



## The Effect of Adding Multi Enzyme Using Tomato Pomace on Broiler Chickens' Performance

Mohammad Bahaadin Shamseborhan and Alireza Safamehr

Department of Animal Science, Maragheh Branch, Islamic Azad University, Maragheh, Iran

\*Corresponding author's email:

### ABSTRACT

This trial was conducted in order to investigate the effects of adding of multi enzyme in diets which broiler chicks were fed corn-soybean meal based with different levels of tomato pomace (TP: 0, 2, 4, 6 and 8%) and two levels of enzyme (0 and 4 gr enzyme per 100 kg of diets). The trial was conducted based on completely randomized design by method of factorial with four replication for each treatment and 480 of male and female broiler chicks Ross at the period of 42 day. The results showed that the using of different levels of tomato pomace at the starter period had significant effect on weight gain, feed conversion ratio ( $p < 0.05$ ), and feed intake ( $p < 0.05$ ). Growth rate at 6% of TP in comparison with control decreased ( $p < 0.05$ ).

**Keywords:** Multi Enzyme, Tomato Pomace and Performance

### INTRODUCTION

Using agro-industrial byproducts is an alternative method for overcoming shortages and higher prices of conventional feed in poultry nutrition. Many byproducts have a substantial nutritive value as animal feed. Thus cereals can be largely replaced by these by-products and therefore competition between human and animal for nutrition is less. Furthermore, using these by-products in animal nutrition can solve related environmental problems.

Tomato (*Solanum Lycopersicum*) is one of the most widely cultivated vegetable crops in Mediterranean countries. After juice is extracted, a residue, tomato pomace, which primarily consists of water, tomato seeds, and peels, is left. The high water content of this by-product limits its length of storage. Because of storage problems, tomato pomace is often dried (Weiss et al, 1997). Dried tomato pomace contains 22.6-24.7% protein, 14.5 – 15.7% fat and 20.8 – 23.5% fiber and this by-product is a good source of vitamin B<sub>1</sub>, B<sub>2</sub> and A (Aghajanzadeh et al, 2010).

Polysaccharides are major components of plant materials used in rations for monogastrics. They are macromolecular polymers of monosaccharides linked by glycosidic bonds. The most important, starch, shows glucose units linked by  $\alpha$ -(1-4) with a few  $\alpha$ -(1-6) bonds and 90-95% of starch is digested in the small intestine of poultry through endogenous enzyme activity. Non-starch polysaccharides (NSP) include

celluloses, hemicelluloses, pectines and oligosaccharides (a-galactosides, etc.). They can also be divided into water-soluble and water-insoluble fractions; fractions which have greater relevance to their nutritional values (Carre, 1993).

Feeding by-products of the crop and food processing industries to livestock is a practice as old as the domestication of animals by humans. It has two important advantages, these being to diminish dependence of livestock on grains that can be consumed by humans (which was almost certainly the primary original reason), and to eliminate the need for costly waste management programs (which has become very important in by-product has increased, particularly in developed countries. The objective of this study was to determine the effects of using tomato pomace on broiler performance.

### MATERIALS AND METHODS

This study was conducted as 5×2 factorial experiment with 3 levels of Tomato pomace (0, 2, 4, 6 and 8 percent) and 2 level of Enzyme (0 and 40 g/100kg) in 10 treatments, 4 replicates and 12 birds in each replicate in a completely randomized design. In this experiment 480 day old broiler chick (Ross 308 strain) were used for 42 days. The chicks were allocated randomly to 10 experimental diets. The diets were formulated to meet the requirements of broiler chicks as established by the NRC (1994). The diets

and water was provided ad libitum. The lighting program during the experimental period consisted of a period of 23 hours light and 1 hour of darkness. Environmental temperature was gradually decreased from 33°C to 25°C on day 21 and was then kept constant. Body weight, feed intake and feed conversion were determined weekly on bird bases. Mortality was also recorded.

The data were subjected to analysis of variance procedures appropriate for a completely randomized design using the General Linear Model procedures of SAS Institute (2005). Means were compared using the Duncan multiple range test. Differences were considered significant at  $P < 0.05$ .

## RESULTS AND DISCUSSION

The effects of different levels of Tomato Pomace and Enzyme and interactions of them on broilers performance are summarized in Table 1. There were significant differences between treatments due to added dietary Tomato Pomace ( $P < 0.05$ ). Data showed that the treatment with 4% TP have highest weight gain and treatment with 6% TP have lowest weight gain ( $P < 0.05$ ). Results showed that increasing enzyme increase weight gain, because improve intestinal digestibility of ration. Adding Enzyme did not have any significant effects on FCR of broilers, but improve this parameter.

**Table 1.** The effects of using Tomato Pomace on broiler performance (0-42day)

Item	Tomato Pomace	Enzyme	Weight Gain	Feed Intake	FCR
1	0	-	44.26 <sup>ab</sup>	87.41 <sup>ab</sup>	1.98 <sup>ab</sup>
2	0	+	42.43 <sup>ab</sup>	82.38 <sup>ab</sup>	1.94 <sup>ab</sup>
3	2	-	41.79 <sup>ab</sup>	85.03 <sup>ab</sup>	2.04 <sup>ab</sup>
4	2	+	42.73 <sup>ab</sup>	81.62 <sup>ab</sup>	1.92 <sup>ab</sup>
5	4	-	40.62 <sup>ab</sup>	82.28 <sup>ab</sup>	2.03 <sup>ab</sup>
6	4	+	46.17 <sup>a</sup>	77.01 <sup>b</sup>	1.67 <sup>c</sup>
7	6	-	39.5 <sup>b</sup>	84.3 <sup>ab</sup>	2.15 <sup>a</sup>
8	6	+	43.58 <sup>ab</sup>	82.08 <sup>ab</sup>	1.89 <sup>b</sup>
9	8	-	41.74 <sup>ab</sup>	92.42 <sup>a</sup>	2.22 <sup>a</sup>
10	8	+	44.01 <sup>ab</sup>	89.41 <sup>ab</sup>	2.03 <sup>ab</sup>
SE			1.63	3.71	0.09
Main Effects of Tomato Pomace					
	0		43.34	84.9 <sup>ab</sup>	1.96 <sup>ab</sup>
	2		42.26	83.33 <sup>ab</sup>	1.98 <sup>ab</sup>
	4		43.4	79.64 <sup>b</sup>	1.85 <sup>b</sup>
	6		41.54	83.19 <sup>a</sup>	2.01 <sup>ab</sup>
	8		42.87	90.92 <sup>a</sup>	2.13 <sup>a</sup>
Main Effects of Enzyme					
	0		41.58 <sup>b</sup>	86.28	2.08
	0.04		43.79 <sup>a</sup>	82.5	1.89
Differences Sources					
	Tomato pomace		ns	ns	ns
	Enzyme		0.04	ns	0.002
	E × TP		ns	ns	ns

## CONCLUSION

The overall results indicated that in broilers adding Tomato Pomace until 4% without any adverse effects on performance of broilers is possible and inclusion Enzyme has improved performance of broilers and recommended.

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