

Media & Spent Media Analytics

Unlock New Process Insights



Product Information

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
- Targeted and untargeted analysis for comprehensive studies

Introduction

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:

- Assess 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

Root Cause Analysis

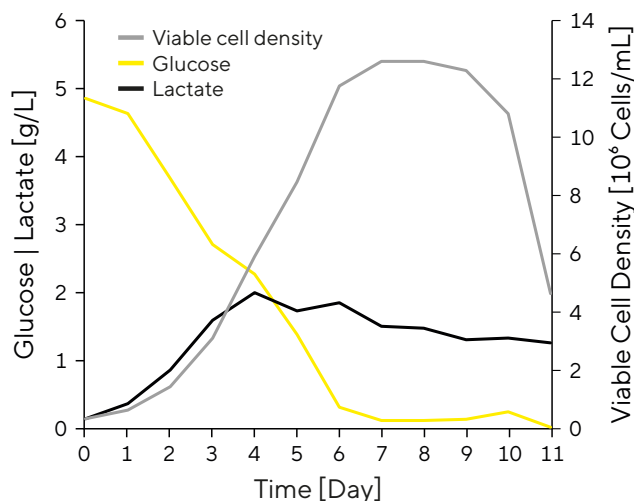
- Identifying molecules of interest

Technical Specifications

At Sartorius, spent media analysis is performed on five 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. In-depth understanding of the bioprocess involves, in addition to the above, measurement of e.g., organic acids, and polyamines
5. Holistic untargeted analyses including multivariate data analysis

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
Glucose and sucrose analysis	Enzymatic-amperometric measurement of glucose and sucrose. Includes digestion of sucrose	SMA-137
Glucose analysis	Enzymatic-amperometric measurement of glucose	SMA-160
Glucose and lactate analysis	Enzymatic-amperometric measurement of glucose and lactate	SMA-162
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
Particle Size Distribution measurement	Analysis of particles size distribution in cell culture media sample	SMA-190
SEC-MALS Analysis	Measurement of weight-averaged masses of macromolecules by size exclusion chromatography with multi-angle static light scattering	SMA-228
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
Analysis of cholesterol by GC	Measurement of cholesterol by gaz chromatography in cell culture media sample	SMA-301
Sugars, Alcohols, small organic acids	Measurement of sugars, alcohols, and small organic acids in cell culture media sample	SMA-302
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
Purine analysis	Measurement of purine in cell culture media sample	SMA-307
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), 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 SMA-308-10 SMA-308-15 SMA-308-20 SMA-308-25
Secretomic analysis by UPLC-Orbitrap-MS	Untargeted analysis of cell culture media sample based on ultra performance liquid chromatography - high-resolution mass spectrometry	SMA-400
ELISA-based analysis for AAV	Automated and validated ELISA for indicated AAV serotype	SMA-175-AAV2 SMA-175-AAV5 SMA-175-AAV8 SMA-175-AAV9

Full list of methods available on request. New methods can be established based on your specific needs. Reach out to your local account manager to learn more about our capabilities.

Learn More About the Value of Media Analytics to Optimize Cell Culture Performance

 **Read White Paper**
[The Value of Spent Media Analytics for Optimizing Cell Culture Performance](#)

[Predicting Cell Culture Media Quality Using Advanced Mass Spectrometry and Multivariate Data Analysis](#)

 **Read Application Note**
[How Spent Media Analytics Can Support Process Optimization](#)

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