EfficientFeed+ Supplements
Enjoy an Improved Process with These Feeding Benefits

**Flexibility**

- Reduce feed volume for **maximum working volume**
- Reduce feed volume for **less dilution**
- Increase feeding within the available space for **higher titers**

**Simplicity**

- **Comparable performance** when scaling up, switching between liquid and Gibco™ Advanced Granulation Technology™ (AGT™) formats
- Easier reconstitution **decreases potential errors**
- Fewer closed-system connections **reduce contamination risk**

How would **flexibility** and **simplicity** benefit your process development or scale-up?
EfficientFeed A+, B+, and C+ Supplements

Available in two formats

1. **AGT format**
   - 1, 10, and 100 L
   - Can be concentrated

2. **Liquid format**
   - Available in 1 L bottle and in 10 L BioProcess Container with Thermo Scientific™ Aegis™ 5-14 film

**Liquid formats are concentrated**

- Gibco™ EfficientFeed™ A+ (3X) Supplement
- Gibco™ EfficientFeed™ B+ (3X) Supplement
- Gibco™ EfficientFeed™ C+ (2X) Supplement
Flexibility
Maximize Bioreactor with Concentrated Liquid and Efficient Feed AGT Supplements

Decrease the need to compromise on feed optimization

Volume (L)

<table>
<thead>
<tr>
<th></th>
<th>Available space</th>
<th>Feeding supplement</th>
<th>Media working volume</th>
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<tbody>
<tr>
<td>Traditional</td>
<td>71</td>
<td>29</td>
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<tr>
<td>Dilution</td>
<td>71</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>Maximum working volume</td>
<td>88</td>
<td></td>
<td>12</td>
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</table>

~20% improvement in bioreactor use

- 3x improvement in feeding supplement volume
Achieve Greater Productivity with Reduced Product Dilution

Notes:
- EFC = EfficientFeed C

Theoretical \( q_p \)

15% EFC + 2X

30% EFC AGT

15% EFC AGT

Glucose feed only

**CHO DG44 cells in Gibco™ CD FortiCHO™ medium supplemented with 30% EfficientFeed C or 15% EfficientFeed C+ AGT supplement**
Simplicity
Comparable Performance Between Liquid and AGT Formats

**EfficientFeed supplement with CHO-S:**
- **average growth**

<table>
<thead>
<tr>
<th>Time (days)</th>
<th>EFA+ 3X Liq</th>
<th>EFA+ 3X AGT</th>
<th>EFB+ 3X Liq</th>
<th>EFB+ 3X AGT</th>
<th>EFC+ 2X Liq</th>
<th>EFC+ 2X AGT</th>
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<td></td>
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<td></td>
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</table>

* Control: average viable cell density of AGT

**EfficientFeed supplement with CHO-S:**
- **average titer**

<table>
<thead>
<tr>
<th>Time (days)</th>
<th>EFA+ 3X Liq</th>
<th>EFB+ 3X Liq</th>
<th>EFC+ 2X Liq</th>
<th>EFA+ 3X AGT</th>
<th>EFB+ 3X AGT</th>
<th>EFC+ 2X AGT</th>
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<td>14</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

* Control: average titer of AGT
EfficientFeed AGT Supplements Provide Consistent Protein Quality

Consistency in protein quality means optimizing feeding won’t require regulatory trade-offs
More Steps = More Risks

**EfficientFeed liquid supplement**

1 step

- Use

**EfficientFeed AGT supplement**

6 steps

- Add water
- Mix
- QS*
- Mix
- Filter
- Use

**Other single-part feed**

10 steps

- Add water
- Mix
- pH adjust
- Mix
- pH back to neutral
- Mix
- QS*
- Mix
- Filter
- Use

**Multiple-part feed**

16 steps

- Add water
- Mix
- QS*/pH adjust
- Mix
- QS*
- Mix
- Filter
- Hold
- Add water
- Mix
- QS*/pH adjust
- Mix
- QS*
- Mix
- Filter
- Use

**Risks associated with more steps:**

- Safety in handling caustics for pH adjustment
- Overshooting salt addition in pH adjustment
- Reconstitution errors
- Local high-pH regions or hotspots

* QS = Quantity sufficient
Room Temperature Simplicity: Reduces Contamination Risk

Typical number of closed-system connections required

- EfficientFeed+ supplements: 1
- Standard bolus feeding: 4
- Daily feeding: 10

Fewer closed-system connections = less contamination risk
Superconcentrated
EfficientFeed A+, B+, and C+ AGT Supplement Design

