruel mass killing practices such suffocating birds during VSD . Ventilation shut down. I am a Colorado resident and urge you to support bill SB26-123 because it will spare millions of chickens &amp; other birds from prolonged, agonizing deaths from VSD &amp; VSD+.</p> <p>Regards Robin j hood Parker CO</p>
<p>Meghan DVM For themselves</p>	<p>As a veterinarian, I am writing to urge you to support the Bill to prohibit Ventilation Shutdown (Plus) for poultry depopulation. It is a tier 3 (not recommended) method of depopulation by the AVMA, and is extremely cruel. Chickens and turkeys are trapped in facilities with all the ventilation shut off and the heat and humidity increased until they die from suffocation and hyperthermia, which can take hours.</p> <p>Over 80% of veterinarians surveyed do not support this method as it is contradictory to veterinary and welfare guidelines, and other, more rapid and humane methods are already available.</p> <p>Respectfully, Meghan Shannon DVM</p>
<p>Alice O’Bannon For</p>	<p>As a resident of Colorado, I urge you to please support SB26-123 to spare chickens and other birds prolonged and agonizing deaths. There are more humane methods such as “rigorous biosecurity” and “isolation and protection.” And</p>

<p>themselves</p>	<p>more! Please vote with your heart as every act of kindness has a ripple effect and the world needs this more than ever. God cares for all creatures no matter how small, and so should we be good stewards. Thanking you in advance for your consideration and kindness.</p>
<p>Jessica Kirchberg For themselves</p>	<p>I am a resident of CO &amp; urge the committee to support SB26-123 because it will spare chickens &amp; other birds from prolonged, agonizing deaths from VSD &amp; VSD+. This is a top issue for me and I vote along these lines. Please support this bill to end this cruel mass-killing practice. Thank you.</p>
<p>Katherine Tkac For themselves</p>	<p>I am ashamed the state allows this to happen. All living beings deserve to be dealt with respect and killing animals by entrapment and fire is inexcusable. All of us should be ashamed that this has occurred in this state. It must stop now. Have some empathy!!!!!!</p> <p>I hope the vote is to stop this horrific act and allow us to become a more civilized state!!!!!!</p>
<p>Jared Bloomfield For themselves</p>	<p>I am a Colorado resident and am strongly in favor of this legislation. I believe it is possible for us to lead with empathy. As a pro business voter, this horrific treatment of animals has simply gone too far</p>
<p>Katherine Blamey For themselves</p>	<p>I am a resident of Colorado and urge the committee to support SB26-123. Suffocating beings to death is incredibly cruel and inhumane, as thousands of American veterinarians have testified. Continuing to approve/allow this immoral practice is unacceptable. Please choose empathy instead.</p>
<p>Virva Aryan For themselves</p>	<p>I am writing in support of prohibiting ventilation shutdown practices. Farmed animals, who have zero freedom or autonomy, at the very least deserve not to suffer a painful death. Ventilation shutdown is a woefully cruel practice that inflicts prolonged suffering in animals' last moments before death. Please prohibit this awful practice that helpless animals endure in their last moments on this earth.</p>
<p>Brooke Hassrick For themselves</p>	<p>Chair and Members of the Committee,</p> <p>I urge you to support SB26-123 and end the use of ventilation shutdown to kill chickens and ducks in Colorado.</p> <p>Ventilation shutdown kills birds by sealing them in barns and raising the temperature until they die from heatstroke. This method causes prolonged suffering as animals experience extreme heat, dehydration, and distress before death. Many veterinary</p>

	<p>and animal welfare experts have stated that this is one of the most inhumane ways to kill animals.</p> <p>Regardless of one’s views on farming, we should agree that animals deserve to be spared unnecessary suffering. SB26-123 establishes a clear standard that cruelty like this has no place in Colorado’s agricultural practices.</p> <p>Colorado has the opportunity to lead by setting humane limits and encouraging better, more responsible methods when depopulation is necessary.</p> <p>Please vote YES on SB26-123.</p> <p>Thank you for your time and consideration.</p>
<p>Christina Hallam For themselves</p>	<p>I am for this bill. Fact: non human animals feel physical pain the same as humans, feel fear and have the desire to live just as humans. The idea that some lives matter more than others is all that is wrong with this world. End speciesism, wake up and think. This is mass genocide with zero regard to the innocent beings who have to experience this why? Because they were born non human. This is a act! To do this to a living being is without humanity. All lives matter ALL!</p> <p>Thank you for your time and attention</p>
<p>Lena Donaker For themselves</p>	<p>I am a resident of CO and I urge the committee to support SB26-123 because it will spare chickens &amp; other birds from prolonged, agonizing deaths from VSD and other inhumane factors.</p>
<p>Claire McCartney For themselves</p>	<p>My name is Claire McCartney and I am submitting this written testimony in strong support of Senate Bill 26-123, which would prohibit the use of ventilation shutdown (VSD) and ventilation shutdown plus (VSD+) as methods of poultry depopulation in our state. I respectfully urge this committee to advance SB26-123 and send a clear message that Colorado will not tolerate unnecessary animal suffering. Permitting mass-killing methods that cause prolonged, excruciating suffering when more humane alternatives exist is simply unconscionable.</p> <p>The bill does not prohibit depopulation itself, nor does it prevent swift action during disease outbreaks. It simply requires that the methods used be humane. Alternatives to ventilation shutdown are already in use in other states and countries, and they are available to Colorado producers. The 2029 effective date gives industry stakeholders, agricultural agencies, and producers sufficient time to prepare and transition.</p> <p>Several states and advocacy organizations have already called for an end to VSD practices, and Colorado has an opportunity to be a national leader in establishing a</p>

	<p>humane standard for poultry depopulation. Passing SB26-123 would demonstrate that our state is willing to act on its values, protect animals from unnecessary suffering, and set a benchmark that other states may follow. I strongly urge the committee to vote in support of SB26-123. This bill is a meaningful, practical, and morally necessary step forward.</p>
<p>Jody Riesberg For themselves</p>	<p>Thank you for hearing the many pleas in favor of this Bill SB26-123. I am extremely grateful that Colorado is on top of this insanity of no ventilation for birds ! It's insane that this torture is even something we have to fight against. Thank you Colorado for having compassion!</p>
<p>Gregory Tkac For themselves</p>	<p>Please pass this bill. This practice is horrific and needs to end.</p>
<p>Alisa Wright Against themselves</p>	<p>I am a taxpaying, law abiding, full time employed sales professional in Colorado. I work in Hospitality Sales. The consideration of a bill with this level of obscenity would make me want to leave Colorado. This is not what this state, so well-known for wildlife, nature, environment and hospitality represents. This is premeditated cruelty, torture and a message to all of the taxpayers and those wishing to vacation here that Coloradans have no compassion and no concern for sentient beings. This is embarrassing. There will be major industry boycotts forthcoming if this horrific allowance is passed.</p>

