

Ash Determination

Materials:

Muffle Furnace (470 °C)
Electronic balance (0.0001 g capacity)
Trays
Aluminum Pans

Procedure:

1. If dry matters have been run, omit steps 2 and 3.
2. Label and weigh aluminum pans, recording the exact weight.
3. Weigh pan and sample (in duplicate) recording the exact weight (2 g is usually sufficient).
4. Put pans on tray and place trays in the muffle furnace. Make sure not to touch the probe on the back wall of the furnace with either trays or pans.
5. Turn on furnace. Make sure furnace is set at 470 °C (for high fat-samples, use slow ash method).

Slow-Ash (high-fat samples, 10% or higher)

- a. Follow same procedure for ashing up to step #5.
 - b. At this point, set furnace at 200 °C for 2-3 hours, turning up the temperature 75 °C every hour, until 470 °C is reached, continue to ash samples overnight.
 - c. Follow the rest of the ash procedure starting at step #7.
6. Leave samples in muffle for 8-24 hours (usually overnight is best).
 7. After samples have ashed, turn off the oven and open the furnace to allow samples to cool down for handling.
 8. Once cool enough to handle, place in drying oven for approximately one hour. Then, remove and place into a desiccator for 20-60 minutes (or until cool to the touch).
 9. Weigh and record samples to the exact weight using same balance that was used for initial dry matter analysis.
 10. Samples may be discarded at this point or saved for mineral or acid insoluble ash (AIA) analyses.

Calculations:

	A	B	C	D	E	F	G	H	I	J
Sample	Empty Pan	Wet Sample + Pan	Dry Sample + Pan	DM %	DM % Mean	Ash + Pan	Ash %	Ash % Mean	sd	% CV
#90	1.3680	3.3670	3.2581	94.552	94.56	1.5597	10.142	10.13	0.020	0.20
	1.3571	3.3570	3.2485	94.575		1.5484	10.114			

$$G = \left[\frac{F - A}{C - A} \right] \times 100$$

$$10.142 = \left[\frac{1.5597 - 1.3680}{3.2581 - 1.3680} \right] \times 100$$

To calculate H, I, and J see section on statistical analysis

Reference

AOAC method # 942.05, Association of Official Analytical chemists, 18^h Ed., Revision 3, 2010.