IAFMM

international association of fish meal manufacturers

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RECOMMENDED METHOD OF ANALYSIS FOR DETERMINATION OF MOISTURE IN FISH MEAL

1. General

Samples for moisture determination must be placed into airtight vessels (e.g. glasses or tins) immediately after sampling and must be packed to the top to prevent any airspace forming. The moisture content of the samples may change during the preparation in the laboratory if it is not in equilibrium with the moisture in the air.

2. Principle

The moisture content is expressed as the loss of weight of the product under certain drying conditions.

3. Apparatus

Fast analytical balance with 0.5mg accuracy.

Cylindrical weighing bottles of stainless steel, aluminium or glass, with lids, of approximately 50 mm diameter and a height of 30 mm.

Well insulated, electric fast-drying cabinet with automatic thermostat. This oven should heat up again quickly after having been opened. The temperature of 103°C. must distribute evenly (1 deg. C. tolerance), ventilation from bottom to top is required. The round shape oven with 360 mm (or 500 mm) dia. has found approval, as has the multi-chamber drying cabinet.

Alternatively, an electrically heated vacuum oven with thermostat, vacuum gauge and oil pump, if possible also with a ventilation device.

Desiccator of glass or metal with indicating selica gel or activated alumina indicator grade. Since fish meal is a good desiccant itself, the chemical desiccants should be freshly dehydrated.

4. Methods

Two alternative procedures are recommended. The type of drying must be reported in the analysis. In the first the fish meal is dried at 103°C. for 4 hours. In the second, drying is performed under reduced pressure.

a. The clean weighing bottles with lids are dried in the cabinet at 103°C. for 30 min., cooled in the desiccator and weighed accurately to nearest 1 mg. Take about 5g of the analytical sample and weigh accurately to nearest 1mg into the bottles and spread out over the bottom of the bottle. The bottles are weighed with lids closed. The drying cabinet is heated to 103°C. and not more than 20 bottles with lids removed are put in at a time. The time of drying is counted from the moment the oven has reached the temperature of 103°C. again. No other samples may be added during the drying time.

The bottles are arranged in the cabinet in such a way that the airstream will flow evenly around all of them from all sides. After 4 hours the bottles are quickly covered with their lids again and put into a desiccator. When they have reached room temperature (after about 45 min.) they are accurately weighed.

b. The clean weighing bottles with lids are dried for 30 min. at 103°C., cooled in a desiccator and weighed accurately to nearest 1mg. Take about 5g of the analytical sample and weigh accurately to nearest 1mg into the bottles and spread out over the bottom of the bottle. The bottles are weighed with lids closed. Place the bottles in the vacuum oven, preheated to 70°C. Put the lid of the bottle beside the same.

Drying under reduced pressure of 20 mm Hg is done with a continuous supply of warm, dry air, or in the presence of a desicant, e.g. CaO (about 300 g for 20 samples). In the latter case the oven is evacuated at 70°C., the connection to the vacuum pump closed and the pump switched off. After 14 hours, air is carefully let in and the cabinet opened. The weighing bottles with lids placed on the bottle are put into a desiccator and when quite cool (after at least 30 minutes) they are accurately weighed. Dry for an additional 30 min. in the vacuum oven and weigh again. The difference between the two weighings shall not exceed 0.2% of the mass of the sample.

5. Calculation

$$\frac{\text{Loss in weight of the bottle containing fish meal after drying (g)}}{\text{Weight of fish meal (g)}} \times 100 = \text{Moisture content (\%)}$$

6. Repeatability

The difference between two determinations carried out simultaneously or in rapid succession by the same analyst should not exceed 0.20%.