

Use of Recirculated Air in Animal Facilities

Determining the use of recirculated air and the appropriate proportion of fresh and recirculated air requires careful evaluation. Where HEPA filtered recirculated air is used without gaseous filter, a greater proportion of fresh air (50%) is recommended. However, where both HEPA and gaseous filtering are performed, a greater percentage of recirculated air may be appropriate. Because ventilation needs vary by species, space, and risk level, decisions should be based on measurable environmental parameters and the performance of the filtration system in use.

Risk assessment along with filtration, recirculated air ratio, environmental quality, proper maintenance and husbandry practices help ensure that air quality supports animal health, personnel safety, and operational efficiency. By integrating routine assessment with appropriate engineering controls, facilities can achieve an evidence-based balance between air cleanliness, energy consumption, and cost while meeting accepted standards for high-quality animal care.

Key Considerations

1. Risk Assessment

Because airborne pathogens and contaminants can travel in exhaust air, recirculating air—especially among multiple animal rooms—can present cross-contamination risks.

Situations where recycling exhaust air may be inappropriate include:

- Nonhuman primate housing
- Biohazard containment areas
- Other high-risk animal housing environments

Air from non-animal areas (e.g., offices, certain storage areas) may pose less risk and typically requires less-intensive filtration.

2. Filtration Requirements Particulate Filtration

If recirculated air is used:

- Exhaust air from animal spaces should be filtered at minimum with high-efficiency particulate filtration (e.g., HEPA or 85–95% ASHRAE-efficient filters, depending on risk).
- The extent and efficiency of filtration should be proportional to the hazards present.

3. Environmental Quality Requirements

Even when air is recirculated, the system must maintain:

- Acceptable temperature and humidity
- Adequate fresh-air dilution
- Control of odors, ammonia, and other gaseous byproducts

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Good husbandry practices—such as frequent bedding changes, optimal stocking density, and appropriate sanitation—help maintaining safe air quality, especially when recirculation is used.

4. System Maintenance and Monitoring

Proper operation of HVAC systems requires periodic measurement of recirculation rates, regular preventive maintenance and documented evaluation. The following should be considered as part of regular review:

- What is the source of air and if less than 100% fresh air, what is the recirculation rate?
- Is the air treated (e.g. use of filters, absorbers, etc.) appropriately?
- What are the frequency and methods of assessing, monitoring, and documenting the function of the HVAC system?

Failure to maintain filtration or monitoring systems can render them ineffective, increasing risks to animals and people.