Catherine Lacey  
[catherineldlacey@gmail.com](mailto:catherineldlacey@gmail.com)

**RE: SB26-123 / ISO Prohibit Ventilation Shutdown for Poultry / Senate Agriculture & Natural Resources Committee**

My name is Catherine Lacey, and I am a concerned Colorado native that writes today in support of SB26-123. I am appalled that slow suffocation is a means of “poultry depopulation” whatsoever. These fellow animals did not ask to be born into crowded inhumane conditions just to be thrown into a grinder or similarly awful, suffocated to death due to an illness they cannot avoid.

The arguments from the opposition only relate to one thing – money. We need to act our way into a different way of thinking about animal welfare. No amount of money can justify this torture. **Please** do not put profit over the welfare of sentient beings.

Thank you, Chairperson and members of the Committee, for your consideration and support of this bill.

Thank you,

A handwritten signature in black ink that reads "Catherine Lacey". The signature is written in a cursive style with a long, sweeping tail that extends to the right.

Catherine Lacey



# VAFAW

Veterinary Association for Farm Animal Welfare

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March 8, 2026

Senator Dylan Roberts

Colorado General Assembly

Chair, Senate Agriculture and Natural Resources Committee

200 E. Colfax Avenue

Denver, CO 80203

Senator Jessie Danielson

Colorado General Assembly

Vice Chair, Senate Agriculture and Natural Resources Committee

200 E. Colfax Avenue

Denver, CO 80203

Re: Support for the Modernizing Depopulation Act (SB26-123)

Dear Chair Roberts and Vice Chair Danielson,

The Veterinary Association for Farm Animal Welfare ([VAFAW](http://www.VAFAW.org)) is a 501(c)(3) nonprofit organization dedicated to advocating for animals used in food and fiber production by providing a veterinary perspective grounded in animal welfare and ethics. As part of our efforts to ensure humane end-of-life practices, VAFAW provides continuing education to veterinary professionals about depopulation and advocates for policies that advance higher-welfare depopulation methods and reduce animals' vulnerability to circumstances that result in depopulation. **On behalf of the veterinarians, veterinary students, producers, and others who are VAFAW members, we urge you to lend your full support to the Modernizing Depopulation Act (SB 26-123).**

As you know, SB 26-123 would require Colorado to phase out the use of heatstroke-based methods of depopulation, including ventilation shutdown (VSD) and ventilation shutdown plus (VSD+). VSD alone involves sealing a poultry house, shutting down its ventilation system, and allowing heat production from the birds to raise the barn temperature and induce fatal heatstroke (hyperthermia). With VSD+, heat or steam is added to more quickly raise the temperature. In either case,

animals typically take hours to lose consciousness, and it is common to have survivors who must be found and killed by another method. While VSD alone is almost never used, VSD+ has become a common depopulation method in the U.S.

### **Heatstroke-based depopulation methods severely compromise animal welfare.**

VFAFW is among numerous veterinary organizations working to reduce the widespread use of VSD+ because of its severely negative impacts on animal welfare. As described in a peer-reviewed [journal article](#) authored by several VFAFW leaders, animals who die of fatal hyperthermia likely experience severe overheating, pain, frustration, nausea, malaise, helplessness, fear, and, finally, exhaustion and respiratory distress. The Colorado legislature seems to recognize the importance of preventing fatal heatstroke as a cause of death, having passed in 2017 a [law](#) that exempts from criminal and civil liability anyone who forcibly enters a locked hot car to save a dog or cat from imminent heatstroke. Research on the pathophysiology of heat stress in poultry and other avian species indicates that they likely have a similar experience as other veterinary species when dying of fatal heatstroke.<sup>1,2,3</sup>

Because of these animal welfare impacts, other countries, such as the United Kingdom, Canada, Australia, and the EU, have all essentially ruled out the use of heatstroke-based depopulation methods.<sup>4,5,6,7</sup> They are not recognized by the World Organization for Animal Health.<sup>8</sup>

### **Higher-welfare depopulation methods are affordable and accessible.**

VFAFW provides educational resources regarding farm animal depopulation. As described in the attached Frequently Asked Questions resource, carbon dioxide-based methods are often used in response to highly pathogenic avian influenza (HPAI) and result in less prolonged distress compared to VSD+. We have also provided numerous continuing education [webinars](#) about depopulation. [One](#) of these covers in detail nitrogen-based methods of depopulation, such as nitrogen whole house gassing and high-expansion nitrogen foam. Modern, nitrogen-based methods are an ideal choice for depopulation related to disease control for a number of reasons:

1. They better protect animal welfare because, when properly deployed, animals experience no pain and little or no distress prior to losing consciousness. Minimizing or eliminating animal suffering associated with depopulation also helps mitigate the negative psychological impacts of depopulation on veterinarians and other depopulation workers.
2. Nitrogen-based methods require little or no animal handling, meaning human exposure to potentially zoonotic diseases is minimized. While the use of VSD+ on a Colorado poultry farm [resulted](#) in 15% of birds surviving the depopulation attempt, nitrogen-based methods result in the rapid deaths of 99.99% to 100% of animals. This means workers do not need to catch and destroy large numbers of debilitated—and potentially infectious—survivors.

3. As discussed further below, nitrogen is widely available and extremely affordable, particularly with advanced preparation, such as entering into contracts with gas suppliers and planning how the method will be deployed on a specific farm.

These benefits recently led the United States Animal Health Association to pass a resolution calling on the United States Department of Agriculture (USDA) to increase accessibility of nitrogen-based depopulation methods.

