MAYO CLINIC LABORATORIES

# Test Definition: FRUCT

Fructosamine, Serum

## Overview

### Useful For

Monitoring intermediate (1-3 weeks) glycemic control

Monitoring glycemic control in patients with shortened red blood cell survival

### Method Name

Colorimetric

### NY State Available

No

## Specimen

### Specimen Type

Serum

### Specimen Required

**Supplies:** Sarstedt 5 mL Aliquot Tube (T914)
**Collection Container/Tube:**
**Preferred:** Serum gel
**Acceptable:** Red top
**Submission Container/Tube:** Plastic vial
**Specimen Volume:** 1 mL
**Collection Instructions:**
1. Serum gel tubes should be centrifuged within 2 hours of collection.
2. Red-top tubes should be centrifuged and the serum aliquoted into a plastic vial within 2 hours of collection.

### Forms

If not ordering electronically, complete, print, and send General Request (T239) with the specimen.

### Specimen Minimum Volume

0.5 mL

### Reject Due To

| | |
|---|---|
| Gross hemolysis | Reject |
| Gross icterus | Reject |

## Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---|---|---|---|
| Serum | Refrigerated (preferred) | 7 days | |
| | Ambient | 72 hours | |
| | Frozen | 60 days | |

## Clinical & Interpretive

### Clinical Information

Fructosamine is a general term, which applies to any glycated protein. It is formed by the nonenzymatic reaction of glucose with the alpha- and epsilon-amino groups of proteins to form intermediate compounds called aldimines. These aldimines may dissociate or undergo an Amadori rearrangement to form stable ketoamines called fructosamines. This nonenzymatic glycation of specific proteins in vivo is proportional to the prevailing glucose concentration during the lifetime of the protein. Therefore, glycated protein measurement in a patient with diabetes is felt to be a better monitor of long-term glycemic control than individual or sporadic glucose determinations. The best known of these proteins is glycated hemoglobin, which is often measured as hemoglobin A1c, and reflects glycemic control over the past 6 to 8 weeks. In recognition of the need for a measurement that reflects intermediate-term glycemic control and was easily automated, a nonspecific test, termed fructosamine, was developed. Since albumin is the most abundant serum protein, it accounts for 80% of the glycated serum proteins, and thus, a high proportion of the fructosamine. Although a large portion of the color generated in the reaction is contributed by glycated albumin, the method will measure all proteins, each with a different half-life and different levels of glycation.

### Reference Values

200-285 mcmol/L

### Interpretation

In general, fructosamine reflects glycemic control in diabetic patients over the previous 1 to 3 weeks. High values indicate poor control.

All glycated proteins are measured by this method, with glycated albumin contributing a large portion.

### Cautions

Since the assay is nonspecific, color may be generated by compounds other than glycated proteins. Interferences are seen from ascorbic acid (vitamin C) and elevated bilirubin values.

However, the second-generation assays have been shown to be highly specific for glycated proteins.

Fasting blood glucose and hemoglobin A1c are the usual and preferred means of monitoring glycemic control.

### Clinical Reference

1. Sacks DB: Diabetes mellitus. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:1194-1197
2. Masharani U, German MS: Pancreatic hormones and diabetes mellitus. In: Gardner DG, Shoback D, eds. Greenspan's Basic and Clinical Endocrinology. 9th ed. McGraw; 2018:46-47

3. Austin GE, Mullins RH, Morin LG: Non-enzymatic glycation of individual plasma proteins in normoglycemic and hyperglycemic patients. Clin Chem. 1987;33:2220-2224
4. Schleicher ED, Mayer R, Wagner EM, Gerbitz KD: Is serum fructosamine assay specific for determination of glycated serum protein? Clin Chem. 1988;34:320-323

## Performance

### Method Description
The fructosamine assay is a colorimetric test based on the ability of ketoamines to reduce nitrotetrazolium-blue to formazan in an alkaline solution. The rate of formation of formazan is directly proportional to the concentration of fructosamine. Uricase serves to eliminate uric acid interference and detergent eliminates matrix effects. The rate of reaction is measured photometrically at 546 nm.(Package insert: Fructosamine reagent. Roche Diagnostics; v 8.0, 12/2018)

### PDF Report
No

### Day(s) Performed
Monday through Saturday

### Report Available
Same day/1 to 2 days

### Specimen Retention Time
14 days

### Performing Laboratory Location
Mayo Clinic Jacksonville Clinical Lab

## Fees & Codes

### Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

### Test Classification
This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

### CPT Code Information

82985

**LOINC® Information**

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|
| FRUCT | Fructosamine, S | 15069-8 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| FRUCT | Fructosamine, S | 15069-8 |