

ANIMAL SCIENCE

Title: Critical Review of Acidifiers – NPB #05-169

Investigator: James E. Pettigrew

Institution: University of Illinois

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Abstract:

We have reviewed the scientific literature on the use of acids in pig diets for the purpose of improving pig health and productive performance. Our focus is on effects of acids on growth performance and some associated factors (independent variables) on the response to acids. The independent variables include diet type, dietary inclusion level of acid, type of acid, weaning age, and performance level. We address both the proposed mechanisms of action of acids and the empirical data on practical results. In this study we have mostly focused on responses to organic acids because they are the most commonly studied acidifiers in pig diets, but the effects of inorganic acids on pig performance are also mentioned when appropriate.

Acid products significantly increase growth rate of pigs, on average more than 12.0% and 6.0% for 0-2 and 0-4 week post-weaning periods, respectively. The addition of acids to the diet also improves the performance of growing (3.5%) and finishing pigs (2.7%). Under stressful or disease conditions, acids appear to be an effective measure to reduce scouring rate and mortality and to sustain a good growth performance. The response of growth performance to acids is not remarkably influenced by type of diet, inclusion level of acid, weaning age or performance level or their interactions. Diet acidification decreases the pH value of the diet, but the data do not suggest it decreases the pH value of the gastrointestinal digesta. In addition, the current data have shown that addition of acids to the diet greatly enhances the dry matter digestibility (0.82%), the response of which to acids is appreciably altered by diet type, acid type, and acid level. It is also indicated that acids differently affect the microbial populations along the digestive tract and they do not produce an environment that is favorable for potentially beneficial bacteria like *Lactobacillus* but adverse to coliforms and *E.coli*. In summary, the application of acids to pig diets can bring benefits to the pork production industry and is likely to be a promising alternative to the use of growth promoters. The improvement in nutrient digestibility and the changes in microbial population are the important influences probably caused by acids.

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For more information contact:

National Pork Board, P.O. Box 9114, Des Moines, Iowa USA

800-456-7675, **Fax:** 515-223-2646, **E-Mail:** porkboard@porkboard.org, **Web:** <http://www.porkboard.org/>