### **Large quantities of nitrogen are affordable and easily accessible in Colorado.**

Because nitrogen is abundantly available—making up 78% of the atmosphere—producing liquid nitrogen is very inexpensive. A researcher on nitrogen-based depopulation methods has calculated that the cost of labor and nitrogen required for nitrogen whole house gassing amounts to \$0.07 to \$0.15 per bird, less than the cost of a single egg.

Liquid nitrogen is readily available from numerous plants in Colorado, as it plays an important role in the oil and gas industry. In addition, because liquid nitrogen is occasionally used to fight coal mine fires, Colorado-based companies that supply it already have experience in rapidly dispatching drivers to haul liquid nitrogen for emergency use. Nitrogen is so abundant that, when produced as a co-product of air separation for higher-value gases (e.g., oxygen, helium, argon), it is released back into the atmosphere without being sold. Entering into contracts to ensure a specific number of liquid nitrogen tankers are always available within a certain number of hours of a request is a straightforward solution that has already been embraced in Australia.

Some poultry companies are exploring nitrogen whole house gassing as a less expensive, more humane alternative to using carbon dioxide modified atmosphere killing (MAK) carts for routine end-of-lay culling of layer hens. This avoids worker injuries related to catching live birds, a significant concern in aviary housing systems. On-site dedicated cryogenic nitrogen plants are available to facilitate such a transition, and the incorporation of such systems would ensure that nitrogen is immediately available at all times for disease-control-related depopulation. This option may be especially attractive in Weld County, where all of the Colorado poultry operations that have used VSD+ to date are located.

Unfortunately, to our knowledge, Colorado poultry operations and animal health officials have not yet undertaken any preparedness steps to enable the use of nitrogen-based methods for HPAI-infected flocks.

### **The AVMA Depopulation Guidelines' designation of VSD+ is extremely controversial.**

Some argue that VSD+ is approved by the American Veterinary Medical Association (AVMA), and therefore, its use should not be phased out in Colorado. However, the AVMA is not a regulatory

body and does not “approve” any depopulation methods. Its Depopulation Guidelines state that “all depopulation activities must comply with federal, state, local, and tribal laws.”

Moreover, the legitimacy of the AVMA’s Depopulation Guidelines is questioned by a number of organizations, including VFAFW. Because of errors, omissions, transparency issues, and stakeholder exclusion, VFAFW recommends against the unconditional incorporation of the AVMA Depopulation Guidelines into policy, particularly when, as is the case for VSD+, they differ markedly from the assessments of other veterinary or animal welfare authorities, including the World Organization for Animal Health.<sup>9,10,11,12,13</sup>

The AVMA has been widely challenged regarding its classification of VSD alone as a “Tier 3” method and VSD+ as a “Tier 2” method (where Tier 1 methods are most preferred and Tier 3 methods are highly discouraged yet remain part of the Guidelines). Numerous peer-reviewed research studies regarding the welfare impacts of VSD+ and other forms of fatal heatstroke are not referenced in the Guidelines, despite being flagged during the comment period as highly relevant to evaluation of the method. The Guidelines omit research conducted by the USDA indicating that, when VSD+ is used on large farms, it takes up to 5 days to find and kill the debilitated survivors by a secondary method.

During the comment period on the current edition of the AVMA Depopulation Guidelines, VFAFW submitted a letter, heavily referenced with evidence from the scientific literature that was signed by 868 veterinarians and veterinary students, including 504 AVMA members. The comment letter requested that the AVMA reclassify ventilation shutdown plus (VSD+) to discourage its use. This recommendation was not incorporated, and no reasons were given for rejecting the input of such a large number of AVMA members.

### **Depopulation for disease control is now a predictable part of poultry production.**

While the U.S. has experienced HPAI outbreaks in the past, this one is crucially different: HPAI is now endemic in wild birds. This means that, for the foreseeable future, depopulation is a permanent and predictable aspect of poultry production. USDA data indicates that, on average, one in nine laying hens dies from HPAI-related depopulation each year. We can no longer treat depopulation as a rare emergency for which it is difficult to adequately prepare.

Current USDA policy permits the use of VSD+ in “constrained circumstances,” when other methods cannot be deployed rapidly enough. Unfortunately, failing to prepare to rapidly access other methods creates these exact “constrained circumstances.” A USDA report concluded that, under this policy, VSD+ has become “the primary depopulation method for commercial table egg premises,” used to destroy 71% of layer hens and pullets.

As veterinarians and as consumers, we find this unacceptable. Poultry operations that are responsible for the welfare of tens of thousands—sometimes millions—of animals must be prepared to end the lives of those animals humanely in the event of a fatal disease outbreak. Not only does this protect animal welfare, but it also helps mitigate public health risk and the psychological harm incurred by veterinarians, producers, and other workers tasked with depopulation.

**The Modernizing Depopulation Act positions Colorado as a leader.**

Passing SB26-123 would permanently phase out heatstroke-based depopulation methods and provide the incentive needed for Colorado to lead the transition to more effective, higher-welfare methods of depopulation that better align with Coloradans' values. We urge you to give the bill your full support.

If VAFAW can be of any further assistance to the committee, please contact Dr. Gwendolen Reyes-Illg at [greyes-illg@vafaw.org](mailto:greyes-illg@vafaw.org).

Thank you for your consideration.

Respectfully,



Gwendolen Reyes-Illg, DVM, MA  
VAFAW Co-Executive Director



Cameron Krier Massey, JD, MPH, MSc  
VAFAW Co-Executive Director



Barry Kipperman, DVM, DACVIM, MSc, DACAW (Diplomate of the American College of Animal Welfare)  
Chair, VAFAW Board of Directors

CC: The Honorable Members of the Colorado Senate Agriculture & Natural Resources Committee

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<sup>1</sup> Xie, S.; Nicholson, A.; Woolford, L.; McWhorter, T.J. Physiological, biochemical and histopathological changes associated with heatstroke in the galah (*Eolophus roseicapilla*) and rock dove (*Columba livia*). *Avian Pathol.* **2019**, *48*, 57–72.

<sup>2</sup> McKechnie, A.E. Regulation of body temperature. In *Sturkie's Avian Physiology*; Elsevier: London, UK, 2022; pp. 1231–1264. ISBN 978-0-12-819770-7.

