

Can we alter water utilization patterns in growing pigs by diet manipulation?

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Concerns relating to the use of water resources by the livestock industry and the rising cost of manure management have increased interest in defining water consumption and utilization by pigs. Specifically, there is a lack of data on the relationship between diet composition and water intake. An experiment was designed to examine the impact of diets differing in protein and mineral content on water utilization patterns in growing pigs.

A total of 48 crossbred barrows were randomly assigned to one of four dietary treatments for a 14 day experimental period. Diets were based on wheat, barley and soybean meal. A low protein (17.8% CP) diet was compared to either high (21.4% CP) or excess (25.4% CP) protein diets. The 17.8% CP diet was supplemented with lysine, methionine, threonine and tryptophan to attain ideal amino acid ratios, and sodium bicarbonate was added to achieve the recommended dietary electrolyte balance. A fourth diet (20.4% CP) was formulated with elevated Ca (1.00% vs. 0.57%), P (0.76% vs. 0.47%) and salt (0.90% vs. 0.40%). Water consumption and spillage were determined daily, and urine and feces were collected on day 11 to 14.

Water intake ($P=0.06$) and output in urine ($P=0.07$) and feces ($P=0.02$) were increased in pigs consuming excess (25.4%) CP. The water to feed ratio was also increased when pigs consumed diets with excessive CP ($P=0.01$). Feed intake was elevated on the 17.8% CP diet. Average daily gain ($P=0.04$) and feed efficiency were increased with the 25.4% CP and the high mineral diets. Nitrogen retention (g N/d) was unaffected by treatment ($P=0.57$).

Implications:

Excessive dietary protein will result in increased water utilization by growing pigs. Conversely, feeding a reduced crude protein diet will not reduce water intake.