

# 4Cell® CHO Media and Feeds

Find the Combination Media  
and Feed That Work Best With  
Your Specific CHO Cell Line

## Product Information

The CHO cell culture media portfolio includes eight distinct CHO media and three companion feeds tailored to the most commercially available CHO cell lines. These are chemically defined, animal-component-free, protein-free CHO media adaptable for batch, fed-batch and perfusion processes. The media are available in various format to suit any needs, such as powder or liquid, and packaged in buckets, bottles or single-use bags. Off-the-shelf catalog products in liquid format under 1 L are readily available for quick screening during media trials via our eShop. Finally, one of our media systems, 4Cell® SmartCHO, supports the growth of CHO-DG44 cell lines and is used in Sartorius's cell line development services.

## Features and Benefits

- 100% chemically defined, animal component-, serum-, and hydrolysate-free
- Scalable from discovery to manufacturing
- Diverse offering (powder, liquid, bottle, bags)
- From off-the-shelf products to custom options
- Global manufacturing facilities use the same raw materials sources



# Introduction

## Relevant Applications

- Monoclonal antibodies (mAbs) and biosimilars
- Recombinant and fusion proteins
- Standard and intensified processes
- Transient and stable clones

## Relevant Process Steps

- Cell line development and cell banking – Our 4Cell® CHO media and feeds are an all-in-one solution for thawing, adaptation, growth, and protein production, eliminating the need for several media types.
- CHO TF allowing transfection for an all in one solution for transient protein expression.
- The 4Cell® SmartCHO media system is also used in Sartorius' cell line development services'.
- Process development – Using 4Cell® CHO media with the Ambr® system enables an optimized and predictive process that lays the foundation for large-scale, high-yielding biomanufacturing.
- Seed train culture – The media supports stable growth and viability in high-density cultures.
- Biotherapeutics manufacturing – Suitable for batch, fed-batch, and perfusion processes.



# Increasing the Success of CHO Cell Media Screening

Sartorius’ CHO media portfolio was developed for the cultivation of Chinese Hamster Ovary (CHO) and other mammalian cell lines. CHO cells can be used for both stable and transient expression of recombinant proteins. Our CHO media portfolio includes several media formulations and companion feeds suitable for the most common CHO cell lines, in batch, fed batch and perfusion cultures.

An important consequence of the diversity within CHO cells is that each variant – and even each subclone – has distinct metabolic requirements, demanding different media | feed compositions to maximize performance. Choosing the right media and feed is the foundation of effective protein production.

## Product portfolio decision tree

The decision tree outlines how to enhance the success of CHO media screening by utilising two pre-selected combinations of media and feeds (see Figure 1). It outlines strategic approaches to optimising cell culture conditions using batch | fed-batch and perfusion methods, which are commonly employed in stable expression systems. 4Cell® CHO TF media are designed for the transient expression of proteins in any CHO cell line and are particularly effective

when used with FectoPRO® transfection reagents. For stable expression, 4Cell® SmartCHO media is designed to support the growth of CHO-DG44 cell lines in fed-batch and perfusion processes. In contrast, 4Cell® TCX6D and TCX10D media are primarily designed for CHO-K1/S and CHO-GS, respectively. The 4Cell® CHOlean medium has been developed with a minimal set of balanced components to provide a lean, robust and flexible basis for the medium. It is also capable of competing with state-of-the-art media in terms of high cell growth and product titer, and is recommended as a second choice of media for any media screening.

The decision tree prominently features 4Cell® SmartCHO Feeds FMA | FMB, which are specialised feed formulations aimed at improving productivity and suitability for any basal media in the portfolio.

Data supporting the decision tree are available in a separate application note. Furthermore, the white paper ‘CHO Media Screening Success Using Benchmarking Studies’ presents various case studies on optimising different media and feed combinations for CHO cell cultures to enhance recombinant protein production in the biopharmaceutical industry.

