



Online Glucose | Lactate measurement in Batch and Fed-batch CHO cultivation



Application
Note

#02

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During the cultivation of animal cells the monitoring of nutrients and metabolites has an important role for the controlling strategy of the cell culture. The measurement of glucose and lactate is one of the first steps during this process. The content of glucose and lactate in the cultivation media gives information about the biochemical status and the living cycle of the cells. These results can be used for calculation of nutrient rates and real time controlling of the culture.

A CHO cell line was used for the cultivation in a chemical defined, protein free media (Mam-pf2, Bioconcept). The cultivations were performed in a Biostat[®] A which was online connected to the BioPAT[®] Trace and controlled by the BioPAT[®] MFCS (all systems from Sartorius Stedim Biotech GmbH). For the control measurements of glucose and lactate a CuBiAn XC (Optocell) was used. The cell numbers and viabilities were measured with a Cedex Analyzer (Roche).

Batch culture

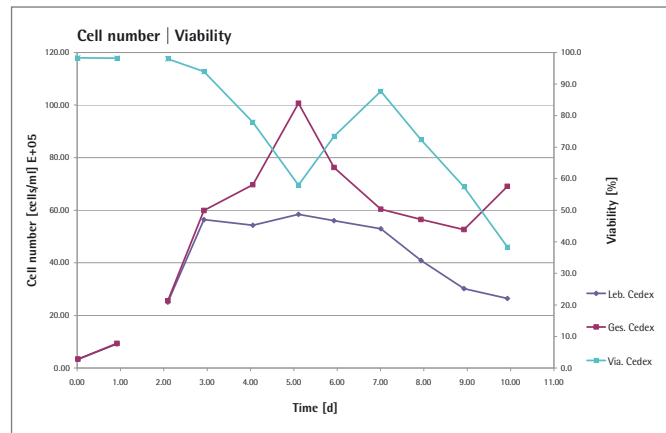


Figure 1: Cell numbers and viability during the batch culture

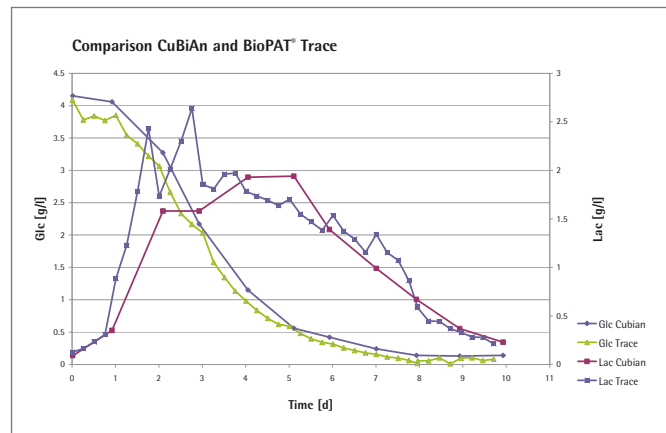
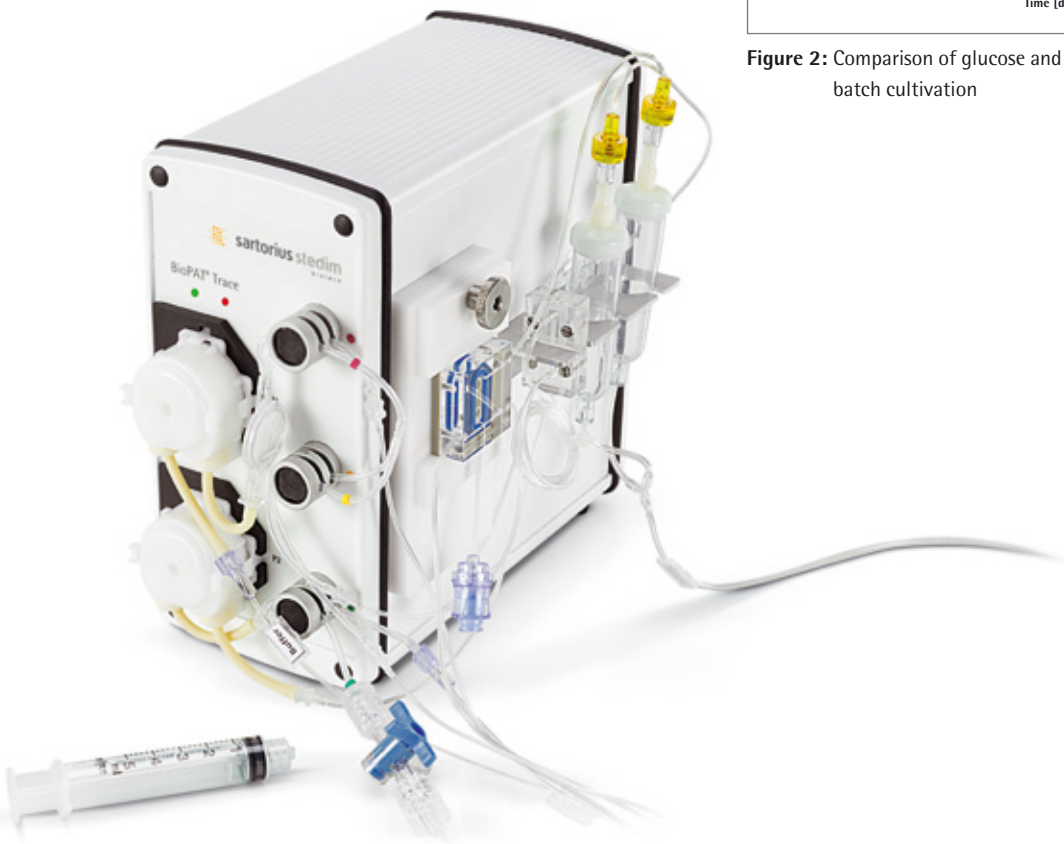


