

Fig. S1. Coil efficiency evaluation, for MRI assays described throughout.

Fig. S1A. Evaluating variability using corn oil phantom measurements

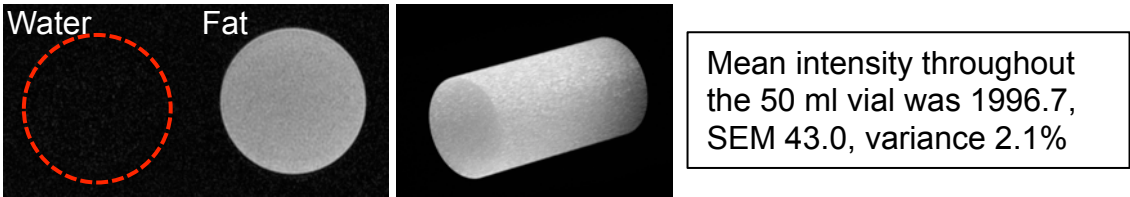


Fig. S1B. Evaluating variability due to padding and coverage

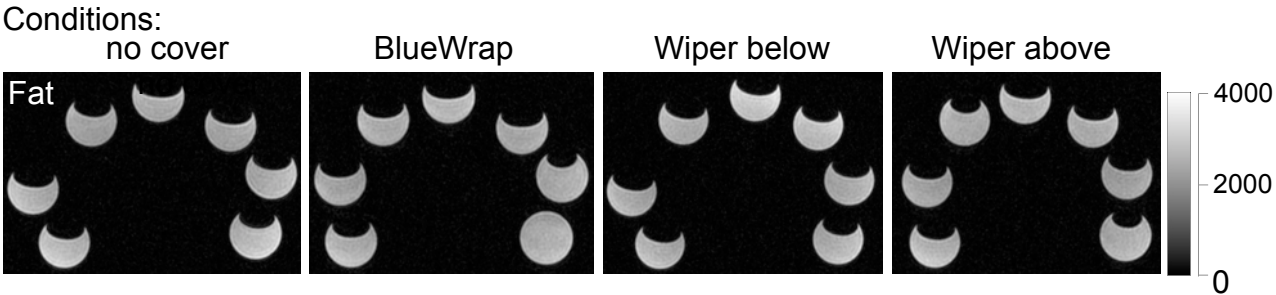
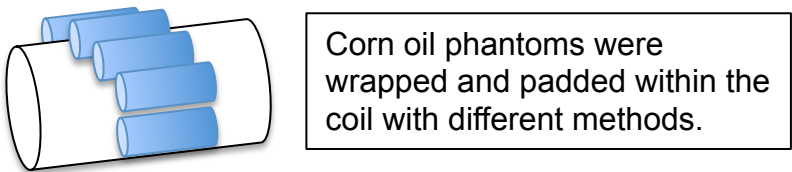


Fig. S2. Correlations of Waist/Hip ratio or BMI with dWAT thickness, for human subject cohort assayed for Fig. 5

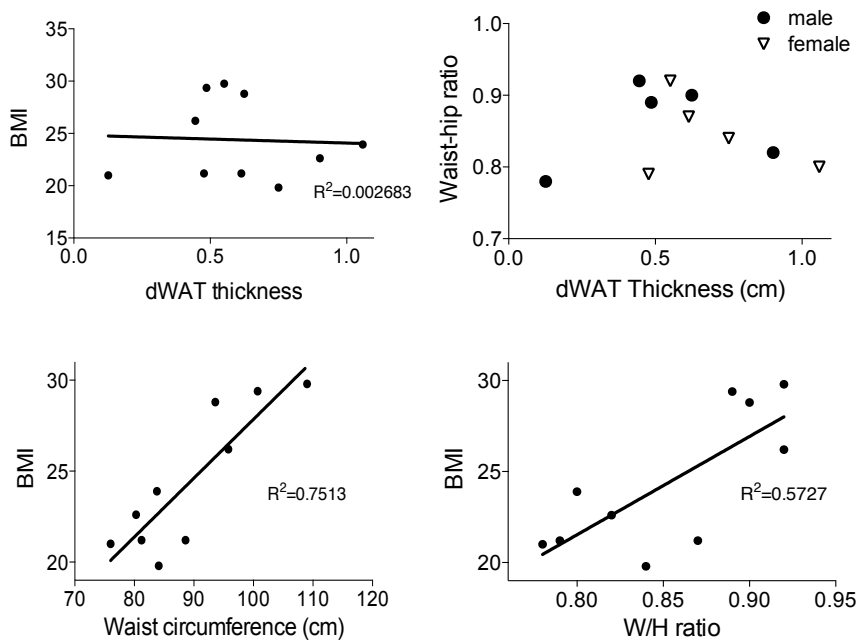


Fig. S3. MRI images of dWAT ordered with respect to Waist Hip ratio (accessory to Fig. 5)

