

Column E Explanation

NOV 30 2012

This form is intended as an aid to completing the Column E explanation. It is not an official form and its use is voluntary. Names, addresses, protocols, veterinary care programs, and the like, are not required as part of an explanation. A Column E explanation must be written so as to be understood by lay persons as well as scientists.

1. Registration Number: 23-R-0023
2. Number 1656 of animals used in this study.
3. Species (common name) Swine of animals used in this study.
4. Explain the procedure producing pain and/or distress.

Open castration of unanesthetized male piglets, aged 7-10 days, is performed in the Swine Teaching Herd as it is done in commercial swine facilities. A vertical incision is placed in the ventral portion of the scrotal sac over each testes. The incision penetrates the skin, the tunics and often the testicular parenchyma in single-motion of the scalpel blade in order to minimize the duration of the procedure. The testes are everted through the incisions and spermatic cords are isolated. Manual traction is placed on the spermatic cord and the resultant traction of the spermatic cord frees the testes for removal. The traction of the blood vessels stimulates hemostasis and precludes the need to ligate or cauterize these vessels. The incisions are not closed to promote drainage. The surgical site is washed with antiseptic solution and the piglet returned to the mother. The total time that the piglet is away from its mother is less than 5 minutes.

5. Provide scientific justification why pain and/or distress could not be relieved. State methods or means used to determine that pain and/or distress relief would interfere with test results. (For Federally mandated testing, see Item 6 below.)

The stated objective of the School of Veterinary Medicine Swine Teaching Herd is to provide the primary laboratory for veterinary students to experience and learn modern standards of commercial swine production husbandry and management. Livestock producers perform apparently painful procedures that we as veterinary educators have an obligation to teach if we expect to prepare our students for their service to farmers. Scientific evidence documents that these procedures are painful. However, the degree of pain experienced by the animal is unknown, and thus the decision when to intervene with analgesics or anesthetics is unclear; especially when the use of analgesics or anesthetics carries a greater risk to the welfare of the young pre-weaned animal than the seemingly painful procedure. These procedures are brief, with the most painful steps preformed rapidly by experienced hands. Alternatively, the use of analgesics or anesthetics is not necessarily effective, may result in similar untoward post-operative effects, and carries a finite risk of fatality. The potential complications associated with anesthesia could compromise the young piglet. Our experience with several thousand castrations is that the animals return to their mother's side immediately and resume nursing; complications associated with blood loss or infection have been nonexistent. Veterinary students are required to use lidocaine (0.5ml of 2% lidocaine) injected into each testicle 15 minutes prior to castration; a faculty member must supervise this procedure and then students are deemed proficient to castrate expeditiously without analgesia.

6. What, if any, federal regulations require this procedure? Cite the agency, the code of Federal Regulations (CFR) title number and the specific section number (e.g. APHIS, 9 CFR 113.102):
None.

Agency _____ CFR _____

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1. Registration Number: 23-R-0023

2. Number 18 of animals used in this study.

3. Species (common name) Ferrets of animals used in this study.

4. Explain the procedure producing pain and/or distress.

The procedure that causes pain or distress is exposure to irradiation. 18 animals were exposed to either gamma-ray irradiation or proton irradiation. During the irradiation exposure (≤ 4 min.), the ferrets were restrained in 16cm x 24cm x 9cm chambers. The highest dose of radiation used in these experiments was 2 Gy, which is considered a moderate dose of radiation. A 2 Gy dose of radiation is used on a daily basis in cancer treatment procedures in humans, and it is a dose that can cause nausea and vomiting in patients. We have observed in our studies that a 2 Gy dose of radiation can also induce vomiting in ferrets. We have also learned from our ferret experiments that the radiation exposure induces changes in the blood cell counts and changes in blood clotting parameters within days after the radiation exposure.

5. Provide scientific justification why pain and/or distress could not be relieved. State methods or means used to determine that pain and/or distress relief would interfere with test results. (For Federally mandated testing, see Item 6 below.)

It is part of our grant work to characterize the threshold dose and approximate amount of time that it takes for ferret blood clotting parameters and blood cell counts to change after the radiation exposure. If medications for these potential effects are given to the ferrets, they could lead to changes in the characteristics of the biological endpoints that we are expected to evaluate as part of our grant work. Therefore, the pain/distress cannot be alleviated with typical veterinary treatments. The changes in blood cell counts or in blood clotting parameters cannot be treated until we have determined the nature of the blood cell count reductions and the blood clotting parameter changes. These biological endpoints are being evaluated so that the risks for blood cell problems arising as a result of astronaut exposure to radiation during space travel can be estimated.

