BioProcessDB Basic Edition

Fermentation Management System

BioProcessDB is a database solution for the management of complete fermentation processes.

All important process data can be entered or automatically calculated. The recorded shaking flask experiments/batches can be linked to family trees. Extensive searching possibilities are available.

The software can be connected with the SCADA software MFCS/win and expand its data management capabilities significantly. Parallel connections to multiple MFCS servers are possible.

ProBioData BioProcessDB works as a client server system and uses Microsoft SQL Server as the underlying platform.

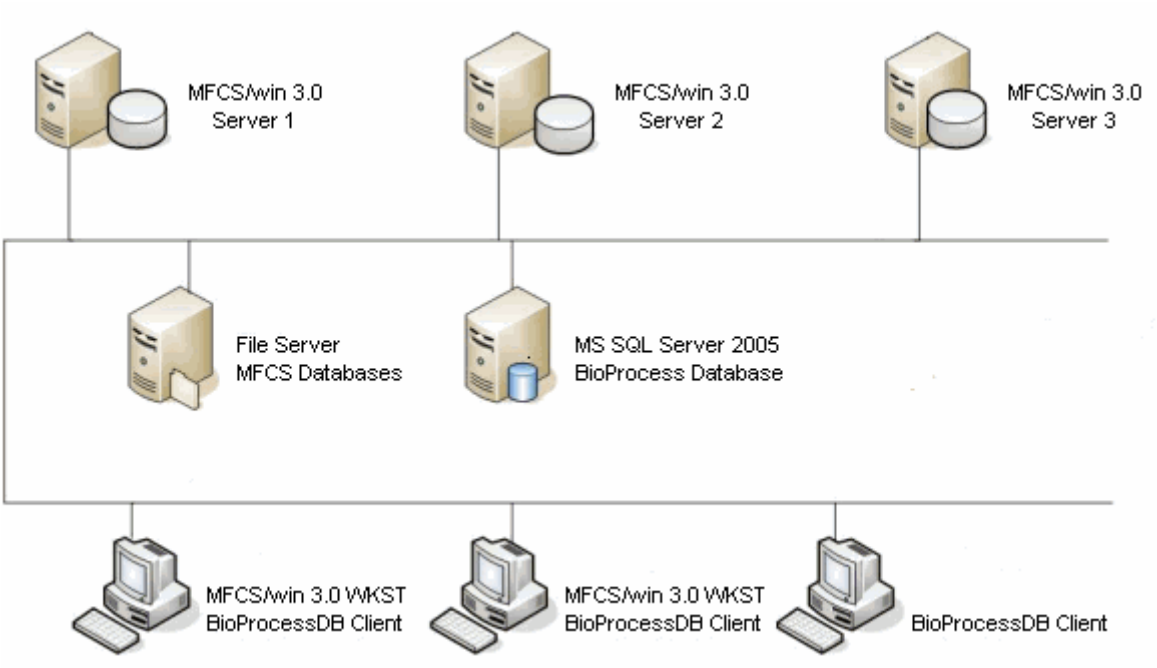


Fig. 1 BioProcessDB in the company network

Directories

The database contains the following directories:

- MFCS Servers
- Fermentors
- Laboratories
- Recipes
- Components
- Component Charges
- Manufacturers
- Media
- Media Preparations
- Organisms
- Strains
- Products
- Profiles
- Shaking Flask Experiments
- Batch Stages
- Batches

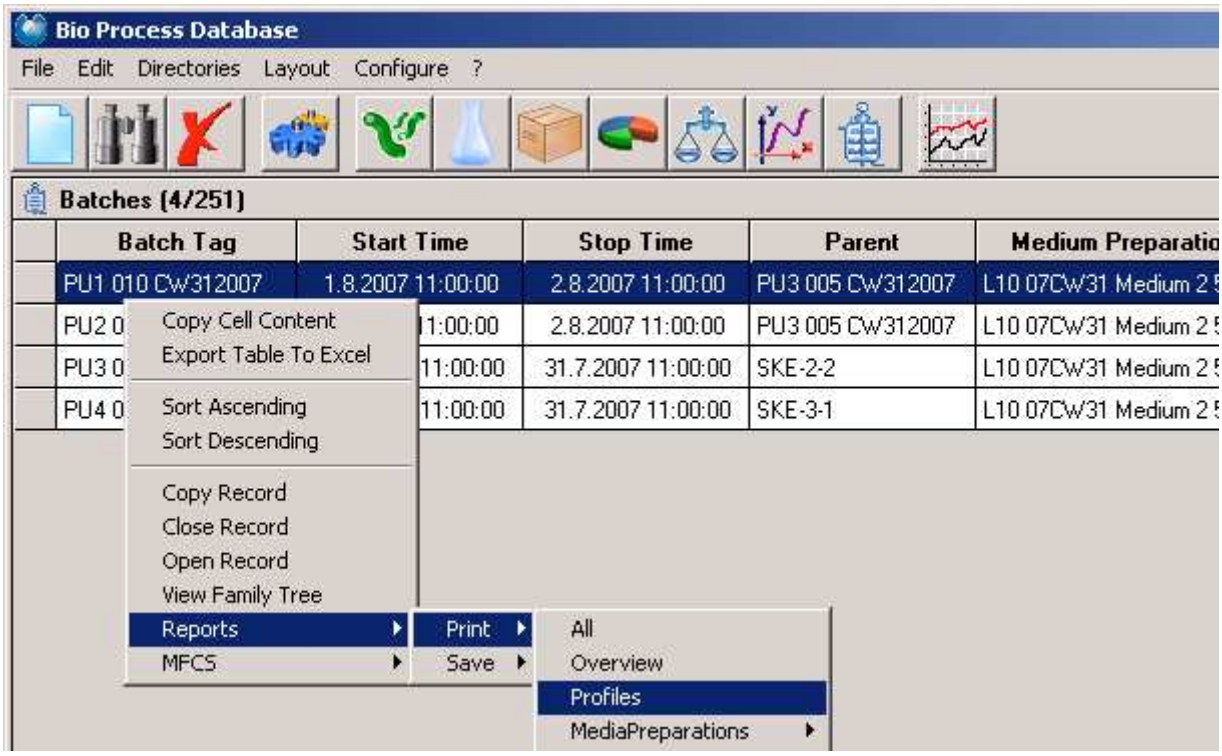


Fig. 2 Directory window

Each user can save his personal layout settings for the directory window to see relevant informations at once.

