

ORIGINAL ARTICLE

Effect of Dry and Fermented Whey Powder on the Broiler Performance

Shahabodin Gharahveysi^{1*}, Mehdi Bahari², Hedye Sadat Taheri¹, Sekineh Asadzadeh¹ and Safiyeh Vatandour¹

1- Department of Animal Science, Qaemshahr Branch- Islamic Azad University, Qaemshahr, Iran.

2- Department of Animal Nutrition, University of Agricultural Sciences and Natural Resources, Sari, Pardsis, Iran.

*Corresponding E-mail address: s.gharavysi@gmail.com

ABSTRACT

The whey powder has considerable amount (about 65%) of Lactose. The poultry could not digest that since lack of the lactase enzyme. Adding whey powder to the diet improved growth performance. In this study the effects of dry and fermented whey powder on the broiler has been investigated in the framework of a completely randomized design with 5 treatments and 3 iteration and 15 broilers totally 225 chicks Ross308 in 3 periods named starter, grower, and finisher. Experiment treatments included the control without whey, 2, 4, 5, and 10% fermented whey powder. The results showed using different levels of whey powder in the feed, FCR, weight of the body, and carcass traits caused significant difference between treatments ($P < 0.05$). The results shown using 4% whey powder in broiler diet improved general performance and carcass traits. Thus whey could use in the broiler diet as a useful foodstuff in improving the performance.

Key words: Whey powder, Performance, Carcass traits and Broiler

Received 14/11/2014 Accepted 29/01/2015

©2015 Society of Education, India

How to cite this article:

Shahabodin G, Mehdi B, Hedye S T, Sekineh A and Safiyeh V. Effect of Dry and Fermented Whey Powder on the Broiler Performance. Adv. Biores., Vol 6 [2] March 2015: 79-82. DOI: 10.15515/abr.0976-4585.6.2.7982

INTRODUCTION

About 2 million tons whey produced in the country equals 150000 tons. Since few countries processing the whey large amount of whey wasted in the year. In addition to environmental problems this caused wasting the material with a high nutrition value that could simply use in the poultry diet [2]. The whey powder has considerable amount (about 65%) of Lactose. The poultry could not digest that since lack of the lactase enzyme. Lactose has been fermented in poultry Gastrointestinal tract and caused producing some useful bacteria [6]. The Researches are shown adding whey powder to the diet improved growth performance in the broiler [1,5]. According to the whey advantageous in the broiler diet that have proven in the several experiments this study trends to show advantageous of this useful feed and is going to improve growth performance of broiler.

MATERIAL AND METHODS

This study had been done in the framework of a completely randomized design with 5 treatments and 3 iteration and 15 broilers totally 225 chicks Ross308 in 3 periods named starter, grower, and finisher during 42 days. Different diet groups are based on standard tables of feed advises (NRC-1994) and was adjusted using diet formulation software UFFDA based on the corn and soybean meal. Experiment treatments were included the control, 2 and 4% whey powder (in the feed) and 10% fermented whey (in the water). The weekly feed consumption, FCR, weight of the body, and carcass components weight are the properties that were measured. The software SAS 9.1 had been used to data analysis and comparison between mean and Duncan test performed in the 5% level.

RESULTS

The effect of using treatments having different levels of whey on the amount of feed consumption during starter, grower, and entire period are given in table (1) shown that there is significant difference between the treatments ($P < 0.05$). The results showed that the treatment having 10% fermented whey in water had higher feed consumption.

Table (1): Effect of using treatments having different levels of whey on the amount of using feed consumption (gr)

Treatment	Starter	Grower	Finisher
Control	938 ^b	3899 ^b	4837 ^b
With 2% whey powder in diet	870 ^c	4083.3 ^b	4945 ^b
With 4% whey powder in diet	935.33 ^b	4008.7 ^b	4944 ^b
With 5% whey powder in water	996.33 ^{ab}	4109.7 ^b	5106 ^b
With 10% whey powder in water	1054.67 ^a	4608.3 ^a	5663 ^a
SEM	9.16	46.27	49.09
P.Value	0.0009	0.005	0.002

The means that shown with different letters have significant difference ($P < 0.05$)

SEM: Mean standard error

Effects of using the treatment with different levels of whey powder on the weight of body during starter, grower, and entire period (Table2) showed that there is significant difference between treatments ($P < 0.05$). The treatment with 4% whey powder in diet and 10% fermented whey in water had lowest and highest body weight, respectively.

