

Cell culture

Scaling your cell culture media

Key considerations when scaling up biologics production to meet global commercial output

Process scale-up is a critical step in the production of biologics, but it can be complex. It requires choosing the optimal media formulations and securing reliable supply chains, all while maintaining product quality and remaining cost-effective. While there are several factors to consider, managing the sourcing, supply, and manufacturing of cell culture media is critical.

Successfully scaling up cell culture media is a key enabler of efficient biologics production. Starting this process early allows developers to proactively address potential challenges—such as solubility, manufacturability, sourcing, and cost optimization—before they become barriers to progress. When media scale-up is considered from the outset, teams can accelerate timelines, reduce risk, and set the stage for a seamless transition to large-scale manufacturing.

To help you navigate this journey, we've outlined the key media-related factors that are essential to enabling a smooth and successful transition to commercial-scale production. By addressing these considerations early, you can avoid common scale-up pitfalls and position your biologic for faster, more reliable global output.

1) Quality of raw materials

As impurities in raw materials can be amplified during the scale-up process, the quality of your raw materials should be a primary focus. Formulations that work at bench scale can sometimes face challenges with productivity when you begin to scale up to large bioreactors. Impurities can impact performance parameters, such as overall titers, growth of the cells, and consistency, resulting in variable product performance and batch-to-batch fluctuations.

High-quality raw materials are also essential for maintaining the critical quality attributes (CQAs) of your biologic—defined during early-stage development—as you scale up. A deviation in these attributes can change a protein's biological activity, which can affect the therapeutic efficacy of your end product.

gibco

Thermo Fisher Scientific actively mitigates variability at the source through raw material harmonization, multi-sourcing strategies, and trace element testing. Its network qualifies thousands of raw materials and uses centralized documentation to streamline compliance across all facilities in its global network.

When media scale-up is considered from the outset, teams can accelerate timelines, reduce risk, and set the stage for a seamless transition to large-scale manufacturing.

2) The regulatory landscape

Speed-to-market is important, but it is equally vital to consider regulatory requirements as a process scales to commercial manufacturing. Thoughtful media selection and documentation can play a critical role in this process, helping maintain consistency, traceability, and compliance across global regulatory submissions.

The first step is making sure that you have the correct traceability documentation for each individual component used in the formulation. One way to do this is through enhanced digitalization. Thermo Fisher offers an electronic Certificates of Analysis (eCoAs) option, called Gibco VeriCert Exchange™. The technology leverages industry-accepted ASTM International standards and machine-readable .xml file formats. Benefits for customers include streamlining data exchange and enhancing process efficiency through rapid qualification of raw materials.

Successful process characterization is also key. CGMP regulations require that all commercially produced biologics meet stringent assay, quality, and purity requirements. When scaling up, the production of a biologic must be optimized to meet regulatory requirements while still making sure it is cost-effective and reproducible.

However, nuances between different regulatory bodies cannot be overlooked, and regulations differ country by country. A formulation has to be independently approved by each country,

as clinical data cannot be leveraged globally. An awareness of any changes during scale-up is critical, as these changes can impact the final formulation as well as its approval.

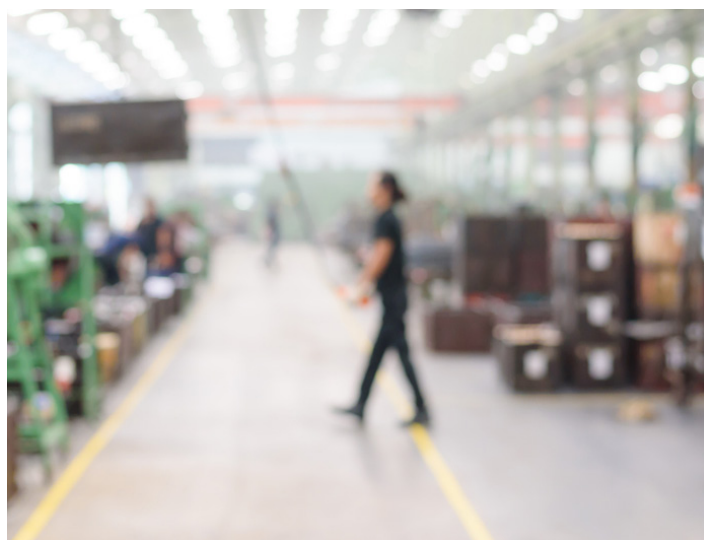
3) Manufacturing footprint and outsourcing

Considering your in-house manufacturing footprint is also important when scaling up. For instance, liquid cell culture media can be ideal at earlier stages, but when it comes to scaling up, dry powder and granular formats, such as Gibco™ Advanced Granulation Technology (AGT™) media, can offer improvements in cost, shipping, dissolution efficiency (for AGT), and in storage space requirements.

It is also important to identify whether you have the capacity to manufacture your bulk process liquids in-house, or whether outsourcing might benefit your process. Large-scale biopharmaceutical production facilities can devote as much as 20% of their floor space to dry powder media and their preparation [1], which can have a major impact on operations and costs.

As such, outsourcing your media production can be an effective way to save space and time. When working with a supplier, resources arrive exactly when you need them, so you don't have to waste floor space storing large quantities of liquids or powders.

Outsourcing can also offer cost efficiencies by enabling the purchase of larger media batches than would be feasible to manufacture in-house, while also reducing the number of QC tests required. These advantages are especially valuable during scale-up, where streamlined operations and resource optimization are critical to improving overall efficiency.





Bringing it all together

From global supply chain disruptions to raw material shortages, unpredictability is an unavoidable reality in biologics manufacturing. In an industry where timelines are tight and stakes are high, partnering with an experienced supplier can be the ideal way to mitigate risk and cement crucial process resilience.

Global manufacturing capabilities, multisourced raw materials, and built-in redundancies help ensure continuity when disruptions occur. Many media manufacturers, for example, maintain safety stock reserves specifically to support customers during unexpected demand spikes or shortages. This preparedness can be the difference between a seamless scale-up and a costly delay.

A trusted collaborator can also bring vital expertise. A supplier with deep experience in scale-up, media optimization, analytics, regulatory support, and logistics can anticipate challenges before they arise and guide you through them. This can help keep your process on track and let you focus on what matters most: bringing your biologic to the patients who need it.

By proactively addressing key media-related factors and choosing a partner who's equipped for both the expected and the unforeseen, you'll be in a strong position to scale confidently and accelerate your path to commercial success.

References

1 Lupis J (2014) Advanced Granulation Technology™ (AGT™ dry media format) culture media benefits and case studies.
http://assets.thermofisher.com/TFS-Assets/LSG/brochures/AGT_CaseStudy_White_Paper_FINAL.pdf?CID=bpd_cc_white_paper_agt_benefits_case_studies_agt

Learn more about streamlining media manufacturing, no matter the stage or scale, at thermofisher.com/media-manufacturing

gibco

For Research Use or Further Manufacturing. Not for diagnostic use or direct administration into humans or animals.

© 2021, 2025 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific and its subsidiaries unless otherwise specified. COL014491 0321