# 10 Myths About Contamination

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Battling the spread of infectious agents in your animal facility? Here's a list of what NOT to believe.

Even with improved housing and health monitoring, positive serologic or culture findings for microorganisms can and do happen in animal facilities. And as much as an animal facility wants negative laboratory results for all agents on an exclusion list, bacteria, viruses, and parasites can sidestep even the best control methodologies, infecting laboratory animal colonies.

Alas, long is the list of potentially contaminating circumstances. Shipping animals between institutions can increase the risk for contamination, especially when an institution's health status is unknown. Movement of staff from areas of low-health status to high also increases risk, as well as other factors, including unscreened biological materials and contaminated food.

Knowledge of such risks helps combat the spread of infectious agents. But what if that knowledge were wrong? What if we were working with faulty assumptions? More risky than the prevalence of certain pathogens or the shipment of animals are the potential false positives in our understandings. These are the myths—things we think are true but are actually false. In this article on microbiological contamination, we'll discuss the 10 most common.

**Myth #1: Contaminations don't happen at well-run facilities.**

Increase the complexity of a system, and you increase the potential for biosecurity failures. Productive research facilities are highly complex operations, with numerous biosecurity variables, including research staff, animal care, and engineering/maintenance personnel. Even the best-run facilities are vulnerable to human error. In addition to supportive husbandry and research materials, there are structural variables, such HVAC systems and pest harborage areas (vertebrate and invertebrate). Even minor errors or system failures increase contamination risks.

**Myth #2: Soiled-bedding sentinels detect everything.**

Dirty bedding only transmits agents hardy enough to stay infectious in soiled bedding. Sentinels therefore can actually miss a number of important pathogens, such as those not stable in dried material or those transmitted through respiratory secretions. Some poorly transmitted agents, for example, include *Pneumocystis carinii*, *Helicobacter spp.*, *Pasteurella pneumotropica*, and fur mites.

**Myth #3: The source of infection is always identifiable.**

An infected mouse, feed bag, clipboard, or dust mote could be long gone. Biosecurity errors may be forgotten or undiscovered as well. It never hurts to perform a thorough investigation, however, as there are usually areas where procedures have begun to drift from the ideal. Even if the smoking gun isn't identified, increased attention to detail never hurts.

**Myth #4: Human cell lines don't contain mouse viruses.**

Nonrodent biological material can carry infectious agents from rodents. Some viruses can infect cells of many species (e.g., *Polyoma* and LCMV). Others can contaminate nonrodent cell lines when rodent cells are used in co-cultivation. This is also true if rodent serum is used to feed cells or if rodent-derived basement membrane gels are used to support xenografts. In addition, serum can become contaminated if it's processed on a column previously exposed to contaminated serum. We once detected mouse parvovirus in rabbit serum due to this, for example.

**Myth #5: The liquid nitrogen used in cryopreservation is sterile.**

There is abundant evidence that materials can become contaminated in liquid nitrogen. As such, embryos or sperm retrieved from liquid nitrogen should not be considered free of biological contaminants. The outsides of containers immersed in liquid nitrogen should be treated as if contaminated and the contents of the container considered the same health status prior to freezing. Always treat animals reconstituted from the freezer as potentially contaminated until proven otherwise.

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**Myth #6: Pet shop rodents are NOT dirty.**

Such animals are often bred in close quarters with no disease control. We have detected *Salmonella*, *Streptobacillus*, lice, mites, pinworms, *Hymenolepis*, and LCMV in rodents from pet stores. In fact, our diagnostic lab actually uses mice from pet store suppliers as a source of positive control serum.

*Rodents and other animals from pet shops are often bred in close quarters with no disease control. [© Pakhnyushchyy – Fotolia.com]*

**Myth #7: Exclusion lists should be based on those of commercial vendors.**

Laboratory rodents are not microbiologically sterile. Like other complex organisms, mice and rats have a rich and complex microflora. Many clients prefer negative results for everything commercial vendors test for. But selecting animals based on inconsequential bacteria doesn't allow for the chance to make selections based on important variables, such as more important infections or even good genetic management. You will save money and headaches by keeping your exclusion lists as simple as possible, and only adding agents relevant to ongoing research.

**Myth #8: Discovering norovirus (or the next new agent) is always something to freak out about.**

It's not. It's just more information. When a new agent is discovered in clinically normal animals, it's typically present in a higher level in the population than "old" agents (because it's never been controlled). For example, finding a new, nonpathogenic virus in immunocompetent animals such as norovirus is just new information about something that has likely always been present. A different story of course, would be a newly discovered agent that actually causes disease in immunocompetent lab animals.

**Myth #9: When concerned about parvovirus, both serology and PCR on lymph nodes (or spleen) should be performed.**

Both methods ask the same question—that is, has the animal ever been infected?—and almost always give the same answer. Because both tests yield little additional information when performed in tandem, money is better spent testing more animals by one method or the other. An alternative would be to also test some animals by fecal PCR, which screens for current shedding of virus.

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**Myth #10: Laminar flow hoods always have laminar flow.**

They only do when they’re empty. Materials and equipment disrupt laminar flow and cause the air to swirl, which can actually spread infectious bacteria or viruses across surfaces or to other objects in the hood. To avoid contamination, clutter must be minimized and manufacturer recommendations followed.

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