



"Ultrasound for Ultra Profits"®

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INSTRUCTIONS FOR USING THE LEAN-MEATER SERIES 11 (S/N: 40001)

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The Renco® LEAN-MEATER® uses pulsed ultrasound to measure the total backfat depth including skin thickness, of mammals having 1, 2, or 3 layers of backfat. Total measurement range including skin is 4-35mm. Some examples are: seals, swine, sheep and cattle. Physically, it is light-weight, hand-held, all-metal and powered by a Nickel Metal Hydride (NMH) rechargeable battery and operated by a single push button. The Layer Switch selects either 1, 2 or 3 layers of backfat. Though not waterproof, the design is otherwise forgiving of adverse farm environments. Extensive training is not required. To assemble, connect the probe to the cable and the cable to the instrument. Twist both connector barrels until they snap into locked position.

How the LEAN-MEATER works:

The probe is placed against the skin of the animal and emits pulses of ultrasound, which enter the animal. The ultrasound is reflected from the inner surfaces of the skin, the backfat and other tissues within the animal. The instrument ignores the reflections from skin ≤ 3 mm thick. The reflections from the backfat layers are calculated and a reading of the total thickness from the top of the skin to the bottom of the last fat layer to be measured will be displayed in millimeters. The last fat layer to be measured is determined by the setting of the Layer switch. When the reading is complete the READ indicator to the left of the digits display will be lit.

The Layer Switch:

Many mammals have only one layer of backfat. In previous versions of the instrument, which were designed primarily for swine that have either 2 or 3 layers of backfat, there were only the "2 Layers" and "3 Layers" switch selections. So, for animals such as seals with 1 layer, and very thick skin, the operator had to rely on the skin to trigger the first layer count. In the new instrument, skin thickness must be >3 mm in order to be counted. In most mammals the skin will not be thick enough to cause this. An example of a mammal whose skin thickness is often thick enough to be counted as 1 layer, is the Harbour Porpoise whose skin ranges from 3-10mm in calves and 2-5mm in mature animals. The addition of a switch selection for 1 layer provides the ability to measure 1 fat layer when used on the majority of animals, which do have thinner skins. However, it will be up to the operator to decide if the readings make sense and to set the Layer switch accordingly.

Why Have a Third Layer Switch?

All swine have the genetic potential for 3 fat layers. As the hog grows, fat is deposited in the top 2 layers. The third layer will not have a fat deposit until later in the hog's life. When the third layer fills with fat, you can measure the depth of the 3 fat layers when the Layer switch is set to "3". *Note: With swine, DO NOT ATTEMPT TO MEASURE THREE FAT LAYERS OVER THE SHOULDER OR THE HAM; the resulting measurements may not be accurate.*

Charging The Battery And Low Power Indication:

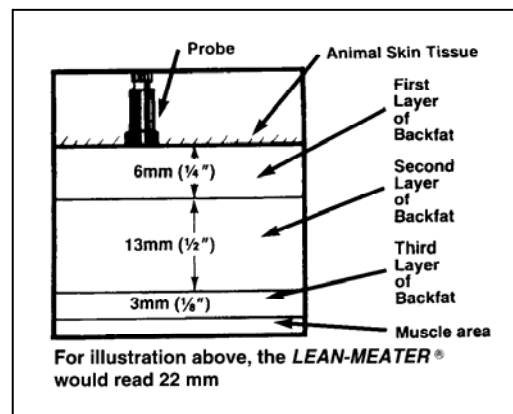
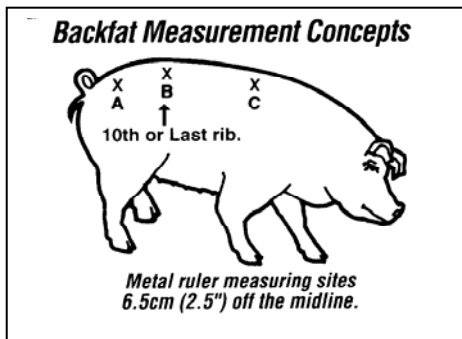
Plug the RENCO charger into a wall outlet that supplies the rated charger voltage and plug the charger cable into the instrument, at which time an indicator light on the right side of the display will light. Charge the battery for about 15 hours before the first use. (Charging the battery after each day's use for three times longer than the time it was used insures long battery life. On the other hand, do not make a practice of charging the battery for extended periods of time, say over 30 hours, as it may actually shorten the battery life.) The instrument is deactivated and not usable when the charger is connected. When the battery becomes discharged a horizontal bar is displayed, indicating that only a short period of battery service remains.

Turn On Sequence:

Press the push button to turn the instrument on. The following sequence will take place. The display will show the number "88" for a second (verifies that all segments are functional), and the READ light on the left side of the display will turn on briefly. After a moment, the right digit will show "0" and the rest of the display will be dark.

Example: Locating The Test Site For Swine

The most accurate spot in which to measure backfat can be found by walking your fingers forward along the hog's flank until you can feel the last rib, then place the probe on this site B, 65mm (2.5 inches) from either side of the backbone. Saturate the skin with a light oil (such as cooking or motor oil) or water. Good contact between probe and skin is required.



