



## TD-NMR

# Body Composition Analysis with minispec LF Series

For Heaviest Rats Down to Little Organs

Innovation with Integrity

### The Bruker minispec Systems LF Series

For many years the Bruker minispec has been well-used in industrial applications as well as R&D.

One decade ago, the minispec found applications in metabolic disorders like diabetes and obesity, in rheumatic diseases monitoring, and in nutrition. Additionally, it became an attractive tool for the non-harmful examination of lab animals to define their wellness and improve the definition of research time-points in which to perform thorough diagnostics and other procedures. Important parameters like Fat and Lean can be determined in only 2 minutes approximately without preparation procedures.

As in big MRI systems in hospitals where humans are examined routinely, the animal is examined without applying anesthesia in a fully awake state. Little movements of the animals will not influence the measurement significantly. For investigation of soft(er) body tissues, Magnetic Resonance is the right choice, rather than x-ray techniques. With minispec LF90II system, not only mice, but also rats can be examined and with minispec LF110, rats 1kg and over can be analyzed.

### Body Composition Analysis (Fat, Lean, free and total Body Water) in

- Rats
- Mice
- Organs and Organ Parts
- Tissue Samples
- Biopsy Investigations

### the minispec LF-series

- Solutions for Mice
  - minispec LF50
- Adaptable Solutions for Mice and Rats
  - minispec LF90II
  - minispec LF110

## Unique Probe-in-Probe Design

The LF90II and LF110 use a unique probe-in-probe solution designed to evaluate small samples with high sensitivity, such as newborn rodents and biopsies. Sensitivity is directly related to the probe's filling factor and its quality factor. As a result, both variables have been optimized to provide ideal performance while remaining user-friendly.

## Reduced animal stress and red restrainers

The Body Composition Analyzer (BCA) application with the minispec reduces animal stress because anesthesia is not necessary. More importantly, the usage of minispec patented red restrainers reduces animal stress. Experiments have shown that rodents may freely move into restrainers due to their dichromatic color sense, while the animal can be monitored at all times.

**Temperature stabilized magnet** for a better accuracy and intra-exam reduced variability

## Further Applications of the LF90II / LF110

In addition to analyzing body composition, the minispec LF-Series can be used for additional applications using simple calibration for simultaneous measurement of fat and moisture content in:

- Animal feed
- Animal feces

## Main Benefits for Research

Enables researchers to perform multiple measurements during the life of the animal. **Animals can be measured even every day, and the method is ideal for longitudinal studies.**

- Non Invasive and Non Destructive
- Quantitative method
- Rapid analysis: measurement takes less than 2 minutes, no sample preparation.
- Economical procedures:
  - no consumables
  - retain expensive lab animals for entire study
- Reduced animal stress
  - No need for anesthetics; no recovery time so minimal effect on metabolism
  - Animals are measured "as-is"
  - Allows more frequent testing, due to reduction of risks to animal health, even daily acquisitions
- Health screening by body composition control
- Operator requires no special NMR skills
- Easy and intuitive minispec software
- Long-term reliable and problem-free operation



## Specifications of the minispec analyzer

- Maximum mass of mice:
  - Mouse systems: LF50 for mice up to 60 g
  - LF90II: rats up to 700 g; mice, organs up to 130 g; biopsies 50 to ...500 mg
  - LF110: rats up to 1000 g; mice, organs up to 130 g; biopsies 50 to ...500 mg
- Maximum inner diameter of the mice container: 48 mm
- Accuracy and precision: about 1% of total mass
- Calibration with standards, with animals or according to special user requirements.
- Measurement frequency: 7.5 MHz (LF50), 6.2MHz (LF90II) and 5.7 MHz (LF110).
- Alternatively, to the standard system: horizontal access to the magnet
- User friendly interface for simple operation during measurement series.
- Microsoft Windows system for data acquisition combined with a Microsoft Access data base allowing safe data management without user labor effort.
- ISO 9001:2000 certified
- CE conformity

minispec Plus 7.2.1

Filter

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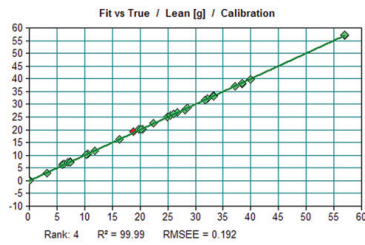
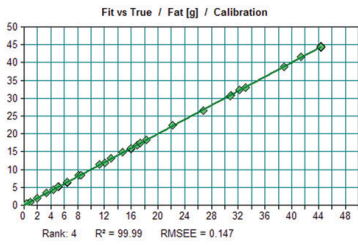
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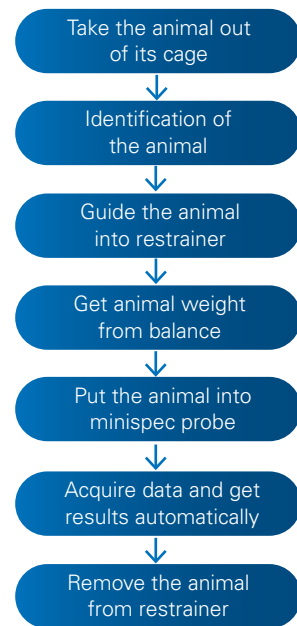
Compound	Value	In	Outlier
fat	60.988	g	*
fluid	4.911	g	*
lean	44.224	g	*
Weight	115.241	g	*

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## Workflow for Body composition analysis with minispec Plus

- User is guided through measurement procedure
- Measurement results are stored in a data base and can be exported to user's data systems
- Direct communication with a balance: convenient and reliable transfer of mice mass.
- Calibration procedure: simple and reliable with full flexibility
- For advanced users: access to the NMR timing parameters allowing an easy adaptation of standards to special needs.



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