Analysis of Pet Food with FT-NIR Spectroscopy

Application Note N308

Pets are today an important part of peoples lives. Therefore consumers trust in brands which guarantee the best quality for their individual animal, since pets of different breed, size and age often need a special nutrient profile in their diet. Pet food producers have to provide a vast amount of different products, produced at an acceptable cost.

From raw materials to finished pet food

The biggest challenge in pet food production is to keep track of the different recipes depending on the availability of the expensive raw materials. Depending on origin and season, they often show huge batch-to-batch variability; nevertheless, feeding the least cost formulation programs with valid compositional data is essential and a fast and accurate analysis, providing results in seconds can help keeping track of the production process.

Near infrared spectroscopy is used in agriculture for many decades for the analysis of main constituents like moisture, fat and protein. It is fast and safe, since it requires little to no sample preparation, nor hazardous chemicals or gases. This makes a quick test of the incoming raw material using FT-NIR available even to production staff, before processing the materials and also allows a fast way of testing the final material before packaging.

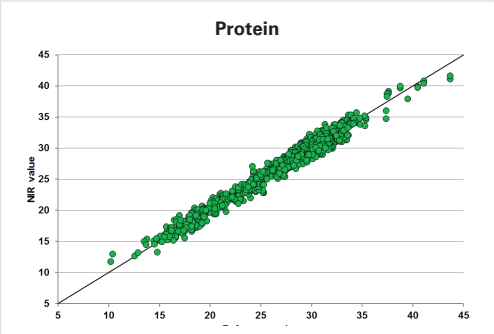
Easy sampling and measurement

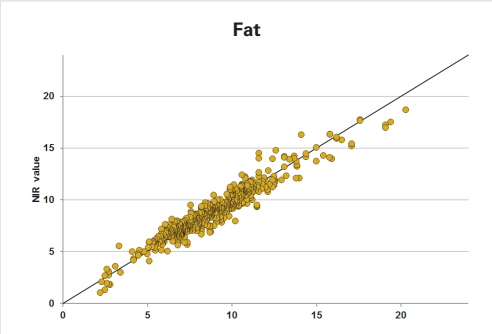
Solid samples like like raw materials and finished pet food are filled in cups with a quartz glass bottom, placed on the integrating sphere of the MPA II or TANGO-R spectrometer and measured from below. This way, the product has an even surface and for highly reproducible results, it is rotated during the measurement. Liquid samples like oils and fats are are simply filled in 8 mm glass vials and are measured in the sample compartment of the MPA II or TANGO-T.

Measurable Parameters in Petfood:

- Moisture
- Fiber
- Fat
- Ash
- Protein
- Starch

Analyzing rabbit food in diffuse reflection on the integrating sphere of the MPA II FT-NIR spectrometer.





Calibration graphs for protein and fat with FT-NIR spectroscopy.

Analyzing fat quality

The fat content in pet food mainly derives from the protein source (e.g. the fat in poultry) but also from added fats e.g. lard, tallow, vegetable or fish oil. Quality pet foods will use good sources of fat and ensure they provide an optimized level of omega-3 oils. Here FT-NIR spectroscopy can help to determine the amount of EPA, DHA and total omega-3 in fish oils. Moreover, the fat quality in general in terms of trans fatty acids (TFA), free fatty acids (FFA) and fatty acid composition can be analyzed.

Online analysis for real-time monitoring

Even real-time online measurements can be carried out using FT-NIR process spectrometers, ensuring highest product quality at all times and minimized rework to maximize profits. Depending on the output of the factory, a return on investment on NIR technology can be realized within a year.

Ready to use calibration packages monitoring

A comprehensive set of universal calibrations for the analysis of raw materials and finished products in the pet food industry as well as for various edible oils and fats is available on request. These calibrations enable a quick and cost-effective start to your FT-NIR analysis, in the lab or online.

FT-NIR Spectrometers: Bruker Optics offers various FT-NIR spectrometer models for lab, at-line and on-line applications:

TANGO

FT-NIR analyzer for routine use in the lab.

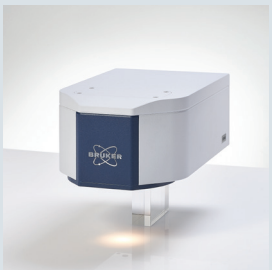
MPA III

Multi purpose analyzer for maximum flexibility.

MATRIX-F II

Process monitoring with probes and sensor heads.

BEAM



Single-point spectrometer with full FT-Power.

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