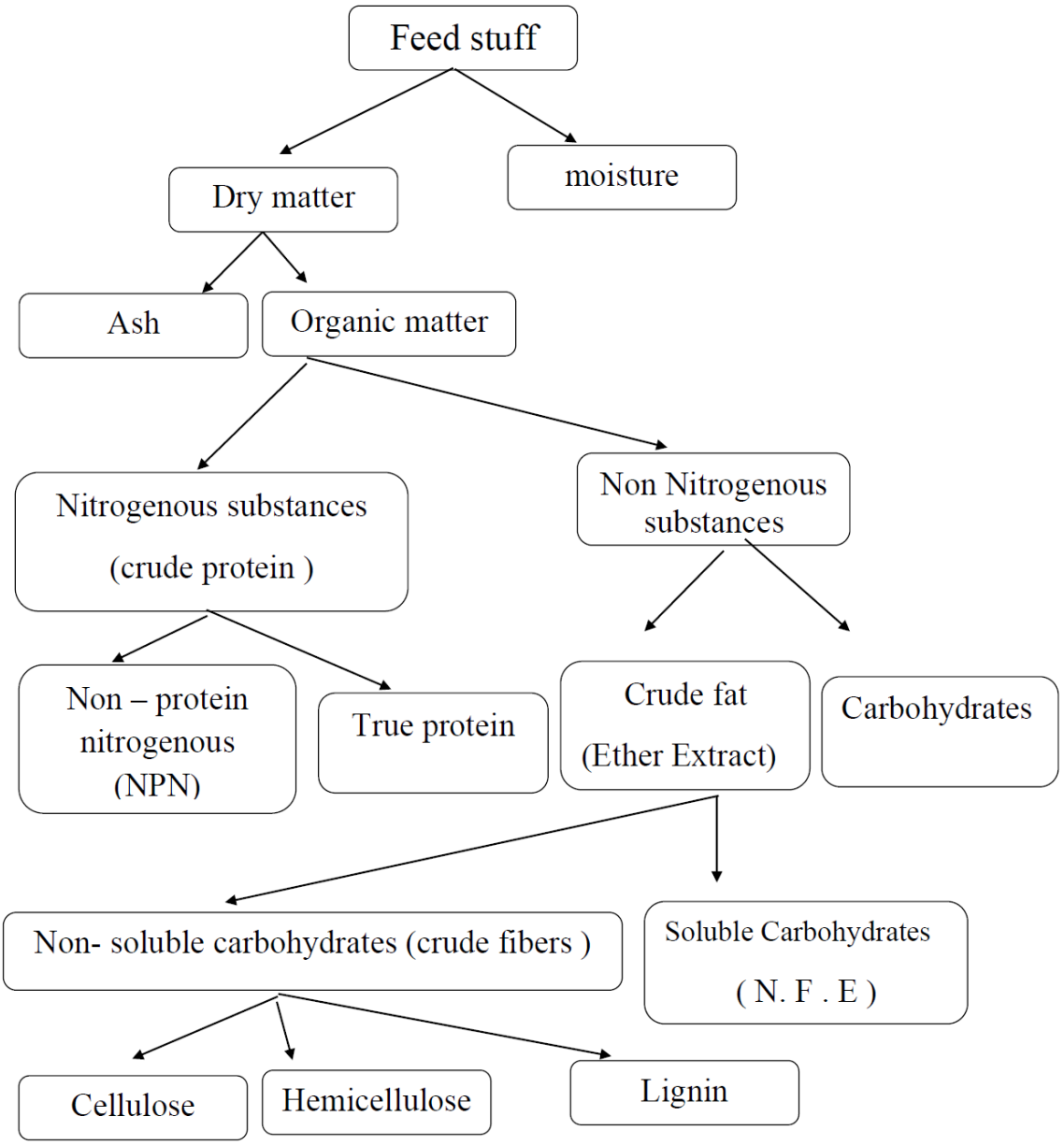
Procedure of feedstuff analysis can be explained within the following schedule:



1. Moisture:-

It is the free water present in the feedstuff. It can be estimated by drying feedstuff sample in drying oven.

2. Dry Matter:-

It is the residual part of feedstuff sample after the total exclusion of moisture. The dry matter contains all the portions of feedstuff sample except the water.

3. Ash:-

It is the non-organic part of feedstuff sample which is the residue after the burning of the sample in muffle furnace. Ash contains salts , minerals and silica .

4. Organic matter:-

It is the non- miniralic portion of dry feedstuff involving crude protein, fat and carbohydrates.

5. Crude protein:-

It is all the nitrogenous substances present in feedstuff sample. It includes true protein and non- true protein (non- protein nitrogen) such as urea.

6. Crude fat:-

It includes all compounds that can be dissolved in organic dissolvents (such as ether, benzene, hexane, etc.). Fats, Oil, waxes, and plant dyes are examples of crude fat.

7. Carbohydrates:-

It includes all types of saccharides such as mono saccharides e.g. glucose and di-saccharides. E.g. sucrose, lactose, and maltose.

Carbohydrates can be divided into two main parts:

A- Nitrogen- Free extract (N.F.E) (Soluble carbohydrates).

These are soluble carbohydrates which are capable of dissolving in diluted acids and bases. Glucose, sucrose, and starch are examples of this type of carbohydrates.

B- Non- soluble carbohydrates (Crude fibers):

These carbohydrates do not dissolve in diluted acids and alkalines but it dissolves in concentrated acids and alkalines Cellulose and hemicellulose and lignin are examples of this type of carbohydrates.

