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## The effect of probiotics on growth performance of broilers

<sup>1</sup>Roozbeh Shabani, <sup>1</sup>Mehran Nosrati, <sup>1</sup>Faramin Javandel, <sup>1</sup>Ali Ahmad Alaw Gothbi and  
<sup>2,3</sup>Hamed Kioumars\*  

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<sup>1</sup>Department of Animal Science, Islamic Azad University, Rasht, Iran  
<sup>2</sup>Department of Animal Science, Mehraeen University, Bandar Anzali, Iran  
<sup>3</sup>School of Biological Science, USM, Minden 11800, Penang, Malaysia

### ABSTRACT

After the FDA ban on fluoroquinolones from being used in poultry over concerns that it was a driving force behind antibiotic-resistant bacteria, the use of probiotic bacteria has become increasingly popular for improved nutrition. The aim of this study was to assess the effects on growth performance by introducing three kinds of commercial probiotics, to the diet of broiler chickens, commercial strain, 308 vertexes in Iran. For this purpose, chickens were divided into four groups include: (a) control group, without probiotics, (b) experimental group containing Protexin, (c) experimental group containing Primalac, (d) experimental group containing Calciparine. The effects of probiotics on growth performance were measured and results shows that feeding broilers with probiotics have significant effects ( $P < 0.05$ ) on average daily gain (ADG) and feed conversion ratio (FCR), while it appeared insignificant on daily feed intake (DFI). However, the results of this research reveal that that feeding chicken broilers with these probiotics have positive effects on growth performance of chicken broilers. Thus, the use of these probiotics is highly recommended.

**Keywords:** Broilers, probiotics, growth performance, commercial strain.

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### INTRODUCTION

Supplementing the ratio with antibiotics growth promoters could increase growth performance of animals. Various mechanisms have been proposed which are include: (a) the nutrients are more efficiently absorbed and less are utilised by the gut, (b) more nutrients are available to the host because of a reduced intestinal microflora, (c) there is a reduction in harmful gut bacteria, (d) production of growth suppressing toxins or metabolites is reduced, (e) microbial de-conjugation of bile acids is decreased [1]. But, with increasing concerns about antibiotic resistance, the ban on subtherapeutic antibiotic usage, there is increasing interest in finding alternatives to antibiotics for poultry production and using probiotics is an approach that has potential to reduce enteric disease in poultry and subsequent contamination of poultry products [2]. However, it is possible to promote growth of broiler chickens and achieving both enhanced performance and good health by using alternatives such as probiotics and probiotics [1,2]. Probiotics are live microorganisms that affect the host animal by improving its intestinal balance [3]. Furlan [4] mentioned that the probiotic mode of action is related to the competition for attachment sites (competitive exclusion). The bacteria present in the probiotic attach to the intestinal mucosa and blocks the attachment of pathogenic bacteria by forming a physical barrier. Khaksefidi and Rahimi [5] conducted an experiment with three hundred and twenty broiler chickens to measure the effects of probiotic on growth of chickens and results revealed that adding probiotic to the diet significantly improved the live weight and feed conversion rate of the chickens.

Cavazzoni et al. [6] evaluated performance of broiler chickens supplemented with *Bacillus coagulans* as probiotic and found that feeding probiotic supplements increase the growth rate of broilers. There have been many previous

studies to evaluate probiotics on broiler and to give good reason for its impact on broiler growth and health status different mechanisms have been proposed. Kabir [7] stated that probiotic effects on intestinal microflora and pathogen inhibition, intestinal histological changes, immunomodulation, some haemato-biochemical parameters and subsequently improve growth performance of broilers. He also mentioned that probiotic improves sensory characteristics of dressed broiler meat and microbiological meat quality of broilers. However, it is mentioned that the main effect of probiotic is in the gastrointestinal tract and associated with its capacity to stimulate the immune response and to control the growth of pathogenic bacteria. [7,8,9,10]. In this study, effects of three probiotics include; Premalac, Calciporin, and Protexin on broilers growth performance were evaluated by measuring ADG, FCR and DFI.