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- <sup>3</sup> Alhenaky, A.; Abdelqader, A.; Abuajamieh, M.; Al-Fataftah, A.-R. The effect of heat stress on intestinal integrity and Salmonella invasion in broiler birds. *J. Therm. Biol.* **2017**, *70*, 9–14.
- <sup>4</sup> The Welfare of Animals at the Time of Killing (England) Regulations 2015. legislation.gov.uk. Available online: <https://www.legislation.gov.uk/ukxi/2015/1782/contents/made>. [Note that similar regulations are in effect in Northern Ireland, Scotland, and Wales. Complete citation information available upon request]
- <sup>5</sup> Canadian Food Inspection Agency. (2022). Planning for Alternative Depopulation Options during a Highly Pathogenic Avian Influenza Outbreak in Canada.
- <sup>6</sup> Animal Health Australia. Operational manual: Destruction of Animals (version 5.0). Australian Veterinary Emergency Plan (AUSVETPLAN), edition 5. **2026**. Canberra, ACT. [https://animalhealthaustralia.com.au/wp-content/uploads/dlm\\_uploads/2026/01/AUSVETPLAN\\_Operational-Manual\\_Destruction-of-Animals-v5.0.pdf](https://animalhealthaustralia.com.au/wp-content/uploads/dlm_uploads/2026/01/AUSVETPLAN_Operational-Manual_Destruction-of-Animals-v5.0.pdf)
- <sup>7</sup> Council Regulation (EC) No 1099/2009 of 24 September 2009 on the Protection of Animals at the Time of Killing. EUR-Lex. <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009R1099>
- <sup>8</sup> World Organisation for Animal Health. Terrestrial Code Chapter 7.6. Killing of Animals for Disease Control Purposes. [https://www.woah.org/fileadmin/Home/eng/Health\\_standards/tahc/2018/en\\_chapitre\\_aw\\_killing.htm](https://www.woah.org/fileadmin/Home/eng/Health_standards/tahc/2018/en_chapitre_aw_killing.htm)
- <sup>9</sup> Hewitt, L. *An independent animal welfare assessment of mass destruction methods for poultry on-farm*, report prepared for the Department of Agriculture, Fisheries and Forestry, Canberra, August. CC BY 4.0. **2025**. <https://www.agriculture.gov.au/sites/default/files/documents/independent-animal-welfare-assessment-mass-destruction-methods-poultry-on-farm.pdf>
- <sup>10</sup> UK Animal Welfare Committee. Advice on emergency culling for the depopulation of poultry affected by high pathogenic avian influenza (HPAI) – consideration of ventilation shutdown (VSD). **2023**. <https://www.gov.wales/sites/default/files/publications/2023-10/animal-welfare-committee-opinion-ventilation-shutdown-emergency-culling-method-poultry-affected.pdf>
- <sup>11</sup> EFSA Panel on Animal Health and Welfare (AHAW). Killing for purposes other than slaughter: Poultry. *Efsa J.* **2019**, *17*, e05850. <https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2019.5850>
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## **FAQs: Farm Animal Depopulation**

### **Q: What is depopulation?**

Depopulation describes the rapid destruction of a population of animals in response to urgent circumstances [1–2]. Today, depopulation is common in animal agriculture in response to certain disease outbreaks as well as market disruptions, corporate bankruptcies, and other economic considerations [3].

### **Q: Is depopulation the same as euthanasia?**

No. Euthanasia involves giving an animal a good death, that is, ending their life in the most rapid, painless, and distress-free manner possible when continuing to live is no longer in their best interest [4]. Disease outbreaks and natural disasters have long necessitated euthanizing herds or flocks of farm animals. As agricultural operations have come to confine tens of thousands or even millions of animals in one location, ending animals' lives via traditional euthanasia methods has become unfeasible.

In its depopulation guidelines, the American Veterinary Medical Association (AVMA) includes language indicating that during depopulation, the animals' welfare needs receive only as much consideration "as practicable," with other concerns taking priority [2]. Despite international standards requiring that depopulation methods result in immediate loss of consciousness or that animal suffering be minimized during loss of consciousness [5], methods that inherently cause severe and/or prolonged suffering have become the norm in the United States. VAFAW seeks a transition to modern depopulation methods that provide a painless, distress-free death, thus meeting the animal welfare standards required for euthanasia methods.

### **Q: What is ventilation shutdown plus (VSD+)?**

Ventilation shutdown plus, or VSD+, is a method of depopulation that involves sealing a barn, shutting off the ventilation system, and adding heat and/or steam to raise the temperature [6]. The animals die of heatstroke, or hyperthermia. Heatstroke directly causes damage throughout the body, and additional pathology develops from the body's response to being overheated [7].

VSD+ is widely used for the depopulation of some farm animal species in the U.S. [6,8].

Since February 2022, when the current highly pathogenic avian influenza (H5N1 HPAI) outbreak began, approximately 190 million chickens, turkeys, ducks, and pheasants have been depopulated. Of these, 72% died on premises where the birds in some or all barns were subjected to VSD+ [9]. VSD+ was also used to kill approximately 250,000 pigs when COVID-19 infections among workers resulted in slaughterhouse bottlenecks [6].

**Q: What are the animal welfare concerns associated with heatstroke-based depopulation methods like VSD+?**

Before animals lose consciousness, they likely experience overheating, pain, anxiety, frustration, helplessness, nausea, malaise, respiratory distress, and exhaustion. Under field conditions, poultry often require hours to lose consciousness and die [10].

According to the USDA, in most poultry barns where VSD+ is used, some birds survive, even after several hours of heat exposure. These debilitated birds are then destroyed by a secondary method, sometimes days later [8].

Under field conditions, pigs often require an hour or more to lose consciousness and die from VSD+ [6]. The higher temperatures and humidity levels involved when VSD+ is used to destroy pigs may result in steam burns, worsening the pain experienced by the animals [10].

**Q: What other depopulation methods are prevalent in the U.S.?**

**Carbon dioxide gassing** is commonly used, especially in the egg industry. Birds are either caught and put into carts or containers with high levels of carbon dioxide, or the gas is pumped into the whole barn. Death is faster than with VSD+, but birds are likely to experience pain and distress before loss of consciousness [10–11].

