Pig farms that use traditional farming practices have less antibiotic resistance

Mencía-Ares Oscar
Cabrera-Rubio Raúl
Cobo-Díaz José Francisco
Álvarez-Ordóñez Avelino
Gómez-García Manuel
Puente Héctor
Cotter Paul D.
Crispie Fiona
Carvajal Ana
Rubio Pedro
Argüello Héctor

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Abstract

Antimicrobial resistance is a critical threat to human and animal health. Animal production systems, with their often-heavy use of antibiotics, are a major driver of antibiotic resistance globally. The resistome is the collection of antibiotic resistance genes in a population of bacteria and is a window into the accumulation of antibiotic resistance in a system. A recent study compared the resistomes of an industrialized intensive pig farming system and a traditional extensive farming system. The extensive systems have lower animal densities, outdoor housing, older age at slaughter, and – critically – less antibiotic use compared to the intensive systems. Researchers examined the metagenomes of the pigs' intestinal microbiomes, the environment on the farm, and the slurry of pig waste. Compared with extensive farms, intensive farms had a higher abundance of antibiotic resistance genes. The class of antibiotics used correlated with the category of resistance genes observed. Interestingly, the difference in abundance lay in mobile genetic units and not on bacterial chromosomes. Mobile resistance genes like these can spread rapidly among bacteria. These results show that extensive farming practices may reduce the antibiotic resistance pressure on the food system and slow the advance of antibiotic resistance for both human and animal health.