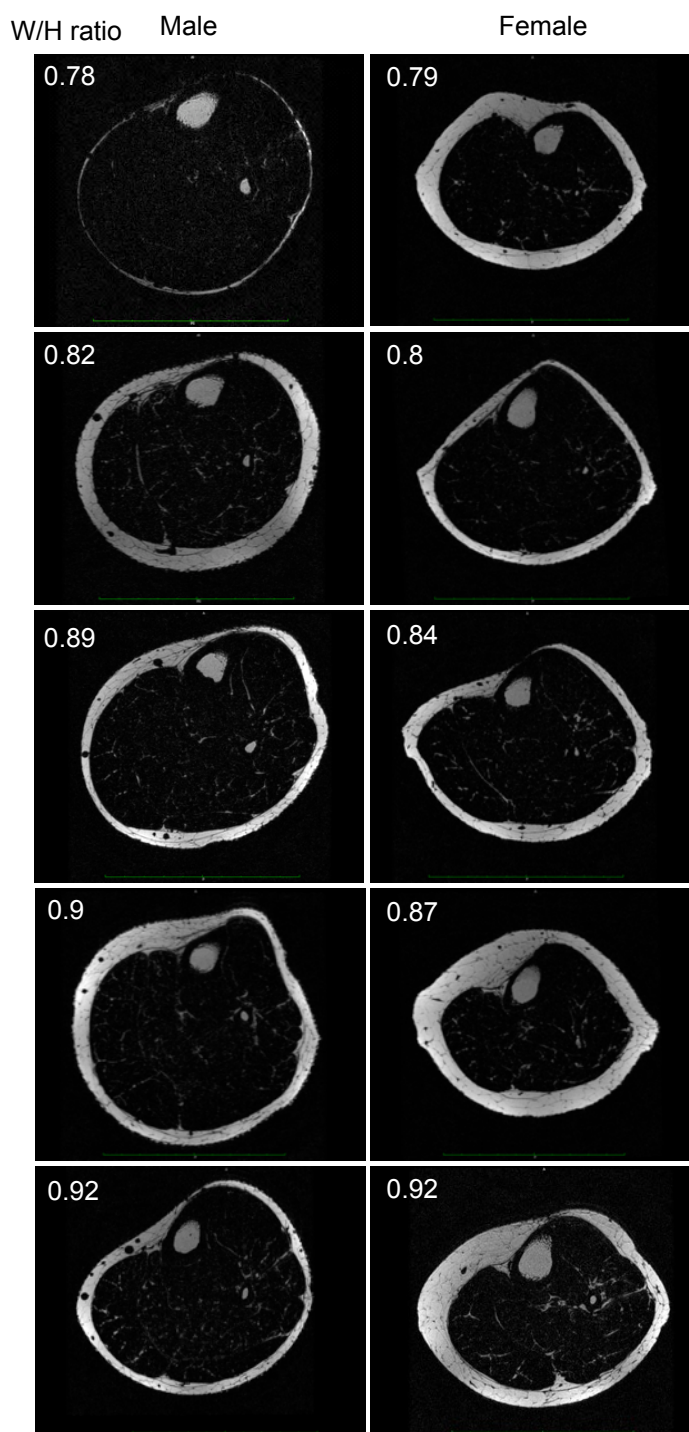


Fig. S4. Imaging of human volunteers (Fig. 5). The left calf of each volunteer was scanned at 3T using an extremity coil array. Axial imaging slices were centered around the widest diameter of the calf.