If a user selects a record from the directory window the record details are displayed in a formula. Data sub categories for the record are avalaible through several tabs. Excerpts from the default formulas for some directories are shown below.

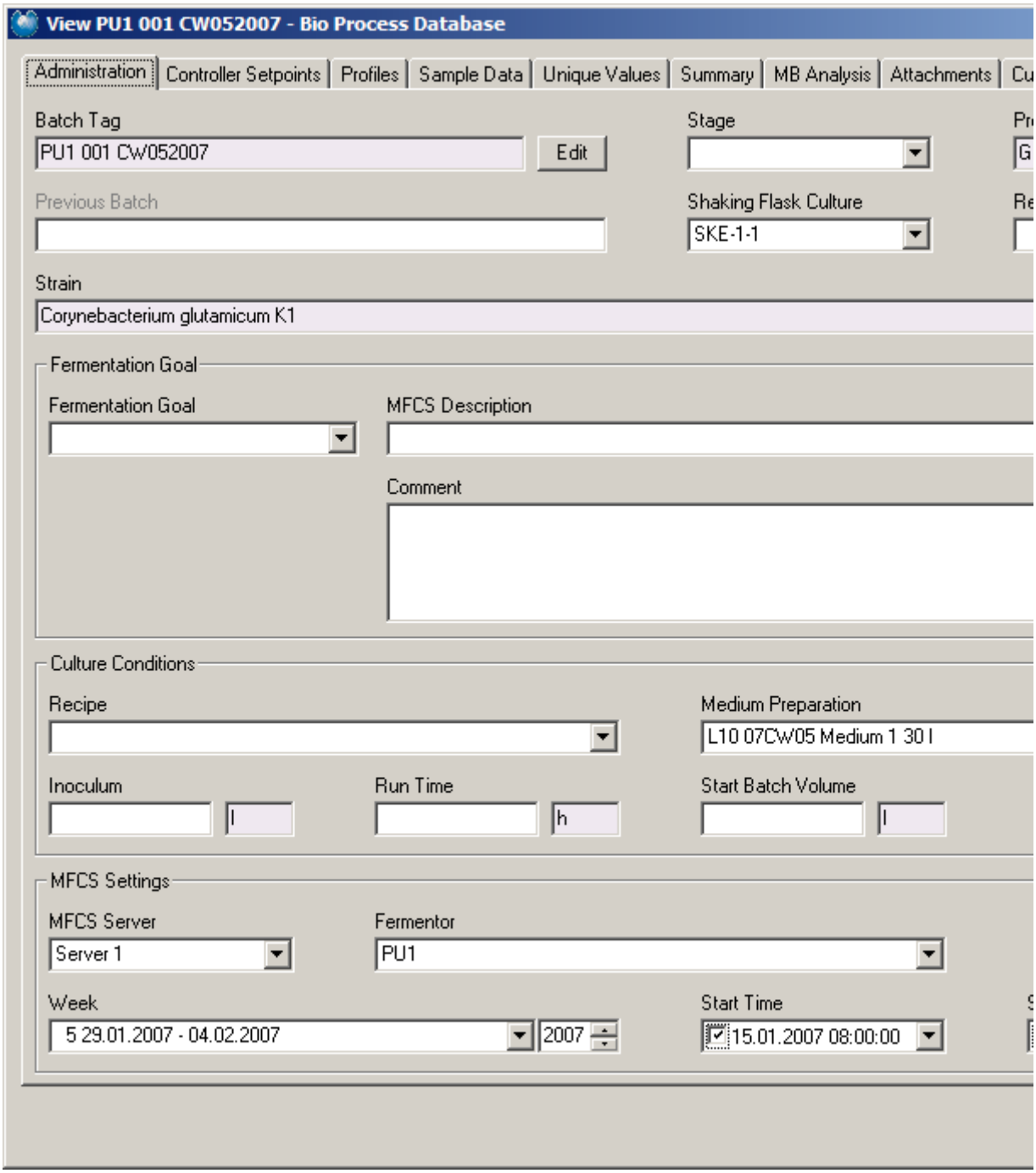


Fig. 3 Batch formula with main tab

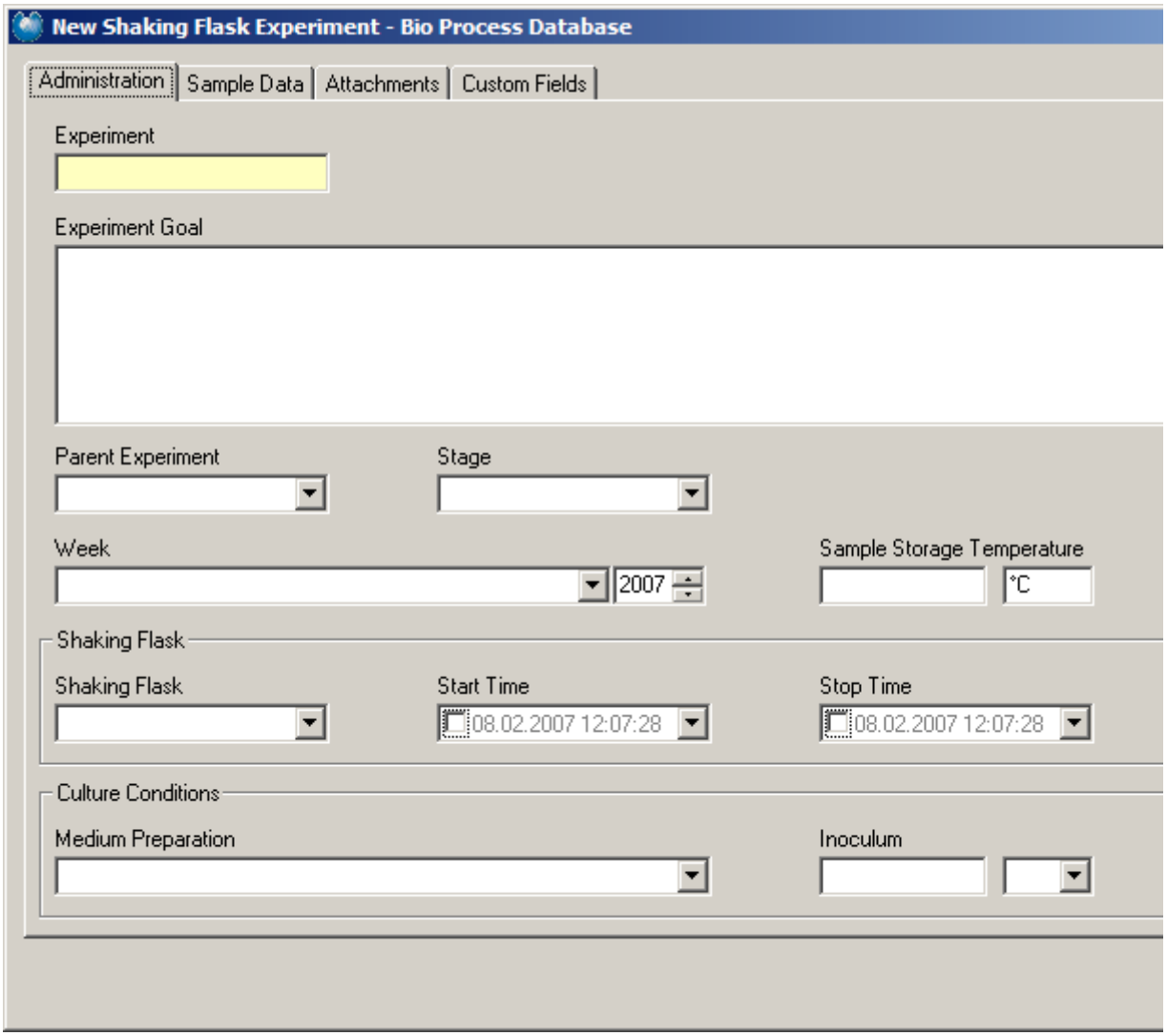


Fig. 4 Shaking flask experiment formula

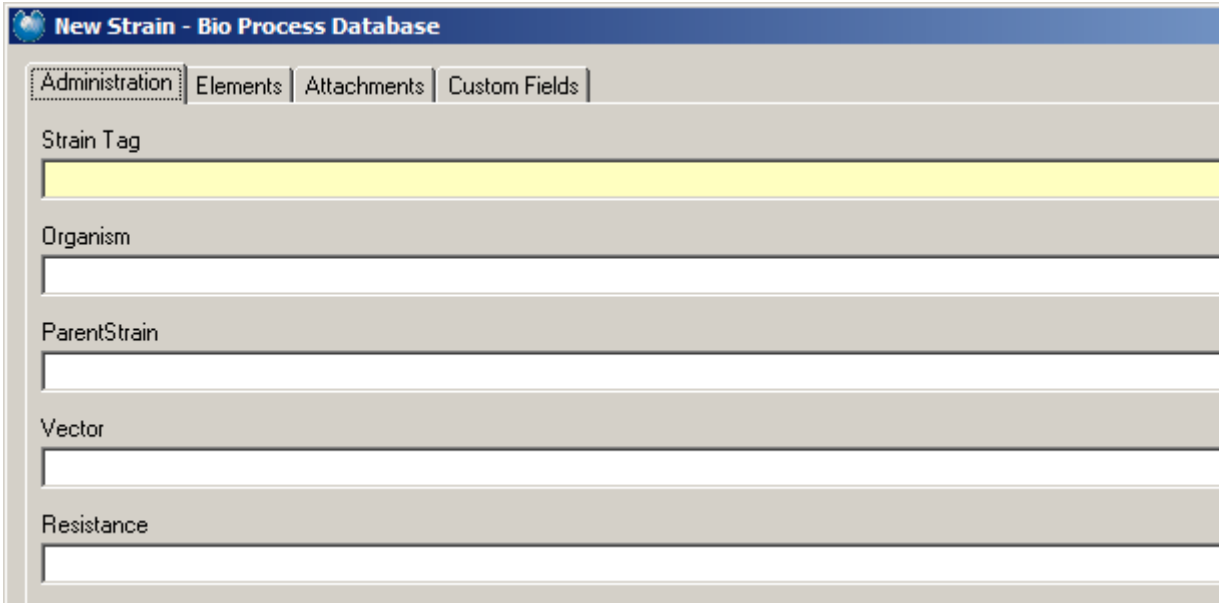


