

METHOD SPECIFICATION
Faculty of Biosciences, NMBU

Method name: Glucose
BIOVIT-nr.: Msp1013

1. Method of analysis / Principle / Main instrument:

Glucose in serum, plasma, and urine.

Glucose C₅H₁₂O₆ is a monosaccharide, an aldohexose that contains four asymmetric carbon atoms and is therefore one of 16 possible stereoisomers. L and D glucose indicate asymmetry in the penultimate carbon atom.

Several active glycolytic enzymes are found in the human blood cells. Human blood must therefore always be taken in the tubes supplemented with Na-fluoride, which inhibits glycolysis. The amount of glycolysis enzymes in ruminants is not so high, which means that the glycolysis does not occur at the same rate.

It is a UV method based on enzymatic-endpoint reaction. (enzymes: hexokinase and glucose-6-phosphate dehydrogenase).

The analysis is performed on RX Daytona +.

Reaction:

Glucose + ATP $\xrightarrow{\text{Hexokinase}}$ Glucose-6-phosphate + ADP

Glucose-6-phosphate + NAD $\xrightarrow{\text{Glucose-6-phosphate-dehydrogenase}}$ D-Gluconate-6-phosphate + NADH + H⁺

Main instrument: RX Daytona+ (Randox Laboratories Ltd, United Kingdom)

1. References and possible modifications

2. Requirements for the degree of grinding and temperature of the sample for storage before analysis

Approximately 0,5-1mL of plasma or serum is needed for the analysis.

The serum is stable for 8 h at 25°C and up to 3 days at +2 - +8 °C.

The serum should be free from hemolysis.

3. Contact person:

Lab leader: Hanne Kolsrud Hustoft

Responsible for analysis: Milena Bjelanovic/Elin Follaug Johnsen

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4. Other literature:

The references are taken from the reagent attachment:

1. Kaplan L.A, Pesce, A.J., Kazmierczak, S.C.,(Mosby Inc. Eds St Louis USA), 2003),580
2. Tietz, N. W., Clinical guide to laboratory tests. 3ème Ed., (W. B. Saunders eds. Philadelphia USA), (1995), 268.
3. Burrin J. M., Price C. P.: Measurement of blood glucose. Ann. Clin. Biochem.(1985)22,327
4. Passey R. B., Gillum R.L., Fuller J. B. et Coll.: Evaluation and comparison of 10 glucose methods and the reference method recommended in the proposed product class standard. Clin. Chem., (1977)23, 131.

5. History - instrument transitions and method modifications

Instrument transition 1995: from Encore to Cobas Mira S spectrophotometer (March-1995)

- Modified 11.01.00 after transition from Roche to ABX reagents.
- Modified 12.02.04 after transition from ABX reagents to Pentra reagents.

Instrument transition 2010: from Cobas Mira to MaxMat (August-2010)

- Method modification after transition to MaxMat spectrophotometer with reagents, controls, and standard from ILS Laboratories ScandinaviaAS.

Instrument transition 2018: from MaxMat to RX Daytona + (October-2018)

- Method modification after transition to RX Daytona + with reagents, controls and calibrators from Randox Laboratories Ltd, United Kingdom.

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