

Effect of dietary levels of tallow and NSP degrading enzyme supplements on nutrient efficiency of broiler chickens

K. Taibipour, H. Kermanshahi*

Dept. of Animal Sci., Ferdowsi Univ. of Mashhad, Mashhad, Iran P.O.Box 91775-1163

*Email kermansh@ferdowsi.um.ac.ir

Introduction Fat digestibility in broilers depends not only on fat type but also on the particular cereal grain that is used. There are considerable evidences showing antinutritive effect of NSP in cereals have a pronounced negative effect on digestibility of fat in young birds. An increase in intestinal viscosity depresses fat digestibility more in animal fat-based diets. Reduction in viscosity due to enzyme addition in such diets should exert a more pronounced effect (Danicke, 1999a). Significant interaction effect between dietary fat type and carbohydrase addition was also reported (Danicke, 1999b). The objective of the present study was to examine the effects of dietary levels of tallow and NSP degrading enzyme supplements on broiler chickens.

Materials and methods In a completely randomized design experiment with a 3*3 factorial arrangement (tallow levels; 0, 20, and 40 g/kg and NSP degrading enzyme levels; 500 and 1000 mg/kg containing 1200 U/g arabinoxylanase and 400 U/g beta-glucanase, GNC Bioferm Inc., Canada) with 4 replicates of 4 birds each, 144 day-old Hubbard Classic male broiler chickens were fed wheat- soybean meal based diets containing 620 g/kg wheat. To make the diets isoenergetic and isonitrogenous with different tallow levels, corn starch was used. For nutrient digestibility using Cr₂O₃ as indigestible marker, feces samples were collected from 18-21 days of age. At 21 days of age, two birds from each replicate of treatments were killed for ileal digesta collection. Data were analyzed using the general linear procedure of SAS (1986).

Result Apparent metabolizable energy (AME), apparent lipid digestibility of feces (ALD_f), apparent protein digestibility (APD), and apparent lipid digestibility of ileal digesta (ALD_i) are shown in table. AME in all treatments affected by tallow and enzyme levels (P<0.01). Increasing the level of tallow in the diet significantly reduced ALD_f (P<0.01) and enzyme addition significantly improved it (P<0.01). This improvement was highest when the level of tallow in the diet was at its maximum level (80.238 vs 68.791). APD was not affected by treatments but improved when enzyme added to each level of tallow. ALD_i was significantly reduced by levels of tallow but increased by enzyme (P<0.01).

Table Effects of different tallow and enzyme levels on AME (MJ/kg) and nutrient digestibilities (%) in broiler chickens from 18-21 days of age

	Tallow(g/kg)			P values	Enzyme(mg/kg)			P values	SEM
	0	20	40		0	500	1000		
AME	12.898 ^a	12.365 ^{ab}	11.368 ^b	0.009	11.158 ^b	12.319 ^a	13.155 ^a	0.008	0.2188
APD	81.609	80.662	80.657	NS	79.786	80.959	82.182	NS	0.7063
ALD _f	82.151 ^a	73.748 ^b	68.791 ^c	0.0001	67.723 ^a	76.738 ^b	80.238 ^c	0.001	0.0902
ALD _i	84.420 ^a	74.321 ^b	70.522 ^b	0.001	69.121 ^b	78.450 ^a	81.756 ^a	0.012	0.740

P values for tallow and enzyme effects were significantly different (p<0.01). AME, apparent metabolizable energy; APD, apparent protein digestibility; ALD_f, apparent lipid digestibility of feces; ALD_i, apparent lipid digestibility of ileal digesta, NS; not significant. The values in each row with different superscripts are significantly different (p<0.05)

Conclusions Under the condition of this experiment, it was concluded that increasing the level of Tallow to diets containing 620 g/kg wheat decreases their AME, ALD_f and ALD_i. Addition of NSP degrading enzyme to diets containing wheat also increases their AME, ALD_f and ALD_i.

Acknowledgement Financial support of Ferdowsi university of Mashhad, Iran is greatly acknowledged.

References

- Danicke, S., Simon, O. and Bedford, M.R.(1999_a) Effects of dietary fat type, pentosan level and xylanase supplementation on digestibility of nutrients and matabolizability of energy in male broilers. *Archives of Animal Nutrition* **52**,245-261
- Danicke, S., Jeroch, H., Bottcher, W., Bedford, M.R. and Simon, O. (1999_b) Effects of dietary fat type, pentosan level and xylanases on digestibility of fatty acids, liver lipids and vitamin E in broilers. *Fett/Lipid*. **101**, 90-100
- SAS Institute, 1986 *SAS User's Guide*. Ver. 6. SAS Institute Inc., Cary, NC.