**Medium-expansion water-based foam** is often used to destroy turkeys and broilers (chickens raised for meat). This wet foam blocks their airway. Death is faster than with VSD+, but birds are likely to experience fear and distress before they lose consciousness. [11]

**Methods that are applied to one animal at a time, such as cervical dislocation and blunt force trauma**, are also used occasionally. While these methods may cause immediate or near-instantaneous loss of consciousness when performed properly, the risk of animal welfare compromise increases when they are used on large numbers of birds or performed by inadequately trained workers.[11]

**Q: How can we assess the animal welfare impact of different depopulation methods?**

Assessing animal welfare at the time of killing involves considering the time to loss of consciousness and what the animal experiences until then [12]. An animal's likely experience can be determined by examining behavior and considering what bodily changes occur. Research on humans and other animals demonstrates the effect that bodily changes have on the individual's experience. For example, physical changes can result in pain, anxiety, or air hunger, which are often referred to as negative affective states [13].

**Q: What are higher-welfare methods of depopulation or mass euthanasia?**

Higher-welfare methods generally rely on the use of inert gases, such as nitrogen or argon, which are not detected by the body. While both gases can be used in containerized systems, nitrogen is the gas typically used with other delivery systems [14].

Nitrogen-based methods include nitrogen whole house gassing and injection of nitrogen gas into a trailer. Nitrogen can also be delivered via a high-expansion foam matrix. Unlike water-based foam, high-expansion nitrogen foam does not obstruct the animal's windpipe [11,15–16].

Inert gas-based methods work by creating a very low-oxygen (anoxic) environment around the animal. Without oxygen, the brain functioning required for consciousness rapidly ceases [11,17]. For certain species, such as chickens, turkeys, and pigs, nitrogen-based methods of killing are considered higher welfare because, when properly deployed, they cause no pain and little to no distress to the animal. For poultry and pigs, nitrogen anoxia is considered a method of humane euthanasia [18].

Nitrogen-based methods are used in other countries in response to H5N1 HPAI and other disease outbreaks; however, in the U.S., they have not yet been deployed in emergency situations. Nitrogen-based methods can also be used for routine end-of-lay culling of hens kept for egg production, offering animal welfare and worker safety benefits over the traditional carbon dioxide carts, particularly in aviary and other cage-free egg production facilities.

**Q: What are barriers to adoption of higher-welfare depopulation methods, and how can they be overcome?**

Nitrogen-based depopulation methods were developed more recently than the methods currently used. In the U.S., commercial operations and governmental agencies often lack the requisite equipment and expertise. While no advanced preparation and very little forethought are required to use VSD+, commercial operations must prepare in advance if nitrogen-based

depopulation methods are to be rapidly deployable. Preparedness measures include contracts with nitrogen suppliers, access to needed equipment, and development of SOPs [2,14,19].

Unfortunately, federal policy currently fails to incentivize the use of higher-welfare depopulation methods [9–10]. Farms receive taxpayer-funded indemnity and compensation payments when their birds are depopulated due to HPAI. USDA policy requires that other depopulation methods be considered before VSD+ is selected, but VSD+ is easily approved if operations can show that other methods were not rapidly accessible. Thus, operations that fail to prepare for the known threat of HPAI infection effectively create the very circumstances required for the USDA to approve use of VSD+.

Public pressure, new laws, and changes to governmental and industry policy can motivate corporate producers, management companies, and animal health officials to plan and prepare for a successful transition to higher-welfare depopulation methods. Most farms—even very large ones—can complete preparations within a few months so they will be ready to deploy nitrogen-based depopulation methods within hours of an HPAI outbreak or other emergency.

**Q: Why should the veterinary profession care about depopulation?**

Our professional oath requires that we, as veterinarians, use our scientific knowledge and skills to prevent and relieve animal suffering [20]. Society expects veterinarians to lead on animal welfare issues, especially when it comes to end of life. Veterinarians know that how an animal dies matters morally, and many have witnessed the suffering of animals experiencing heatstroke.

However, the depopulation guidelines promulgated by the American Veterinary Medical Association include low-welfare methods requiring minimal planning or preparation [2]. These guidelines are often cited by industry and government representatives as justification for the use of VSD+. These veterinary guidelines entrench heatstroke-based depopulation methods and threaten to undermine society's trust in the U.S. veterinary profession and its moral legitimacy. With depopulation now a routine part of animal agriculture, VFAW believes the veterinary profession must, at a minimum, advance the transition to higher-welfare depopulation methods.

It's not only the animals who suffer. Veterinarians and other workers tasked with depopulation often experience significant negative psychological impacts, such as secondary trauma and moral distress/injury, especially when significant animal suffering is involved [21]. We can support our colleagues who do this difficult work by hastening the transition to higher-welfare methods and working together to reduce the risk of circumstances that result in depopulation.

## **Q: How does VFAFW work to advance animal welfare in the context of depopulation?**

VFAFW works to advance policies that (1) reduce animals' vulnerability to dying by depopulation and (2) promote a transition to higher-welfare methods of depopulation.

We lobby Congress to push for HPAI vaccination of poultry, which requires USDA authorization, as this would dramatically reduce the number of birds depopulated annually. In addition, our efforts have contributed to Congress directing the USDA to advance nitrogen-based depopulation methods.

We work with veterinary colleagues to advance higher-welfare depopulation methods and provide education about them. VFAFW leaders collaborated with other members of the US Animal Health Association to pass a resolution advancing nitrogen-based methods. VFAFW led a collaborative effort that resulted in over 850 veterinarians and vet students petitioning the American Veterinary Medical Association (AVMA) to revise its depopulation guidelines to better protect animal welfare. In addition, we submitted technical comments on the depopulation guidance of both the AVMA and the World Organization for Animal Health during their respective comment periods.

Finally, VFAFW brings the discourse about depopulation and animal welfare to academia by challenging depopulation-related research that obfuscates or downplays the negative welfare impacts of depopulation methods.

