



The advancement of science and technology in the field of medicine and research has resulted in high demand for biological sample storage. Laboratory products and samples are at risk of degradation due to their components' heat-sensitivity and their vulnerability to the rapid growth of microorganisms. To prevent these unwanted instances from happening, refrigeration plays an important role in preserving samples' integrity and viability. Refrigerated vaccines, for example, must be stored at between 2°C and 8°C to maintain their potency, otherwise, it may result in product loss. Household fridges and lab fridges are often entrusted to store these valuable samples, but which of the two is the right equipment?

Household refrigerator as a cheaper substitute.

A household refrigerator is designed to store food products for consumption such as meat, dairy, and vegetables. The temperature may be adjusted through a thermostat dial and is not strictly regulated to a specific set point since food items generally do not need precise temperature regulation. It is a low-cost equipment, which is why it is usually purchased as substitute equipment for sample storage.

On the contrary, a lab grade refrigerator costs more. It is equipped with a microprocessor controller that ensures accurate temperature setting and provides alarms to signal critical conditions for storage of temperature-sensitive products.



Esco HP Series Laboratory Refrigerators

A LAB-GRADE REFRIGERATOR IS THE RECOMMENDED EQUIPMENT FOR STORAGE OF THE FOLLOWING:



Purchasing the right equipment can be expensive that is why most end-users would likely use a household refrigerator in place of a lab refrigerator to cut expenses. The cost of products stored in cold storage would sum up to thousands, if not millions of dollars. Considering this amount of expense, is it worth the cut?

TABLE 1. COMPARISON OF COST AND PRESENCE OF SIGNIFICANT FEATURES

	Laboratory Refrigerator	Household Refrigerator
Market Price	high-priced	low-priced
Air Circulation	forced convection	natural convection
Alarms for Critical Conditions	audible and visual	none
Material	lab-grade	commercial-grade
Monitoring System	available	none
Temperature Distribution	uniform	non-uniform

A poor refrigeration system, uneven temperature distribution, frequent temperature fluctuations, and lack of temperature monitoring system increase the risk of sample spoilage and wastage. That being the case, entrusting expensive samples to a household refrigerator will cost more than the price of the right laboratory equipment.

References:

[1] F. John Mills. (2009, June). *Biopreservation and Biobanking*. <http://doi.org/10.1089/bio.2009.0702.fjm>

[2] *Vaccine Refrigeration Specifications*. (2017, February 7). <https://www.elitecme.com/resource-center/laboratory/vaccinerefrigeration-specifications/>

