



Effects of Xylanase and Monensin Sodium on Broiler Chick Growth Performance

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Introduction

- There is increasing consumer pressure to limit the antimicrobial use in poultry feed.
- One potential replacement for antimicrobials to improve nutrient digestibility is exogenous xylanase.
- It is known that xylanase will improve nutrient digestibility in higher fiber diets, but its ability to replace an antimicrobial like monensin sodium is unknown.
- Potentially, xylanase will improve FCR in corn or wheat based diets.
- Further research is needed to identify the effect of antimicrobial use in a setup other than battery cages.

Objective

The objective of this experiment was to evaluate if xylanase can replace monensin sodium to improve nutrient digestibility and if the impact differs based on the fiber level of the diet.

Procedures

- 216 Cobb chicks, with an initial average weight of 44.02 g, were hatched and allotted to battery cages (6 birds/cage, 6 cages/ treatment) for a 21-d growth experiment.
- Chicks were fed 1 of 6 dietary treatments consisting of corn- or wheat-based diet
 - 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
- Birds were fed ad libitum in battery cages for 21 days, while body weight and feed intake were reported weekly to determine BW gain, total feed intake, and FCR.
- Data was analyzed using the GLIMMIX procedure of SAS with cage as the experimental unit and treatment as the fixed effect.

Diets

Table 1. Formulas of Dietary Treatment		
Ingredient, lbs	Treatment 1: Corn Negative Control	Treatment 2: Wheat Negative Control
Wheat	0	165
Corn	147	0
Soybean meal	88	68.4
Soy oil	4.45	6.83
Dical	5.43	5.08
Limestone	1.95	0.85
Salt	0.58	0.35
L-Lys	0.45	0.85
DL-Met	0.63	0.60
L-Thr	0.075	0.30
Sodium bicarb	0.45	0.90
Poultry VTM	0.75	0.75
Econase XT	0	0
Coban 90	0	0
Total	250	250

Results

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
<i>P</i> -value				0.90	< 0.0001	< 0.0001	0.006

Conclusions

- Xylanase improves carbohydrate digestibility in wheat-based diets, restoring FCR to that of corn-based diets.
- In corn-based diets, neither the monensin sodium nor the xylanase improved ($P > 0.05$) FCR compared to the corn-based diets.
- Ultimately there was limited impact of feeding an antimicrobial in this battery cage setting.

Support

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Photos: C.K. Jones