

Food & Beverage Series

L-LACTATE IN LUNCH MEATS



Introduction

L-Lactate concentrations in complex matrices such as lunch meats can be measured directly and quickly using the YSI 2900 Series 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.



a xylem brand

I. Materials & Setup

- A. YSI 2900 Series Biochemistry Analyzer - equipped with a 2329 L-Lactate Membrane and 2357 Buffer.
- B. L-Lactate standards (0.50 g/L, 2.50 g/L).
- C. Connect the 2900 Series instrument to a suitable power source.
- D. Perform the instrument and membrane daily checks described in the Operations Manual (Section 5).
- E. Volumetric glassware (Class A recommended).
- G. The following instrument setup is recommended:
Sample Size 25 µL

Probe A Parameters

Chemistry	L-Lactate
Unit	g/L
Calibrator	0.50 g/L
End Point	30 Sec

Autocal Parameters

Temperature	1°C
Time	30 Min
Sample	5 Sam
Cal Shift	2%

II. 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 water making sure no water enters the container. Allow the sample to melt stirring occasionally to keep the sample homogeneous.
- 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 2900 Series instrument with a 0.50 g/L L-lactate standard solution.
- F. Assay the sample prepared in D by aspiration into the 2900 Series. 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 for specifications.
- H. Calibrate frequently as described in the Operations Manual.

III. 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.

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

$$\frac{\% \text{ L-Lactate}}{1.27 \text{ g/L} \times 0.500 \text{ L} / 27.93 \text{ g}} = 0.0227 \text{ g L-Lactate/g Meat} = 2.27\% \text{ (w/w)}$$

$$\begin{aligned} \text{Sodium lactate} &= 112.07 \text{ g/mole} \\ \text{L-lactate} &= 89.07 \text{ g/mole} \\ 112.07 / 89.07 &= 1.26 \\ 2.27\% \text{ (w/w) L-lactate} &= 2.86\% \text{ (w/w) sodium lactate} \\ \times 1.26 & \end{aligned}$$



The YSI 2900 offers multiple sample processing options.



YSI 2900
Biochemical Analyzer

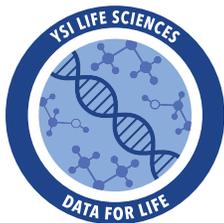
APPLICATION NOTE 212LS-02



The YSI 2900 Series Biochemistry Analyzers offer a wide range of configurations, options and accessories to meet the needs of various industry applications.

Ordering Information

- 2900 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)



YSI Life Sciences develops and manufactures scientific instruments, sensors and systems that serve a variety of scientific and industrial markets worldwide. YSI has a long history in the life sciences and bioanalytical markets, most notably with our introduction of the world's first commercial whole blood glucose analyzer in 1975. Today there are over 10,000 YSI instruments installed around the world, trusted in critical situations to provide the most accurate data in the shortest time.

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