

## **Body Composition 體組成分析**

### **1. Purpose**

1.1 TD-NMR uses similar NMR technology, providing analysis of fat tissue, lean tissue, and free fluid by the same physical selection rules that give rise to contrast in MRI. Tissue contrast is high between fat and muscle based on relative relaxation times.

The minispec Body Composition Analyzer is based on Time Domain NMR. It acquires and analyzes TD-NMR signals from all protons in the entire sample volume and can provide 3 components of interest: Fat, Free Body Fluid, and Lean Tissue values. This Magnetic Resonance technology allows researchers the opportunity to make multiple measurements during the life of the animal.

### **2. Safety Requirements**

2.1 General laboratory procedures should be followed, which include: no eating, no chewing gum, no drinking, and no applying of cosmetics in the work area. Laboratory coats and gloves must be worn at all times in the work area, unless the protocol specifically describes the appropriate attire for the procedure.

### **3. Associated Documents**

3.1 Minispec LF50 TD-NMR

### **4. Notes**

- 4.1 There are high magnetic fields associated with all magnets. People with pacemakers or medical implants should not work in the immediate area of the magnet.
- 4.2 Animals with ear tag would not be allowed to put in this machine.
- 4.3 Do not put any substances interfering NMR signals, especially metal material.

### **5. Quality Control**

- 5.1 Validate the conditions of machine by using validate sample (seeds of fast plants) before experiment.
- 5.2 The temperature of magnet is maintained at 37°C and the measurement frequency is 7.5 MHz.

### **6. Equipment**

6.1 Minispec LF50 TD-NMR Body Composition Analyzer

### **7. Supplies**

- 7.1 Gloves
- 7.2 Mask
- 7.3 Paper towel
- 7.4 Cap
- 7.5 Teflon holder
- 7.6 Validation sample (canola seeds)
- 7.7 Ethanol 70%

### **8. Procedures**

- 8.1 Turn on the computer.
- 8.2 Start the minispec program.

- 8.3 Select a calibration that you want, and ensure that the calibrations are listed on the right side of the program.
- 8.4 Ensure that the balance is ON and Zeroed.
- 8.5 Click “Daily Check” and follow the on-screen prompts to perform the daily check for the instrument.
- 8.6 If all checked items pass, the “Daily Check” flag will be validated for 24 hours.
- 8.7 Click “Measure” button to start measurement session.
- 8.8 Enter operator’s ID, sample ID as prompted.
- 8.9 Place the animal onto zeroed balance, write down the sample weight and enter the sampler weight to the program when prompt.
- 8.10 Insert the animal into sample holder and place the holder into the instrument. Ensure that the holder has reached its stopping position.
- 8.11 Click “OK” to start NMR measurement.
- 8.12 Repeat step 8.7~8.11 to measure more samples.
- 8.13 Click “Cancel” at sample ID prompt if no more sample is to be measured.