Fig. 5 Strain formula

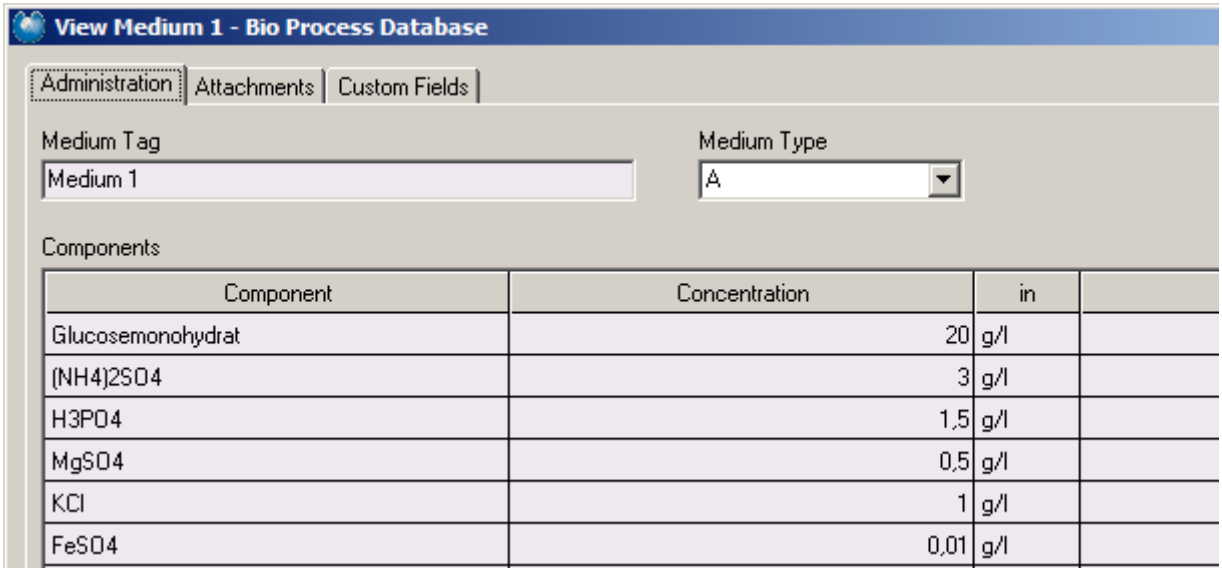


Fig. 6 Medium formula

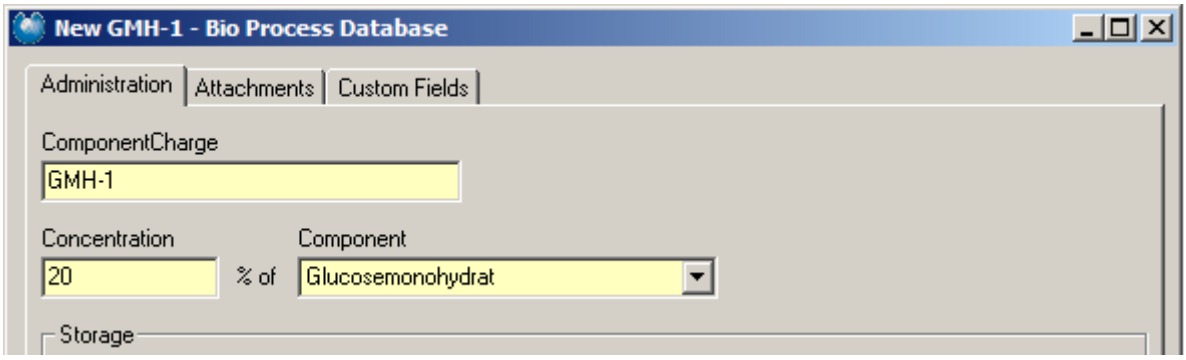


Fig. 7 Component charge formula

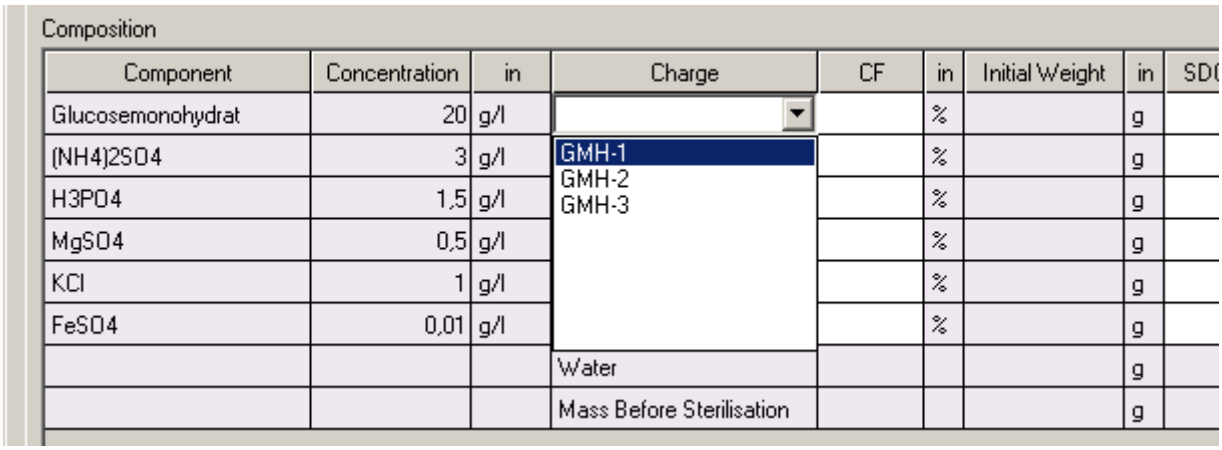


Fig. 8 Component table for medium preparation

If the default fields are not sufficient for your work, you can add customer specific fields using the “Custom Fields”-feature. If you need a more sophisticated