## MATERIALS AND METHODS

This study was conducted in 2012 as a portion of Animal Science Research Program in Agricultural and Animal Science Research Center of Azad University, Rasht Branch in north of Iran. 160 chickens broiler were used for this experiment. The ratios were prepared according to need of chicken broilers for three periods include: day 1 to day 14 of the experiment, day 14 to day 28 of the experiment, and day 28 to the end of experiment when chickens slaughtered. The animals were housed in experimental pens and fed two times a day with a basal diet include corn and soybean. Food was offered in the morning and evening and that refused from the previous day was removed before the new meal was given on the following morning. However, for this research four rations were used. The ratios include: (1) basal diet, (2) basal diet+ Premalac, (3) basal diet+ Calciporin, (4) basal diet+ Protexin.

A completely randomized design of 4 diets in a 4x4 factorial design was replicated four times. The model was:

$$X_{ij} = M + T_i + E_{ij}$$

Where:

$X_{ij}$  = Observations

$M$  = Treatment average

$T_i$  = Effect of the treatment

$E_{ij}$  = Experimental error

## RESULTS AND DISCUSSION

Results are shown in Table 1 to 3. The results show that the treatments had significant effects in ADG and FCR. However, the chicken broilers feed with Protexin, resulted in the most favorable ADG while broilers fed with ratios of Premalac and Calciporin were ranked second and third and broilers in control group were ranked fourth. Feed conversion ratios are also provided in Table 2. The results showed that the ratio which includes probiotics was associated with the best outcome. The chicken broilers feed with Protexin have the lowest FCR and was the most favorable while broilers fed with ratios of Premalac and Calciporin were ranked second and third and broilers in control group were ranked fourth. The results of current study are in line with other studies that investigated effect of probiotics on chicken broilers. The primary role of a diet is to provide enough nutrients to fulfill metabolic requirements of the body and also to modulate different functions of the body. Probiotics are beneficial microorganisms that can be suitably used to improve growth performance and health of broiler chickens [11].

**Table 1. Effects treatments on broilers daily feed intake (DFI).**

Treatments	1st week	2nd week	3rd week	4th week	5th week	6th week	average
Control	16.25	63.29	76.79	154.64	173.54	195.36	113.31±1.77
Protexin	16.61	61.36	76.61	175.00	175.29	202.68	117.76±4.74
Primalac	15.36	62.86	81.96	153.04	171.61	194.64	113.25±2.02
Calciparine	17.75	61.96	77.68	159.29	175.25	198.21	115.02±1.79

<sup>a,b,c</sup> Means within rows for different group with different superscripts differ ( $P < 0.05$ )

**Table 2. Effects treatments on broilers average daily gain (ADG).**

Treatments	1st week	2nd week	3rd week	4th week	5th week	6th week	average
Control	11.51 <sup>b</sup>	24.50 <sup>b</sup>	40.29 <sup>b</sup>	62.29 <sup>b</sup>	89.32 <sup>b</sup>	127.14 <sup>b</sup>	59.18 <sup>b</sup> ±2.54
Protexin	14.57 <sup>a</sup>	29.04 <sup>a</sup>	51.93 <sup>a</sup>	88.04 <sup>a</sup>	108.57 <sup>a</sup>	155.54 <sup>a</sup>	74.61 <sup>a</sup> ±2.76
Primalac	14.56 <sup>a</sup>	28.43 <sup>a</sup>	51.54 <sup>a</sup>	83.39 <sup>a</sup>	109.11 <sup>a</sup>	151.96 <sup>a</sup>	73.16 <sup>a</sup> ±1.39
Calciparine	13.66 <sup>a</sup>	28.18 <sup>a</sup>	50.71 <sup>a</sup>	81.43 <sup>a</sup>	112.57 <sup>a</sup>	144.93 <sup>a</sup>	71.91 <sup>a</sup> ±0.41

<sup>a,b,c</sup> Means within rows for different group with different superscripts differ ( $P < 0.05$ )