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# VAFAW

Veterinary Association for Farm Animal Welfare

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March 8, 2026

Senator Dylan Roberts

Colorado General Assembly

Chair, Senate Agriculture and Natural Resources Committee

200 E. Colfax Avenue

Denver, CO 80203

Senator Jessie Danielson

Colorado General Assembly

Vice Chair, Senate Agriculture and Natural Resources Committee

200 E. Colfax Avenue

Denver, CO 80203

Re: Support for the Modernizing Depopulation Act (SB26-123)

Dear Chair Roberts and Vice Chair Danielson,

The Veterinary Association for Farm Animal Welfare ([VAFAW](http://www.VAFAW.org)) is a 501(c)(3) nonprofit organization dedicated to advocating for animals used in food and fiber production by providing a veterinary perspective grounded in animal welfare and ethics. As part of our efforts to ensure humane end-of-life practices, VAFAW provides continuing education to veterinary professionals about depopulation and advocates for policies that advance higher-welfare depopulation methods and reduce animals' vulnerability to circumstances that result in depopulation. **On behalf of the veterinarians, veterinary students, producers, and others who are VAFAW members, we urge you to lend your full support to the Modernizing Depopulation Act (SB 26-123).**

As you know, SB 26-123 would require Colorado to phase out the use of heatstroke-based methods of depopulation, including ventilation shutdown (VSD) and ventilation shutdown plus (VSD+). VSD alone involves sealing a poultry house, shutting down its ventilation system, and allowing heat production from the birds to raise the barn temperature and induce fatal heatstroke (hyperthermia). With VSD+, heat or steam is added to more quickly raise the temperature. In either case,

animals typically take hours to lose consciousness, and it is common to have survivors who must be found and killed by another method. While VSD alone is almost never used, VSD+ has become a common depopulation method in the U.S.

### **Heatstroke-based depopulation methods severely compromise animal welfare.**

VFAFW is among numerous veterinary organizations working to reduce the widespread use of VSD+ because of its severely negative impacts on animal welfare. As described in a peer-reviewed [journal article](#) authored by several VFAFW leaders, animals who die of fatal hyperthermia likely experience severe overheating, pain, frustration, nausea, malaise, helplessness, fear, and, finally, exhaustion and respiratory distress. The Colorado legislature seems to recognize the importance of preventing fatal heatstroke as a cause of death, having passed in 2017 a [law](#) that exempts from criminal and civil liability anyone who forcibly enters a locked hot car to save a dog or cat from imminent heatstroke. Research on the pathophysiology of heat stress in poultry and other avian species indicates that they likely have a similar experience as other veterinary species when dying of fatal heatstroke.<sup>1,2,3</sup>

Because of these animal welfare impacts, other countries, such as the United Kingdom, Canada, Australia, and the EU, have all essentially ruled out the use of heatstroke-based depopulation methods.<sup>4,5,6,7</sup> They are not recognized by the World Organization for Animal Health.<sup>8</sup>

### **Higher-welfare depopulation methods are affordable and accessible.**

VFAFW provides educational resources regarding farm animal depopulation. As described in the attached Frequently Asked Questions resource, carbon dioxide-based methods are often used in response to highly pathogenic avian influenza (HPAI) and result in less prolonged distress compared to VSD+. We have also provided numerous continuing education [webinars](#) about depopulation. [One](#) of these covers in detail nitrogen-based methods of depopulation, such as nitrogen whole house gassing and high-expansion nitrogen foam. Modern, nitrogen-based methods are an ideal choice for depopulation related to disease control for a number of reasons:

1. They better protect animal welfare because, when properly deployed, animals experience no pain and little or no distress prior to losing consciousness. Minimizing or eliminating animal suffering associated with depopulation also helps mitigate the negative psychological impacts of depopulation on veterinarians and other depopulation workers.
2. Nitrogen-based methods require little or no animal handling, meaning human exposure to potentially zoonotic diseases is minimized. While the use of VSD+ on a Colorado poultry farm [resulted](#) in 15% of birds surviving the depopulation attempt, nitrogen-based methods result in the rapid deaths of 99.99% to 100% of animals. This means workers do not need to catch and destroy large numbers of debilitated—and potentially infectious—survivors.

3. As discussed further below, nitrogen is widely available and extremely affordable, particularly with advanced preparation, such as entering into contracts with gas suppliers and planning how the method will be deployed on a specific farm.

These benefits recently led the United States Animal Health Association to pass a resolution calling on the United States Department of Agriculture (USDA) to increase accessibility of nitrogen-based depopulation methods.

### **Large quantities of nitrogen are affordable and easily accessible in Colorado.**

Because nitrogen is abundantly available—making up 78% of the atmosphere—producing liquid nitrogen is very inexpensive. A researcher on nitrogen-based depopulation methods has calculated that the cost of labor and nitrogen required for nitrogen whole house gassing amounts to \$0.07 to \$0.15 per bird, less than the cost of a single egg.

Liquid nitrogen is readily available from numerous plants in Colorado, as it plays an important role in the oil and gas industry. In addition, because liquid nitrogen is occasionally used to fight coal mine fires, Colorado-based companies that supply it already have experience in rapidly dispatching drivers to haul liquid nitrogen for emergency use. Nitrogen is so abundant that, when produced as a co-product of air separation for higher-value gases (e.g., oxygen, helium, argon), it is released back into the atmosphere without being sold. Entering into contracts to ensure a specific number of liquid nitrogen tankers are always available within a certain number of hours of a request is a straightforward solution that has already been embraced in Australia.

Some poultry companies are exploring nitrogen whole house gassing as a less expensive, more humane alternative to using carbon dioxide modified atmosphere killing (MAK) carts for routine end-of-lay culling of layer hens. This avoids worker injuries related to catching live birds, a significant concern in aviary housing systems. On-site dedicated cryogenic nitrogen plants are available to facilitate such a transition, and the incorporation of such systems would ensure that nitrogen is immediately available at all times for disease-control-related depopulation. This option may be especially attractive in Weld County, where all of the Colorado poultry operations that have used VSD+ to date are located.

Unfortunately, to our knowledge, Colorado poultry operations and animal health officials have not yet undertaken any preparedness steps to enable the use of nitrogen-based methods for HPAI-infected flocks.

### **The AVMA Depopulation Guidelines' designation of VSD+ is extremely controversial.**

Some argue that VSD+ is approved by the American Veterinary Medical Association (AVMA), and therefore, its use should not be phased out in Colorado. However, the AVMA is not a regulatory

body and does not “approve” any depopulation methods. Its Depopulation Guidelines state that “all depopulation activities must comply with federal, state, local, and tribal laws.”