Table (2): Effect of using the treatments with different levels of whey on the weight of the body(gr)

Treatment	Starter	Grower	Finisher
Control	598 ^a	1881.7 ^{ab}	2479.67 ^{ab}
With 2% whey powder in diet	592 ^a	1938 ^a	2530 ^{ab}
With 4% whey powder in diet	623 ^a	1974.3 ^a	2597.33 ^a
With 5% whey powder in water	594.33 ^a	1830.3 ^{ab}	2418 ^b
With 10% whey powder in water	542.33 ^b	1371.7 ^b	2247.33 ^c
SEM	6.17	73.45	16.11
P.Value	0.02	0.13	0.0005

The means that shown with different letters have significant difference ($P < 0.05$)

SEM: Mean standard error

Effect of using the treatment with different levels of whey on FRC during 3 mentioned periods showed in table3. This showed that there is significant difference between treatments ($P < 0.05$). In the starter the treatments with 2% whey in the diet and 10% fermented whey had the lowest and highest FRC, respectively. In the grower and entire periods the treatments with 4% whey powder and 10% fermented whey in the diet had the lowest and highest FCR, respectively.

Table (3): Effect of using treatment with different levels of whey on FCR

Treatment	Starter	Grower	Finisher
Control	1.56 ^{bc}	2.06 ^b	1.94 ^b
With 2% whey powder in diet	1.46 ^c	2.10 ^b	1.95 ^b
With 4% whey powder in diet	1.49 ^c	2.02 ^b	1.90 ^b
With 5% whey powder in water	1.67 ^b	2.23 ^b	2.10 ^b
With 10% whey powder in water	1.94 ^a	2.53 ^a	2.51 ^a
SEM	0.20	0.03	0.02
P.Value	0.0001	0.009	0.0004

The means that shown with different letters have significant difference ($P < 0.05$)

SEM: Mean standard error

Effect of using the treatments with whey in different levels on the carcass traits is shown in table [4]. This shows significant difference in the weight of carcass, carcass percent, weight of chest, weight of drumstick

and weight of wing ($P < 0.05$). The treatments with 4% whey powder in diet and 10% fermented whey had lowest and highest amounts of the considered properties at the end of experiment.

Table (4): Effect of using treatment with different levels of whey on the carcass traits

Treatments	carcass weight (gr)	percent of carcass	breast weight (gr)	drumstick weight (gr)	Wings weight (gr)
Control	1884.55 ^{bc}	76 ^c	678.43 ^{bc}	235.57 ^{bc}	84.80 ^{bc}
2% whey powder in diet	1953.16 ^b	77.20 ^b	703.14 ^b	244.14 ^b	87.89 ^b
4% whey powder in diet	2044.10 ^a	78.53 ^a	735.88 ^a	255.51 ^a	91.98 ^a
5% whey powder in water	1837.68 ^c	76 ^c	661.56 ^c	229.71 ^c	82.69 ^c
10% whey powder in water	1698.98 ^d	75.60 ^d	611.63 ^d	212.37 ^d	76.45 ^d
SEM	12.32	0.03	4.43	1.54	0.55
P.Value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001

The means that shown with different letters have significant difference ($P < 0.05$)

SEM: Mean standard error

DISCUSSION AND CONCLUSION

Results of feed consuming shown using 10% fermented whey in the water improved this parameter during 3 periods of experience. An experiment was conducted to investigate the effect of Bactocell and whey powder on performance and properties of broiler carcass [2]. They concluded that diet with whey powder caused significant increase in feed consuming of broiler ($P < 0.05$). They reported that being more population of useful bacteria than harmful and disease causing microbes in Gastrointestinal tract that may reducing layers of the bowel diameter and increasing attraction rate and finally improving availability to feed energy and producing required material of the body is the reason of improving broiler performance. When using the whey powder the situation will more suitable for producing and creating colony [8]. Results of a research showed the maximum feed consuming is related to treatment with 10% whey [5] which corresponded with results of this study. Whey consists of 65% Lactose. Poultry couldn't digest because they don't have Lactase. Lactose is fermenting in gastrointestinal tract of poultry and caused some of useful Bacteria [6].

