Ash and Moisture Analysis with prepASH 340 Series for Food Analysis

Ash and Moisture Application

Sample Weighing | Auto-Stop | High Temperature | Moisture Content

Moisture and ash are crucial analytical values in food samples and are often needed as calculation reference for other analytical parameters too. Furthermore ashing is part of the sample preparation for the analysis of individual elements in the mineral content. Moisture is a critical parameter for shelf life time of food and ash gives information on the salt content.

Automation of the moisture and ash analysis brings efficiency, quality and security into the laboratory.

1. Analysis of meat

The nutrient content of meat and meat products is determined with the following analysis and often calculated as packages by contract laboratories:

Moisture, **ash**, total fat, total protein, carbohydrate (calculated) and kcal/kJ (calculated). Here the ash is a quality characteristic itself and is needed to calculate the carbohydrate.

Carbohydrate = 100 % – moisture – ash – fat – protein.

Similar for other food:

Nutrient with **moisture**, **ash**, dietary fibre, total protein, total fat, fatty acid composition, total sugar (saccharose, glucose fructose, lactose, galactose, maltose) carbohydrate (calculated), energy value (kcal/kJ).

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2. Analysis of milk

Fat and Proteins content are calculated on **dry mass**. Ash gives the totals mineral content of milk: Calcium and phosphorous are the major minerals found in milk. These minerals are required in large quantities by the rapidly growing neonate for bone growth and development of soft tissues.

Calcium and phosphorous mostly are associated with the casein micelle structure. Milk also contains most other minerals found in the body.

3. Analysis of flour/pasta

The determination of the ash content in flour serves to estimate the degree of the endosperm separation from the bran during milling, i.e. the grade of flour. The more refined the flour the less ash is produced. In pasta production the ash determination of flour is crucial. The grade of milling determines the properties of the flower and therefore the possible use: e.g. pasta or bread.

The final analysis of pasta contains an ash determination too. This ash contains the minerals from the flower plus the salt given to the dough.

Most food samples have to be dried at 105°C and ashed at 550°C (SLMB) until a stable weight is reached. Flour and some flour products are dried at 105°C or 130°C and ashed at 600°C or 900°C (see special application sheet).

Working Steps of moisture and ash determination

Standard Method with oven	vs	prepASH
Annealing empty crucibles for stable weight	Dry Matter	possibility to pre-define a "heating out"
Measuring tare of crucible one by one		Automatic Procedure
Sampling		Sampling
Weighing + documentation of each crucible		Automatic + entering the sample
Samples in drying over + START		START PROGRAM
Removing samples from over + cool down		Results (moisture)
Back weighing samples, calculation (moisture)		
Pre-ashing with rapid incinerator or hot plate	Ash	Results (ash)
Samples in muffle furnace		
Removing samples + cooling down in exicator		
Calculation and documentation (ash)		
Back weighing for stable results (repeat?)		

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Customer Reference: UFAG Laboratories AG (Official webpage of http://www.ufag-laboratorien.ch/)

Sursee, Switzerland, contract laboratory, 2 prepASH

As the leading independent service laboratory in Switzerland, UFAG LABORATORIEN AG offer integral analytical solutions for the food industry. (1 company, 2 business units, 90 employees)

UFAG LABORATORIEN AG define their level of performance and quality as TOTAL QUALITY MANAGEMENT (TQM), including compliance with:

EN ISO/IEC 17025

Good Manufacturing Practice (GMP)

UFAG LABORATORIEN AG created a basis for national and international recognition of their study reports.

Contract Laboratories

Contract laboratories have to deal with a huge variety of samples.

The profit of automation is maximal since the time consuming weighing back until stable weight has been reached is omitted. (Industries with only a few samples will have extensive knowledge of these samples and can therefore dry and ash for a fixed time. Therefore, manual work is not as extensive as it would be for “unknown” samples which may require weighing to be carried out several times until the weight is consistent).

prepASH – Optimal Solution to Determine Ash

Reduced time and effort: prepASH is a fully automatic drying and ashing machine, no need for multiple weighing after the time consumed cooling down in the desiccator and automatic calculation of results. Working in groups of similar samples in a single run will increase efficiency and optimise time of analysis.

Improved safety and efficiency: No more dangerous analysis with the open flame. The prepASH analysis can be done in different time slots, e.g. at night.

Increased quality up to 20% of each ash determination has to be re-analysed because of faulty/undefined results. prepASH is highly repeatable and reliable!

Detailed analysis reports: Due to the permanent recording of measurements during the entire process and the automatic saving of the final results, all data is retrievable at any moment.

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