Moreover, the legitimacy of the AVMA’s Depopulation Guidelines is questioned by a number of organizations, including VFAFW. Because of errors, omissions, transparency issues, and stakeholder exclusion, VFAFW recommends against the unconditional incorporation of the AVMA Depopulation Guidelines into policy, particularly when, as is the case for VSD+, they differ markedly from the assessments of other veterinary or animal welfare authorities, including the World Organization for Animal Health.<sup>9,10,11,12,13</sup>

The AVMA has been widely challenged regarding its classification of VSD alone as a “Tier 3” method and VSD+ as a “Tier 2” method (where Tier 1 methods are most preferred and Tier 3 methods are highly discouraged yet remain part of the Guidelines). Numerous peer-reviewed research studies regarding the welfare impacts of VSD+ and other forms of fatal heatstroke are not referenced in the Guidelines, despite being flagged during the comment period as highly relevant to evaluation of the method. The Guidelines omit research conducted by the USDA indicating that, when VSD+ is used on large farms, it takes up to 5 days to find and kill the debilitated survivors by a secondary method.

During the comment period on the current edition of the AVMA Depopulation Guidelines, VFAFW submitted a letter, heavily referenced with evidence from the scientific literature that was signed by 868 veterinarians and veterinary students, including 504 AVMA members. The comment letter requested that the AVMA reclassify ventilation shutdown plus (VSD+) to discourage its use. This recommendation was not incorporated, and no reasons were given for rejecting the input of such a large number of AVMA members.

### **Depopulation for disease control is now a predictable part of poultry production.**

While the U.S. has experienced HPAI outbreaks in the past, this one is crucially different: HPAI is now endemic in wild birds. This means that, for the foreseeable future, depopulation is a permanent and predictable aspect of poultry production. USDA data indicates that, on average, one in nine laying hens dies from HPAI-related depopulation each year. We can no longer treat depopulation as a rare emergency for which it is difficult to adequately prepare.

Current USDA policy permits the use of VSD+ in “constrained circumstances,” when other methods cannot be deployed rapidly enough. Unfortunately, failing to prepare to rapidly access other methods creates these exact “constrained circumstances.” A USDA report concluded that, under this policy, VSD+ has become “the primary depopulation method for commercial table egg premises,” used to destroy 71% of layer hens and pullets.

As veterinarians and as consumers, we find this unacceptable. Poultry operations that are responsible for the welfare of tens of thousands—sometimes millions—of animals must be prepared to end the lives of those animals humanely in the event of a fatal disease outbreak. Not only does this protect animal welfare, but it also helps mitigate public health risk and the psychological harm incurred by veterinarians, producers, and other workers tasked with depopulation.

**The Modernizing Depopulation Act positions Colorado as a leader.**

Passing SB26-123 would permanently phase out heatstroke-based depopulation methods and provide the incentive needed for Colorado to lead the transition to more effective, higher-welfare methods of depopulation that better align with Coloradans' values. We urge you to give the bill your full support.

If VAFAW can be of any further assistance to the committee, please contact Dr. Gwendolen Reyes-Illg at [greyes-illg@vafaw.org](mailto:greyes-illg@vafaw.org).

Thank you for your consideration.

Respectfully,



Gwendolen Reyes-Illg, DVM, MA  
VAFAW Co-Executive Director



Cameron Krier Massey, JD, MPH, MSc  
VAFAW Co-Executive Director



Barry Kipperman, DVM, DACVIM, MSc, DACAW (Diplomate of the American College of Animal Welfare)  
Chair, VAFAW Board of Directors

CC: The Honorable Members of the Colorado Senate Agriculture & Natural Resources Committee

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## **FAQs: Farm Animal Depopulation**

### **Q: What is depopulation?**

Depopulation describes the rapid destruction of a population of animals in response to urgent circumstances [1–2]. Today, depopulation is common in animal agriculture in response to certain disease outbreaks as well as market disruptions, corporate bankruptcies, and other economic considerations [3].

### **Q: Is depopulation the same as euthanasia?**

No. Euthanasia involves giving an animal a good death, that is, ending their life in the most rapid, painless, and distress-free manner possible when continuing to live is no longer in their best interest [4]. Disease outbreaks and natural disasters have long necessitated euthanizing herds or flocks of farm animals. As agricultural operations have come to confine tens of thousands or even millions of animals in one location, ending animals' lives via traditional euthanasia methods has become unfeasible.

In its depopulation guidelines, the American Veterinary Medical Association (AVMA) includes language indicating that during depopulation, the animals' welfare needs receive only as much consideration "as practicable," with other concerns taking priority [2]. Despite international standards requiring that depopulation methods result in immediate loss of consciousness or that animal suffering be minimized during loss of consciousness [5], methods that inherently cause severe and/or prolonged suffering have become the norm in the United States. VAFAW seeks a transition to modern depopulation methods that provide a painless, distress-free death, thus meeting the animal welfare standards required for euthanasia methods.

### **Q: What is ventilation shutdown plus (VSD+)?**

Ventilation shutdown plus, or VSD+, is a method of depopulation that involves sealing a barn, shutting off the ventilation system, and adding heat and/or steam to raise the temperature [6]. The animals die of heatstroke, or hyperthermia. Heatstroke directly causes damage throughout the body, and additional pathology develops from the body's response to being overheated [7].

VSD+ is widely used for the depopulation of some farm animal species in the U.S. [6,8].

Since February 2022, when the current highly pathogenic avian influenza (H5N1 HPAI) outbreak began, approximately 190 million chickens, turkeys, ducks, and pheasants have been depopulated. Of these, 72% died on premises where the birds in some or all barns were subjected to VSD+ [9]. VSD+ was also used to kill approximately 250,000 pigs when COVID-19 infections among workers resulted in slaughterhouse bottlenecks [6].

**Q: What are the animal welfare concerns associated with heatstroke-based depopulation methods like VSD+?**

Before animals lose consciousness, they likely experience overheating, pain, anxiety, frustration, helplessness, nausea, malaise, respiratory distress, and exhaustion. Under field conditions, poultry often require hours to lose consciousness and die [10].

According to the USDA, in most poultry barns where VSD+ is used, some birds survive, even after several hours of heat exposure. These debilitated birds are then destroyed by a secondary method, sometimes days later [8].

Under field conditions, pigs often require an hour or more to lose consciousness and die from VSD+ [6]. The higher temperatures and humidity levels involved when VSD+ is used to destroy pigs may result in steam burns, worsening the pain experienced by the animals [10].

