

Claims

What is claimed is:

1. A method of performing a filtration process, comprising:
 - receiving one or more of the following values as user inputs into a harvest system:
process volume and packed cell volume (PCV);
 - receiving one or more of the following values as administrative inputs into the harvest system: initial concentration factor (CF), permeate throughput volume (PTV), and calculated yield;
 - running the harvest system in:
 - a) concentration mode
 - b) diafiltration mode; and
 - c) concentration mode

wherein a control algorithm calculates a number of diavolumes processed during diafiltration based on the user and/or administrative inputs.
2. A method of automating harvest of a product from a cell culture, comprising:
 - inputting a concentration factor and a permeate throughput volume;
 - starting a run in concentration mode;
 - adding buffer using a diafiltration pump once the input concentration factor has been reached;
 - stopping the diafiltration pump once the calculated number of diavolumes have been processed; and
 - ending the run when the total permeate volume has reached the user input permeate throughput volume.
3. A method of performing a filtration process, comprising:
 - receiving as user inputs: a process volume, a pellet cell volume, a solids cutoff, and optionally a filter retention value;
 - receiving as user or administrative inputs: a percent yield and a permeate throughput volume;

calculating run parameters using a control algorithm based on the user and administrative inputs;

beginning the filtration process run in concentration mode;

adding an aqueous solution using a diafiltration pump based on the run parameters that are calculated;

stopping diafiltration once a calculated number of diavolumes have been processed; and

ending the filtration process when the total permeate volume has reached the input permeate throughput volume.

4. The method of claim 3 wherein the control algorithm uses the percentage of a cell culture that is solid and the percentage of the cell culture which is liquid to calculate an expected product yield.
5. The method of claim 3 wherein the step of performing diafiltration occurs when the system reaches a predetermined percentage of solids.
6. The method of claim 3 wherein the step of stopping diafiltration further comprises stopping once a calculated percent yield is reached based on the number of diavolumes needed.
7. An apparatus, comprising:

a processor; and

memory comprising instructions that when executed by the processor cause the processor to:

receive one or more of the following values as user inputs into a harvest system: process volume and packed cell volume (PCV);

receive one or more of the following values as administrative inputs into the harvest system: initial concentration factor (CF), permeate throughput volume (PTV), and calculated yield; and

run the harvest system in:

- d) concentration mode
- e) diafiltration mode; and

f) concentration mode

wherein a control algorithm calculates a number of diavolumes processed during diafiltration based on the user and/or administrative inputs.

8. At least one non-transitory computer-readable medium comprising a set of instructions that, in response to being executed by a processor circuit, cause the processor circuit to:

receive one or more of the following values as user inputs into a harvest system:
process volume and packed cell volume (PCV);

receive one or more of the following values as administrative inputs into the harvest system: initial concentration factor (CF), permeate throughput volume (PTV), and calculated yield; and

run the harvest system in:

- a) concentration mode
- b) diafiltration mode; and
- c) concentration mode

wherein a control algorithm calculates a number of diavolumes processed during diafiltration based on the user and/or administrative inputs.

9. An apparatus, comprising:

a processor; and

memory comprising instructions that when executed by the processor cause the processor to:

input a concentration factor and a permeate throughput volume;
start a run in concentration mode;
add buffer using a diafiltration pump once the input concentration factor has been reached; and
stop the diafiltration pump once the calculated number of diavolumes have been processed; and
end the run when the total permeate volume has reached the user input permeate throughput volume.

10. At least one non-transitory computer-readable medium comprising a set of instructions that, in response to being executed by a processor circuit, cause the processor circuit to:
 - input a concentration factor and a permeate throughput volume;
 - start a run in concentration mode;
 - add buffer using a diafiltration pump once the input concentration factor has been reached; and
 - stop the diafiltration pump once the calculated number of diavolumes have been processed; and
 - end the run when the total permeate volume has reached the user input permeate throughput volume.
11. An apparatus, comprising:
 - a processor; and
 - memory comprising instructions that when executed by the processor cause the processor to:
 - receive as user inputs: a process volume, a pellet cell volume, a solids cutoff, and optionally a filter retention value;
 - receive as user or administrative inputs: a percent yield and a permeate throughput volume;
 - calculate run parameters using a control algorithm based on the user and administrative inputs;
 - begin the filtration process run in concentration mode;
 - add an aqueous solution using a diafiltration pump based on the run parameters that are calculated;
 - stop diafiltration once a calculated number of diavolumes have been processed; and
 - end the filtration process when the total permeate volume has reached the input permeate throughput volume.

12. The apparatus of claim 11, wherein the control algorithm uses the percentage of a cell culture that is solid and the percentage of the cell culture which is liquid to calculate an expected product yield.
13. The apparatus of claim 11, the memory comprising instructions that when executed by the processor cause the processor to perform diafiltration when the system reaches a predetermined percentage of solids.
14. The apparatus of claim 11, the memory comprising instructions that when executed by the processor cause the processor to stop diafiltration when a calculated percent yield is reached based on the number of diavolumes needed.
15. At least one non-transitory computer-readable medium comprising a set of instructions that, in response to being executed by a processor circuit, cause the processor circuit to:
 - receive as user inputs: a process volume, a pellet cell volume, a solids cutoff, and optionally a filter retention value;
 - receive as user or administrative inputs: a percent yield and a permeate throughput volume;
 - calculate run parameters using a control algorithm based on the user and administrative inputs;
 - begin the filtration process run in concentration mode;
 - add an aqueous solution using a diafiltration pump based on the run parameters that are calculated;
 - stop diafiltration once a calculated number of diavolumes have been processed; and
 - end the filtration process when the total permeate volume has reached the input permeate throughput volume.
16. The at least one non-transitory computer-readable medium of claim 15, wherein the control algorithm uses the percentage of a cell culture that is solid and the percentage of the cell culture which is liquid to calculate an expected product yield.

17. The at least one non-transitory computer-readable medium of claim 15, comprising instructions that, in response to being executed by the processor circuit cause the processor circuit to perform diafiltration when the system reaches a predetermined percentage of solids.
18. The at least one non-transitory computer-readable medium of claim 15, comprising instructions that, in response to being executed by the processor circuit cause the processor circuit to stop diafiltration when a calculated percent yield is reached based on the number of diavolumes needed.