customization, we can offer you the redesign of the existing default tabs or the development of completely new tabs.

Of course we can also implement import-/export solutions for existing data collections may be stored in Excel*.

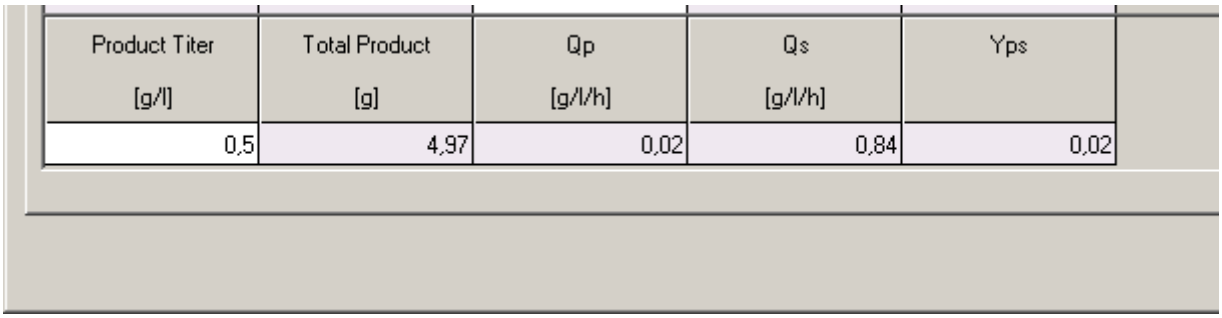
You can easy generate a new record similar to an existing record. Select the existing record, choose “Copy Record”, make the necessary changes and save it as a new record.

