Cary and Blair Transport Medium

(See Transport Media)

Casamino Acids

Bacto™ Casamino Acids • Bacto™ Casamino Acids, Technical • Casamino Acids, Vitamin Assay

Acidicase™ Peptone

Intended Use

Bacto Casamino Acids and Bacto Casamino Acids, Technical are used in preparing microbiological culture media. Casamino Acids, Vitamin Assay is used in vitamin assay procedures.

Acidicase Peptone is used as a nutritional supplement in vitamin assay, susceptibility testing and other laboratory media and microbial fermentation where the high salt content will not interfere.

Summary and Explanation

Bacto Casamino Acids is an acid hydrolysate of casein, prepared according to the method described by Mueller and Miller. The method describes a reduction in sodium chloride and iron content of the hydrolyzed casein. This hydrolyzed casein, supplemented with inorganic salts, growth factors, cystine, maltose and an optimum amount of iron was used by Mueller and Miller to prepare diphtheria toxin. Bacto Casamino Acids duplicates this specially treated hydrolyzed casein.

Bacto Casamino Acids, due to the nearly complete hydrolysis of casein and the low sodium chloride and iron content, makes an excellent supplement for many media formulations where nitrogen requirements are minimal. This product has been recommended as a compromise for the replacement of pure amino acids in a defined medium for the growth of Lactobacillus, thus eliminating the complexity of preparation. Additionally, it has been successfully used, along with Tryptone Peptone, in nutritional studies to determine a bacterium’s growth requirement for peptides or amino acids. It also works well as a component in laboratory media. It has been utilized in such diverse applications as TYI-S-33 media for the parasite Entamoeba histolytica and LCM medium for the growth of a nematode-bacterium complex.

Bacto Casamino Acids, Technical is an acid hydrolysate of casein. The hydrolysis is carried out as in the preparation of Bacto Casamino Acids, but the sodium chloride and iron content of this product have not been decreased to the same extent. Bacto Casamino Acids, Technical is recommended for use in culture media where amino acid mixtures are required for a nitrogen source and the sodium chloride content is slightly increased. It is particularly valuable in studying the growth requirements of bacteria.

Bacto Casamino Acids, Technical is prepared according to the method suggested by Mueller for use in the preparation of diphtheria toxin. Bacto Casamino Acids, Technical has been used in a medium for primary isolation of gonococcus and meningococcus, in agar-free media for the isolation of Neisseria, in a tellurite medium for the isolation of Corynebacterium and in the preparation of a medium for the testing of disinfectants.

Casamino Acids, Vitamin Assay is an acid digest of casein specially treated to markedly reduce or eliminate certain vitamins. It is recommended for use in microbiological assay media and in studies of the growth requirements of microorganisms. Casamino Acids, Vitamin Assay is commonly used as an amino acid source in early phases of nutrition work. Casamino Acids, Vitamin Assay was used as the acid hydrolyzed casein in studies on p-aminobenzoic acid and p-teroylglutamic acid as growth factors for Lactobacillus species.

Several media containing Casamino Acids are specified in standard methods for multiple applications.

Acidicase Peptone is a hydrochloric acid hydrolysate of casein. The manufacturing process produces a casein hydrolysate that has a high salt content of approximately 37% and nitrogen content of approximately 8%. The hydrolysis of the casein, a milk protein rich in amino acid nitrogen, is carried out until all the nitrogen is converted to amino acids or other compounds of relative simplicity. It is deficient in cystine, because casein contains little cystine, and in tryptophan, which is destroyed by the acid treatment.

Principles of the Procedure

Bacto Casamino Acids, Bacto Casamino Acids, Technical, Casamino Acids, Vitamin Assay and Acidicase Peptone are acid hydrolyzed casein. Casein is milk protein and a rich source of...
### User Quality Control

NOTE: Differences in the Identity Specifications and Cultural Response testing for media offered as both Difco™ and BBL™ brands may reflect differences in the development and testing of media for industrial and clinical applications, per the referenced publications.

<table>
<thead>
<tr>
<th>Identity Specifications</th>
<th>Bacto™ Casamino Acids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried Appearance:</td>
<td>Very light beige, free-flowing, homogeneous.</td>
</tr>
<tr>
<td>Solution:</td>
<td>1.0% solution, soluble in pure water upon slight heating. Solution is very light amber. 2.0% solution, soluble in pure water upon slight heating. Solution is light amber, clear.</td>
</tr>
<tr>
<td>Reaction of 2.0%</td>
<td>pH 5.8-6.65</td>
</tr>
<tr>
<td>Solution at 25°C:</td>
<td>pH 5.0-7.5</td>
</tr>
</tbody>
</table>

### Bacto™ Casamino Acids, Technical

<table>
<thead>
<tr>
<th>Identity Specifications</th>
<th>Bacto™ Casamino Acids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried Appearance:</td>
<td>Very light beige, free-flowing, homogeneous.</td>
</tr>
<tr>
<td>Solution:</td>
<td>1.0% solution, soluble in pure water. Solution is colorless to very light amber, clear.</td>
</tr>
<tr>
<td>Reaction of 1.0%</td>
<td>pH 5.0-7.5</td>
</tr>
<tr>
<td>Solution at 25°C:</td>
<td>pH 6.5-8.5</td>
</tr>
</tbody>
</table>