**Figure 1:** A Pre-Selection of 4Cell® CHO Media and Feeds to Guide the Initial Media Selection Process

Process	Batch   Fed-batch				Perfusion
Expression system	Transient	Stable			
Cell line		CHO DG44	CHO-K1 & CHO-S	CHO-GS	CHO-DG44
	↓	↓	↓	↓	↓
First choice medium	4Cell® CHO TF Medium	4Cell® SmartCHO PM	4Cell® CHO Medium TCX6D	4Cell® CHO-GS Medium TCX10D	4Cell® SmartCHO PM
Second choice medium		4Cell® CHOlean Medium			
High titer feed	4Cell® SmartCHO Feeds FMA   FMB				

# Technical Specifications

**Table 1:** Main Components Included (■) or Absent (–) in Each 4Cell® CHO Media Formulation

Medium	Surfactant	Phenol Red	L-Glutamine	Hypoxanthine   Thymidine	Growth Factors	Glucose [g/L]	Amino Acids	Vitamins
4Cell® SmartCHO Stock and Adaptation Medium	■	–	–	–	–	6	■	■
4Cell® SmartCHO Production Medium	■	–	–	–	–	6	■	■
4Cell® SmartCHO Feed Medium A	■	–	–	–	–	77	■	■
4Cell® SmartCHO Feed Medium B	–	–	–	–	–	–	■	–
4Cell® CHO Medium TCX6D	■	–	–	■	■	8.35	■	■
4Cell® CHO Medium TC-42 w/ IGF	■	–	–	–	■	8.35	■	■
4Cell® CHO Medium TC-42 w/ rInsulin	■	–	–	–	–	8.35	■	■
4Cell® CHO Medium TC-42 w/o IGF	■	–	–	–	–	8.35	■	■
4Cell® CHO-GS Medium TCX10D	■	–	–	■	–	6	■	■
4Cell® CHOlean Medium	■	–	–	–	–	8.5	■	■
4Cell® CHO TF Medium	■	–	–	■	–	6	■	■
4Cell® CHO Feed TCX7D	■	–	–	■	–	60	■	■
4Cell® Basic Feed	■	–	–	–	–	20	■	■

# Ordering Information

## CHO Media Portfolio

Medium	Description	Format   Volume to Prepare   Packaging	Order Number	MTS MTO*
4Cell® SmartCHO Stock & Adaptation Medium (SAM)	Allows the cultivation or media adaptation of CHO-DHFR <sup>+</sup> cell lines	Liquid   2 × 1 L   bottles	CFP3FB1106	MTS
		Liquid   1 L   bag	CFP3FB1102	MTS
		Liquid   2 × 5 L   bags	CFP3FB1116	MTS
		Powder   10 L   container	CQP3FB1146	MTS
		Powder   25 L   container	CQP3FB1147	MTS
		Powder   250 L   container	CQP3FB1148	MTS
4Cell® SmartCHO Production Medium (PM)	Used for effective cultivation of any CHO cell lines. Helps produce high yield of the active protein	Liquid   2 × 1 L   bottles	CFP3FB2107	MTS
		Liquid   1 L   bag	CFP3FB2101	MTS
		Liquid   2 × 5 L   bags	CFP3FB2124	MTS
	Supports the development of CHO-DG44 clones in Sartorius Cell Line Development Services	Powder   9 L   container	CQP3FB2149	MTS
		Powder   20 L   container	CQP3FB2150	MTS
		Powder   200 L   container	CQP3FB2151	MTS
4Cell® CHO Medium TCX6D	Basal medium supplemented with a growth factor	Liquid   1 L   bottle	1070-0001	MTS
		Powder   10 L   container	CQP3FF0600	MTS
		Powder   50 L   container	CQP3FF0603	MTO
		Powder   200 L   container	CQP3FF0604	MTO
		Powder   250 L   container	CQP3FF0601	MTO
		Powder   500 L   container	CQP3FF0602	MTO
4Cell® CHO-GS Medium TCX10D	For long-term high-performance growth of CHO-GS cells	Liquid   1 L   bottle (w/ Dextran sulfate)	1100-0001	MTO
		Liquid   1 L   bottle (w/o Dextran sulfate)	1150-0001	MTS
		Powder   10 L   container (w/o Dextran sulfate)	1150-0010DPM	MTS
		Powder   50 L   container (w/o Dextran sulfate)	1150-0050DPM	MTS
		Powder   100 L   container (w/o Dextran sulfate)	1150-0100DPM	MTS
		Powder   200 L   container (w/o Dextran sulfate)	1150-0200DPM	MTO
		Powder   500 L   container (w/o Dextran sulfate)	1150-0500DPM	MTO
4Cell® CHOlean Medium	Robust growth medium for a variety of applications	Liquid   1 L   bottle	1140-0001	MTS
		Liquid   1 L   bottle (for SILAC**)	1141-0001	MTO
	Lean formulation with minimal components ideal for all CHO cell lines	Powder   10 L   container	1140-0010DPM	MTS
		Powder   50 L   container	1140-0050DPM	MTO
		Powder   100 L   container	1140-0100DPM	MTO
4Cell® CHO TF Medium	Ideal medium for working with transient CHO cells. Can be used with FectoPRO® transfection reagents	Liquid   1 L   bottle	886-0001	MTS
		Liquid   1 L   bottle (for SILAC**)	888-0001	MTO
		Powder   10 L   container	886-0010DPM	MTS
		Powder   50 L   container	886-0050DPM	MTO

