

Exceptions to Standards and Regulations under the AWA for Reporting Period 10/1/2020– 9/30/2021:

The following exceptions to Guide standards were reviewed by the IACUC and are approved in protocols active during this reporting period.

Housing (Individual):

Nineteen investigators were approved to individually house social animals (pigs, guinea pigs, rabbits, wild rodents, cats and dogs) on 40 protocols. Investigators provided scientific justification for this housing (precision of feeding, monitoring feed intake, prevention of coprophagy, protection of surgical sites, infection protocols, maintenance of gnotobiotic individuals, safety of animal and personnel).

Pigs: Most individually housed pigs are 1) neonatal piglets housed in an artificial-rearing system for up to 5 weeks, or 2) following surgical procedures to prevent interference of the surgical site from pen mates. The cages currently in use for artificial rearing of piglets meet Guide standards for space.

Gnotobiotic pigs: isolator to be used to house the germ-free piglets is a specialized positive pressure, flexible film pig tub isolator (Class biologically Clean, Madison, WI; http://www.cbclean.com/pig_tub_isolator.html). Positive pressure isolator creates pressurized chambers in which the air pressure inside the chamber is greater than the ambient room pressure. The system is composed of a leak-proof, stainless steel, rectangular tub (42 x 23.5 x 19.5 inches), fitted with a durable 20 mil vinyl canopy, a 12 inch acrylic transfer port, two pairs of 15 mil Hypalon/CSM dry box gloves and an electric air blower. Each tub contains removable floor grates, dividers, feeder trays, top grates and a work pan. The tub contains 3 sections (one section per piglet) separated by stainless steel dividers. The space in which the piglets are housed is 23.5 inches long and 19.5 inch high. If 3 piglets are housed per isolator, each section is 13 inches wide (2.12 square feet per piglet). The floor grates are made of stainless steel, which allows for urine and feces to drop down through the flooring to the bottom of the tub. The 5 inch diameter inlet and outlet filters will be used for sterilizing air blown in and out from the system. Neonatal pigs acquired via caesarian section will be housed in isolators until 21 days of age. These pigs are used to model the role of microbial glucocorticoid metabolism in human health.

Additionally, pregnant gilts and sows may be housed individually as per standard agricultural practice. Some are maintained in standard farrowing crates from mid-gestation until after farrowing/caesarian section delivery or weaning. Some gilts may be housed in isolation due to experimental infection protocol. These studies utilize the piglets, and the sows are euthanized following delivery.

Most often pigs that are housed individually are adjacent to conspecifics, with visual, olfactory and/or auditory access to conspecifics. Some sows used in infection studies are housed one per isolation room, but have olfactory and auditory access to conspecifics as well as frequent human contact, and will eventually have litters.

555 pigs were housed individually on these protocols during this reporting period.

Dogs and cats: Dogs are typically housed individually, adjacent to conspecifics, with visual, olfactory and/or auditory access to conspecifics. Most are on feeding studies, requiring individualized feed intake and prevention of coprophagy for at least part of each study. Dogs are allowed outside of pens daily for playing with conspecifics and with caretakers. Cats are on feeding studies, requiring individualized feed intake and prevention of coprophagy. Cats are allowed outside of pens most of the time for playing with conspecifics and with caretakers, with cage confinement only during meal and collection periods.

46 dogs and 40 cats were housed as described during the reporting period.

Guinea Pigs: Guinea pigs are housed individually to prevent virus transmission for short periods, as part of the approved influenza study.

No Guinea pigs were housed individually during this reporting period.

Rabbits: Rabbits will be housed individually for the following reasons:

- when implanted with orthopedic implants being tested; each of them will need to be housed individually to prevent disturbance from cage mates.
- The adult rabbits will be individually housed for observation of feeding efficacy, to avoid potential injuries during pregnancy.
- To develop a rabbit passive protection model, in which pregnant rabbits are immunized. Offspring, which have acquired vaccine-derived maternal antibodies, will be challenged. The adult rabbits will be individually housed for observation of feeding efficacy, and to avoid potential injuries during pregnancy.

45 rabbits were used on these protocols during the reporting period.

Wild Rodents: Captive rodents (rats and mice) need to be housed individually to understand whether rodents are seed predators or seed dispersers. Individuals will be fed a predetermined number of fruits/seeds and then success of gut passage documented via examination of fecal materials.

No rodents were used on this protocol during the reporting period.

Agricultural Housing for Animals Assigned to Biomedical Studies:

Five investigators (8 protocols) were approved for agricultural type housing (pastures, paddocks, stalls, floor pens, gestation and farrowing crates) for agricultural species.

Most of the animals (Cattle, horses, llamas, pigs, sheep and goats) were on the protocols that house the resident teaching herds for the College of Veterinary Medicine. **During the reporting period, the following were acquired/born for the teaching herds:**

116 pigs
76 sheep

Three investigators (6 protocols) are approved to house pigs used in biomedical studies in an agricultural setting. One investigator housed sheep used in a biomedical study in standard agricultural housing. This housing situation was deemed most suitable for the nature of the study by the IACUC.

