



The University of Vermont

Research Protections Office
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Institutional Animal Care & Use Committee
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Memorandum

To: USDA Animal Care

From: Donna Silver, Director *Donna Silver*
Research Protections Office

Date: June 27, 2022

Re: Appeal to Recent USDA Citation at Annual Site Inspection

The University of Vermont (UVM) respectfully appeals the Critical citation outlined in Inspection ID: 2016090000794766, received from the USDA on June 9, 2022.

“A sheep died when it was anesthetized for an acute procedure without appropriate anesthetic support procedures for the species. Investigations by the facility concluded that death was due to hypoventilation as an insufficient ventilator was used and no gastric tube was passed, leading to compression of the lungs by the expansion of the gastrointestinal tract, and an inability to maintain oxygen levels compatible with life. Sheep under anesthesia require that species specific procedures such as passing a gastric tube be performed to ensure that they can be safely anesthetized, or fatal complications may result. The facility shall ensure that animals are handled during anesthesia in a manner that does not cause trauma or physical harm. Correct from this time forward.”

The Attending Veterinarian (AV) was out of town at the time of the unannounced inspection visit from the USDA Veterinary Medical Officer (VMO). The Attending Veterinarian provided additional significant information regarding the cited event in a subsequent conversation with the VMO on June 22, 2022. We believe that the information shared orally with the VMO and outlined below should result in reversal of the initial citation.

Experience of Technician. The technician who performed the sheep surgery in question is a RLAT with almost 40 years of experience performing surgery on animals, including rodents, calves, and pigs. Prior to performing sheep surgeries, he completed the Sheep & Goats CITI training, as required by the IACUC, and he reviewed other literature on sheep anesthesia. As further described below, the manufacturer of the ventilator scheduled to be used during the surgery informed the technician that the ventilator should work when used in sheep.

Attending Veterinarian Participation. Because this was the technician’s first surgery on sheep, the Attending Veterinarian was present to assist and provide additional training as needed. She was present from the start of the procedure, including ketamine/xylazine induction, endotracheal intubation, isoflurane anesthesia, and positioning on the operating table, and she stayed until she was satisfied the technician no longer needed her assistance. This surgery was intentionally planned to be a non-survival procedure. The sheep had been fasted for 12 hours to reduce bloat, the table was tilted to elevate the chest, and the nose was positioned lower than the poll to allow release of secretions.

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Use of Gastric Tube. The Attending Veterinarian has extensive experience with sheep anesthesia at other institutions. In the AV's experience, a gastric tube is sometimes passed for prolonged procedures when a sheep has not been sufficiently fasted or when bloat develops during the procedure and interferes with anesthesia. However, the AV believes a gastric tube is not required for successful sheep surgery and was not a critical factor in the current situation.

Ventilator Failure. The technician was accustomed to using a pressure ventilator that supplies gas volume according to pulmonary pressure. The manufacturer informed the technician that the ventilator should work fine in sheep. However, from the start of the procedure, the ventilator did not appear to provide adequate tidal volume. The settings were adjusted multiple times to try to increase respiratory volume and frequency to normalize the high CO₂ and low O₂. However, this was not successful, and the CO₂ remained elevated for a prolonged period. The sheep died on the table (under anesthesia) about two hours later.

IACUC Response. The AV informed the IACUC of the incident, and the IACUC responded appropriately by requiring the technician to perform only non-survival procedures using a volume pump ventilator, and under the supervision of the AV, until he was consistently successful. The technician complied with these guidelines, and he has performed many successful survival sheep surgeries since that time.

We appreciate the thorough and constructive review of our program by the USDA Veterinary Medical Officer as we strive for continuous improvement of animal care at UVM. Given the above clarifications, we ask that the original citation be reversed. If we can provide any further documentation or information, please do not hesitate to contact me at 802-656-8804 or Donna.Silver@uvm.edu.