

# MICROMANOMETRIC DETERMINATION OF GALACTOSE BY DIFFERENTIAL FERMENTATION USING A STRAIN OF STREPTOCOCCUS MASTITIDIS

CAROLYN FOUST SPRAGUE<sup>1</sup> AND W. D. BELLAMY<sup>2</sup>

*Laboratory of Bacteriology, College of Agriculture, Cornell University, Ithaca, New York*

Received for publication October 6, 1948

Methods for the determination of galactose in the presence of other sugars by differential fermentation with yeast have been used since 1914. Kluyver (1914) observed that certain strains of yeast ferment galactose and developed a method of measuring fermentable sugars by carbon dioxide evolution. Hopkins, Peterson, and Fred (1930) employed a modification in which they measured residual reducing sugar after 8 days' fermentation with selected yeasts. Harding and Nicholson (1932-33, 1933) and Scott and West (1936) used resting yeast suspensions for fermentation and reducing sugar methods to analyze sugar mixtures for glucose and galactose. They also determined lactose by employing acid hydrolysis followed by fermentation and reducing sugar analysis. Kahlenberg (1938) also determined glucose, galactose, and lactose by differential fermentation with yeast suspensions. His method was inconvenient in that a 5-day incubation period with aeration was required to obtain the cells, and a high reducing value of the yeast suspensions decreased the precision of the method. Wise and Appling (1944) determined galactose at levels of 20 to 150 mg in the presence of other sugars by selective fermentation with yeast suspensions with a recovery of 92 to 98 per cent as determined by the reducing value after 48 hours' fermentation.

With the exception of Kluyver's method, which employs a gasometer to measure carbon dioxide evolution, all of these methods are similar in three respects: (1) the use of yeast strains that are specific for one or more sugars, (2) the 3- to 8-day incubation period to obtain large cell crops, and (3) the determination of reducing sugars before and after fermentation for periods varying from 30 minutes to 6 days. All of the reducing sugar methods require great care in harvesting and washing the cells in order to avoid high endogenous reducing values.

The purpose of this paper is to present a simplified, rapid micromethod for the determination of galactose in the presence of other sugars. With lactic acid bacteria used for analysis, cells can be prepared overnight; and small amounts of galactose can be fermented by the resting suspension in less than an hour, thus effecting a considerable saving in time and eliminating the necessity of sterile techniques in the fermentation procedures. In addition, resting cell suspensions

<sup>1</sup> Present address: Department of Physiology, New York State Veterinary College, Cornell University, Ithaca, New York.

<sup>2</sup> Present address: Anti-Biotic Division, Sterling-Winthrop Research Institute, Rensselaer, New York.

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