Superconcentrated
- Target: 150–200 g/L

Neutral pH
- pH range: 6.5–7.1

Simple to prepare
- Just add water

Hydrates quickly
- ≤90 min

Flexible
- Add less water to concentrate

Designed for more flexibility and simplicity
Superconcentrate AGT Format Easily by Adding Less Water

Example: comparison of final volumes for reconstitution of 10 L packages of EfficientFeed A+, B+, and C+ supplements

Less dilution can mean **easier downstream processing**
Superconcentration From Original Concentrates of ~50–80 g/L to ~150–200 g/L

EfficientFeed supplement concentrations

Concentration factor

Concentration (g/L)
No Long Mixing Times Required Even at Highest Concentrations: EfficientFeed A+, B+, and C+ AGT Supplements Are pH-Neutral

EfficientFeed products are easy to reconstitute and use
Catalog EfficientFeed Supplements

**Flexibility**
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**Simplicity**
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- Easier reconstitution **decreases potential errors**
- Fewer closed-system connections **reduce contamination risk**

Accomplish more while minimizing risk with EfficientFeed supplements
When more than one EfficientFeed product may be needed to get the best result, this kit allows you to test 1 L of each to determine the best fit.
<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity</th>
<th>Cat. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EfficientFeed A+ AGT Supplement</td>
<td>1 L</td>
<td>A2502304</td>
</tr>
<tr>
<td>EfficientFeed A+ AGT Supplement</td>
<td>10 L</td>
<td>A2502305</td>
</tr>
<tr>
<td>EfficientFeed A+ AGT Supplement</td>
<td>100 L</td>
<td>A2502301</td>
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<tr>
<td>EfficientFeed B+ AGT Supplement</td>
<td>1 L</td>
<td>A2503004</td>
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<td>10 L</td>
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<td>EfficientFeed B+ AGT Supplement</td>
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<td>EfficientFeed C+ AGT Supplement</td>
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<td>EfficientFeed C+ AGT Supplement</td>
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<td>A2503101</td>
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<td>Gibco Feed Kit A+, B+, C+</td>
<td>3 L</td>
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[thermofisher.com/efficientfeed](https://thermofisher.com/efficientfeed)
## Liquid Format Ordering Information

<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity</th>
<th>Cat. No.</th>
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<tbody>
<tr>
<td>EfficientFeed A+ 3X Supplement</td>
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<td>EfficientFeed A+ 3X Supplement</td>
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<td>EfficientFeed B+ 3X Supplement</td>
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<td>EfficientFeed B+ 3X Supplement</td>
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<td>EfficientFeed C+ 2X Supplement</td>
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<tr>
<td>EfficientFeed C+ 2X Supplement</td>
<td>10 L</td>
<td>A3937602</td>
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</tbody>
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Custom orders are now available in any BioProcess Container (BPC) size

[thermofisher.com/efficientfeed](thermofisher.com/efficientfeed)
# EfficientFeed Supplement and Media Guide

These are not universal, but would be a good place to start

<table>
<thead>
<tr>
<th>CHO cell type</th>
<th>Banking medium contains growth factor</th>
<th>Customer will sequentially adapt cells</th>
<th>Media option</th>
<th>Matched feed option</th>
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</thead>
<tbody>
<tr>
<td>CHO-S</td>
<td>N</td>
<td>Y</td>
<td>Gibco™ Dynamis™ Medium</td>
<td>EfficientFeed C+ Supplement</td>
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<tr>
<td>Gibco™ ExpriCHO-S™</td>
<td>Y</td>
<td>Y</td>
<td>Gibco™ ExpriCHO™ Stable Production Medium (with GlutaMAX™ added)</td>
<td>EfficientFeed C+ Supplement</td>
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<tr>
<td>ExpriCHO-S</td>
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<td>N</td>
<td>ExpriCHO SPM</td>
<td>EfficientFeed C+ Supplement</td>
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<tr>
<td>DG44/DXB11</td>
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<td>N</td>
<td>Gibco™ CD OptiCHO™ Medium</td>
<td>EfficientFeed A+ Supplement</td>
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<td>Dynamis Medium</td>
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<tr>
<td>GS CHO</td>
<td>N</td>
<td>Y</td>
<td>Dynamis or CD OptiCHO™ Medium</td>
<td>EfficientFeed C+ or B+ Supplement</td>
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<tr>
<td>Other CHO</td>
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<td>Y</td>
<td>Dynamis Medium</td>
<td>EfficientFeed C+ Supplement</td>
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