

---

## Overview

### Useful For

Diagnosing fat malabsorption due to pancreatic or intestinal disorders

Monitoring effectiveness of enzyme supplementation in certain malabsorption disorders

This test is **not useful for** differentiating among pancreatic diseases.

### Method Name

Nuclear Magnetic Resonance (NMR) Spectroscopy

### NY State Available

Yes

## Specimen

### Specimen Type

Fecal

### Necessary Information

Length of collection period is required.

### Specimen Required

#### Patient Preparation:

1. For 3 days prior to and during the collection period:
  - a. Patient should be on a fat-controlled diet (100-150 g fat per day).
  - b. No laxatives (particularly mineral oil and castor oil).
  - c. No synthetic fat substitutes (eg, Olestra) or fat-blocking nutritional supplements.
2. The use of diaper rash ointments will falsely elevate test results. Discontinue use during collection period.
3. Barium interferes with test procedure; a waiting period of 48 hours before stool collection analysis is recommended.

**Supplies:** Stool Containers - 24, 48, 72 Hour Kit (T291)

**Container/Tube:** Stool container complies with shipping requirements, do not use other containers.

**Specimen Volume:**

**Preferred:** Entire 48-, or 72-hour collection

**Acceptable:** Entire 24-hour or random collection

**Collection Instructions:**

1. All containers must be sent together.
2. The entire collection must contain at least 5 g of feces.
- 3. For a random collection, a minimum of 5 g (do not send entire collection) is required.**
4. The number of containers sent should be indicated on the labels (1 of 4, for example).

**Additional Information:**

1. Patient can store sample at refrigerate temperature during collection period.
2. A separate order and collection should take place if stool bicarbonate, calcium, chloride, magnesium, osmolality, pH, potassium, sodium, or any microbiology testing is desired.

## Forms

If not ordering electronically, complete, print, and send [Gastroenterology and Hepatology Client Test Request](#) (T728) with the specimen

## Reject Due To

Preservative, media, or charcoal    Reject

## Specimen Minimum Volume

See Specimen Required

## Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Fecal	Frozen (preferred)	180 days	
	Refrigerated	180 days	

---

**Clinical & Interpretive****Clinical Information**

Total fecal lipids include glycerides, phospholipids, glycolipids, soaps, sterols, cholesteryl esters, and sphingolipids. Excess fecal fat in feces, (steatorrhea) is indicative of malabsorption disorders, such as pancreatic insufficiency or Whipple disease. Therefore, measurement of the fecal fats can be useful in establishing a diagnosis of such pancreatic diseases as cystic fibrosis, chronic pancreatitis, neoplasia, or stone obstruction, and such intestinal diseases as Whipple disease, regional enteritis, tuberculous enteritis, gluten-induced enteropathy (also called celiac disease or sprue), and the atrophy of malnutrition.

Distinguishing free fatty acids from neutral fats, once thought to be helpful in the differential diagnosis of pancreatic disease, has fallen out of favor. Note that the composition of fats in the feces, normally predominately free fatty acids, can change significantly to predominately neutral fatty acids when the patient is on orlistat. This test does not distinguish between free and neutral fatty acids.

**Reference Values**

## TIMED COLLECTION

> or =18 years: 2-7 g fat/24 hours

Reference values have not been established for patients who are <18 years of age.

## RANDOM COLLECTION

All ages: 0-19% fat

**Interpretation**

Excretion of more than 7 grams fat/24 hours, when on a diet of 100 to 150 g of fat, is suggestive of a malabsorption defect.

Abnormal results from a random specimen should be confirmed by submission of a timed collection.

Test values for timed fecal fat collections will be reported in terms of g/24 hours; the duration of the collection may be 24, 48, 72, or 96 hours. Test values for random fecal fat collections will be reported in terms of percent fat.

---

Coefficient of Fat Absorption (CFA) can be calculated as follows:

(grams fat consumed – grams of fat excreted) x 100

CFA = -----

grams of fat consumed

### Cautions

Proper patient preparation is critical (see Specimen Required). Failure to adhere to a fat-controlled diet or to exclude other oils or oil substitutes from the diet may make interpretation difficult.

Barium interferes with test procedure; a waiting period of 48 hours before fecal collection is recommended.

The use of charcoal as a marker is not recommended. If charcoal is used, please notify the laboratory.

### Clinical Reference

1. Van de Kamer JH: Total Fatty Acids in Stool. In: Seligson D, ed. Standard Methods of Clinical Chemistry. Vol 2. Academic Press; 1958:34-38
2. Ellefson RD, Caraway WT: Lipids and Lipoproteins. In: Tietz NW, ed. Fundamentals of Clinical Chemistry. 2nd ed. WB Saunders Co; 1976:474-541
3. Shils ME, Ross AC, Caballero B, Cousins RJ, eds: Modern Nutrition in Health and Disease.10th ed. Lippincott Williams and Wilkins; 2006:1143-1151
4. Shils ME, Ross AC, Caballero B, Cousins RJ, eds: Modern Nutrition in Health and Disease.10th edition. Lippincott Williams and Wilkins; 2006:1227-1234
5. Hart PA, Conwell DL: Diagnosis of exocrine pancreatic insufficiency. Curr Treat Options Gastroenterol. 2015 Sep;13:347-353. doi:10.1007/s11938-015-0057-8

### Performance

#### Method Description

After the well-homogenized stool sample is weighed and dried, it is rolled in Teflon and placed in a nuclear magnetic resonance spectrometer (NMR). The NMR determines the percent of fat in the sample. The percent is then converted to grams fat/24 hours excretion or percent fat of random sample.(Korpi-Steiner NL, Ward JN, Kumar V, McConnell JP:

---

Comparative analysis of fecal fat quantitation via nuclear magnetic resonance spectroscopy [1H NMR] and gravimetry.  
Clin Chim Acta. 2009 Feb;400[1-2]:33-36)

**PDF Report**

No

**Specimen Retention Time**

7 days

**Performing Laboratory Location**

Rochester

**Fees & Codes****Test Classification**

This test was developed, and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

**CPT Code Information**

82710

**LOINC® Information**

Test ID	Test Order Name	Order LOINC Value
FATF	Fat, F	16142-2

Result ID	Reporting Name	LOINC®
STWT	Total Weight	30078-0
DUR2	Duration	13363-7
PFAT	Percent Fat	35745-9
TFAT	Total Fecal Fat/24 Hr	16142-2