Classification of Milk Replacer Types

Modern milk replacers can be classified by protein source, energy content and presence of medication.¹

Protein Sources
Protein sources are generally classified as milk or alternative proteins.

Protein/Energy Levels
Protein and energy levels are both important to choosing a milk replacer. Protein levels in calf milk replacers generally range from 18% to 22% and fat levels from as low as 10% to 22%. Calf growth and performance is related to a large number of factors; and differing protein levels, protein/energy ratios, and protein sources interact. Growth is regulated by daily intake of protein and energy, therefore, different feeding levels will also affect performance. Some applications, such as cold weather feeding, require a higher energy level. (Because fat is a very concentrated energy source, the content of fat in a milk replacer will be responsible for most of the difference in energy levels.)

All Milk Protein
Alternative Protein
Dried Whey Protein Concentrate
Soy Protein Isolate
Dried Whey
Protein Modified Soy Flour
Dried Whey Product
Soy Protein Concentrate
Skim Milk
Soy Flour
Casein
Plasma Protein
Sodium or Calcium Caseinate
Modified Wheat Protein

Low Fat
High Fat
Protein 18-22%
Protein 18-22%
Fat 10-15%
Fat 16-22%
Metabolizable Energy Level
1660 - 1810 kcal/lb.
Metabolizable Energy Level
1770 - 1950 kcal/lb.
Medicated Versus Non-Medicated

Including medication in milk replacers can provide significant benefits in calf health and performance. However, use of medication may require a withdrawal period prior to slaughter. Five medications have approval for use in milk replacers: Chlortetracycline (CTC), Oxytetracycline (OTC), Oxytetracycline in combination with Neomycin (OXY/NEO), Decoquinate and Lasalocid. The first three medications are antibacterial while Decoquinate and Lasalocid aid in the prevention of coccidiosis. (See Table below for use levels and withdrawal).

<table>
<thead>
<tr>
<th>Medication</th>
<th>Use Level</th>
<th>Statement</th>
<th>Withdrawal Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlortetracycline</td>
<td>20 g/ton</td>
<td>For increased rate of weight gain and improved feed efficiency.</td>
<td>None Required</td>
</tr>
<tr>
<td></td>
<td>2000 g/ton</td>
<td>Treatment of bacterial enteritis caused by E. coli susceptible to chlortetracycline.</td>
<td>Treat for not more than 5 days. Do not use in calves to be processed for veal.</td>
</tr>
<tr>
<td>Oxytetracycline</td>
<td>10-20 g/ton</td>
<td>For increased rate of weight gain and improved feed efficiency.</td>
<td>None Required</td>
</tr>
<tr>
<td></td>
<td>2000 g/ton</td>
<td>Treatment of bacterial enteritis caused by E. coli susceptible to oxytetracycline.</td>
<td>Withdraw 5 days before slaughter.</td>
</tr>
<tr>
<td>Oxytetracycline/Neomycin</td>
<td>100 g/ton Oxy 200 g/ton Neo</td>
<td>Aid in the prevention of bacterial diarrhea (scours).</td>
<td>Withdraw 30 days before slaughter.</td>
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<tr>
<td></td>
<td>200 g/ton Oxy and 400 g/ton Neo to 400 g/ton Oxy and 800 g/ton Neo</td>
<td>Aid in the treatment of bacterial diarrhea (scours).</td>
<td></td>
</tr>
<tr>
<td>Decoquinate</td>
<td>45.4 g/ton (to give 22.7 mg decoquinate per 100 lbs. body weight).</td>
<td>For the prevention of coccidiosis in ruminating and non-ruminating calves and cattle caused by E. bovis and E. zuernii.</td>
<td>None Required.</td>
</tr>
<tr>
<td>Lasalocid</td>
<td>90 g/ton</td>
<td>For the control of coccidiosis caused by Eimeria bovis and Eimeria zuernii in replacement calves.</td>
<td>None Required.</td>
</tr>
</tbody>
</table>