SARTORIUS

Product Datasheet

Spent Media Analytics

Unlock New Process Insights

Spent media analytics is the examination of the used media from production steps throughout process development. The information gathered facilitates the selection of an optimal cell culture medium and feed combination, as well as the development of suitable feeding strategies.

Sartorius' Spent Media Analytics Platform offers a range of analytical methods compliant with ICH standards where appropriate. Our services gather information about amino acids, trace elements, water-soluble vitamins and other analytes of interest e. g. glucose, lactate, and ammonium present in your sample. The analysis is performed by our dedicated analytical scientists experienced in cell culture media applications and method development.

Features and Benefits

- Ready-to-use validated analytical methods
- Available as bundles to simplify your analytics process
- Industry-leading expertise
- Fast turnaround times to speed up your media selection and process optimization

Relevant Applications

Spent media analytics is a valuable tool that enables the tracking of changes in medium composition. The information gathered reveals insights into the metabolic processes of the cell population and how the media influences process and product characteristics. These services can help users:

- Asses media performance in mAbs and biosimilars, recombinant proteins, viral vaccines, and gene therapy applications
- Monitor nutrient consumption to quickly identify any adverse outcomes
- Optimize feeding strategies to maximize cell viability and productivity
- Speed up upstream process development timelines
- Troubleshoot commercial production processes and find opportunities for improvement

Relevant Process Steps

- **Product development**
  - Media benchmarking studies
  - Understanding growth conditions for clones, ensuring critical quality attributes are maintained
- **Process development**
  - Process optimization minimize to the content of components | metabolites
  - Identification of critical specific components in media and determination of their influence on cell growth/productivity and product quality
  - Analyzing culture conditions and feed strategies to see how they affect process performance
- **Commercial lot release**
  Process troubleshooting and maximizing productivity

Technical Specifications

At Sartorius, spent media analysis is performed on four different levels, ranging from basic insights into full process understanding:

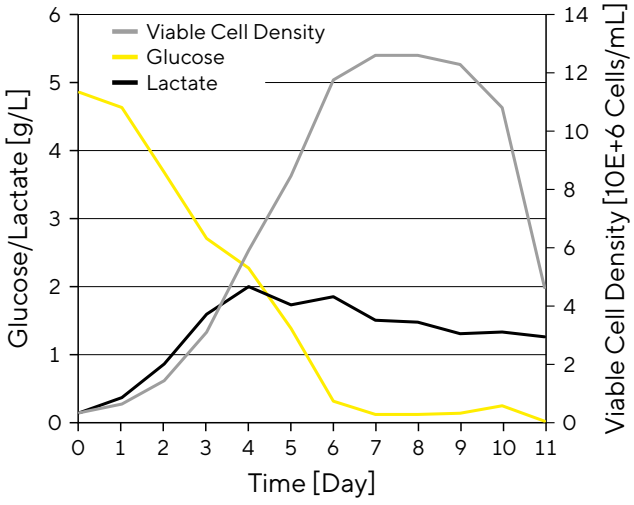
1. Analysis of only primary parameters like pH value, osmolality, glucose, lactate, glutamine, and ammonium

2. Analysis of essential parameters like amino acids, dipeptides, and vitamins

3. For a comprehensive understanding of the bioprocess, we measure and analyze trace elements and ions

4. For in-depth understanding of the bioprocess involves, in addition to the above, measurement of e. g., organic acids, polyamines, and nucleotides

Figure 1: *Analysis of Glucose and Lactate Metabolism in a CHO Process via Spent Media Analytics*



Note. Figure 1 describes a typical CHO batch process where spent media analysis was used to gain process insight. Lactate is produced from glucose in the medium. The glucose levels gradually decrease over 6 days and are eventually depleted. Identifying this limitation of glucose by spent media analysis facilitates the design of an optimized feeding strategy for a fed-batch process where feed supplements are added periodically, limiting the depletion of glucose in the media.

