JOB DESCRIPTION
Department of Animal and Aquaculture Sciences, NMBU

Method name: CF (Crude Fiber)
BIOVIT No .: Arb1043

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1. Introduction / purpose

CF (Crude fiber) is a chemical fraction in Weende's system for characterizing feed materials. This fraction is not a limited and uniform fraction, but consists mainly of most of the cellulose and the equation in a feed sample. Together with nitrogen-free extracts (NFE), it provides a measure of the carbohydrate content of the sample. CF is defined as the organic residue remaining after sequential treatment of the sample with H_2SO_4 (1.25%) and NaOH (1.25%).

2. Reagents

- Acetone
- Reagent 1: 145 mL H_2SO_4 to 20 L RO water (0.255 N H_2SO_4)
- Reagent 2: 250 g NaOH to 20 L RO water (0.313 N NaOH)

3. Risk assessment

After boiling and rinsing, the drain tap on the left side of the instrument MUST be opened (vertically = open) before the lid of the chamber is opened. If this is not done, the hot contents of the chamber will splash on the people standing around the instrument. This is due to the overpressure that occurs in the chamber during cooking and rinsing.

4. Equipment

- Arrived^{200} Fiber Analyzer
- Heat seller
- Filter bags (F57 from Arrived)
- Assay weight (accuracy: 0.1 mg)
- Drying cabinet (103 ± 2 °C)
- Desiccator
- Marker (permanent marker)
- Hob
- Water boiler
- Measuring cup
- Glass w / lid

5. Special remarks

The method is based on Weende's method and indicates the amount of indigestible fiber in the sample. However, the method does not give the total amount of fiber and it is estimated that what is measured in the sample contains approx. 50 - 80% cellulose, approx. 20% hemicellulose and 10 - 50% lignin. Van Soest methods of fiber analysis (NDF / ADF / ADL) are more modern alternatives to CF (1).

7. Job description

Weighing of samples

1. Label the filter bags with the sample number
2. Weigh the filter bag and note the weight **(W_0)**
3. Tare the weight with the bag on top
4. Weigh 0.95 - 1 g sample directly into the filter bag and note the weight **(W_1)**
5. Heat seal the filter bag approx. 0.5 cm from the opening
6. Shake the bag so that the sample material is evenly distributed in the bag
7. Repeat these points with all the samples and an empty filter bag

Degreasing (all types of samples)

8. Place the bags in a 250 mL beaker.
9. Add petroleum seats so it covers the bags.
10. Leave for 10 minutes.
11. Pour off the petroleum ether and allow the bags to air dry in the fume cupboard

Fill the bag holder

12. Place the samples in the bag holder.
    a. The bag holder consists of 9 trays with space for 3 bags per. Tray.
    b. Place the air-dried bags in the trays.

c. The first 3 bags are placed in the recesses on the first board.
d. The next 3 are placed on board no. 2 etc.
e. The trays are rotated 120 ° relative to each other.
f. Tray number 9, the top tray, must be empty.
g. This acts as a lid for the other 8 trays.

PROCEDURE ON ARRIVAl

13. ARRIVAL must have room temperature before the analysis is started. (If ARRIVED is hotter than room temperature, cool it with cold water several times until room temperature is reached).
14. Put the bag holder in ARRIVAL.
15. Add a maximum of 2 liters of 0.255N H_2SO_4 (Reagent 1).
16. Press the Blue (AGITATE) and Red (HEAT) buttons.
17. Check that the bag rack is in motion
18. Screw the lid back on.
19. Set hours of 40 minutes.
20. At the end of cooking time;
21. Turn off the Blue and Red buttons.
22. OPEN THE DRAINER AND allow the reagent to drain before opening the lid.
23. Open the lid.
24. Close the drain tap.

Rinsing

25. Add 1900-2000 mL of 50-90 ºC water.
26. NB! If the HEAT button is NOT on, the lid may be up during rinsing.
27. Press AGITATE.
28. Clean for 5 minutes.
29. Empty and repeat once.

Further on ARRIVAL

30. Add 1900-2000 mL of tempered 0.313N NaOH (Reagent 2).

31. Put on AGITATE and HEAT

32. Check that the bag rack is in motion.

33. Screw the lid back on.

34. Set hours of 40 minutes.

35. Open the drain tap, allow the reagent to drain before opening the lid.

Rinsing

36. Repeat the rinsing points, but rinse three times in total.

Drying

37. Remove the bag rack and gently squeeze off some water after rinsing.

38. Place the bags in 250 mL beakers.

39. Add acetone to cover the samples.

40. Let the samples stand for 3-5 minutes.

41. Pour out the acetone.

42. Allow the samples to air dry.

43. Leave the samples in a drying cabinet (102 ^{o}C +/- 2) for 2-4 hours.

44. Take the samples out of the oven and place them directly in drying bags. (Ordinary desiccators should not be used).

45. Allow the samples to reach room temperature before removing them one by one and weighing them. (Make sure that not too much air enters the drying bag).

Ashes

46. Mark the counting glasses with the sample number

47. Weigh the counting glass and note the weight **(W_3)**

NB! The numbering disappears during the incineration.

Therefore, note how you place the samples.

48. The samples are ashed for 2 hours at 550 ° C

49. Cool in desiccator

50. When the temperature of the samples has become stable (room temperature) the samples are weighed **(W_4)**

8. Calculation

$$\frac{(W_2 - W_0 \times F) - (W_4 \times W_3)}{W_1} \times 1000 = amount\ CF\ in\ the\ sample\ \left(\frac{g}{kg}\right)$$

W_0 = weight of bag
W_1 = weight of weighted sample
W_2 = dry weight CF (sample + bag)
W_3 = weight of counting glass
W_4 = weight of counting glass + ash
F = pose correction factor = 0.9987

Reference

1) McDonald, P., Edwards, P. A., Greenhalg, J. F. D., Morgan, C. A., 2002. Animal Nutrition, 7th edition, Prentice Hall, Harlow