The BioProcessDB includes already some default control and calculation possibilities for the entered data. Examples:

A doublet control prevents the user from inserting the same medium compound several times.

For the saved media a medium preparation can be calculated with input options for mass, seperate sterilisations and charges.

Basic calculations for the analysis of your fermentations like eg. productivity and yield coefficients.



Product Titer [g/l]	Total Product [g]	Qp [g/l/h]	Qs [g/l/h]	Yps
0,5	4,97	0,02	0,84	0,02

Fig. 9 Excerpt from the summary tab

The batch family tree shows ancestry and descendants of a selected batch.

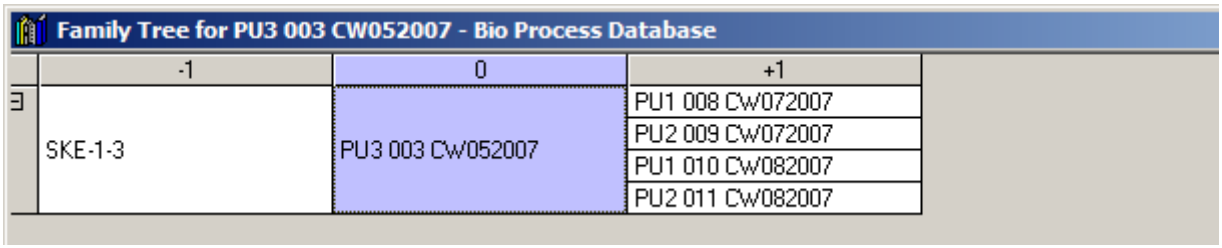


Fig. 10 Family tree

An implementation of customer specific calculation and analysis functions can be ordered.

Searching

All data fields and tables shown in a record formula can be used as search criteria. This offers extensive searching possibilities. If nevertheless a deeper data digging is required, the powerful “more”-feature is available.

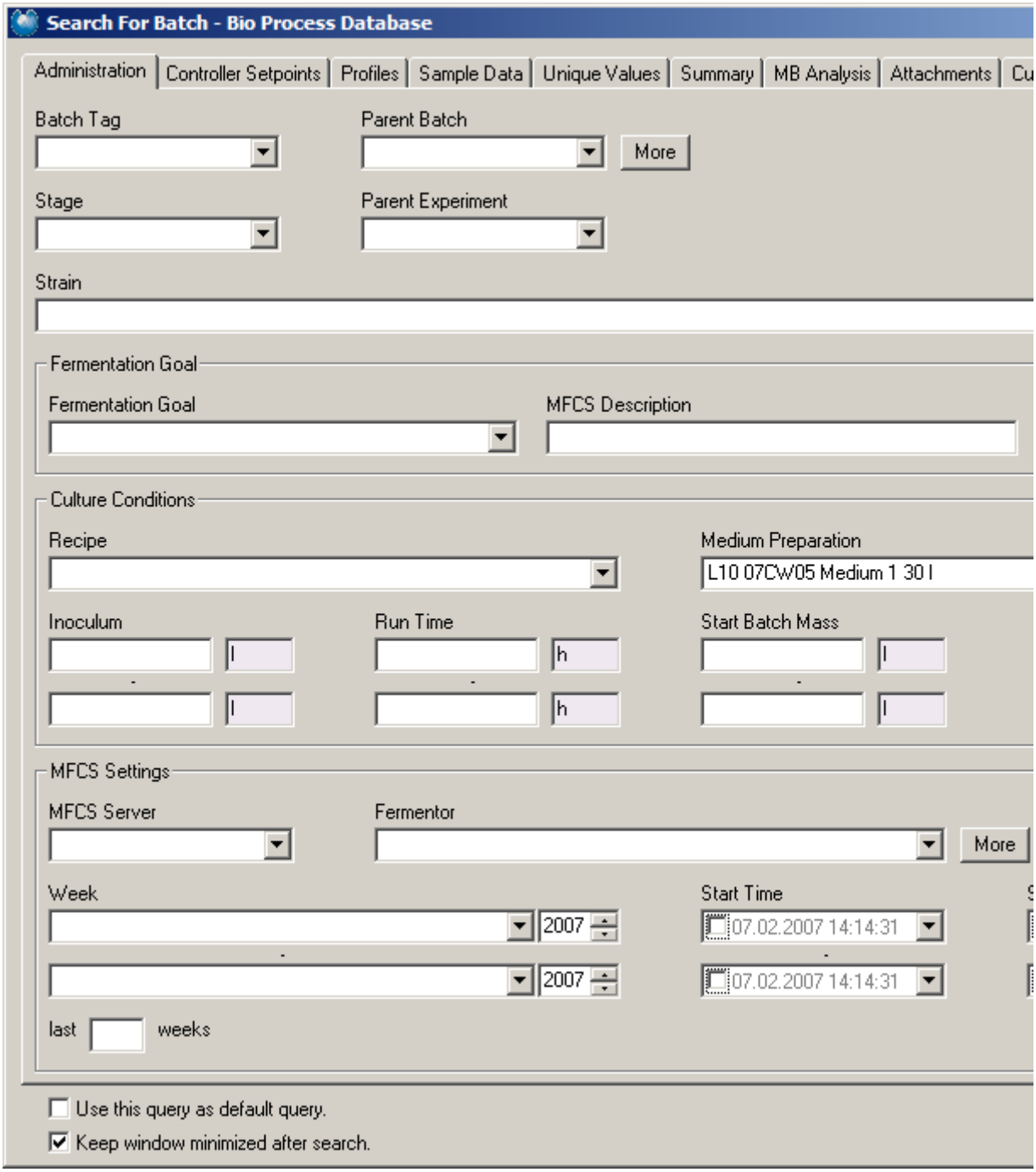


Fig. 11 Batch formula search mode with a search for batches with the selected medium preparation