Ordering Information

Item	Description/Analyte Measures	Order Number
Amino Acid Analysis	20 amino acids plus additional analytes: Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Hyp, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, Val, Taurine, Ornithine, Citrulline, Hydroxyproline	SMA-103
Dipeptide Analysis by UHPLC-MS/MS	UHPLC-MS/MS-based measurement of dipeptides e. g. Alanyl-glutamine, Glycyl-tyrosine	SMA-107
Analysis of Total Amino Acid Content	The total amino acid content is quantified, including additional HCl hydrolysis and sample preparation step before amino acid analysis. 20 amino acids plus additional analytes: Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Hyp, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, Val, Taurine, Ornithine, Citrulline, Hydroxyproline	SMA-115
Water-Soluble Vitamins by UHPLC-MS/MS	Our UHPLC-MS/MS method covers the following water-soluble vitamins, vitaminoids and precursors: Vitamin B1 Thiamine, Vitamin B2 Riboflavin, Vitamin B3 Nicotinamide, Vitamin B5 (Calcium) Pantothenate, Vitamin B6 Pyridoxal and Pyridoxine, Vitamin B7 Biotin, Vitamin B9 Folic acid and Aminobenzoic acid, Vitamin B12 Cyanocobalamin, Vitaminoids Choline chloride	SMA-132
Sucrose Analysis	Enzymatic-amperometric measurement of sucrose. Includes digestion of sucrose	SMA-134
Ascorbate (Vitamin C) Analysis	Quantitation of ascorbic acid (vitamin C) via a proprietary method by UHPLC-MS/MS	SMA-135
Glucose and Sucrose Analysis	Enzymatic-amperometric measurement of glucose and sucrose. Includes digestion of sucrose	SMA-137
Glutathione Analysis	UHPLC-MS/MS based measurement of glutathione (oxidized and reduced state)	SMA-149
Phosphate Analysis by Photometric Assay	Photometric assay for the quantitative analysis of inorganic phosphate (ortho-phosphate)	SMA-156
Glucose Analysis	Enzymatic-amperometric measurement of glucose	SMA-160
Glucose and Lactate Analysis	Enzymatic-amperometric measurement of glucose and lactate	SMA-162
Ammonium (Concentration) Analysis	Assay for the determination of ammonium concentrations	SMA-164
Pyridoxal Phosphate Measurement by UHPLC	Measurement of Pyridoxal Phosphate using UHPLC-MS/MS	SMA-178
Culture Media Analysis Bundle	The culture media analysis bundle combines the most common and informative analytical parameters regarding spent cell culture medium: amino acids, glucose and lactate, trace elements, and water-soluble vitamins	SMA-180
High Abundant Cation Analysis by ICP-MS	Measurement of the highly abundant cations sodium, potassium, magnesium, calcium, and iron using ICP-MS	SMA-186
Organic Acids Analysis by UHPLC-MS	Organic acid content is determined using UHPLC-MS, including citric acid, fumaric acid, lactic acid, malic acid, pyruvic acid, succinic acid, and tartaric acid	SMA-216
Peptide Size Determination by SEC	Qualitative determination of peptide sizes using size exclusion chromatography (SEC). Quantification range: 0.1 – 1,000 kDa	SMA-220
Spent Media Analytics Trace Element Bundle	Trace elements are determined by ICP-MS, including chromium, manganese, iron, cobalt, nickel, copper, zinc, selenium, molybdenum, and cadmium	SMA-300
Polyamine Analysis by UHPLC-MS/MS	The levels of polyamines (such as putrescine, spermidine, and spermine) in mammalian cells play a key role in cells' viability and protein synthesis	SMA-306
Spent Media Analytics Element Analysis Bundle	Choose 5, 10, 15, 20, and 25 elements from: silver (Ag), aluminum (Al), arsenic (As), boron (B), barium (Ba), calcium (Ca), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), iron (Fe), mercury (Hg), potassium (K), lithium (Li), magnesium (Mg), manganese (Mn), molybdenum (Mo), sodium (Na), nickel (Ni), phosphorous (P), lead (Pb), rubidium (Rb), sulfur (S), selenium (Se), tin (Sn), strontium (Sr), titanium (Ti), thallium (Tl), yttrium (Y), zinc (Zn), and zirconium (Zr)	SMA-308

Germany
Sartorius Stedim Biotech GmbH
August-Spindler-Strasse 11
37079 Goettingen
Phone +49 551 308 0

Sartorius Xell GmbH
Waldweg 21
33758 Schloss Holte-Stukenbrock
Phone +49 521 96989 200

USA
Sartorius Stedim North America Inc.
565 Johnson Avenue
Bohemia, NY 11716
Toll-Free +1 800 368 7178

For more information, visit
www.sartorius.com

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