**Q: What other depopulation methods are prevalent in the U.S.?**

**Carbon dioxide gassing** is commonly used, especially in the egg industry. Birds are either caught and put into carts or containers with high levels of carbon dioxide, or the gas is pumped into the whole barn. Death is faster than with VSD+, but birds are likely to experience pain and distress before loss of consciousness [10–11].

**Medium-expansion water-based foam** is often used to destroy turkeys and broilers (chickens raised for meat). This wet foam blocks their airway. Death is faster than with VSD+, but birds are likely to experience fear and distress before they lose consciousness. [11]

**Methods that are applied to one animal at a time, such as cervical dislocation and blunt force trauma**, are also used occasionally. While these methods may cause immediate or near-instantaneous loss of consciousness when performed properly, the risk of animal welfare compromise increases when they are used on large numbers of birds or performed by inadequately trained workers.[11]

**Q: How can we assess the animal welfare impact of different depopulation methods?**

Assessing animal welfare at the time of killing involves considering the time to loss of consciousness and what the animal experiences until then [12]. An animal's likely experience can be determined by examining behavior and considering what bodily changes occur. Research on humans and other animals demonstrates the effect that bodily changes have on the individual's experience. For example, physical changes can result in pain, anxiety, or air hunger, which are often referred to as negative affective states [13].

**Q: What are higher-welfare methods of depopulation or mass euthanasia?**

Higher-welfare methods generally rely on the use of inert gases, such as nitrogen or argon, which are not detected by the body. While both gases can be used in containerized systems, nitrogen is the gas typically used with other delivery systems [14].

Nitrogen-based methods include nitrogen whole house gassing and injection of nitrogen gas into a trailer. Nitrogen can also be delivered via a high-expansion foam matrix. Unlike water-based foam, high-expansion nitrogen foam does not obstruct the animal's windpipe [11,15–16].

Inert gas-based methods work by creating a very low-oxygen (anoxic) environment around the animal. Without oxygen, the brain functioning required for consciousness rapidly ceases [11,17]. For certain species, such as chickens, turkeys, and pigs, nitrogen-based methods of killing are considered higher welfare because, when properly deployed, they cause no pain and little to no distress to the animal. For poultry and pigs, nitrogen anoxia is considered a method of humane euthanasia [18].

Nitrogen-based methods are used in other countries in response to H5N1 HPAI and other disease outbreaks; however, in the U.S., they have not yet been deployed in emergency situations. Nitrogen-based methods can also be used for routine end-of-lay culling of hens kept for egg production, offering animal welfare and worker safety benefits over the traditional carbon dioxide carts, particularly in aviary and other cage-free egg production facilities.

**Q: What are barriers to adoption of higher-welfare depopulation methods, and how can they be overcome?**

Nitrogen-based depopulation methods were developed more recently than the methods currently used. In the U.S., commercial operations and governmental agencies often lack the requisite equipment and expertise. While no advanced preparation and very little forethought are required to use VSD+, commercial operations must prepare in advance if nitrogen-based

depopulation methods are to be rapidly deployable. Preparedness measures include contracts with nitrogen suppliers, access to needed equipment, and development of SOPs [2,14,19].

Unfortunately, federal policy currently fails to incentivize the use of higher-welfare depopulation methods [9–10]. Farms receive taxpayer-funded indemnity and compensation payments when their birds are depopulated due to HPAI. USDA policy requires that other depopulation methods be considered before VSD+ is selected, but VSD+ is easily approved if operations can show that other methods were not rapidly accessible. Thus, operations that fail to prepare for the known threat of HPAI infection effectively create the very circumstances required for the USDA to approve use of VSD+.

Public pressure, new laws, and changes to governmental and industry policy can motivate corporate producers, management companies, and animal health officials to plan and prepare for a successful transition to higher-welfare depopulation methods. Most farms—even very large ones—can complete preparations within a few months so they will be ready to deploy nitrogen-based depopulation methods within hours of an HPAI outbreak or other emergency.

**Q: Why should the veterinary profession care about depopulation?**

Our professional oath requires that we, as veterinarians, use our scientific knowledge and skills to prevent and relieve animal suffering [20]. Society expects veterinarians to lead on animal welfare issues, especially when it comes to end of life. Veterinarians know that how an animal dies matters morally, and many have witnessed the suffering of animals experiencing heatstroke.

However, the depopulation guidelines promulgated by the American Veterinary Medical Association include low-welfare methods requiring minimal planning or preparation [2]. These guidelines are often cited by industry and government representatives as justification for the use of VSD+. These veterinary guidelines entrench heatstroke-based depopulation methods and threaten to undermine society's trust in the U.S. veterinary profession and its moral legitimacy. With depopulation now a routine part of animal agriculture, VFAW believes the veterinary profession must, at a minimum, advance the transition to higher-welfare depopulation methods.

It's not only the animals who suffer. Veterinarians and other workers tasked with depopulation often experience significant negative psychological impacts, such as secondary trauma and moral distress/injury, especially when significant animal suffering is involved [21]. We can support our colleagues who do this difficult work by hastening the transition to higher-welfare methods and working together to reduce the risk of circumstances that result in depopulation.

## **Q: How does VAWAW work to advance animal welfare in the context of depopulation?**

VAWAW works to advance policies that (1) reduce animals' vulnerability to dying by depopulation and (2) promote a transition to higher-welfare methods of depopulation.

We lobby Congress to push for HPAI vaccination of poultry, which requires USDA authorization, as this would dramatically reduce the number of birds depopulated annually. In addition, our efforts have contributed to Congress directing the USDA to advance nitrogen-based depopulation methods.

We work with veterinary colleagues to advance higher-welfare depopulation methods and provide education about them. VAWAW leaders collaborated with other members of the US Animal Health Association to pass a resolution advancing nitrogen-based methods. VAWAW led a collaborative effort that resulted in over 850 veterinarians and vet students petitioning the American Veterinary Medical Association (AVMA) to revise its depopulation guidelines to better protect animal welfare. In addition, we submitted technical comments on the depopulation guidance of both the AVMA and the World Organization for Animal Health during their respective comment periods.

Finally, VAWAW brings the discourse about depopulation and animal welfare to academia by challenging depopulation-related research that obfuscates or downplays the negative welfare impacts of depopulation methods.

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