Take the samples for feed analysis:

The sample is part of feedstuff substance which represent a proper part of the whole feedstuff components samples taken should be free from adulteration to determine their actual values in a correct way.

It is preferable to write the chemical composition of these samples on the packs or bags or sacks containing these feedstuff.

Rations or feedstuffs stored in the form or displayed in local markets have different types, forms, or shapes such as sacks, grains, cubicles, hay, and straw bales and green vegetative. plants cultivated in the field and liquid dietary substances. Hence, each types of this feed should be sampled in its specific method for ideal sample representative.

Basic conditions necessary for obtaining ideal sample:-

1. Samples should be taken from places having sufficient light to recognize it's morphological characters such as homogeneity, storing methods. One authorized worker should carry out sampling to ensure proper samples.
2. Preparation of requirements and special equipment's used for sample receiving prior to the operation.
3. Determination of places in which samples will be taken from them.

Methods of sample taking:

There is an important notice that sample taken from the fields or sacks filled with animal feed for food analysis should represent (10%) of the feed. This percentage should be taken or included from different parts of the ration and should be random without any discrimination.

There are different methods to take samples owing to shape, form of animal feed as follows:-

1. Taking samples from grains, cereal, and seed sacks:

This operation is carried out by obtaining (10%) of number of available sacks. Samples should be taken from different location of the sack with multiple dimensions and directions using a special pen designed for sample picking. The primary sample should be to small less size sample called**2** is a sample prepared from the total blending of the primary sample. The primary sample is located on clean and smooth surface in a square form. The large square is then subdivided into multiple small squares. Subsequently, the sample intended for analysis is taken from each square as shown in the figure.

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The collection of this sample weighs about 1.kg. later, this sample is packed in three special jars until the operation of analysis takes place.

2. Taking samples from feedstuffs having pellets, cubes or tablet forms:

Similar procedures are followed. Some tablets, pellets, are taken from different regions of the sacks and from multiple directions. The primary sample is then reduce into (1 Kg.) applying the same method.

3. Taking samples from hay bales:-

The previous method is followed as in case of grains. Ten percent of samples is taken i.e. from ten bales, only one bale is taken. However, if the bales are less than ten bales, sample should be taken from most bales. Primary sample should be taken from different places and directions. The primary sample show later be reduced after blending and chopping followed the same mentioned method.

4. Taking samples from heaps of straw or other plant by- products:-

Some secondary products which do not constitute the main product such as the remaining of plant stems, plant leaves of tuber (underground Stem or rhizome) as well as straws gathered in forms of heaps in the field. To obtain the primary sample, (10)points (spots) of different regions and directions were determined. Later, samples were taken from the primary sample. Lastly, these samples are further reduced into one sample following the previous method.

5. Taking samples from green roughage of the field:-

Thirty- fifty spots of green roughages are randomly determined within the farm. Three- five plants were selected from each area. These plants are cut using sharp instrument at the ground level. All parts of the plant should be preserve from falling and this represented the primary sample.

This sample will further be reduced after it's chopping in the lab. to small pieces (2-3)cm. length using sharp scissors. These operations should be done to secure that the heat should be distributed to all pieces of the samples for drying. One- two hundred grams are taken for estimation of primary moisture.

6. Taking samples of liquid substances:

The quantity and volume of primary sample depends on the volume of liquid substance for the purpose of analysis. If the purpose is to carry out total laboratory estimation of all the matters. Hence, the weight of dry matter within the liquid substance should not be less than (150 gram). The sample is taken after careful and total mixing and blending of the liquid by glass bar and then by special instrument used for taking liquid sample.

preparation of samples for analysis:

Typical, sample is prepared for lab. analysis operations as follows:

1. Exclusions of all foreign bodies such as fine stones, gravels, dust, sand, debris and straws. If the sample is of grain origin.
2. The sample is grinding using cereal mill for small amount of grain. Willy mills or ball mills are used for coarse grain grinding. The later mills are manufactured from smooth stainless metals. Temperature of the sample should not be elevated during the grinding. The sample is then sieved and is regrind for those of rough and coarse parts again in order to be homogenous.
3. The green forages and plant (grasses) of should be dried first to get rid of humidity. The process of drying is done by putting it in oven (60-70C□) for (16) hours (overnight). Then, the sample is ground, kept in special glass packages until food analysis of the sample will be carried out.
4. Meat and animal byproducts samples. The samples are exposed to mincing and crushing "pulverization" in special mortar or using special blenders after separation meat from bone.

Preservation of samples until carrying out the food, analysis:

Some feedstuffs are characterized by rapid deterioration and spoilage due to rapid autolysis leading to changes in the ratio and amounts of its feeding components. Hence, many methods are suggested to prevent changes in moisture, enzymatic activity and microbial development.

To prevent changes occurring in moisture:-

Such as green. Feeds (grasses): can be avoided by drying, followed by grinding and then packed in special glass jars.

To prevent enzymatic activity occurrence:

It can be preserved by grinding the sample and mincing and crushing operations. Then, the samples should be stored and kept after the addition of (95%) hot alcohol. Calcium carbonate are added to neutralize the acidity by precipitation. The sample will later warm in water bath (60C) for half an hour. Lastly, the sample is cooled and is kept in low temperature.

To prevent Microbial development occurrence:

It is done by addition of preservatives such as acetic acid or sodium benzoate by sufficient amounts to prevent microorganism growth.

To preserve the milk:

It is carried out by addition of (2ml) of mercuric chloride to each liter of milk.