

## **The impact of fermentation recipe and time on downstream processing**

Benjamin Fuchs, Saravanan Andan\*, Erik Gommeren, Michael Doby, Greg Wood, Anthony Trasatti, Shawn Reddell

DuPont Engineering Research & Technology (DuET), Experimental Station, Building E304 Wilmington, DE 19880, USA; Phone: + 302 695 2146, Fax: + 302 695 3501

A biological process can basically be divided into 3 overall technology areas: fermentation, downstream processing and utilities. Each of this area mostly includes several unit operations, which makes the overall process fairly complex and difficult to develop, design or even predict. What complicates the situation even more is that development efforts in these different areas are very often not connected from the beginning. Fermentation specialists look for titer and yield, while downstream people look for high fluxes, limited fouling, etc. Ideally though, these development efforts take place hand in hand in order to find the overall optimum of the process rather than individual optima in the different areas.

This paper shows how fermentation recipe and time can significantly influence downstream processing, and in this case mainly sedimentation in the centrifugal field and filtration. A design of experiments was chosen to determine the influence of yeast concentration, glucose concentration, yeast extract concentration, antifoam, etc. on the separation performance. The results of this work emphasise again the importance of collaboration between fermentation and separation specialists from the start of the development in order to find the overall process optimum.

Key words: downstream processing, aging, fermentation, centrifugation, filtration