How to compare the cost and real value of a laboratory fermentor-bioreactor?

This guide should help colleagues to judge better what they get for their money when buying a laboratory fermentor. Some producers try to lower the initial selling price by supplying equipment and components with minimal value. Unaware clients decide to buy lower priced instruments without consideration of the much lower value obtained, future costs and lower efficiency of such material which inevitably will decrease the productivity of their work for many years. Today, the cost of wages, of laboratory space and infrastructure are orders of magnitude larger than the acquisition costs of a laboratory fermenter or bioreactor. This certainly justifies the truth, that only the best is good enough.

The table below shows common additional costs in US$ for the described features or options:

Add US$	**Description**
1’500 to 3’500	If the proposed fermentor has only a mechanical seal, lip seal etc. it has lower value compared to instruments with magnetic seal or LAMBDA membrane physical seal.
1’500 to 2’500	When your fermentor has only floating ball flow rate measurement (rotameter) compared to an exact mass flow electronic system allowing a recording and a reproducible setting of the gas flow.
450 to 650	When your system has only manual flow air control when comparing to instruments with automatic, electronic and proportional air valve. This allows controlling DO by airflow variation and not only by stirring speed.
5’000 to 10’000	If your system requires the acquisition of new sets of probes and head plate when you wish to use vessels of different volumes.
5’000 to 9’000	When your system does not allow exact measurement of biologic activity compared with systems which allow this (for ex. LAMBDA INTEGRATOR)
2’500 to 3’500	If your system requires a circulating water bath and jacketed vessel when compared to systems with radiation temperature control.
600 to 1’200	Per pump, if pumps delivered with your system have only on/off control at fixed speed as compared to systems like LAMBDA peristaltic pumps where the speed control is regulated in range 1: 1’000 and which can also be used separately from the fermentor.
150 to 250	For each stirring device necessary to adapt the system to prokaryotic or eukaryotic cultures.
2’000 to 3’000	For the individual control of each parallel vessel (usually only sequentially controlled), compared to systems with precise and constant control of each vessel such as the LAMBDA MINIFOR.

6'000 to 15'000 (each month !)	Per each m^2 of lab bench surface used by the fermenter. People often ignore that the lab bench surface is the most expensive surface in the world. A larger foot-print of the fermentor costs proportionally more money each month. With only 0.1 m^2 footprint, LAMBDA MINIFOR is several times more compact than any other fermentor system.
100 to 600 for each run	Time spent for dismantling, cleaning and setting-up of the laboratory fermenter increases considerably the project costs. Big savings can be achieved when setting time is of only about 10 minutes. See e.g. the installation video of the LAMBDA MINIFOR: http://www.lambda-instruments.com/?pages=video#fermentor
More than 30 per run	For systems using consumable parts (such as O-rings, seals, etc.) compared with fermentation systems using permanent parts like the LAMBDA MINIFOR. Various additional costs arise due to mistakes resulting from the complexity of the fermenter system. One should always prefer efficient, compact and simple technical solutions (number of cables, tubings, o-rings, screws to be fixed, connections etc.)