SARTORIUS

Product Datasheet

# 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

# Technical Specifications

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

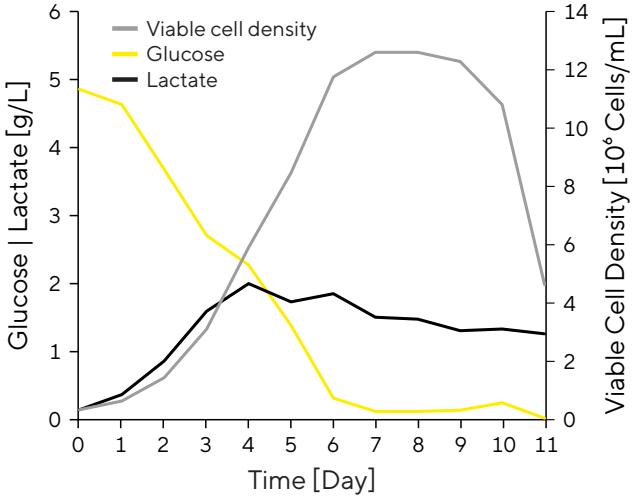
1. Analysis of only primary parameters like pH value, osmolality, glucose, lactate, glutamine, and ammonium

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.

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

Read white paper

Read application note

# 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:<br>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 |
| 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 |
| **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 |
| 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:<br>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<br>SMA-308-10<br>SMA-308-15<br>SMA-308-20<br>SMA-308-25** |
| ELISA-based analysis for AAV | Automated and validated ELISA for indicated AAV serotype | SMA-175-AAV2<br>SMA-175-AAV5<br>SMA-175-AAV8<br>SMA-175-AAV9 |

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