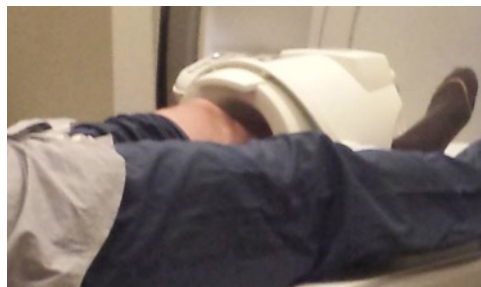
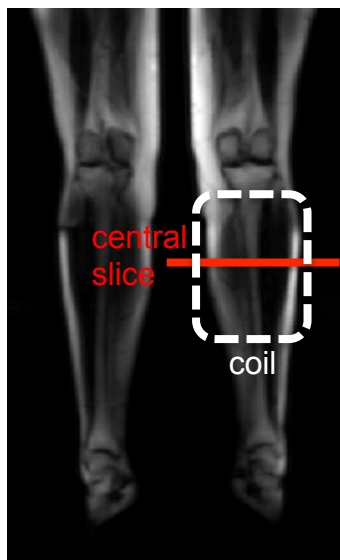
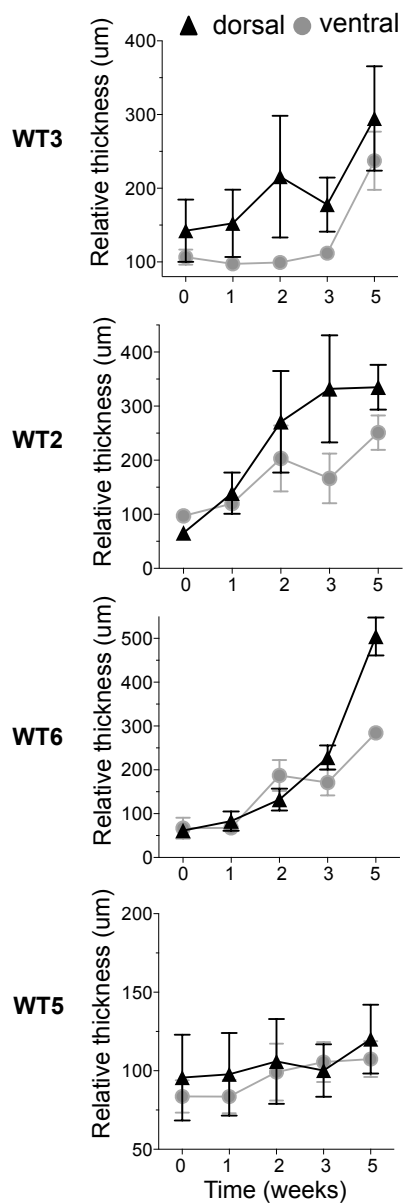
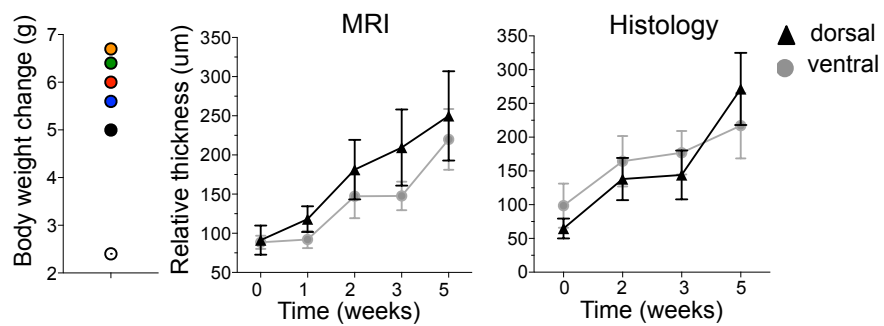


Fig. S5.



Supplemental Methods

Limit of sensitivity for assaying rodent dWAT:

We estimate that in order to enable detection of dWAT we require a signal to noise (SNR) ratio >3 in voxels containing partial fat volume (dWAT is less than 1 voxel thick). The relationship between the SNR in voxels with a thin DWAT layer (“partialfat”) with respect to fully filled voxels nearby (“totalfat”) can be expressed as follows,

$$SNR_{partialfat} = \frac{SNR_{totalfat} * thickness_{DWAT}}{thickness_{voxel}}$$

(where $SNR_{partialfat}$ is the SNR in the fat image in voxels containing partial fat volume, $SNR_{totalfat}$ is the SNR in the fat image in voxels containing only fat (as measured from nearby larger fat depots), $thickness_{DWAT}$ is the thickness of the DWAT layer, and $thickness_{voxel}$ is the voxel size in-plane.)

Thus, in order for $SNR_{partialfat} > 3$, we need

$$thickness_{DWAT} > 3 * \frac{thickness_{voxel}}{SNR_{totalfat}}$$

Assuming a voxel thickness of 310 μm (larger in-plane voxel dimension), and an $SNR_{totalfat}=16$ (measured from fat-only regions and nearby noise regions), we expect to be able to detect DWAT thickness **above 58 μm** (with the current imaging setup and protocol).

This limit will not significantly affect human subjects, where on average, the skin-associated fat layer is thicker.