



Effects of monensin sodium and xylanase on broiler growth performance

A.J. Swanson, C.J. Delfelder, R.S. Beyer, C.R. Stark, C.E. Evans, A.D. Yoder, and C.K. Jones



Department of Animal Sciences and Industry, Kansas State University, Manhattan

Introduction

•Consumers are continuing to have an effect on the usage of antimicrobials in poultry feed. Antimicrobials are utilized to help with nutrient digestibility. A substitute for this antimicrobial is exogenous xylanase. This enzyme can improve nutrient digestibility found in high fiber diets.

Objective

To determine if xylanase can replace monensin sodium, improve nutrient digestibility, and if this impact differs based on the fiber level of the diet.

Photo: KSU broiler



Photo: KSU broilers



Photo: KSU broiler battery cage



Dietary Treatments

Corn-or wheat-based diet supplemented with either 0.10 g/kg monensin sodium (Coban 90; Elanco Animal Health, Greenfield, IN) or 16,000 betaxylanase units/kg beta 1-4, endoxylanase enzyme (Econase XT; AB Vista, Marlborough, UK). Treatments were characterized as: 1) corn-based with no monensin sodium or xylanase; 2) wheat-based with no monensin sodium or xylanase; 3) corn-based with monensin sodium but no xylanase 4) wheat-based with monensin sodium but no xylanase 5) corn-based with xylanase but no monensin sodium 6) wheat-based with xylanase but no monensin sodium

Acknowledgement

Special thanks to Koch Industries Inc for the financial support



Materials and Methods

- 216 broiler Cobb 1-d-old chicks (6 birds/cage and 6 cages/treatment)
- Chicks were fed 1 of 6 dietary treatments consisting of a corn-or-wheat-based diet supplemented with either monensin sodium or xylanase.
- Birds were weighed and feed disappearance measured on a weekly basis starting on d 0 and ended on d 21 to determine average daily gain (ADG), average daily feed intake (ADFI) and feed conversion ratio (FCR).
- Daily mortality was accounted for, and was log transformed to normalize distribution for analysis.
- Data were analyzed with the GLIMMIX procedure of SAS with cage as the experimental unit and treatment as the fixed effect

Results

Table 1. Effect of grain type, monensin sodium, or xylanase inclusion level on broiler growth performance.

Grain Type	Monensin Sodium	Xylanase	n	1-d BW, g	21-d BW, g	Feed intake, g	FCR, g/g
Corn	No	No	6	43.8	848.5 ^a	54.0 ^a	1.46 ^{ab}
Wheat	No	No	6	44.0	879.0 ^{ab}	57.5 ^{bc}	1.52 ^c
Corn	Yes	No	6	43.9	940.4 ^c	58.6 ^{bc}	1.44 ^a
Wheat	Yes	No	6	44.2	932.1 ^c	57.4 ^{bc}	1.50 ^{bc}
Corn	No	Yes	6	44.0	868.6 ^a	56.3 ^{ab}	1.45 ^a
Wheat	No	Yes	6	44.2	926.0 ^{bc}	59.6 ^c	1.47 ^b
SEM				0.64	14.91	1.15	0.014
P-value				0.90	< 0.0001	< 0.0001	0.006

^{abc}Values in columns not sharing the same superscript letter are significantly different (P ≤ 0.05).

¹Treatments consisted of mash diets manufactured from either corn or wheat with or without 0.10 g/kg monensin sodium (Coban 90; Elanco Animal Health, Greenfield, IN) or with or without 16,000 BXU/kg beta 1-4, endo-xylanase enzyme (Econase XT; AB Vista, Marlborough, UK) supplementation. Treatments were fed to 216 Cobb chicks (6 birds/cage).

Treatment impacted (P < 0.01) final BW, feed intake, and FCR. The corn-based control diet had improved (P < 0.05) FCR compared to the wheat-based control diet. In corn-based diets to the monensin sodium and xylanase had no significant difference (P > 0.05) for FCR compared to the corn-based control. In wheat-based diets, xylanase showed to have had a significant difference (P < 0.05), but monensin sodium showed no significant improvement (P > 0.05) on FCR compared to the wheat-based control.

Conclusions

- This study suggests that xylanase improves digestibility in wheat-based diets. However, in this environmental setting, there was little impact of the antimicrobial given in the feed.