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EVALUATION OF TRITICALE FOR BROILER CHICKENS

Industry Impact

Poultry diets are typically composed primarily of corn and soybean meal. However, due to the production of ethanol, the prices of grains are expected to increase. Triticale is currently not being grown in Atlantic Canada on a large acreage. However, compared to wheat and rye, a higher yield per acre (Leeson and Summers 1997) makes it a possible candidate as an alternative feed ingredient for regional poultry diets. The present study indicates that feeding the Titan cultivar of triticale at the level of 45% is feasible. Results also indicate that the commercial enzyme was not required for the cultivar of triticale (Titan) evaluated. However, for commercial recommendations, dietary inclusion level of triticale as well as the need for a commercial enzyme may be dependant upon the variety of triticale available.

Introduction

Triticale (*Triticale hexaploide L*) is a hybrid cereal cross of wheat (*Triticum aestivum L)* and rye (*Secale cereale L*). It possesses the hardiness qualities of rye, such as drought tolerance and disease resistance (Boros 1999). Triticale and wheat have very similar nutrient compositions (triticale 11.8% CP; wheat 13.3% CP; NRC 1994), however, similar to wheat and rye, triticale contains arabinoxylans (Malthlouthi et al. 2002). Arabinoxylans can increase digesta viscosity in birds and can result in a 10-15% reduction in the apparent metabolizable energy value of wheat (Leeson and Summers 1997). In addition, different wheat varieties contain different levels of arabinoxylans (Mathlouthi et al. 2002). A study was conducted to determine if triticale could be fed successfully to broiler chickens at high levels and if an enzyme was required at the high level.

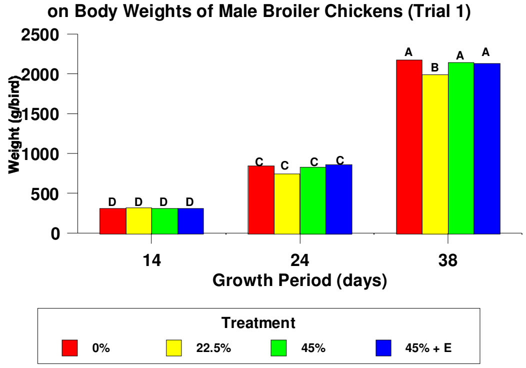
Trials

Two trials were conducted in which day-old broiler chickens were fed one of four dietary treatments: 0%, 22.5%, 45% triticale and 45% plus a commercial enzyme (Allzyme WB 500) (45%+E). The control diet (0%) was a corn/soybean-based diet. The treatments were fed for a period of 38 days. Titan, a winter cultivar of triticale (12.5% CP), grown locally, was used in the trials. The triticale was determined to contain 7.8 ppm vomitoxin.

Results

For trial 1, birds fed the 22.5% diet had lower ($P \leq 0.05$) 38-d body weights (Graph 1) and consumed less ($P \leq 0.05$) feed during the overall duration of the trial (Table 1) (1166, 1074, 1179, 1179 g bird^{-1} for 0%, 22.5%, 45% and 45%+E respectively) than those fed other diets but there was similar ($P > 0.05$) feed conversion (Table 2) (1.61, 1.60, 1.60, 1.60 feed gain^{-1} bird^{-1} for 0%, 22.5%, 45% and 45%+E respectively) among diets containing triticale. The lower 38 day body weight for the 22.5% treatment was not considered to be the result of the level of triticale in the diet since feed consumption of the birds fed the 45% and 45%+E was not incrementally affected by the step up in triticale content. Earlier research (Hamilton et al 1985) determined that chickens can tolerate feed containing up to 5 ppm of vomitoxin. The level of vomitoxin in the diets containing 45% triticale was less than than 5 ppm. Therefore, the vomitoxin in the triticale was not considered to be detrimental to growth performance. Further, for trial 2, diet had no effect (P>0.05) on growth performance providing further evidence that the reduced body weights in the first trial were not the result of level of triticale.

Figure 1. Effect of Dietary Treatment and Age on Body Weights of Male Broiler Chickens (Trial 1)



A-D P<0.05

Table 1. Effect of dietary treatment and age on feed consumption (g bird^{-1}) (Trial 1)

Dietary treatment	1-14 d	15-24 d	25-38 d	Dietary treatment mean
0%	397	890	2212	1166^{ab}
22.5%	359	760	2103	1074^{b}
45%	367	840	2329	1179^{a}
45% + E	387	838	2313	1179^{a}
Age mean	377^{c}	832^{b}	2239^{a}	

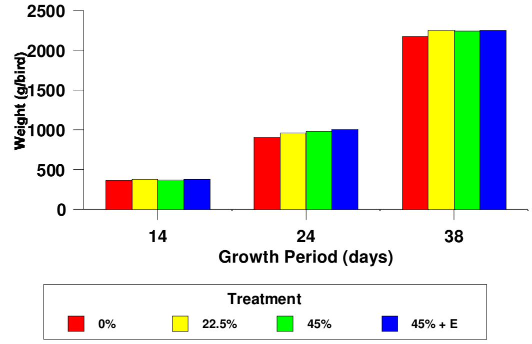
$^{a-c}$ Least-square means within the same row or column with different letters differ significantly (P<0.05).

Table 2. Effect of dietary treatment and age on feed conversion (feed gain^{-1} bird^{-1}) (Trial 1)

Dietary treatment	1-14 d	15-24 d	25-38 d	Dietary treatment mean
0%	1.48	1.67	1.67	1.61
22.5%	1.38	1.71	1.71	1.60
45%	1.41	1.63	1.77	1.60
45% + E	1.46	1.53	1.81	1.60
Age mean	1.43^{c}	1.64^{b}	1.74^{a}	

$^{a-c}$ Least-square means within the same row with different letters differ significantly (P<0.05).

Figure 2. Effect of Dietary Treatment and Age on Body Weights of Male Broiler Chickens (Trial 2)



P>0.05

Table 3. Effect of dietary treatment and age on feed consumption (g bird^{-1}) (Trial 2)

Dietary treatment	1-14 d	15-24 d	25-38 d	Dietary treatment mean
0%	428	885	2225	1179
22.5%	443	981	2370	1265
45%	434	898	2377	1236
45% + E	405	896	2341	1214
Age mean	427^{c}	915^{b}	2328^{a}	

$^{a-c}$ Least-square means within the same row with different letters differ significantly (P<0.05).

Table 4. Effect of dietary treatment and age on feed conversion (feed gain^{-1} bird^{-1}) (Trial 2)

Dietary treatment	1-14 d	15-24 d	25-38 d	Dietary treatment mean
0%	1.34	1.63	1.75	1.57
22.5%	1.31	1.69	1.84	1.61
45%	1.31	1.47	1.89	1.56
45% + E	1.20	1.44	1.87	1.51
Age mean	1.29^{c}	1.56^{b}	1.84^{a}	

$^{a-c}$ Least-square means within the same row with different letters differ significantly (P<0.05).

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For more information on this project or any other project contact apri@nsac.ca

Diet compositions and references available upon request.