



# Food & Feed Industry

- Fast and Reliable Quality Control by Time Domain NMR

# Solutions for the Food & Feed Industries

## ● QA / QC and Research with Ease

To determine the essential properties of food and feed, Bruker developed a powerful device for fast and reliable answers throughout all production and processing steps: the minispec based on Time Domain (TD)-NMR. This method is well recognized due to its time saving qualities and simplicity of operation. No chemicals and consumables are required. Moreover, a large variety of food can be analyzed with minimal sample preparation. TD-NMR is an inherently quantitative method, insensitive to matrix effects that occur in many complex foods and food intermediates. TD-NMR provides clear advantages over wet-chemical and other spectroscopic methods. It has been adapted in various AOCS, ISO, and IUPAC standard methods as well.

Bruker started its development in close partnership with major food companies in the 1970's and continues to innovate to this day. Our strong commitment to the food and feed industries has led to many dedicated applications. The most notable is the Solid Fat Content determination (SFC) in fat compositions.

### The Range of Applications

International standard applications

- Solid Fat Content (SFC) Determination
  - ISO 8292
  - AOCS Cd 16b-93; AOCS Cd 16-81
  - IUPAC 2.150
- Oil & Moisture Determination in Seeds and Residues
  - ISO 10565; ISO 10632
  - AOCS Ak4-95
  - USDA GIPSA approved

Key applications

- Droplet Size Distribution of Oil in Water/Water in Oil Emulsions
- Total Fat Content in Chocolate

Further applications

- Total Fat and Moisture Content in
  - in Chips
  - in Milk Powder
  - in Food Snacks
- Flavor / Oil Content Determination
- Oil and Moisture Determination (> 10 % moisture content)

### The Key Advantages

Fast and accurate

The measurement takes typically less than one minute. Minimal sample preparation and high accuracy (e.g.  $\pm 0.1\%$  for total fat determination) make the minispec analysis the method of choice for Quality Control (QC) in the food industry.

Reproducible & non-destructive

The repeatability and reproducibility of the minispec analysis are significantly better compared to wet-chemical methods. The measurement is non-invasive, non-destructive and allows heterogeneous samples to be analyzed without grinding or homogenization.

Safe & simple

Raw materials and foodstuffs are measured without grinding, cutting, or any other sample preparation. No chemicals such as solvents are required.

Compact and robust

The small footprint of the minispec unit allows flexible placement anywhere in the production facility. No dedicated supplies or consumables are required.

## Application Examples



### Oil & Moisture Determination in Seeds and Residues

This method is the international standard to measure the oil and moisture content in seeds and seed residues. The oil content determines the value of the crop and thus, it is of utmost importance to farmers and oil mills. The moisture influences the shelf life and is therefore controlled frequently.



### Droplet Size Distribution of Water in Oil and Oil in Water Emulsions

With the minispec NMR method, the droplet size distribution in water in oil emulsions such as margarine or mayonnaise are measured conveniently and non-invasively. For example, this is an important parameter since the water content and droplet size distribution influence shelf life, taste, and oral sensation.



### Solid Fat Content (SFC) Determination

This international standard method is used to measure the melting profile of fat composition. It is important to characterize it in detail to ensure proper performance of many final customer products, such as margarine or chocolate.



### Total Fat Content in Chocolates

The total fat content in chocolate can be measured quickly and conveniently without the need for any chemicals or sample preparation. The method can be applied to chocolate liquors, intermediate products and final chocolate products, too.



### Oil and Moisture Determination (>10% moisture)

For foodstuffs like meat with moisture contents exceeding 10 %, a TD-NMR application is available that uses a chemo-metric data analysis to determine the fat content of the sample. This way, time-consuming pre-drying of the sample can be avoided.



### Total Fat and Moisture Content in Food Snacks

The minispec provides an easy analysis of fat and moisture content (moisture <10 %) in a wide range of foods such as chips, crisps, pretzels, etc.



### Total Fat and Moisture in Milk and Cacao Powder

In these economically important foodstuffs, the fat and moisture content is routinely measured with Bruker's minispec in QC.



### Total Fat Content in Feeds

The total fat content of pet food can be determined in a rapid and easy manner; for example with dog and cat food.

# The Bruker Commitment



*We provide worldwide expert system support.*

## Application Consulting

Bruker's minispec application groups are located in key sites around the world to provide expert system support, method development, and application improvement. The corporate philosophy and commitment guarantee customers a long-term, reliable partnership and

- application training courses
- direct support through telephone and electronic communication



*We offer our customers regular training courses.*

## Training

Individual training sessions can be arranged directly at Bruker facilities around the world. A visit to one of the company's demo facilities allows the customers to see all minispec configurations and the full range of accessories.



*We provide competent service to ensure reliable operation.*

## Service

Bruker instruments are designed to provide many years of trouble-free operation. However, should a problem occur, a network of Bruker companies and representatives around the world are ready to respond fast and competently to customer needs. Professional installations and a high standard of post delivery service are main commitments to Bruker customers.