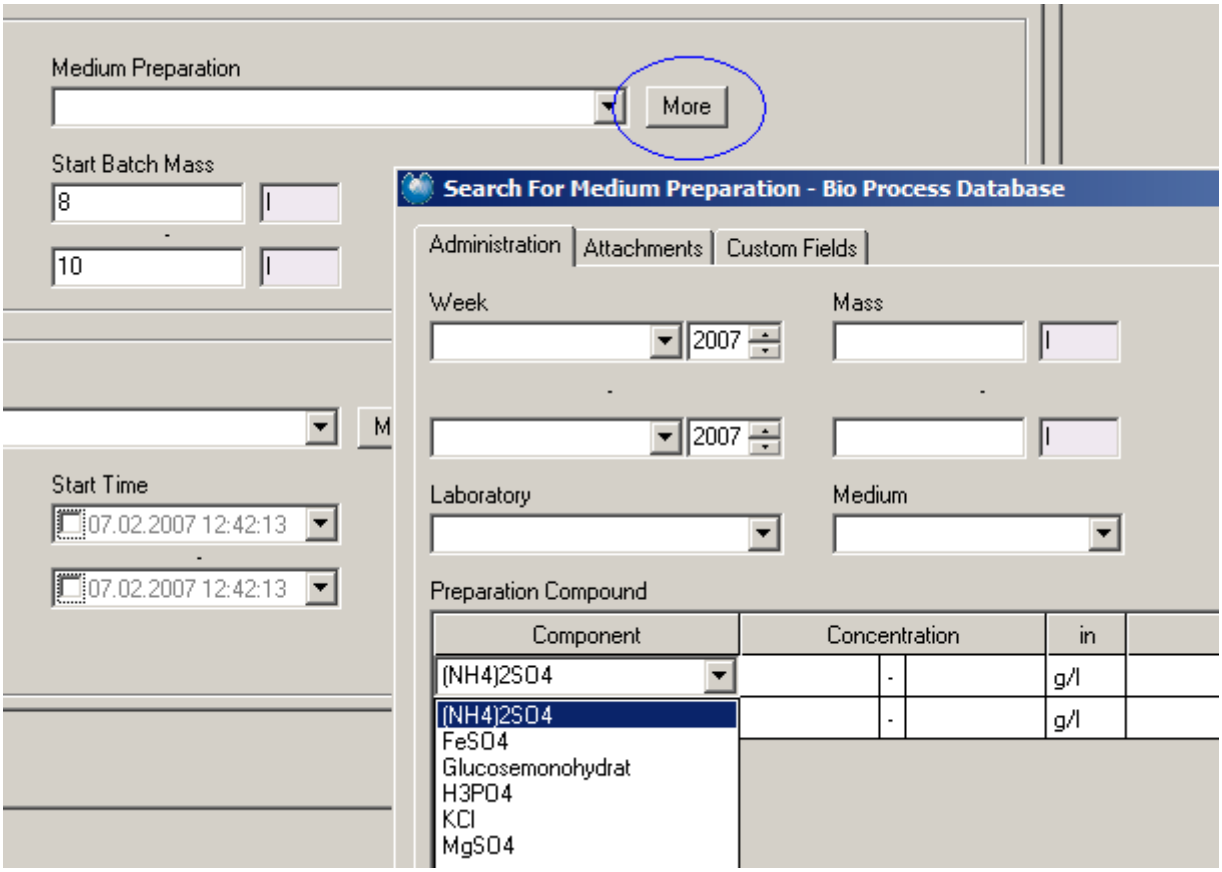
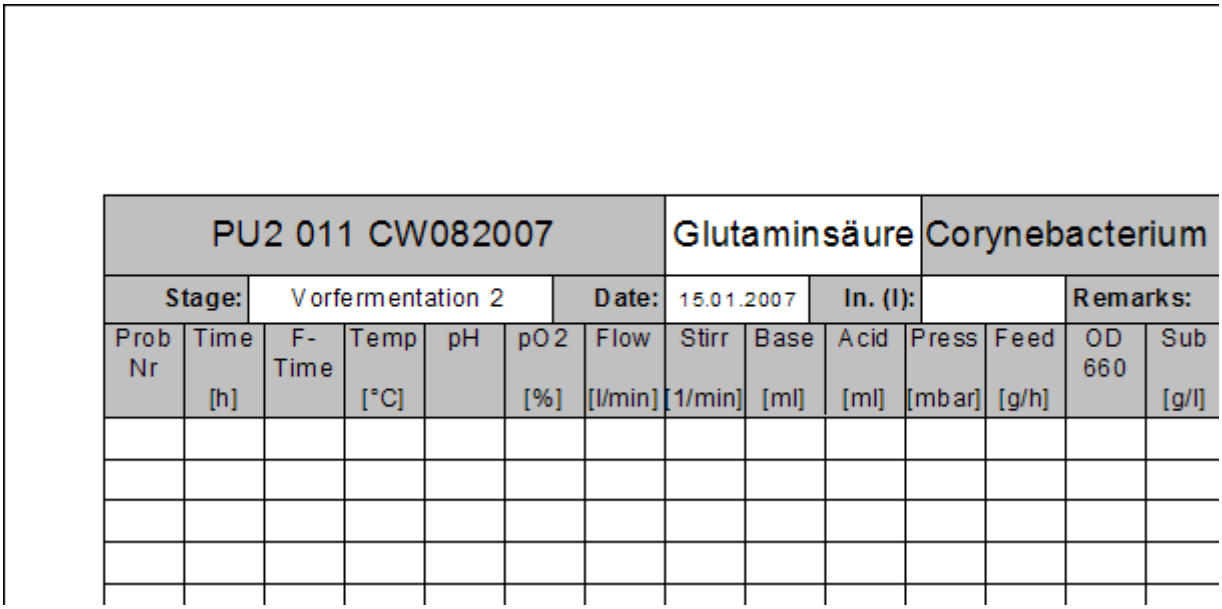


Fig. 12 The advanced search finds all batches with a medium preparation which meets certain conditions

Reports

The database provides the printing of some default reports which can also be exported to an Excel or Adobe Acrobat* file. Customer specific reports can be designed by ProBioData on demand.



