Validating a Preamplification Step in the Mass Pathogen Screening Process of Rodent Colonies

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One of the most important steps in the overall workflow of manufacturing a drug is ensuring that the mice in which the drug is tested are healthy; unhealthy or sick mice will provide inaccurate results that do not properly describe the effects of the drug, which may lead to false conclusions being formed among researchers. To know whether the testing mice are healthy, many research institutions utilize soiled-bedding sentinels (SBS), or non-experimental mice solely implemented to pick up pathogens for colony health examination. This method, however, takes a lot of time and money, not to mention that its results are often inaccurate. This has caused a shift to environmental health monitoring (EHM) practices, but some institutions are still reluctant to make this change because of their belief that EHM practices may omit small concentrations of pathogens that can still infect the mice. To bridge this gap, I conducted a validation experiment of the implementation of preamplification into rodent screening practices. Preamplification is a step that boosts pathogen concentrations via a standard thermocycler. The results of my experiment showed that preamplification does boost pathogen concentrations to a detectable point, as real-time PCR readings dropped by 7-12 cycles while digital droplet PCR readings showed a high sample presence in the preamplification cartridges compared to no-amplification samples.

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