

1500PP Bottle (WM) Has the Same Cell Density and Viability as Smaller Bottles

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- > 1500PP bottles (WM) isolate the same cell density pellet as 1.0 L bottles
- > 1500PP bottles (WM) maintain the same cell viability as 1.0 L bottles
- > 1500PP bottles (WM) allow for reduced procedure time compared to 1.0 L bottles
- > 1500PP bottles (WM) therefore accelerate cell pelleting with the same efficiency as 1.0 L bottles, and no minimum filling is required

Executive Summary

Most cell culture starts with small-scale setups using dishes, flasks, or tubes. However, these small vessels become limiting when you need to produce significant amounts of a secreted protein or other cellular product. Scaling up involves transitioning from small-scale culture conditions to larger vessels such as bioreactors. Centrifugation is a well-established purification technique used in cell culture workflows. It plays a vital role during various stages, including cell harvest, bulk lysate clarification, and even as a primary or secondary purification method. The main pain point when isolating cells from a bioreactor or larger volume is the capacity of the rotor and vessels. Here, we show that our Rotor R9A2 can hold 4 x 1500PP bottles (WM) and isolate the same cell density as the smaller 1.0 L bottle solutions.



Introduction

Cultured cells serve as models for studying normal cell physiology, biochemistry, and aging. Researchers explore metabolic pathways, drug effects and mutagenesis using these systems. Scaling up cell culture conditions is crucial for advancing research. It allows researchers to produce larger quantities of cells, proteins, or other cellular products but also enhances productivity, consistency, and translatability. Centrifugation plays a vital role in cell culture workflows,

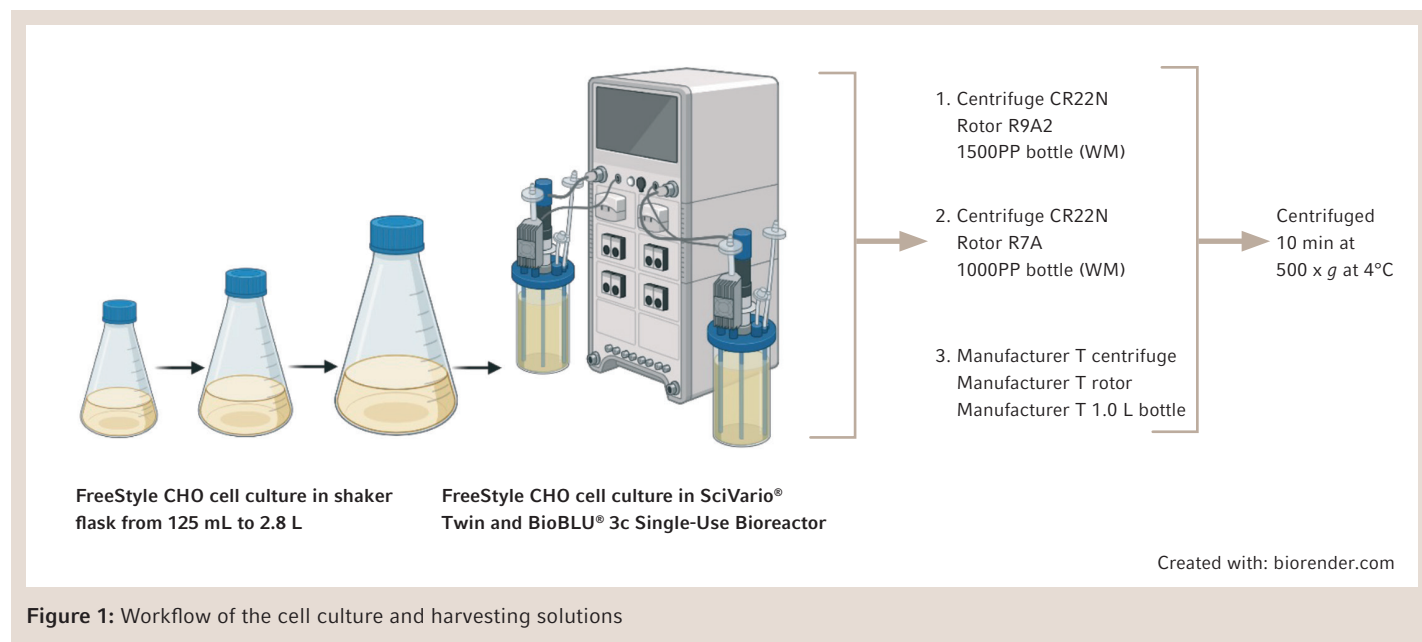
both in basic research and bioprocessing laboratories. Rotors that can hold 1.0 L bottles or smaller volume consumables usually serve as the reference for isolating cells from culture using benchtop or floor standing centrifuges. This is a time-consuming way to process the complete batch volume. Consequently, our 1500PP bottles (WM) allow the isolation of the same density of cell pellet in fewer steps compared to lower volume solutions such as 1.0 L bottles.

Solution & Benefits

The Rotor R9A2, purpose-built for Centrifuges CR22N and Centrifuge CR30NX, accommodates up to four 1500PP bottles (WM). Rigorous testing has revealed a remarkable 32 % reduction in processing time from bottle filling and balance adjustments to supernatant decanting, pellet recovery, and subsequent bottle washing and autoclaving [1]. In our White Paper, we delve into the cell pelleting efficiency of 1500PP bottles (WM) using the Rotor R9A2 in combination with the Centrifuge CR22N. Our objective is to validate that with increasing volume, the harvesting efficiency, cell density, and viability remain on par with lower-volume alternatives, such as 1.0 L bottles.

