

Aim - Determination of Crude Fibre

Crude fibre consists largely of cellulose, variable proportion of hemicelluloses and highly variable proportion of lignin along with some minerals. It represents only 60% to 80% of the cellulose and 4% to 6% of the lignin. The crude fibre content is commonly used as measures of the nutritional value of livestock feeds and also in the analysis of various food products to detect quality, quantity and adulteration.

Principle: During the acid and subsequent alkali treatment, oxidative hydrolytic degradation of the native cellulose and considerable degradation of lignin occur. The organic residue obtained after the carbohydrates and proteins have been removed is filtered and final filtrate is weighed, incinerated, cooled and weighed again. The loss in weight gives the crude fibre content.

Materials:

- H₂SO₄: 1.25%
- NaOH solution : 1.25%
- Beaker
- Hot water bath or hot plate

Method:

- Sample extraction with ether and petroleum ether to remove fat. (In case fat content is less than 1 %, extraction may be omitted)
- Weight 2g of moisture and fat free sample and transfer it to a one liter beaker.
- Add 200ml of 1.25% sulphuric acid and some bumping chips to it.
- Boil for 30 mins, and shake the contents after every 5 min.
- Filter through muslin cloth and wash with boiling water until washing are free of acid
- Again, boil the residue with 200ml of 1.25% NaOH of 30 min.
- Filter through muslin cloth again and wash with 25ml of boiling water H₂SO₄, three 50ml portions of water and 25ml of alcohol
- Remove the residue and transfer to pre-weighed porcelain crucible.
- Dry the residue to a constant weight at 110°±2°C and record the weight
- Ignite the residue in muffle furnace at 500-600°C for 2-3 hr, cool and weigh again.
- The loss of weight due to ignition is the weight of crude fibre.

- To avoid foaming add few drops of iso-amyl alcohol, if necessary.

Calculation:

Crude fibre content (%) =

Where,

A = Weight of the empty crucible

B = Weight of residue after drying in oven

C = Weight of ash after incineration