

## Formulations & Specifications

### Ham's F-12

**Product Number HFP05-10X1LT**

With L-glutamine. Without sodium bicarbonate. Store at 2° to 8°C.

Components	mg/L
Biotin (C <sub>10</sub> H <sub>16</sub> N <sub>2</sub> O <sub>3</sub> S)	0.0070
Calcium Chloride, Anhydrous (CaCl <sub>2</sub> )	33.2000
Choline Chloride (C <sub>5</sub> H <sub>14</sub> ONCl)	14.0000
Cupric Sulfate, Pentahydrate (CuSO <sub>4</sub> · 5H <sub>2</sub> O)	0.0025
D-Calcium Pantothenate (C <sub>18</sub> H <sub>32</sub> CaN <sub>2</sub> O <sub>10</sub> )	0.5000
D-Glucose, Anhydrous (C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> )	1802.0000
Ferrous Sulfate, Heptahydrate (FeSO <sub>4</sub> ·7H <sub>2</sub> O)	0.8300
Folic Acid (C <sub>19</sub> H <sub>19</sub> N <sub>7</sub> O <sub>6</sub> )	1.3000
Glycine (C <sub>2</sub> H <sub>5</sub> NO <sub>2</sub> )	7.5000
Hypoxanthine, Sodium (C <sub>5</sub> H <sub>3</sub> N <sub>4</sub> O.Na)	4.7000
L-Alanine (C <sub>3</sub> H <sub>7</sub> NO <sub>2</sub> )	8.9000
L-Arginine, Hydrochloride (C <sub>6</sub> H <sub>14</sub> N <sub>4</sub> O <sub>2</sub> · HCl)	211.0000
L-Asparagine, Monohydrate (C <sub>4</sub> H <sub>8</sub> N <sub>2</sub> O <sub>3</sub> · H <sub>2</sub> O)	15.0000
L-Aspartic Acid (C <sub>4</sub> H <sub>7</sub> NO <sub>4</sub> )	13.0000
L-Cysteine, Hydrochloride, Monohydrate (C <sub>3</sub> H <sub>7</sub> NO <sub>2</sub> · HCl · H <sub>2</sub> O)	35.0000
L-Glutamic Acid (C <sub>5</sub> H <sub>9</sub> NO <sub>4</sub> )	14.7000
L-Glutamine (C <sub>5</sub> H <sub>10</sub> N <sub>2</sub> O <sub>3</sub> )	146.0000
L-Histidine, Hydrochloride, Monohydrate (C <sub>6</sub> H <sub>9</sub> N <sub>3</sub> O <sub>2</sub> · HCl · H <sub>2</sub> O)	21.0000
L-Isoleucine (C <sub>6</sub> H <sub>13</sub> NO <sub>2</sub> )	4.0000
L-Leucine (C <sub>6</sub> H <sub>13</sub> NO <sub>2</sub> )	13.0000
L-Lysine, Hydrochloride (C <sub>6</sub> H <sub>14</sub> N <sub>2</sub> O <sub>2</sub> · HCl)	36.5000
L-Methionine (C <sub>5</sub> H <sub>11</sub> NO <sub>2</sub> S)	4.5000
L-Phenylalanine (C <sub>9</sub> H <sub>11</sub> NO <sub>2</sub> )	5.0000

L-Proline (C <sub>5</sub> H <sub>9</sub> NO <sub>2</sub> )	34.5000
L-Serine (C <sub>3</sub> H <sub>7</sub> NO <sub>3</sub> )	10.5000
L-Threonine (C <sub>4</sub> H <sub>9</sub> NO <sub>3</sub> )	12.0000
L-Tryptophan (C <sub>11</sub> H <sub>12</sub> N <sub>2</sub> O <sub>2</sub> )	2.0000
L-Tyrosine, Disodium, Dihydrate (C <sub>9</sub> H <sub>9</sub> NO <sub>3</sub> Na <sub>2</sub> ·2H <sub>2</sub> O)	7.8000
L-Valine (C <sub>5</sub> H <sub>11</sub> NO <sub>2</sub> )	11.7000
Linoleic Acid (C <sub>18</sub> H <sub>32</sub> O <sub>2</sub> )	0.0800
Lipoic Acid (DL-Thiolic Acid) (C <sub>8</sub> H <sub>14</sub> O <sub>2</sub> S <sub>2</sub> )	0.2100
Magnesium Chloride, Anhydrous (MgCl <sub>2</sub> )	57.2200
Myo-Inositol (C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> )	18.0000
Niacinamide (C <sub>6</sub> H <sub>6</sub> N <sub>2</sub> O)	0.0400
Phenol Red, Sodium Salt (C <sub>19</sub> H <sub>13</sub> NaO <sub>5</sub> S)	1.2000
Potassium Chloride (KCl)	223.6000
Putrescine, Dihydrochloride (C <sub>4</sub> H <sub>12</sub> N <sub>2</sub> ·2HCl)	0.1600
Pyridoxine, Hydrochloride (C <sub>8</sub> H <sub>11</sub> NO <sub>3</sub> · HCl)	0.0600
Pyruvic Acid, Sodium Salt (C <sub>3</sub> H <sub>3</sub> NaO <sub>3</sub> )	110.0000
Riboflavin (C <sub>17</sub> H <sub>20</sub> N <sub>4</sub> O <sub>6</sub> )	0.0400
Sodium Chloride (NaCl)	7599.0000
Sodium Phosphate Dibasic, Anhydrous (Na <sub>2</sub> HPO <sub>4</sub> )	142.0000
Thiamine, Hydrochloride (C <sub>12</sub> H <sub>17</sub> ClN <sub>4</sub> OS · HCl)	0.3000
Thymidine (C <sub>10</sub> H <sub>14</sub> N <sub>2</sub> O <sub>5</sub> )	0.7000
Zinc Sulfate, Heptahydrate (ZnSO <sub>4</sub> · 7H <sub>2</sub> O)	0.8600