Experimental Design

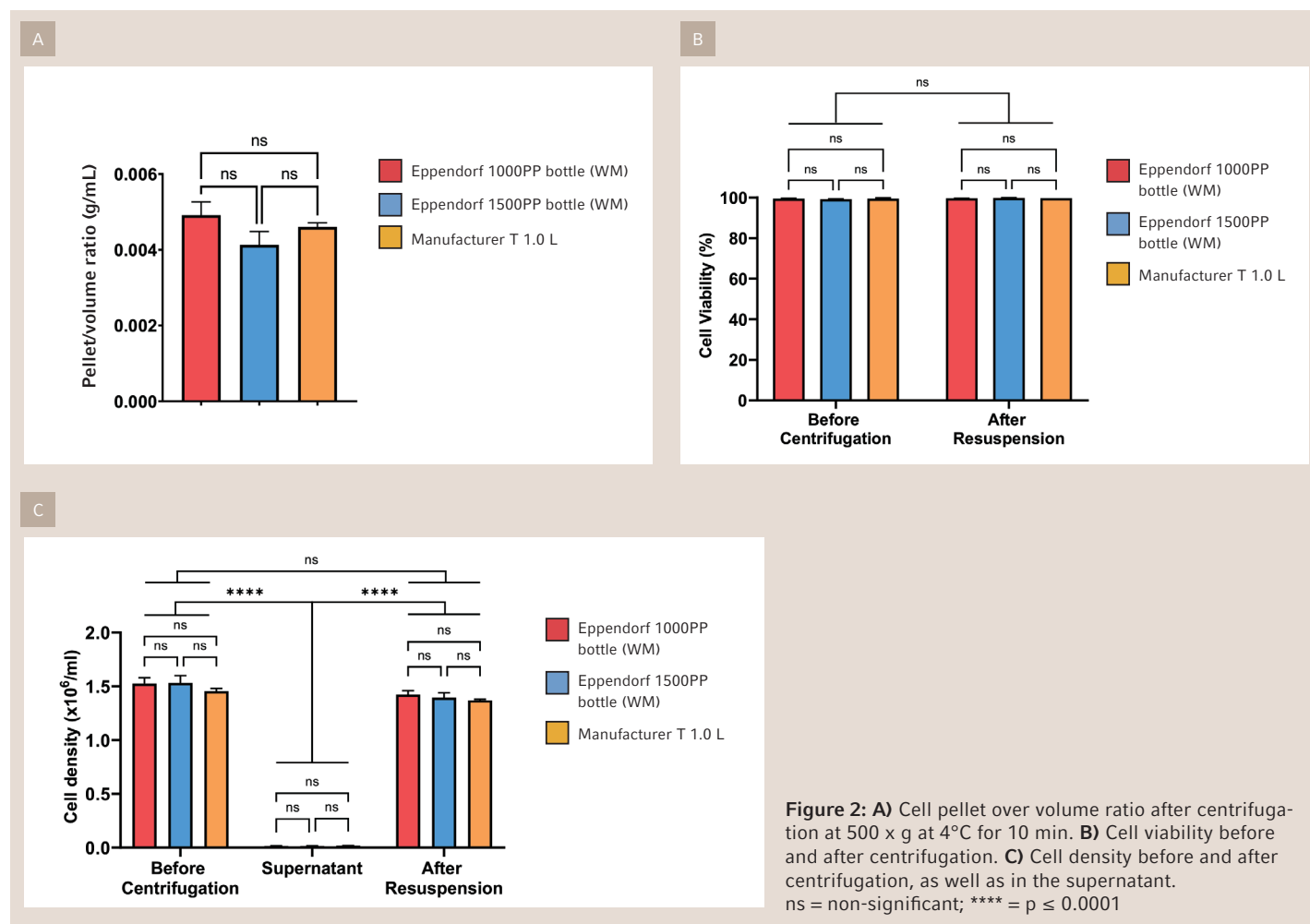
Here we compared the pelleting potential of a FreeStyle CHO cell culture in different rotors and centrifuges (Figure 1). FreeStyle CHO cells were cultured in shaker flasks for a few days and then transferred to SciVario® twin equipped with BioBLU® 3c Single-Use Bioreactors. This setup compared the weight of cell pellets isolated from 7 L of cell culture. Each rotor contained 2 bottles. Cell viability and density were measured before and after centrifugation, and in the supernatant after centrifugation.



Outcomes

Following centrifugation, all bottles showed a pellet at their bottom. The cell density and viability before and after centrifugation were similar for each bottle, which indicates that the cells were neither damaged nor remained in the supernatant

under the conditions applied. Furthermore, the cell density in the supernatant was nearly undetectable (Figure 2B and C). The ratio of pellet weight to supernatant volume shows that every bottle can isolate the same number of cells (Figure 2A).



Summary

This experiment validates that 1500PP bottles (WM) are equally effective in isolating the same number of cells compared to their 1.0 L counterparts. This finding underscores the scalability and reliability of larger-volume containers for cell harvesting. Therefore, the solution offered here for

the Centrifuge CR22N with the Rotor R9A2 and the 1500PP bottles (WM) for the purpose of pelleting cells will ensure that the entire cell culture will be pelleted, thus saving time as these 1500PP bottles (WM) require less time to process.

References

[1] Eppendorf SE. Unique 4 x 1.5 L Capacity Rotor for High- Speed Centrifuges CR22N and CR30NX.

Eppendorf Ordering Information		
Description	Manufacturer	Order no.
Centrifuge CR22N	Eppendorf	Inquire
Rotor R9A2	Eppendorf	5721 221 014
1500PP bottle (WM)	Eppendorf	5721 411 035
SciVario® twin	Eppendorf	7600 100 001
BioBLU® 3c Single-Use Bioreactors	Eppendorf	1386 120 000

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