Antibiotics can be administered via various routes in swine production, which may influence antimicrobial resistance development. A total of 40 barrows and 40 gilts (initially 93.9 ± 3.57 kg BW) were used in a 35-d study to determine the effects of tylosin administration route on growth performance and antimicrobial resistance in fecal enterococcus isolates. Pigs (1 pig/pen, 20 pigs/treatment) were blocked by initial BW and gender. Within blocks, combinations of 2 pens (1 barrow pen and 1 gilt pen) were assigned randomly to 1 of 4 treatments. The antibiotic treatments followed US label directions and were: 1) no antibiotic (CON), 2) 110 mg tylosin per kg feed for 21 d (FEED), 3) 8.82 mg tylosin per kg BW through intramuscular injection twice daily for the first 3 d of each wk during the 3-wk treatment period (IM), and 4) 66 mg tylosin per liter of drinking water for the first 3 d of each wk during treatment period (WATER). Antibiotics were administered during d 0 to 21 and all pigs were then fed a common diet with no antibiotic treatment from d 21 to 35. Among the medicated pigs, total tylosin dose administrated was 18.0 g via IM, 8.6 g in FEED, and 3.7 g with WATER. Fecal samples were collected on d 0, 21, and 35. Antimicrobial susceptibility was determined according to minimal inhibitory concentration breakpoints. No evidence for route×gender interactions (P>0.55) were observed for growth performance. From d 0 to 21, pigs receiving CON and FEED had greater (P<0.05) ADG than those receiving IM, with the WATER group intermediate (1.26, 1.26, 1.15, 1.22 kg/d, respectively). There was no evidence for different ADFI among treatments. Pigs receiving IM (0.324) or WATER (0.322) had poorer (P<0.05) G:F than CON (0.347), but were not different from pigs receiving FEED (0.339). No evidence for route×day interactions (P>0.23) were observed for enterococci resistance to any antibiotic. Overall, enterococcal isolates collected from pigs receiving FEED or IM were more resistant (P<0.05) to erythromycin and tylosin than CON and WATER groups. Resistance prevalence to these 2 antibiotics was greater on d 21 and 35 than d 0. In summary, tylosin injection decreased ADG and G:F of finishing pigs, likely due to the stress reaction to handling and injection. Tylosin administration through injection and feed resulted in greater probability of enterococcal resistance to erythromycin and tylosin compared with in-water treatment, which is likely a combined effect of administration route and dosage.

Key Words: administration route, antimicrobial resistance, fecal enterococci