

EFFICACY OF VTR-XYLANASE IN LAYING HENS

FROM WK 24 TO WK 32 OF AGE

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Introduction

The objective of this study was to evaluate the efficacy of VTR-XYLANASE at graded dose levels on laying hens. Responses were characterised by the determination of apparent total-tract digestibility/metabolizability, N-retention, and apparent N-corrected metabolizable energy (AMEN) in feeds. In addition, laying performance, egg quality, and health status was measured. For comparison, laying hens were fed the basal diet without VTR-XYLANASE (control group). The study was carried out in faculty of agriculture science, Humboldt-Universität zu Berlin, Berlin.

Materials and methods

A total of 200 healthy laying hens (Lohmann Brown) were purchased from a local commercial source. Selected hens were randomly assigned to 40 pens. Adult layers were fed on arrival with the control diet for 7 days acclimatisation. Following acclimatisation, pens were distributed within a climate-controlled barn for laying hens. Each treatment (T1-T4) comprised 10 replicates. Hens were maintained on a 16 h light and an 8 h dark schedule per day with an average light intensity of about 65 lux throughout the experiment. Throughout the 7-d adaptation period and the following 56-d experimental period the poultry house was provided with controlled climate and forced ventilation (air speeds about 0.5 m/s). The room temperature was kept at approximately 21 °C throughout the 7-d pre-treatment and 56-d treatment period. The relative humidity was ranging between 50 and 58 %.

Wheat-rye-barley-soybean meal diet was formulated according to nutritional requirements of adult laying hens as recommended by the Society of Nutrition Physiology (1999). Control diet T1 with 0 U/kg VTR-XYLANASE, treatment diets T2 with 1000 U/kg, T3 with 1500 U/kg, and T4 2000 U/kg VTR-XYLANASE, respectively. Mash feed and water were supplied *ad libitum*. Data were analysed by one-way ANOVA using SPSS software.

Feed composition and calculated analysis of experimental diets					
Treatment groups		T1	T2	T3	T4
Ingredients					
Soybean meal (CP 49%)	%	20.3300	20.3300	20.3300	20.3300
Wheat	%	20.0100	20.0100	20.0100	20.0100
Rye	%	20.0000	20.0000	20.0000	20.0000
Barley	%	14.9980	14.9980	14.9980	14.9980

Corn	%	10.0000	10.0000	10.0000	10.0000
Limestone	%	9.2200	9.2200	9.2200	9.2200
Soybean oil	%	3.0000	3.0000	3.0000	3.0000
Minerals & vitamins ¹⁾	%	1.2000	1.2000	1.2000	1.2000
Monocalcium phosphate	%	0.8800	0.8800	0.8800	0.8800
Titanium(IV)-dioxide	%	0.3000	0.3000	0.3000	0.3000
DL-Methionine	%	0.0600	0.0600	0.0600	0.0600
Tixosil ²⁾	%	0.0020	0.0010	0.0005	
VTR-XYLANASE	%		0.0010	0.0015	0.0020

Results and Conclusions

The significantly enhanced AME_N content in feed may suggested that the AME_N can be decreased by an average of 0.55 MJ/kg feed by VTR-XYLANASE supplementation, and improved the apparent metabolizability of gross energy significantly. The positive impacts of VTR-XYLANASE on apparent total-tract metabolizability/digestibility resulted obviously from hydrolysis of bonds between sugars in xylan molecules including arabinoxylans.

These data indicated that the higher availability of energy and nutrients resulted in less feed being consumed and in improved laying performance. Hens fed VTR-XYLANASE at 1,000 to 2,000 U/kg feed showed significantly enhanced egg production and egg mass output; therefore, feed conversion ratio was significantly improved in comparison with the control group.

The average apparent total-tract digestibility of crude fat increased significantly in treatments supplemented with VTR-XYLANASE at 1,500 and 2,000 U/kg feed as compared with the control group (+2.7%, P = 0.001). In addition, apparent total-tract digestibility of crude protein tended to be significant at 2,000 U/kg feed in comparison with the control group (+9.5%; P = 0.072). Moreover, the inclusion of VTR-XYLANASE seemed to be efficient in enhancing the apparent digestibility of crude fibre in contrast to those fed diets without VTR-XYLANASE; effects were significant at 2,000 U/kg feed (10.04% vs. 0.69%, P = 0.008).





