Defatting Samples using XT4 Filter Bags Prior to Dietary Fiber Analysis

Definition
Alternative method for de-fatting samples prior to total dietary fiber (TDF) analysis using ANKOM XT4 Filter Bags.

Scope
This method is applicable to food and pet food.

A. Apparatus

1. ANKOM XT Filter Bags (Part # XT4)
2. Acetone Resistant Marker (Part # F08)
3. Bag Weigh Holder (Part # X20)
4. Wave Spring Bag Holder (Part # 983.7)
5. Heat Sealer (Part # HS or HSI)

B. Reagents

1. n-Hexane (reagent grade or higher)

C. Procedure

1. Number all empty XT4 filter bags with a solvent resistant marker.
2. Tare the weight of the bag weigh holder, then place an empty filter bag in the holder in an open position and record the weight of the empty bag ($\mathbf{W_0}$).
3. Tare the weight of the empty filter bag and the holder together.
4. Add 1.0 g of sample to the filter bag. Keep all particles away from the top sealing area of the filter bag.
5. Record the weight of the sample ($\mathbf{W_1}$).
6. Set the Heat Sealer dial to 6. (The setting may vary from sealer to sealer).
7. Seal the filter bag within 4 mm of its open end. Keep the sealer arm down for 2-3 seconds after the red sealer light turns off (to cool the seal). The seal can be seen as a solid melted stripe along the top edge of the filter bag.
8. Repeat steps 2-7 for all filter bags that will be used in the defatting process.
9. Place a stir bar in a 250 mL beaker.
10. Place the filter bags into the wave spring bag holder and place the bag holder into the 250 mL beaker so that there is a small gap between the top of the stir bar and the bottom of the bag holder.
11. Fill the beaker with petroleum ether or hexane until the filter bags are submerged.
12. Place the beaker on a hot plate which is set to 65°C and 700rpm.
13. Allow for 30min extraction at 65 °C and 700rpm. A watch glass placed over the beaker may be necessary to prevent excess evaporation of solvent.
14. After the 30 min extraction, pour off the solvent and let the filter bags air dry for 10 minutes.
15. Place the filter bags and bag holder in an oven at 102 °C for 15 minutes.
16. Record the weight of the filter bags post-extraction and drying ($\mathbf{W_2}$).

17. Calculate the correction factor for the fat loss. The defatted samples are now ready for TDF analysis.
    Correction factor, $C = (W_2\text{-}W_0)/W_1$

18. Quantitatively transfer the defatted sample from the XT4 bag to the IDF or Flow Thru Filter Bags.
    a. Cut the XT4 filter bag just below the heat seal, leaving a small portion uncut (and therefore still attached to the body of the bag).
    b. When prompted by the TDF Dietary Fiber Analyzer to add sample to the IDF filter bags, pour out the defatted contents of the XT4 filter bag into the IDF filter bag.
    c. Weigh the emptied XT4 filter bag (**W_3**).

19. Calculate the weight of defatted sample (**W_4**) that was transferred into the IDF or flow through bag.

$$W_4 = W_2 - W_3$$

20. Calculate the original sample weight (**M**) that corresponds to the defatted sample weight (**W_4**). Enter weight (**M**) into the TDF spreadsheet under original sample weight.

$$\mathrm{M} = \frac{\mathrm{W4}}{\mathrm{C}}$$

Note: One could also defat sample in bulk, and aliquot from the defatted sample (0.5 g) for TDF analysis. Calculations must be adjusted to reflect original sample weight.