

# Comparison of different indigestible markers for digestibility estimation in turkeys and chickens

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Ileal transit time of digesta (marker), apparent ileal protein digestibility and apparent metabolizable energy (AME<sub>N</sub>) estimates of different cereal-based diets (containing wheat, dehulled barley, oats) fed as such or enzyme-supplemented in 3- and 6-week-old turkeys and broilers (Exp. 1) and in 9-week-old turkeys and adult hens (Exp. 2) were investigated. The differences between ileal digestibility and AME<sub>N</sub> estimates calculated by using titanium dioxide (TiO<sub>2</sub>), chromic oxide (Cr<sub>2</sub>O<sub>3</sub>) or acid insoluble ash (AIA) as indigestible markers were detected. TiO<sub>2</sub> retention time in ileum was elongated with bird age, but more pronouncedly in broilers than in turkeys. Oats inclusion to the diets decreased retention time more in turkeys than in broilers especially at 6 weeks of age. Differences between ileal digestibility estimates obtained with TiO<sub>2</sub> or Cr<sub>2</sub>O<sub>3</sub> were small and mainly not significantly different from 0. At faecal level, however, AME<sub>N</sub> estimates were generally higher when calculated with TiO<sub>2</sub> than with Cr<sub>2</sub>O<sub>3</sub> in Exp. 1 but higher with TiO<sub>2</sub> than with Cr<sub>2</sub>O<sub>3</sub> in Exp. 2. AIA gave remarkably lower AME<sub>N</sub> values than TiO<sub>2</sub>. In addition effects of markers interacted with age of the birds and dietary treatments. It is concluded that comparability of digestibility results obtained by different markers can be questioned.

**Keywords:** turkeys, chickens, digestibility, marker, transit time

**Table 1. Difference between AME<sub>N</sub> estimates in different diets calculated with different markers.**

	AMEN <sub>Ti</sub> – AMEN <sub>Cr</sub>					
	WB	WB+E	O	O+E	WBO	WBO+E
Exp. 1, turkeys, 3 weeks	-0.549*	-0.237	-0.240*	-0.564*	-0.498*	-0.248*
Exp. 1, broilers, 3 weeks	-0.311*	-0.175	-0.333*	-0.414*	-0.568*	-0.222
Exp. 1, turkeys, 6 weeks	-0.170	0.005	-0.138	-0.375*	-0.152	-0.036
Exp. 1, broilers, 6 weeks	-0.153	-0.071	-0.165	-0.244*	-0.171	-0.089
Exp. 2, turkeys, 9 weeks	0.036	-0.016	-0.023	0.376*	0.084	0.106*
Exp. 2, hens	0.079	0.039	0.073	0.367*	0.214*	0.165*

  

	AMEN <sub>Ti</sub> – AMEN <sub>AIA</sub>					
	WB	WB+E	O	O+E	WBO	WBO+E
Exp. 1, turkeys, 3 weeks	0.440*	0.194	0.028	0.325*	0.018	0.024
Exp. 1, broilers, 3 weeks	0.576*	0.226*	0.100	0.612*	-0.204	0.048
Exp. 1, turkeys, 6 weeks	0.378*	0.172	0.229*	-0.010	0.112	0.236*
Exp. 1, broilers, 6 weeks	0.353*	0.053	0.123	-0.045	-0.027	0.099
Exp. 2, turkeys, 9 weeks	0.417*	0.416*	0.936*	0.391*	0.404*	0.558*
Exp. 2, hens	0.340*	0.228	-0.089	-0.234	0.052	-0.151

\*for marked means, 95 % confidence interval does not cover 0 indicating significant difference

WB = wheat+dehulled barley based diet, O = oats based diet, WBO = wheat+dehulled barley+oats based diet, +E = supplemented with enzyme (β-glucanase+xylanase)