108 pigs were used during the reporting period.

Multiple Major Survival Surgeries:

Two investigators were approved for two surgeries on individual animals (swine, sheep) for scientifically justified reasons, on 5 protocols. The swine surgeries are liver resections. The sheep surgeries are laparotomies (part of the embryo transfer process) approximately 1 year apart.

No pigs were used on this protocol during the reporting period.

No sheep were used on this protocol during the reporting period.

Prolonged Restraint:

One investigator was approved for prolonged restraint of calves. Calves are tethered in their crates for 6 – 8 days, restricting their ability to turn around during fecal collections to prevent contamination with urine.

One calf was used on this protocol during the reporting period.

Reduced space allowance: Two investigators are approved to house neonatal piglets in smaller than standard cages for short periods.

Piglets will be housed in an artificial rearing system until a maximum of 4 weeks of age; they are not expected to exceed 15 kg in weight. Although this system does not meet the Guide's floor space requirement, the Guide also states that "adequate resources for thermoregulation are particularly important for newborn animals since it allows for radiant heaters to be placed above the piglets to maintain consistent, appropriate microenvironmental temperatures for neonatal piglets (~30-34 °C).

One investigator was approved to house gnotobiotic neonatal pigs in isolator units through 21 days of age. Isolator to be used to house the germ-free piglets is a specialized positive pressure, flexible film pig tub isolator (Class biologically Clean, Madison, WI; http://www.cbcclean.com/pig_tub_isolator.html). Positive pressure isolator creates pressurized chambers in which the air pressure inside the chamber is greater than the ambient room pressure. The system is composed of a leak-proof, stainless steel, rectangular tub (42 x 23.5 x 19.5 inches), fitted with a durable 20 mil vinyl canopy, a 12 inch acrylic transfer port, two pairs of 15 mil Hypalon/CSM dry box gloves and an electric air blower. Each tub contains removable floor grates, dividers, feeder trays, top grates and a work pan. The tub contains 3 sections (one section per piglet) separated by stainless steel dividers. The space in which the piglets are housed is 23.5 inches long and 19.5 inch high. If 3 piglets are housed per isolator, each section is 13 inches wide (2.12 square feet per piglet). The floor grates are made of stainless steel, which allows for urine and feces to drop down through the flooring to the bottom of the tub. The 5 inch diameter inlet and outlet filters will be used for sterilizing air blown in and out from the system. Neonatal pigs acquired via caesarian section will be housed in isolators until 21 days of age.

16 pigs were used on these protocols during the reporting period.

Food/Water restriction/deprivation:

Five investigators were approved to withhold food/nutrition on 8 protocols for scientifically justified reasons.

Calves: Calves will be infected with *Cryptosporidium* to generate oocysts in order to evaluate novel drugs to treat cryptosporidiosis in cattle. Feeding milk, milk replacer, or creep feed to calves with cryptosporidiosis predisposes them to fatal *Clostridium perfringens* infection, and adds fat to the excreted feces, which interferes with oocyst purification and dramatically reduces oocyst yield. During the first 4 days of collection periods, the calf will be switched from milk replacer to a commercial calf oral rehydration/electrolyte fluid. Thereafter, the calf is put back on milk replacer for the rest of the duration of feces collection to avoid prolonged nutrient deprivation.

One calf was used on this protocol during the reporting period.

Cattle, horses, and Goats: All 3 species being embalmed to provide teaching resources will be fasted for 8 – 48 h in order to achieve more complete preservation of each animal during the embalming process.

no animals were used on this protocol during the reporting period.

Pigs: To investigate how maternal immune activation impacts the offspring's immune, hormonal, and metabolic responses to stressors later in life, offspring of PRRSV challenged sows will be fasted for 24 - 48 h to induce stress. The time period is based on previous data showing glucocorticoid induced gluconeogenesis (an indication of stress) requires 12-48 hrs of fasting in pigs, depending on the strain and size

6 sows were used on this protocol during the reporting period.

Dogs: In a study to determine how diets differing in protein source affect nutrient digestibility, gene expression, stool characteristics, fermentative end-products, and microbiota of healthy adult dogs. Dogs will be fed once daily, which is common for pet dogs and in other testing facilities.

46 Dogs were used on this protocol during the reporting period.

Non-standard temperature conditions

Guinea Pigs are used to investigate the biology of influenza infection. During transmission experiments, animals may be housed under temperature (10-15°C) and relative humidity (RH; 10-20%) conditions that fall below the range recommended in the Guide (20-26°C and 30-70% RH). These conditions are required for optimal transmission of influenza virus in this model. No adverse behaviors have been observed under these conditions.

No Guinea pigs were used on this protocol during the reporting period.