Choline Determination

I. Introduction

Choline concentrations in complex matrices can be measured directly and quickly using the YSI 2700 SELECT Biochemistry Analyzer. YSI's unique enzyme technology provides for specific choline measurement. Measurements are virtually unaffected by color, turbidity, density, pH, or the presence of reducing substances.

When a sample is injected into the sample chamber, the choline diffuses into the membrane containing choline oxidase. The choline is immediately oxidized to hydrogen peroxide and betaine. The hydrogen peroxide is detected amperometrically at the platinum electrode surface. The current flow at the electrode is directly proportional to the hydrogen peroxide concentration, and hence to choline concentration.

II. Materials and Setup

A. YSI 2700 SELECT Biochemistry Analyzer - equipped with a 2771 Choline Membrane and 2357 Buffer.

B. Choline standards (175 mg/L, 450 mg/L). Place the 175 mg/L solution in Cal Station #1.

C. Connect the 2700 SELECT to a suitable power source.

D. Perform the instrument and membrane check described in the User's Manual (Section 3).

E. Volumetric glassware (Class A recommended).

F. The following instrument setup is recommended.

Sample size:	25 µL
Sample Station #	2
CalMethod	One Station

Black Probe Parameters

Chemistry	Choline
Unit	mg/L (ppm)
Calibrator	175 mg/L
End Point	30 Sec
CalStation#	1

White Probe Parameters

Single Channel 2700	N/A
Dual channel 2700	None

Autocal Parameters

Sample Error	ON
Temperature	1°C
Time	15 Min
Sample	2 Sam
Cal Shift	2%

III. Method

A. Total choline concentration should not exceed 450 mg/L, as determined on Part D below; otherwise the sample will require further dilution. Use volumetric glassware for all dilutions. Dilute with either water or 2357 buffer.

B. Calibrate the 2700 SELECT with a 175 mg/L Calibration Standard.

C. Check the linearity of the membrane at least once a day by injection of a choline linearity check solution (450 mg/L). Refer to the User's Manual (Section 3) for specifications.

D. Assay the sample by aspiration into the 2700 SELECT. The linear range of the system is 0 to 450 mg/L choline. If the value reported exceeds this, further dilution is required.

E. Calibrate frequently as described in the User's Manual (Section 6).

IV. Calculations

To calculate % choline, multiply the reported value by the appropriate dilution factor.

Example: 5.0 grams of pet food and 100 mL of water were mixed in a blender for 5 minutes. The supernatant was analyzed for choline. The value reported was 77.0 mg/L choline.

% Choline:

77.0mg/L x 0.100 L/5000 mg = 0.0015 g choline/g pet food

= 0.15% (w/w)

Example: Infant formula was aspirated into the 2700 SELECT (no dilution). The choline content was as follows:

Sample	mg/L Choline
Infant Formula A	232
Infant Formula B	138
Medical Nutritional Formula A	398
Medical Nutritional Formula B	386

V. Ordering Information

YSI No.	
2700	Biochemistry Analyzer
2771	Choline Membrane Kit
2772	Choline Standard Solution (175 mg/L)
2773	Choline Standard Solution (450 mg/L)
2357	Buffer Kit
2363	Potassium Ferrocyanide Test Solution
2392	NaCl Solution (for membrane installation)

Note

Software version 2.45 or higher is required to run the choline chemistry. If you do not have a compatible software version, please contact YSI Customer Service.

YSI *incorporated*

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