The result of weigh of body showed treatment with 4% whey powder has better effect on weight of broiler body investigated in this research. An experiment was conducted to investigate the effects of using whey powder on the broiler performance [6]. The result showed the broiler fed by this diet had significant weight increasing than control ($P < 0.05$). Results of a research showed using 2% whey powder in the broiler diet between 0-21 days caused significant increase in weight of broiler body than other diets ($P < 0.05$). The result of a study showed that treatment with whey has maximum weight increase [1]. The result of an investigation showed that poultry could not digest whey powder and using 8% whey powder caused increasing osmotic pressure and diarrhea [9]. These researchers showed using 4% whey powder caused improving lipid digest and protein and attracting the mineral like calcium and phosphor by the body. In other that fermentation in result of no digest Lactose led to increasing the number of Lactobacilli and decreasing pathogenic bacteria.

FCR results showed using 4% whey powder is best situation for improving this parameter. A study was conducted to investigate the effects of whey levels in the water on the broiler performance [5]. Results showed the lowest FCR is related to the treatment with 10% whey. Results of a research showed the diet with 4% whey powder has significant effect on FCR and fed broiler with this diet had significant FCR than the control [6] that is consistent with this study results. Results of another research showed using 4% whey in the broiler diet during 11-24 days caused improving FCR [3].

Carcass traits results showed the treatments with 4% whey powder has better performance than others. An experiment was conducted to investigate the effects of using the whey in the drinking water of the broiler on the performance and carcass traits of them [7]. The results showed that the treatment with 5% whey powder caused higher carcass weight than others. General results of this study showed using 4% whey powder in the broiler diet caused improving performance and carcass traits. Thus the whey could use in the broiler nutrition as an effective feed in improving performance.

REFERENCE

1. Pourreza, J. and Mohamadlipour, M., (2003). Effect of using the whey by drinking water on the broiler performance. *Natural resource and agriculture science and technology*, 7(4): pages 157-166.

2. Rastad, A., Samiea, A. and Daneshvar, F.,(2008). Investigation of bactocell and whey powder on the performance and properties of the broiler carcass, *Natural resource and agriculture science and technology*, No. 43.
3. Zanganeh, A., Vakili, R., Zarghi, H., foroughi, A., Zakizadeh, S. and Salahshour, T., (2012). Effects of using different dosage of the whey powder and probiotics on the performance and efficiency of the broiler carcass. 5th congress on livestock science, Isfahan University of technology.
4. Sheikh, S.,(2008). Produce process of whey. 3rdNational congress on recycling and using renewable organic resource, Islamic Azad University Khorsagan Branch.
5. Ghafouri, M., Vakili, R. and Khosravi, M.,(2013). Effects of different usage of the whey in water on broiler performance. 2ndNational seminar on management and nurture of livestock and poultry, Shahid Bahonar university of Kerman.
6. Mehri, M., ZareShahneh, A. and Samie, A.,(2004). Effects of using whey powder on the broiler performance. *Agriculture science of Iran magazine*, volume 35, number 4, page 1007-1013.
7. Adnan N. A., Haider T.A., Ahmed, K. and Majeed, A.,(2008). Effect of Supplemental Fresh Liquid Whey to Drinking Water onBroiler Performance. *J. Sci. Davajen. Iraq.* (2)3:121-127.
8. Kalarathy, R., Abdullah, N., Jalaludin, S. and Ho, Y.W.,(2003). Effects of lactobacillus cultures on growth performance abdominal fat deposition serum lipids and weight of organs of broiler chickens. *British Poultry Science*, 44(1):139-144.
9. Kermanshahi, H. and Rostami, H.,(2006). Influence of supplemental dried whey on broiler performance and cecal flora, *international journal of poultry science*. 5(6):538-543.