Scientific Abstract. Porcine reproductive and respiratory syndrome virus (PRRSV) is a major swine virus that causes reproductive impairment in sows, as well as respiratory disease, reduction in growth rates, and mortalities in all ages of pigs. The objective of this study was to quantify the impact PRRSV has on grow-finisher pig feed efficiency and tissue accretion rates. Thirty PRRSV naïve, littermate pairs of maternal line Choice Genetics gilts (33 ± 3 kg BW) were selected and pairs split across two barns consisting of five pens (n = 6 pigs/pen/barn). Pigs in both barns were fed typical Midwest corn-soybean-DDGS diets. All pigs had ad libitum feed and free access to water. One barn was inoculated (CHAL) via an I.M. injection of a live PRRSV strain isolated from the region (0 days post inoculation, dpi), while pigs in the other barn were given a saline control injection (CONT). Pig performance (ADG, ADFI, GF) in both barns was assessed from 35 kg BW until each group reached 128 kg market BW. Additionally, longitudinal body composition was assessed using Dual-energy X-ray absorptiometry on days 1, 42 and 80 dpi, and lean, protein, fat and bone accretion rates calculated. Serological data showed that the CHAL pigs PRRSV titers peaked 7 dpi and these pigs seroconverted by 35 dpi. According to both genomic and protein PRRSV titers, CONT pigs were naïve to PRRSV throughout the study. PRRS infection also reduced ATTD of dry matter, energy and nitrogen by 3-5% at 21 dpi and these were stilled attenuated 70 dpi later. Compared to the CONT, PRRSV CHAL pigs had decreased ADG (0.89 vs. 0.80 kg/d, P < 0.001), ADFI (2.05 vs. 1.93 kg/d, P < 0.001), and GF (0.44 vs. 0.41 kg/d, P < 0.001) over the entire test period. To get the CHAL pigs to the same live weight it took an extra 14 days on feed. The CHAL pigs also had attenuated whole body lean (547 vs. 633 g/d, P = 0.001), protein (109 vs. 126 g/d, P = 0.001) and fat (169 vs. 205 g/d, P = 0.001) accretion rates compared to their CONT counterparts. Based on plant data, this then translated in leaner carcasses and reduced yields. These data clearly demonstrate that PRRSV infection reduces digestibility, feed efficiency and protein accretion rates in grow-finisher pigs.