**Table 3. Effects treatments on feed conversion ratio (FCR)**

Treats	1st week	2nd week	3rd week	4th week	5th week	6th week	average
Control	1.41 <sup>a</sup>	2.60 <sup>a</sup>	1.91 <sup>a</sup>	2.49 <sup>a</sup>	1.96 <sup>a</sup>	1.55 <sup>a</sup>	1.92 <sup>a</sup> ±0.07
Protexin	1.14 <sup>c</sup>	2.09 <sup>b</sup>	1.48 <sup>b</sup>	1.99 <sup>b</sup>	1.62 <sup>b</sup>	1.31 <sup>b</sup>	1.58 <sup>b</sup> ±0.05
Primalac	1.05 <sup>c</sup>	2.22 <sup>b</sup>	1.61 <sup>b</sup>	1.84 <sup>b</sup>	1.58 <sup>b</sup>	1.28 <sup>b</sup>	1.55 <sup>b</sup> ±0.03
Calciparine	1.31 <sup>b</sup>	2.20 <sup>b</sup>	1.53 <sup>b</sup>	1.96 <sup>b</sup>	1.56 <sup>b</sup>	1.37 <sup>b</sup>	1.60 <sup>b</sup> ±0.02

<sup>a b c</sup> Means within rows for different group with different superscripts differ ( $P < 0.05$ )

Ignatova et al. [12] conducted a research to evaluate effects of dietary inclusion of probiotics on chicken's performance. Two hundred 1-d old male White Plymouth Rock-mini chickens were studied for this research purpose. However, results revealed that probiotic supplementation has positive effects on final body weight by 14.4% ( $P < 0.001$ ), increased feed intake by 7.7%, and improved feed utilization by 8.1%. Several studies have been conducted to evaluate the ability of probiotics to change the type and number of the microflora in the digestive tract and results show that dietary supplementation of probiotic have a positive effect on growth performance and would significantly increase ADG and FCR in broiler chicks receiving probiotics [13,14,15]. The results of current study also show that feeding broilers with probiotics had no significant effect on FI, but improved them as numeral and increasing FI itself could improve growth performance.

### CONCLUSION

The results revealed that using probiotics had significant effects ( $P < 0.05$ ) on average daily gain and feed conversion ratio and positively affects growth of chicken broilers. Thus, according to the results, the use of these probiotics for chicken broilers is recommended. The authors also suggest that future research could be done with different breeds of chicken broilers.

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### REFERENCES

- [1] E.I. Ohimain, T.S. Ruth, T.S. Ofongo, *Int. J. Anim. Vet. Adv.*, **2012**, 4: 135-143.
- [2] J.A. Patterson, K.M. Burkholder, K.M., *J. Poult. Sci.*, **2003**, 4: 627-631.
- [3] R. Fuller, *J. Poult. Sci.*, **2001**, 38: 189-196.
- [4] R.L. Furlan, *Chapeçó, Santa Catarina, Brazil.*, **2005**, 58-76.
- [5] A. Khaksefidi., S. Rahimi, *Asian-Aust. J. Anim. Sci.*, **2005**, 8: 1153-1156.
- [6] V. Cavazzoni, A. Adami, C. Castroville C, *Brit. J. Pol. Sci.*, **1998**, 9: 526-539.
- [7] S.M. Kabir, *Int. J. Mol. Sci.*, **2009**, 10: 3531-3546.
- [8] J.P. Higgins, S.E. Higgins, J.L. Vicente, A.D. Wolfenden, G. Tellez, B.M. Hargis, *Poult. Sci.*, **2007**, 86: 1662-1666.
- [9] H.K. Huang, Y.J. Choi, R. Hude, J.W. Lee, B. Lee, V. Zhao, *Poultry Sci.*, **2004**; 83: 788-795.
- [10] K.C. Mountzouris, P. Tsirtsikos, E. Kalamara, S. Nitsch, G. Schatzmayr, K. Fegeros, *Poult. Sci.*, **2007**, 86: 309-317.
- [11] S. Zamanzad-Ghavidel, K. Nazer Adl, N. Maheri Sis, S. Aharizad, A. Mirzaei-aghsaghali, M. Mohammadian, S.A. Siadati. *Annals of Biological Research.*, **2011**, 2: 325-331.
- [12] M. Ignatova1, V. Sredkova, V. Marasheva. *Biote. Anim. Hus.*, **2009**, 25: 1079-85.
- [13] J. Yeo, K. Kim, *Poult. Sci.*, **1997**, 76: 381-385.
- [14] G.R. Gibson, F. Fuller, *J. Nutr.*, **2000**, 130: 391-395.
- [15] M. Midilli, S.D. Tuncer, *Turk. J. Vet. Anim. Sci.*, **2001**, 25: 895-903.