Making the Measurement

To make a measurement, apply a generous amount of coupling fluid such as cooking oil or water to the test site. Insufficient coupling fluid is the most common source of error. (For swine, start with the Layer switch set to 3, unless you know there are only 2 layers—see below.) Press the Power button. Apply the probe to the test site, use a gentle pressing/rotating action to force out any air bubbles between the skin and probe. It is important that the probe be kept perpendicular to the back. Errors may result if probe is at an angle. Many have found that the probe is most easily managed if held between the index and middle fingers.

The READ indicator lights when the appropriate layers have been found. If the READ light does not come on, then skin contact is poor. Use more oil. Make a greater effort to remove air bubbles—ultrasound will not pass through air. Be sure probe is perpendicular to the animal's back. Consistency of probe placement is of great importance in obtaining comparative measurements.

Example: Working with Swine

The first reading should be taken with the Layer selection switch at 3. This will measure the total depth of 3 layers of fat plus the skin. The READ indicator will light when the Lean-Meater detects 3 fat layers. However, if the third layer has not developed the READ indicator will not light. In that case set the Layer switch to “2” and try again. The READ indicator will light when the instrument detects and measures, the total of the skin plus the 2 fat layers.

The instrument attempts a new measurement several times each second. A reading will remain until a new, different reading is detected. If while the READ light is lit, the probe is removed from the animal in a manner that does not trigger a new reading, the reading will be displayed for several seconds.

Important: Small irregularities in the fat may block the beam of sound, causing the Lean-Meater to give low readings. Moving the probe slightly will allow the beam to bypass, and the correct reading to appear. (Note: Always keep the probe perpendicular to the animal’s back).

Fat layers are not uniformly thick. Averaging two or three readings at adjacent sites insures greatest accuracy. Measurement occurs only when the READ light is on. Accuracy of the reading is ± 1 digit.

Older animals with tough dead skin will require extra effort to obtain a good clean probe contact with the underlying live tissue. If necessary, remove the hair at the site (true for all mammals). Then wet the skin with hot water. Next, apply light oil and allow it to wet the skin a minute or two before measuring. Young hogs or other animals, with softer skin, generally do not require much site preparation.

Only site B (see the drawing) will give an accurate reading of the three layers of fat. The Lean-Meater measures the skin and the first 2 or 3 layers of fat. Many hogs have the thin third layer of fat at an early age. As they increase in weight and age, the third layer becomes thicker and more wide spread over the body. Site B is the location normally used in the old metal ruler probing technique, and shows the best correlation with overall carcass yield. Because of the trapezius muscle at the shoulder (false lean), measurement at site C is more difficult and inconsistent. (True for both ruler and ultrasound devices). Site A will give accurate measurement for two layers of fat but may not give an accurate measurement for three layers of fat due to the muscle tissue below the fat layers.

Values obtained using ultrasonic devices on live animals will generally be different than those measured at slaughter because measurement sites are somewhat different and the fat on a hanging carcass is distorted or cut.

For comparison of backfat values between animals of different weights, the readings should be adjusted to a “standard” 100kg (220 Lb.) hog. Tables of adjustment factors are readily available from most extension services and while supplies last, Renco can supply a special slide rule for this purpose. Probing should be done on gilts that are contemporaries and that are at or near market weight.

Battery: The NMH battery is “green” and does not need to be recycled when disposed. The Renco NMH battery uses special cells and should only be replaced with Renco replacements to avoid damage and shortened battery life. Warranty is void if battery is replaced with other than a Renco replacement. To replace battery, remove top cover by removing the end screw and loosening the nut on the Layer switch. Unplug battery, replace with new battery and replace cover. The instrument will automatically turn off if it has been on for more that two minutes during which there has been no measurement

activity. This protects the battery from discharge if say the instrument is inadvertently placed upside down on a table so as to keep the push button actuated.

Test Cylinder: A Test Cylinder is provided for verifying that the instrument is operational. Wet the end of the probe or Cylinder and apply the probe to the Cylinder. Do not allow the opposite end to be in full contact with any surface and be sure the hole is not plugged. With the Layer Switch on “2”, the reading should be about 25mm, depending on humidity, or about 30mm for instruments purchased in Australia and New Zealand. Since the Lean-Meater is a crystal controlled device, the actual reading is not as important as just getting a reading. If there is any internal problem you will most likely not get any reading at all.

Service and Help

To help with any questions or problems in regard to the use of the Lean-Meater, RENCO provides free telephone technical support during the warranty period, which may be obtained by reading the FAQ's on our Internet site, email or calling. (Our phones are open M-F, 8am to 4pm Central Time.) We do not charge for online or telephone technical support. Use the original carton to return the instrument to the factory for service and regardless of problem, be sure to return instrument, probe, cable and charger.

If you need to return the instrument to the factory, send to:

RENCO CORPORATION
116 Third Avenue North
Minneapolis, MN 55401, USA

DO NOT ATTEMPT TO USE THE LEAN-MEATER WHEN THE BATTERY IS CHARGING, AS IT IS AUTOMATICALLY DEACTIVATED WHEN THE CHARGER IS CONNECTED AND WILL NOT WORK.

CAUTION! DO NOT USE THE LEAN-MEATER ON HUMAN BEINGS.