Figure 2: Comparison of glucose and lactate values during the batch cultivation



Fed – Batch Culture

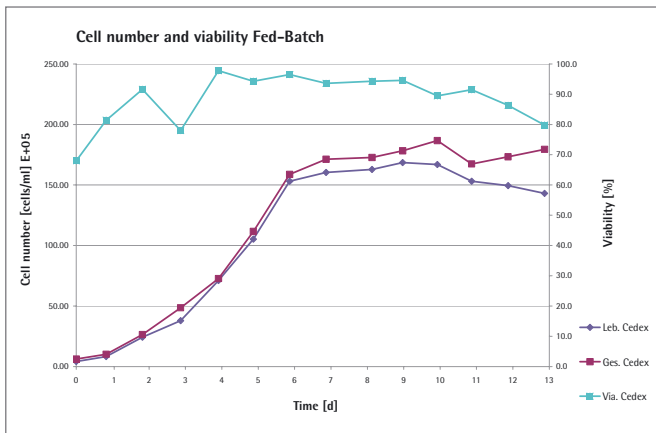


Figure 3: Cell number and viability during the fed-batch culture

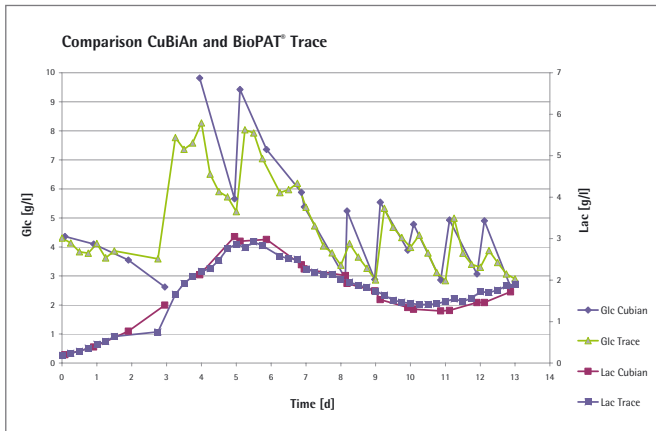


Figure 4: Comparison of glucose and lactate values during the fed-batch cultivation

The demonstrated results show the ability of online measurement of glucose and lactate during the cultivation of CHO cells with the BioPAT® Trace system. Other the whole cultivation time a stable measurement could be observed.

The online measurement offers the possibility to measure the glucose and lactate values with a time dependent strategy. During the presented cultures it was done every 6 hours.

The easy handling of the system gives the user the possibility for an easy integration of this online measurement in every existing cultivation system.

The BioPAT® Trace gives the following advantages for the users:

- Continuous or time dependent measurement strategy
- Direct online connection
- Easy to handle
- Direct integration of results for controlling of fermentation

Acknowledgment

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