

# Microbiology Research Equipment Cost of Ownership

Ask Yourself: Do up front savings outweigh the cost of ownership savings?



When buying a new car, do you solely consider the sticker price before purchasing? Analyze the full cost of ownership when comparing prices—a gas guzzling lemon may look cheap on the price tag, but you know the extra fuel will quickly dwarf your initial savings. A gas hog costs more to operate and causes more damage to the environment. The same level of scrutiny should go into purchasing your microbiological research equipment.

## Lifespan and Reliability

According to the National Science Foundation (NSF), the industry standard for the life cycle of a biosafety cabinet (BSC) should be around 15 years<sup>1</sup>, but poorly built units will often break down well before then. If properly maintained, a high-quality cabinet can safely operate for twice the industry standard.


Research equipment failure compromises your research specimens and may shut down your entire lab. Suddenly, all the funds you saved from buying the cheaper equipment must be poured into maintenance costs. Even worse, your research could face an extended interruption while the equipment is being serviced, interfering with your productivity.

Many agencies providing monetary support will calculate the total cost of ownership to avoid wasting funds on poor quality. If you can show the upfront cost is offset by long-term reliability, funding agencies are more likely to approve those purchases.

## Technical Support

Another important facet to mull over is the level of technical support offered by your equipment manufacturer—even the most reliable equipment inevitably requires servicing. Much like changing your car's oil, a BSC must have its filters inspected and replaced regularly. Consider what their warranty covers and for how long. Make sure you understand their service standards, including average lead time to send a certified technician or replacement parts to your area. Large manufacturers commonly neglect troubleshooting services and rely on AI programs that simply reiterate the manual's basic troubleshooting procedures. Quality technical support can save your lab from substantial downtime and often goes unaccounted for during the purchasing process.





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Work surface vibrations and constant ambient noise from the motor blower can compromise cell-line integrity. Review the noise and vibration specifications for any equipment under consideration. Include the surrounding environment of the intended cabinet location in your review, as well. Any nearby sources of sound and vibration will compound with the workstation.

In conclusion, incorporate the equipment's quality of raw materials, energy consumption, filter lifespan, motor reliability, and its manufacturer's level of technical support into consideration before you commit to buying new lab equipment. So much more than just the initial price affects a piece of equipment's overall value.

## Maintenance Costs

Aside from the initial price, equipment maintenance often remains at the forefront of thought when considering its cost of ownership. Sooner or later, the BSC filters that provide product, personnel, and environmental protection must be replaced. This replacement process usually dominates the maintenance costs of all biosafety cabinets. Quality manufacturers design their cabinets specifically to maintain constant laminar airflow speeds as filter loading increases, which extends the filter lifespan.

Depending on the type of work you conduct, consider adding a pre-filter to your BSC to further decrease the frequency of routine maintenance. Vivarium research facilities present a particularly challenging environment for airflow filters. Animal dander, cage bedding, powders, and aerosols quickly clog HEPA filters, causing faster turnover—a mesh pre-filter can effectively block larger particles before reaching the expensive HEPA filters.

BSC motor blowers can also become a major monetary sink. One versus two motors will have a profound effect on the operational longevity of the cabinet. In this case, more is not necessarily better—two motors create two points of potential motor failure instead of one.

## Workflow Efficiency

The value of ergonomics extends beyond user comfort while working. Repetitive stress injuries plague all workplaces, including microbiology labs. A [2018 study](#)<sup>2</sup> shows that 34.5% of medical science students reported lab-related musculoskeletal problems in the previous 12 months. Sick and/or injured personnel require time outside the workplace to recover—this inhibits your lab's productivity and inflates employee healthcare expenditures.



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## References

- i. NSF/ANSI, NSF International Standard/American National Standard NSF/ANSI 49 - 2019 [Biosafety Cabinetry: Design, Construction, Performance, and Field Certification](#) Informative Annex 1
- ii. Stefania Penkala, Hannan El-Debal, and Kristy Coxon, "[Work-related musculoskeletal problems related to laboratory training in university medical science students: a cross sectional survey](#)," BMC Public Health 18 (2018): 1208.



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