

Animal Facility Guidelines

Walls and Floors

Materials and finishes should be durable, impervious, and resistant to water and chemicals used in their sanitation. Epoxy coating on **walls** and **floor**; methyl methacrylate as an alternative. Sealed or painted concrete floor generally does not stand up well, requires frequent refinishing and does not provide a non-slip service. In addition, the rubber or vinyl cove bases often associated with these types of finishes may provide refuge for vermin.

Ceilings

The preferred substrate for **ceilings** is moisture resistant drywall that is well sealed at all ceiling-wall joints and penetrations. It should be coated with a 2-stage epoxy finish or high-quality enamel paint. (Suspension panels may be necessary to access services between ceiling and roof, therefore reinforced plastic, aluminum, or stainless steel should be considered for the framing. The panels should be easily cleaned (smooth-surfaced vinyl-coated drywall panels work well). Lighter panels should be kept in place with clips to improve the seal between the panels and the frame.

Doors

The doors and frames should be made of a durable metal and completely sealed.

Electrical

At least one electrical outlet is required in each animal room. In areas where they may be exposed to water, they must have a ground fault interrupter (GFI) and be fitted with an all-weather cover. All electrical conduits through walls must be completely sealed.

Security

Security systems that limit access to authorized individuals only must be in place. Card or proximity badge access systems have the advantage over keys in that they permit the passage of people to be monitored and restrict the times of access. They also have the advantage of being able to quickly delete lost or stolen cards from the system.

Emergency Power

In order to maintain the health and well-being of animals during power outages, it is essential that critical functions be supplied with emergency power. A reduction of 50% of the air supply for short periods of time may be acceptable, however the maintenance of air pressure differentials is essential. Sufficient emergency lighting should be available to permit personnel to function safely in the facility.

Environmental Monitoring

Good quality air at the appropriate temperature and humidity levels must be available at all times, and must be monitored throughout the day. Temperature sensors should be recorded at approximately 90cm from the floor. Humidity can be recorded in the supply air duct. Animals should be maintained and manipulated in a negatively ventilated environment in the laboratory.

Lighting

All light fixtures should be vapour-proof.

Bright light should be avoided (greater than 325 lux). Most animals do best at light wavelengths ranging from 450nm to 700nm. Fluorescent light approaches sunlight more closely than incandescent light. Most animals do well on a 12:12 (hrs on/hrs off) light cycle. This may need to be altered depending on the species, studies, and time of year.

HVAC

The HVAC system should supply clean air at specific temperatures and humidity to the animals housed within a room and exhausts all contaminated air. HVAC systems must operate continuously 24hrs/day, year round; therefore adequate redundancy is critical. Generally, all animal holding space should be supplied with at least 50% of its normal air turnover during short cutback periods of less than 12hrs. Duplication of fans and an alternative electrical power source to maintain operation of the balanced system to an appropriate level is mandatory.

Temperature

The temperature of each animal room should be controllable within 1 degree Celsius. The temperature of each room should be controlled separately. The most common method of controlling temperature is by bringing cooler air to the room level. The air for each individual room is brought to the preselected temperature by means of a reheat coil immediately before it is distributed to the room. The reheat system is controlled by monitoring the temperature of the air as it leaves the room, which constitutes the sum total of the heat of the air supplied plus heat gain in the room from animals/fans/equipment. It is important to note that reheat coils supplied from manufacturers are set to fail "on"; however in animal facilities they must be set to fail in the "off" position.

Humidity

Relative humidity should be maintained between 40% - 60% and controlled to plus/minus 5%. The relative humidity may be controlled at the suite level, rather than on a room-to-room basis.

Air Intake/Exchange/Exhaust

Animal facilities should be supplied with 100% fresh air at all times; air should not be recirculated within the facility. All fresh air is filtered into the facility to remove larger particulates; otherwise charcoal or HEPA filters should be used. There should be no possibility within the system for cross-contamination of

fresh air with exhaust air. Contaminated air (from animal facilities) must be efficiently removed from the room with easily changeable filters (30% pleated) on every exhaust grill within each room. It is recommended that there be 15 to 20 air exchanges per hour in a room.

Differential Pressure

To control the movement of air and eliminate a potential source of cross-contamination, clean areas are kept at a positive pressure relative to dirty areas (animal rooms). It is essential to have well-sealed rooms in order for differential pressurization to work. It is very difficult to control directly, and is recommended that room pressures are set through controlling the volume of air taken in versus the volume exhausted. For example, to achieve a positive pressure in a room relative to a corridor, air could be blown into the room at 500 cubic feet per minute (CFM) and exhausted at 400 CFM. Assuming the room is well sealed, the excess 100 CFM would be forced out into the corridor through small cracks around the perimeter of the door.

MISC

-adequate storage should be available for all cages and equipment not in current use

-janitorial services from institutional building service units should not be used in animal facilities.