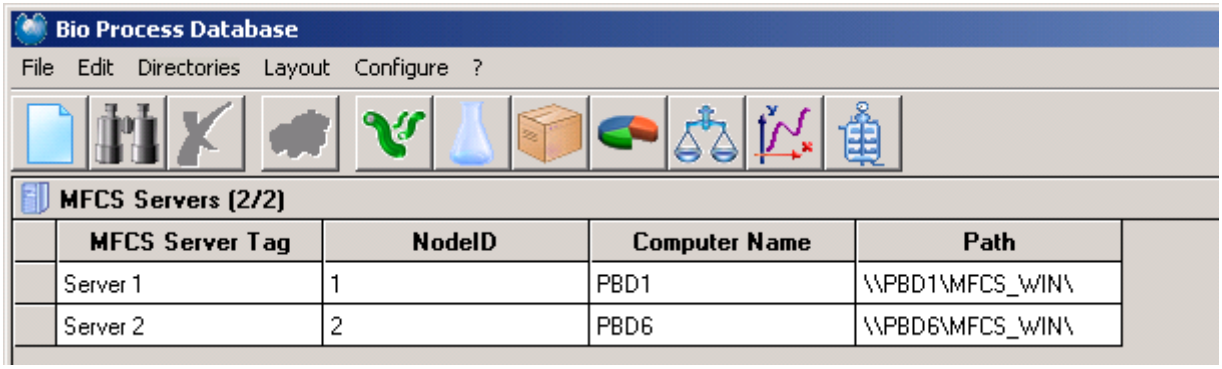
PU2 011 CW082007							Glutaminsäure			Corynebacterium			
Stage:	Vorfermentation 2			Date:	15.01.2007		In. (l):			Remarks:			
Prob Nr	Time [h]	F-Time	Temp [°C]	pH	pO2 [%]	Flow [l/min]	Stirr [1/min]	Base [ml]	Acid [ml]	Press [mbar]	Feed [g/h]	OD 660	Sub [g/l]

Fig. 13 Report example – fermentation protocol

Interaction with MFCS/win

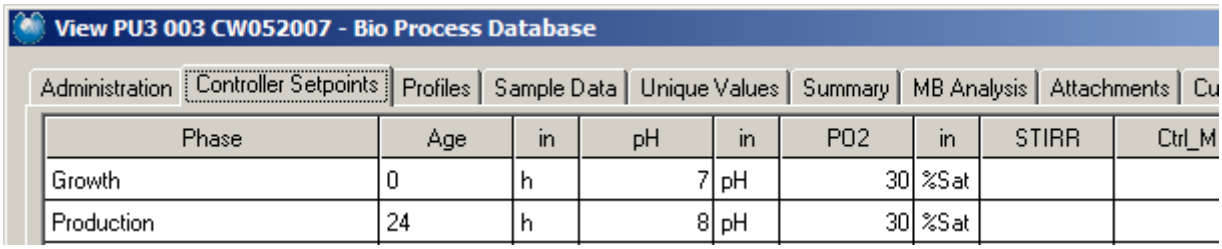
BioProcessDB offers possibilities for an integrated data management for all MFCS servers installed in your company.

Below are some examples for the MFCS/win integration.



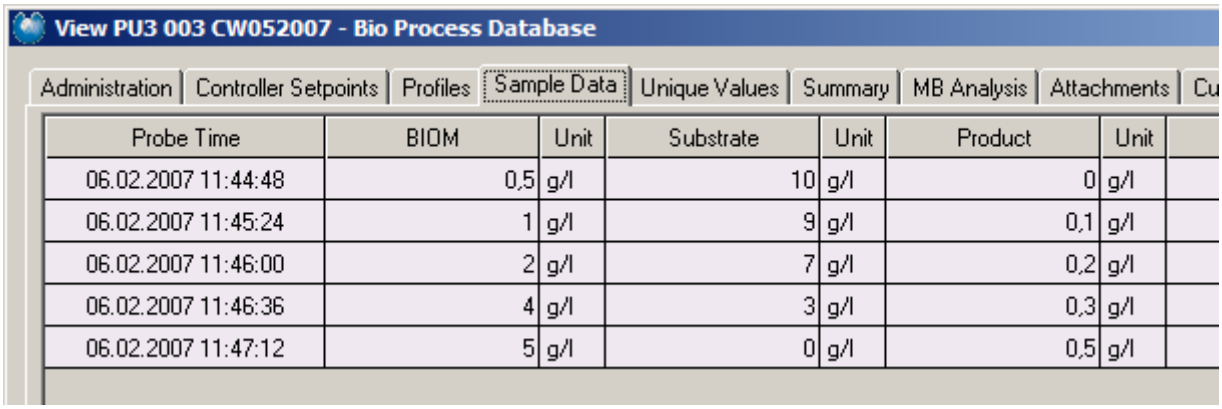
	MFCS Server Tag	NodeID	Computer Name	Path
	Server 1	1	PBD1	\\PBD1\MFCS_WIN\
	Server 2	2	PBD6	\\PBD6\MFCS_WIN\

Fig. 14 MFCS server directory



Phase	Age	in	pH	in	PO2	in	STIRR	Ctrl_M
Growth	0	h	7	pH	30	%Sat		
Production	24	h	8	pH	30	%Sat		

Fig. 15 Enter controller setpoints for the PU controllers imported from the MFCS



Probe Time	BIOM	Unit	Substrate	Unit	Product	Unit
06.02.2007 11:44:48	0,5	g/l	10	g/l	0	g/l
06.02.2007 11:45:24	1	g/l	9	g/l	0,1	g/l
06.02.2007 11:46:00	2	g/l	7	g/l	0,2	g/l
06.02.2007 11:46:36	4	g/l	3	g/l	0,3	g/l
06.02.2007 11:47:12	5	g/l	0	g/l	0,5	g/l

Fig. 16 Sample values imported from MFCS/win are shown in the batch formula

Technical Issues

BioProcessDB is designed as client server solution based on Microsoft SQL Server* 2005 and therefore suited for multiuser scenarios.

