

## L-Lactate in Lunch Meats

### I. Introduction

L-Lactate concentrations in complex matrices such as lunch meats can be measured directly and quickly using the YSI 2700 SELECT Biochemistry Analyzer. YSI's unique enzyme technology provides for specific L-lactate 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 L-lactate diffuses into the membrane containing L-lactate oxidase. The L-lactate is immediately oxidized to hydrogen peroxide and pyruvate. 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 the L-lactate concentration.

### II. Materials and Setup

- A. YSI 2700 SELECT Biochemistry Analyzer - equipped with a 2329 L-Lactate Membrane and 2357 Buffer.
- B. L-Lactate standards (0.50 g/L, 2.50 g/L). Place the 0.50 g/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 Operations 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	L-Lactate
Unit	g/L
Calibrator	0.50 g/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	5 Sam
Cal Shift	2%

### III. Method

- A. Cut the sample into several pieces (about 1 inch squares).
- B. Weigh the cut pieces of meat and record the exact weight.
- C. Transfer the sample to a clean dry blender. Add about 100 mL of distilled or deionized water. Turn the blender on and allow the sample to blend for about 5 minutes.
- D. Transfer the sample to a 500 mL volumetric flask. Using distilled or deionized water, rinse the blender and use this rinse to dilute the sample to the mark on the flask.
- E. Calibrate the 2700 SELECT with a 0.50 g/L L-lactate standard solution.
- F. Assay the sample prepared in D by aspiration into the 2700 SELECT. The linear range of the system extends to 2.50 g/L L-lactate. If the value reported exceeds this, further dilution is required.
- G. Check the linearity of the membrane at least once a day by injection of an L-lactate linearity check solution (2.50 g/L). Refer to the Operations Manual (Section 3) for specifications.
- H. Calibrate frequently as described in the Operations Manual (Section 6).

### IV. Calculations

27.93 grams of turkey lunch meat was diluted to 500 mL in a Class A volumetric flask. When assayed the value reported was 1.27 g/L L-lactate.

% L-lactate

$$1.27 \text{ g/L} \times 0.500 \text{ L} / 27.93 \text{ g} = 0.0227 \text{ g L-lactate/g meat}$$

$$= 2.27\% \text{ (w/w)}$$

To measure sodium lactate multiply the concentration by the ratio of the formula weights of sodium lactate and L-lactate.

$$\text{Sodium lactate} = 112.07 \text{ g/mole}$$

$$\text{L-lactate} = 89.07 \text{ g/mole}$$

$$112.07 / 89.07 = 1.26$$

$$2.27\% \text{ (w/w) L-lactate} \times 1.26 = 2.86\% \text{ (w/w) sodium lactate}$$

### V. Ordering Information

#### YSI No.

2700	Biochemistry Analyzer
2329	L-Lactate Membrane Kit
2776	L-Lactate Standard Solution (0.50 g/L)
2777	L-Lactate Standard Solution (2.50 g/L)
2357	Buffer Kit
2363	Potassium Ferrocyanide Test Solution
2392	NaCl Solution (for membrane installation)

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