Relationship of chemical composition and metabolisable energy of triticale for poultry

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Introduction Triticale, a hybrid of wheat and rye is an alternative cereal grain to maintain the metabolisable energy of poultry diet (Zarghi, H., and A. Golian, 2009). The chemical composition and metabolisable energy of triticale may vary based on the agronomical conditions. The purpose of this study was to determine the nitrogen corrected true metabolisable energy (TME_n) of triticale produced in the northeast of Iran, and in addition, to investigate the relationship between chemical composition and TME_n of triticale for poultry.

Materials and methods Ten triticale samples were collected randomly from different locations in the northeast of Iran (Khorasan Razave Province). The samples were analyzed for dry matter, ether extract (EE), crude protein (CP), crude fibre (CF), ash and calculated nitrogen free extract (NFE). The precision-fed rooster assay, Sibbald (1982) was used to determine the TME_n of samples. Fifty five adult cockerels (Hy-Line, average weight of 2030 g) were housed in individual metabolism cages and fed a maintenance diet for two weeks of adaptation. At the start of the experiment on the third week, following a period of 24 h feed restriction, 25 g of each ground sample was fed to a bird by intubation with five birds per sample. Five feed restricted cockerels were kept deprived of feed to estimate the endogenous energy losses. Total excreta voided over the following 48-h period were collected, dried and ground for subsequent analyses. Gross energy (GE) of feed and excreta samples was measured in a Bomb-calorimeter (Model 1266, PARR).

Results The average and standard deviation (SD) of chemical composition of the ten triticale samples is shown in Table 1. A wide variation in CP (121.8 to 170.0 g/kg dry matter basis) and NFE (747.6 to 798.4 g/kg dry matter basis) was found between triticale samples. The determined TME_n of the samples collected from different locations varied between 13.6 and 14.7 MJ/kg on dry matter basis. The regression equation describing the relationship between the TME_n and chemical composition of the triticale samples is shown in the following formula:

$$TME_n \text{ (MJ Kg}^{-1} \text{ dry matter basis)} = 16.063 - 0.115\ EE - 0.027\ CP \qquad r^2 = 0.81$$

Table1 The average chemical composition, gross energy (GE) and nitrogen corrected true metabolisable energy (TME_n) for ten triticale samples (dry matter basis).

Triticale samples	No	EE	CP	CF	Ash	NFE	GE	TME_n
		g/kg					MJ/kg	MJ/kg
Average	10	16.5	140.5	49.2	17.7	776	17.5	14.2
Standard deviation		2.93	13.67	4.96	3.25	16.2	0.20	0.40

Conclusion The average TME_n value (14.2 MJ/ kg dry matter basis) found for triticale in this study was very close to the value reported by National Research Council (NRC, 1994) and in the range of values (14.0 to 15.2 MJ/ kg dry matter) reported by Flores et al. (1994). The TME_n prediction equation was derived to estimate the TME_n of triticale from the chemical composition for poultry nutrition.

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