6. What, if any, federal regulations require this procedure? Cite the agency, the code of Federal Regulations (CFR) title number and the specific section number (e.g. APHIS, 9 CFR 113.102):

None

Agency _____ CFR _____

Protocols	Species	Justification
7	Macaca mulatta	A full quad caging unit with 1 horizontal divider in place to house an individual animal or a pair, shaped like a "C". This gives the NHP excess floor space exceeding the Regulations but may have limited height to floor space ratio for approximately half of the cage. An exemption to house animals this way was requested because NHPs favor vertical space over horizontal space and this is an innovative enclosure that gives them multiple levels on which to perch.
8	Macaca mulatta	The provision of fluid as an experimental reward is used as the most effective and humane way to motivate the monkeys to perform the psychophysical tasks that are critical to the proposed research. Typically investigators allow the animal to work for as much water as it desires during the course of an experiment. Records are maintained for each monkey with a minimum daily amount (along with a normal range); this amount is approved by an Attending Veterinarian designee. The monkeys are offered free access to water outside of the experimental session at least twice daily for at least 1 hour each time. Therefore, when the monkey is 'on study', it will not be offered ad-lib water. The monkeys receive water through two possible mechanisms: rewards during behavioral/recordings sessions and through food/fruit/vegetable supplements.
4	Macaca mulatta	In addition to monkeys with dispositions not compatible to social housing, monkeys receiving vectors of different serotypes cannot be housed together. If animals are housed together that have received different vector serotypes, it may result in cross contamination between experimental animals with a negative impact on the research data.
1	Felis catus	The neuromuscular agent Gallamine (non-pharmaceutical grade) is preferred for use because the corresponding pharmaceutical grade neuromuscular blocker (Pancuronium) fails to completely paralyze the eyes. As the study outcomes require complete stabilization of the eyes for ocular assessments, Pancuronium (pharmaceutical grade) fails to fully abolish small, non-volitional twitches and small drifts in eye position, that ultimately compromise the success of the research.

1	Felis catus	<p>For less than 24 hours (overnight) animals may be housed in primary enclosures less than the required housing dimensions and need for a resting surface. Investigators request that cats be allowed to be housed temporarily in an animal transport carrier (with water, food, and litter) during the 20 hour decay period needed for [18F]-PET reagents. PET scanning is done in the A-PET facility and they need to be kept there until the isotope appropriately decays. They are transported back to their permanent housing site the next day. The carrier to be used overnight for 1-2 cats will be a "large dog" airline carrier (approximately L33" X W23" X H30"). The justification for using a temporary cage without resting surface is that it is a very short period of time, it reduces the amount of surface area that needs to be decontaminated (due to the isotopes), and the cats will be less active for much of the described time frame due to recovery from anesthesia.</p>
1	Felis catus	<p>Animals are housed singly in 1 of 2 containers with the following dimensions: 18" long by 18" wide and either 12" or 18" high. These cage sizes provide for close positioning of electronic devices and infusion cables required to monitor brain activity. Close positioning is essential to reduce electrical noise, which would degrade the integrity of the data collected. The cages provide adequate space for an animal of this size (approximately 0.5kg) to comfortably move about, eat, drink, sleep and urinate/defecate. Resting boards will not be installed in these boxes. Cats of this age (P25-P40) and size typically do not frequently climb up on resting boards. The resting board, projecting into the interior of the chamber, can tangle and/or snag the electrical recording cables we use to record neuronal activity in the freely-behaving animal. This can damage the cranial implant, causing distress/discomfort, termination of the experiment and if the damage to the skull is severe enough, euthanasia. The investigator instead provides soft toys and blankets that the animals can rest upon. While in the chamber, recordings are collected continuously. Single housing is required to avoid damage to the equipment and cables, which would likely result from excess physical activity. Singly-housed animals receive enrichment via human interaction/contact at least 3-4 times per day.</p>
1	Felis catus	<p>We request an exemption for the use of non-pharmaceutic grade gallamine in our NMB experiments. Although we have tried to find a supplier of pharmaceutical grade gallamine as requested by IACUC, we can not find a supplier. We have also been unable to obtain our secondary NMB agent (pancuronium bromide) as this is back-ordered by our supplier, with no consistent availability.</p>