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Supporting information for article:

**Live pig airway surface imaging and whole-pig CT at the Australian
Synchrotron Imaging and Medical Beamline**

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Supplementary videos description

Supplementary video files (.mp4 format) were assembled from the processed images to show the variability in particulate behaviour on the tracheal airway surfaces. Supplementary Videos can be played using the free VLC Media Player (available at <http://www.videolan.org/vlc/>).

S1 shows an example of a full sequence from Fig 8 containing all 10 frames per breath, prior to application of the particle detection and tracking algorithm. Respiratory and cardiac motion results in an unstable background.

S2 shows the automatically detected and tracked particles in the same sequence shown in S1 (~20x speed). In this example, rapidly moving and clumped particles are poorly detected and tracked.

S3 shows the manually detected and tracked particles in the same sequence shown in S1 (~20x speed). All moving particles are accurately detected and tracked throughout the sequence.

S4 shows a short segment of the high-magnification fluoroscopic imaging of the lungs of Fig 5 (~10x speed).