Tested for Windows XP SP3.

Feature List

- Administration of media, strains, shaking flasks, fermentations and others
- Extensive possibilities for searching and filtering
- Integrated standard calculations
- Fast generating of similar records with the "Copy Record"-function
- Generating of family trees
- Ideal MFCS/win extension for data management capabilities
- Report and export functions e.g. to Excel, PDF
- Hyperlinks to customer documents and external resources
- User specific adjustment of data layout
- Customers can define specific data fields
- High level customization on demand through ProBioData
- Ready for networks and multiuser scenarios
- User management
- Audit trail
- Batch definition module to define MFCS batches via BioProcessDB
- Data can be exported from BioProcessDB or other sources like Excel sheets to the MFCS/win SDM. Please ask for customized solutions.
- Export of all measured MFCS values into an Excel crosstable for plotting or statistic evaluations
- If you want to connect another SCADA system than MFCS/win to the BioProcessDB, please contact us.
- Plotting. More information below.

Plotting

The BioProcessDB plot module allows you to plot nearly as much batches as you want in one chart. You can combine batches from different servers and different variables for one plot. It is possible to assign the batch runtime to the x-axis for a time series chart or any MFCS variable to plot one variable against another.

The plot can be zoomed, printed or exported as a picture to a png file. The module provides the generation of plots for certain time periods or for the last x minutes of a running batch. Plot configurations can be saved as templates for reusing.

An additional feature is to import the complete MFCS access database of a batch into a newly generated SQL Server database to improve the speed of the plot generation.

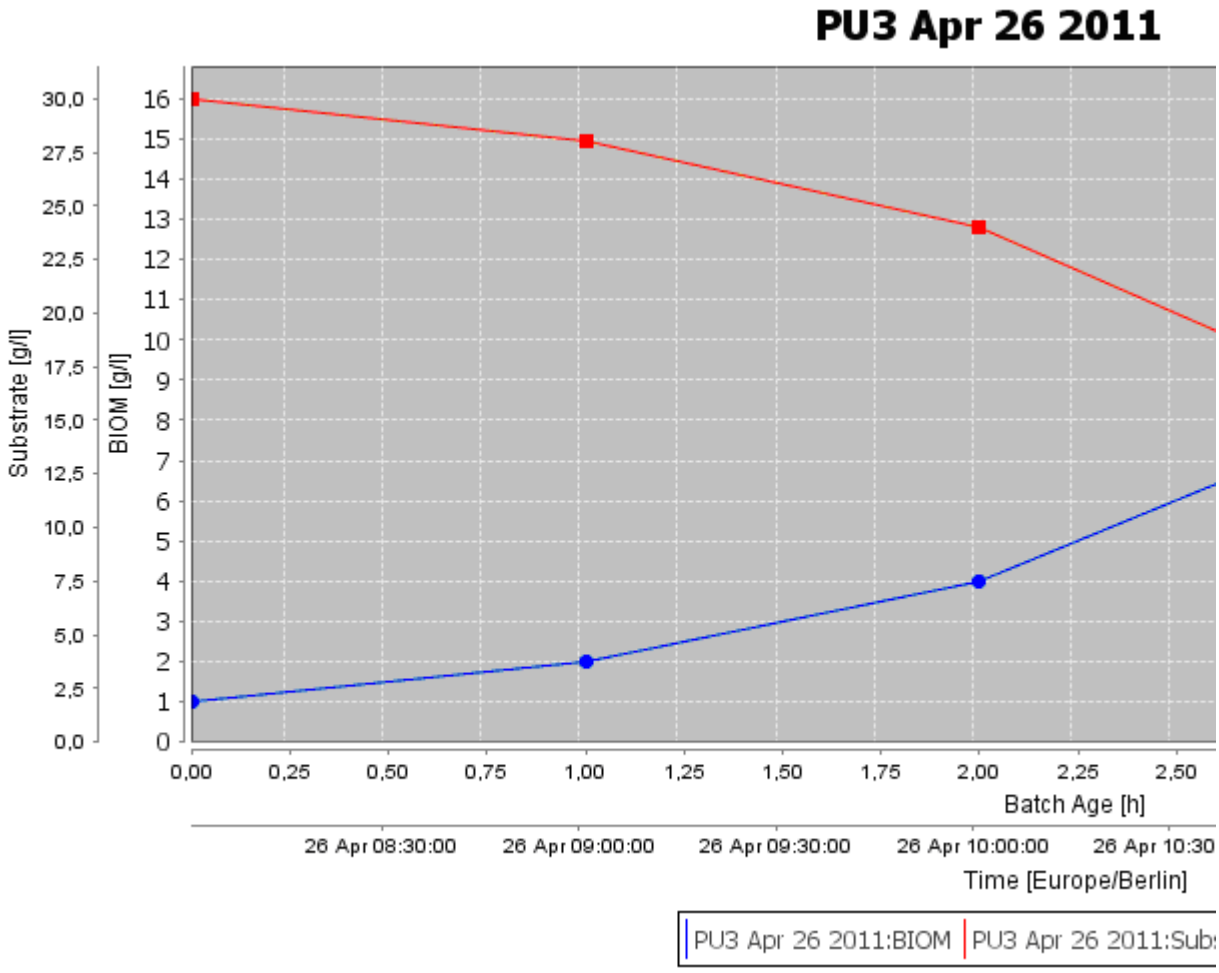


Fig. 19 Plotting some offline data

Contact

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* Glossary

Adobe Acrobat is a product of Adobe Corporation
Excel and SQL Server are products of Microsoft Corporation
MFCS/win is a product of Sartorius-BBI-Systems GmbH