

Research summary:

Effect of phytase and inositol on laying hen digestibility, productivity and behaviour



About the study

Phytase is frequently used in broiler diets to decrease phytate anti-nutritional factors and to increase phosphorus availability with positive effects on diet digestibility and bird performance. When phytase is used in high levels, inositol, the core molecule of phytate, is released. Inositol is a key element in numerous metabolic pathways, and its dietary supplementation is known to improve broiler performance.

Little is known about its effect on laying hens, thus the goal of this project was to

determine the effects of high levels of phytase or inositol on laying hen performance, digestibility and behaviour.

How we did it

600 Lohmann LSL-Lite hens were assigned to 1 of 5 dietary treatments that offered a combination of high or reduced balanced protein and phytase, inositol or no supplementation. Diets were fed *ad libitum* from 19 to 59 weeks of age. Data collection included inositol levels in blood and eggs, performance, behaviour, stress levels, digestibility and gene expression.

What we found

No effects of protein level were found except for reduced amino acid digestibility and more sitting behaviour.

Inositol and phytase supplementation increased inositol in the digestive contents and the egg yolks. Inositol absorption likely occurred early on, but the excess of inositol might reduce phosphorus availability from the digesta. Inositol released from phytase action was likely slowly absorbed along the small intestine.

Phytase supplementation did not affect laying hen performance, but inositol increased feed intake and the incidence of egg abnormalities, while it decreased eggshell quality. Feather cover on the vent area was decreased with both, phytase and inositol supplementation. Addition of inositol, but not phytase, reduced hen fearfulness.



This project was funded by:



In conclusion

Site of absorption does not affect inositol accumulation in egg yolks.

Unlike their effect on broiler production, phytase and inositol did not benefit laying hen performance. In fact, egg quality might have suffered from inositol supplementation.

Fearfulness was reduced with inositol supplementation, and along with phytase dietary addition, they both likely increased vent feather pecking.

Who we are



Dr. Eugenia Herwig is a Post-Doctoral Fellow working with Dr. Karen Schwean-Lardner.



Dr. Karen Schwean-Lardner is an Associate Professor at the University of Saskatchewan. Her research focuses primarily on the management and welfare of laying hens, broiler chickens, and turkeys.



Dr. Hank Classen is a Distinguished Professor Emeritus at the University of Saskatchewan. His research focused on poultry nutrition and management.