Organic Application Note

Fat in Peanut Butter

Standard Method Used for Comparison

AOAC Method 948.22a—Crude Fat by Soxhlet Extraction with Diethyl Ether

Accessories

501-081 Glass Wool; 502-327 LECO-Dry; 502-369 Kimwipe®

Collection Vial Preparation Procedure

1. Cut 1.3 to 1.5 g of glass wool from the end of the glass wool rope.
2. Pull the compact section of glass wool apart so that the material is loosened considerably.
3. Pack the loosened glass wool into the collection vial with a clean spatula, a little at a time. The goal is to have random, not vertical orientation of wool strands.
4. Tare the empty balance pan.
5. Weigh the collection vial and enter initial vial weight into the instrument.
6. Install the collection vial on the instrument collection system.

Sample Preparation Procedure

1. Place 2.2 to 2.4 g of LECO-Dry into a 50 ml beaker.
2. Place beaker with LECO-Dry on balance and tare the weight.
3. Drop 0.4 to 0.6 g of peanut butter onto the LECO-Dry.
4. Enter the sample weight into the instrument.
5. Remove the beaker from the balance. Thoroughly mix the peanut butter with LECO-Dry, using a clean spatula. The prepared sample should not be sticky or adhere to the side of the beaker. If this happens, reduce the amount of peanut butter.
6. Install a lower end-cap assembly on a thimble and place in a thimble stand.
7. Pack 1/4 of a Kimwipe into the bottom of the thimble by folding it once and packing it into the bottom of the thimble with a clean spatula.
8. Transfer the prepared sample into the thimble using the funnel.
9. Install the upper end-cap assembly on the thimble.

Extraction Parameters/Procedure

1. Set up (or recall and activate) the following instrument parameters:

Extraction Pressure:	9000 psi
Extraction Temperature:	100°C
HVR Temperature:	100°C
Static Time:	0 minutes
Dynamic Time:	45 minutes
Flow Rate:	1.3 lpm

2. The pump head should be at 0°C or below from the last set of extractions. However, the refrigeration system times out and stops 20 minutes after extractions end. If the system has timed out, pre-cool the pump head by pressing any key on the key pad. The thimble and HVR temperatures should also be at set values. Temperatures can be displayed using the "Ambient Monitor" menu.
3. Insert the thimbles into the instrument and press the START key. The extraction will automatically take place, and the system will depressurize.

TFE2000

Post-Extraction Manipulations

1. Remove the collection vials from the instrument and allow them to de-gas for 15 minutes.
2. Using the thimble removal tool, remove the thimbles and place them in the thimble stand to cool.
3. Tare the empty balance pan.
4. Weigh each collection vial and enter the weight into the instrument.
5. Results will be automatically calculated. Choose the print option to receive a printout of the results.

Typical Results (Crude Fat by AOAC 948.22 = 51.4%)

Sample ID	Weight (g)	TFE2000 Fat (%)	Standard Method AOAC 948.22 (%)
#1	0.4788	50.92	51.4
	0.4205	51.25	
	0.4978	51.53	
	0.5657	51.92	
	0.6141	51.49	
	0.5437	51.57	
	Average	***51.45***	
	Std. Dev.	***0.34***	

The LECO **TFE2000** was developed to safely extract fats/oils from your food, feed, and oilseed samples by using an advanced analytical technique. Extensive research proves that liquid CO_2 at elevated pressures and temperatures is the most effective extraction solvent for these target applications. Extraction by CO_2 offers superior performance over conventional organic solvents plus:

speed—simultaneous extractions take just minutes to complete; method development is simplified

low cost—a CO_2 tank will supply extraction solvent for approximately 100 extractions; no disposal or recycle cost

convenience—no need for solvent evaporation steps in the method

safety—non-toxic, non-explosive

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Form No. 203-821-078
7/03-REV2