Feed	Description	Format   Quantity   Package	Order Number	MTS MTO*
4Cell® CHO Medium TC-42	First generation basal medium originally designed for CHO-DHFR <sup>-</sup> cell lines	Liquid   1 L   bottle (w/ IGF)	510-0001	MTO
		Liquid   1 L   bottle (w/ Insulin)	509-0001	MTO
		Liquid   1 L   bottle	511-0001	MTS
		Liquid   1 L   bottle (for SILAC**)	512-0001	MTO
		Powder   10 L   container	CQP3FF0400	MTO
		Powder   50 L   container	CQP3FF0401	MTO
4Cell® SmartCHO Feed Medium A (FMA)	4Cell® SmartCHO FMA and 4Cell® SmartCHO FMB are the ideal companion feeds to be used together with 4Cell® SmartCHO, 4Cell® CHO Medium TCX6D, 4Cell® CHO-GS Medium TCX10D, or 4Cell® CHOlean Medium	Liquid   2 × 1 L   bottles	CFP3FB3108	MTS
		Liquid   1 L   bag	CFP3FB3101	MTS
		Liquid   2 × 5 L   bags	CFP3FB3132	MTS
		Powder   3 L   container	CQP3FB3152	MTS
		Powder   30 L   container	CQP3FB3153	MTS
4Cell® SmartCHO Feed Medium B (FMB)	When used together, 4Cell® SmartCHO FMA and 4Cell® SmartCHO FMB drive high titers	Liquid   2 × 125 mL   bottles	CFP3FB4109	MTS
		Liquid   2 × 500 mL   bottles	CFP3FB4110	MTS
		Liquid   1 L   bag	CFP3FB4101	MTS
		Liquid   2 × 5 L   bags	CFP3FB4140	MTO
		Powder   2 L   container	CQP3FB4154	MTS
		Powder   4 L   container	CQP3FB4155	MTS
		Powder   45 L   container	CQP3FB4156	MTS
4Cell® CHO Feed TCX7D	Standard feed with 60 g/L D-glucose	Liquid   1 L   bottle	1080-0001	MTS
		Powder   2 L   container	1080-0002DPM	MTS
		Powder   5 L   container	1080-0005DPM	MTS
		Powder   10 L   container	1080-0010DPM	MTO
		Powder   25 L   container	1080-0025DPM	MTO
		Powder   50 L   container	1080-0050DPM	MTO
4Cell® Basic Feed	Low nutrient level feed with 20 g/L D-glucose	Liquid   1 L   bottle	1092-0001	MTS
		Liquid   10 L   bag	1092-0010BAG	MTO
	Also suitable for hybridoma and HEK293 cells	Liquid   20 L   bag	1092-0020BAG	MTO
		Liquid   50 L   bag	1092-0050BAG	MTO
		Powder   5 L   container	CQP3FF0800	MTO
		Powder   10 L   container	CQP3FF0801	MTS
		Powder   50 L   container	CQP3FF0802	MTO

\*MTS: Made to stock ; MTO: Made to order are subject to longer lead time. Please contact your sales representative for more information.

\*\*SILAC means w/o lysine and arginine ideal for expression of labeled proteins.



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