### Difco™ Casamino Acids, Vitamin Assay

<table>
<thead>
<tr>
<th>Identity Specifications</th>
<th>Difco™ Casamino Acids, Vitamin Assay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried Appearance:</td>
<td>Light beige, free-flowing, homogenous.</td>
</tr>
<tr>
<td>Solution:</td>
<td>3.0% solution, soluble in pure water upon boiling. Solution is very light to light amber, clear, may have a slight precipitate.</td>
</tr>
<tr>
<td>Reaction of 3.0%</td>
<td>pH 6.5-8.5</td>
</tr>
<tr>
<td>Solution at 25°C:</td>
<td>pH 6.5-8.5</td>
</tr>
</tbody>
</table>

### Cultural Response

#### Bacto™ Casamino Acids or Bacto™ Casamino Acids, Technical

Prepare a sterile 1% solution and adjust the pH to 7.2 ± 0.2. Inoculate and incubate tubes at 35 ± 2°C for 18-48 hours.

<table>
<thead>
<tr>
<th>ORGANISM</th>
<th>ATCC</th>
<th>INOCULUM CFU</th>
<th>RECOVERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia coli</td>
<td>25922</td>
<td>10^2-10^3</td>
<td>Good</td>
</tr>
<tr>
<td>Salmonella choleraesuis subsp. choleraesuis serotype Typhi</td>
<td>19430</td>
<td>10^2-10^3</td>
<td>Good</td>
</tr>
</tbody>
</table>

#### Difco™ Casamino Acids, Vitamin Assay

Prepare various vitamin assay media using Casamino Acids, Vitamin Assay to determine the vitamin content. It should not contain a vitamin content higher than 20% above the following values:

- Vitamin B₁₂: 0.2 ng/g
- Biotin: 0.3 ng/g
- Folic Acid: 3.3 ng/g
- Niacin: 0.17 µg/g
- Pantothenate: 0.04 µg/g
- Riboflavin: 0.1 µg/g
- Thiamine: 0.1 µg/g
- Thymine: 0.1 µg/g

### Typical Analysis

Refer to Product Tables in the Reference Guide section of this manual.

### Directions for Preparation from Dehydrated Product

Refer to the final concentration of Bacto Casamino Acids, Bacto Casamino Acids, Technical, Casamino Acids, Vitamin Assay and Acidicase Peptone in the formula of the medium being prepared. Add appropriate product as required.

### Procedure

See appropriate references for specific procedures using these hydrolysates.

### Expected Results

Refer to appropriate references and procedures for results.

### References

**Casein Agar**
*(See Nocardia Differentiation Media)*

**Casein Digest**

**Intended Use**
Casein Digest is used in preparing microbiological culture media.

**Summary and Explanation**
Casein Digest, an enzymatic digest of casein similar to N-Z-Amine A, was developed for use in molecular genetics media. This product is digested under conditions different from other enzymatic digests of casein, including Tryptone and Casitone.

**User Quality Control**

**Identity Specifications**
**Difco™ Casein Digest**

| Dehydrated Appearance: | Light beige, free-flowing, homogeneous. |
| Dehydrated Solution: | 1%, 2%, and 10% solutions, soluble in purified water. Solutions are: 1%-Light to medium amber, clear; 2%-Medium amber, clear; 10%-Dark amber, clear. |

**Cultural Response**
**Difco™ Casein Digest**
Prepare NZM Broth per formula. Inoculate and incubate at 35 ± 2°C for 18-72 hours.

<table>
<thead>
<tr>
<th>ORGANISM</th>
<th>ATCC*</th>
<th>INOCULUM CFU</th>
<th>RECOVERY</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus subtilis</em></td>
<td>6633</td>
<td>10^1-10^3</td>
<td>Good</td>
</tr>
<tr>
<td><em>Escherichia coli (HB101)</em></td>
<td>33694</td>
<td>10^1-10^3</td>
<td>Good</td>
</tr>
<tr>
<td><em>Escherichia coli (JM107)</em></td>
<td>47014</td>
<td>10^1-10^3</td>
<td>Good</td>
</tr>
<tr>
<td><em>Escherichia coli (DH5)</em></td>
<td>53868</td>
<td>10^1-10^3</td>
<td>Good</td>
</tr>
<tr>
<td><em>Saccharomyces cerevisiae</em></td>
<td>9763</td>
<td>10^1-10^3</td>
<td>Good</td>
</tr>
<tr>
<td><em>Streptomyces avermitilis</em></td>
<td>31267</td>
<td>10^1-10^3</td>
<td>Fair to good</td>
</tr>
</tbody>
</table>

*Tested with addition of 0.5% dextrose.

Casein Digest is contained in the formulas of NZ media (NZCYM Broth, NZYM Broth and NZM Broth), which are used for cultivating recombinant strains of *Escherichia coli*. *E. coli* grows rapidly in these rich media because they provide amino acids, nucleotide precursors, vitamins and other metabolites that the cells would otherwise have to synthesize. Consult appropriate references for recommended test procedures using NZ media.1,2

**Principles of the Procedure**
Casein Digest is a nitrogen and amino acid source for microbiological culture media. Casein is raw milk protein, a rich source of amino acid nitrogen.

**Procedure**
See appropriate references for specific procedures using Casein Digest.

**Expected Results**
Refer to appropriate references and procedures for results.

**References**

**Availability**
**Difco™ Casein Digest**
Cat. No. 211610 Dehydrated – 500 g