ECONOMIC EVALUATION OF PROBIOTIC (LACTOBACILLUS ACIDOPHILUS) USING IN DIFFERENT BROILER BREEDS WITHIN EGYPT.

Mohamed A.E. Omar
Dept. of Animal Wealth Development, Fac. Vet. Med., Zagazig Univ.

A B S T R A C T

This study aimed to evaluate economic effect of Probiotic (L. acidophilus) for different breeds of broiler in Egypt. This work was conducted at special poultry farm in Shrakia Governorate, during period extended from 11th of October 2013 till 23th of December 2013 to investigate the effect of dietary supplementation of some Probiotic (L. acidophilus) (Probax®) on economic and productive efficiency of broilers. A total number of 450 bird, consists of three breeds (Hubbard, Ross and Cobb) of boilers were used in this research (150 bird for each breed). Two groups of each breed (75) were used, where one treated with Probiotic (L. acidophilus, 1gm/kg ration) and control not treated. All groups feeds with standard starter and finisher rations. The different productive and economic measures are applied. The results showed significant effect (P <0.05) of Probiotic (L. acidophilus) on the final body weight where the highest body weight was Ross treated group and lowest was the cobb control groups. In addition, there was no significant difference (P > 0.05) among all groups of breeds in dressing percentage, abdominal fat percent and gizzard fat percent. The results indicated that addition of Probiotic (L. acidophilus) to broilers diet caused a higher improvement in broilers net profit than control which given diet without any feed additives. The Probiotic (L. acidophilus) treated groups in both Ross and Hubbard given the highest value in net profit compared with Cobb. Finally, we concluded that the Probiotic (L. acidophilus) play important role in improving the economic and productive efficiency of poultry farm although it constitutes small cost portion from the total or variable costs of poultry production. Also, indicated that using 1gm/kg ration of probiotic L. acidophilus was better for Ross breed than that of Hubbard and cobb breed.

Key words: Broiler Farms, Economic Evaluations, Probiotic (L. acidophilus).

(BVMJ-26(2):52-60, 2014)

1. INTRODUCTION

Feed expenditures had a considerable percentage of costs in livestock production, especially up to 75-80 % for poultry production. Therefore, in the last years it was investigated feed additives to increase feed efficiency (Ayhan and Aktan, 2004). Feed additives are non-nutritive compounds that are added to livestock rations to improve the efficiency of feed utilization and feed acceptance (Hassanein et al., 2002). Nowadays, feed additives are assuming apposition of prime importance in poultry production. They are aiming primarily for improving the physical performance of bird such as increasing body weight and body weight gain and improving feed conversion ratios. In addition, they play an important role in improving the productive and economic efficiency of poultry farms (Abd El-Gawad et al., 2004 and Anjum et al., 2005). Enzyme supplementation of high fiber-containing diets has been reported to bring about reduction in cost as well as improvement in

the performance and carcass characteristics of broiler chicks (Pettersson & Aman 1991; Onilude and Oso, 1999). An expert panel commissioned by FAO (Food and Agriculture Organization; 1993) defined probiotic as "live microorganisms" which when administered in adequate amounts confers a health benefit on the host and improvement of growth weights and hence improve economic efficiency.

The aim of this research is to study the effect of Probiotic (L. acidophilus) (Probax®) on:-

I- Productive efficiency of different breeds of broilers via their effects on growth performance parameters in terms of body weight, body weight gain, relative growth rate, feed intake, feed conversion ratio and carcass traits. II- Economic evaluation of different breeds of broilers via their effects on costs, returns and net profit.

2. MATERIALS AND MEHODS

2.1. Materials:

This work was conducted at the special poultry farm, during period extended from 11th of October 2013 till 23th of December 2013 to investigate the effect of dietary supplementation of some Probiotic (L. acidophilus) (Probax®) on economic and productive efficiency of broilers.

2.1.1. Experimental birds:

Three breed (Hubbard, Ross and Cobb) of boilers are used in this research (150 birds for each breed). Two groups of each breed (75) were used, where one treated with Probiotic (L. acidophilus) with 1gm/kg ration and control not treated

2.1.2. Management:

a. Housing:

The birds were housed in a clean, well ventilated farm that previously disinfectant and prepared for receiving birds.

b. Temperature:

The starting temperature was 33°c±1 during the 1st week then decrease gradually until reach 25°c±1 at the 7th week.

c. Lighting:

The birds were subjected to continuous lighting program (natural and artificial).

d. Feeding:

The birds were feeding on starter and finisher ration according to NRC (1994). Three groups from each breed left as control only on starter and finisher. The other three groups from each breed supplemented or treated with Probiotic (L. acidophilus, 1gm/kg ration).

2.2.Productive efficiency measurements:

I. Evaluation of growth performance:

A. Growth parameters:

1. Body weight/gm:

At the beginning of the experiment (at one day old), the chicks were individually weighted to the nearest gm, and then they were weighted weekly till the end of the experiment.

2. Body weight gain (BWG):

The gain in body weight per week was calculated by subtracting the body weight between two successive weights.

3. Relative growth rate (RGR):-

RGR (expressed in percentage) was calculated every week according to Crampton and Lioyd (1959) using the following formula:

$$RGR = \frac{1/2\ (W2 + W1)}{(W - W1)\ 100}$$

Where: W1 = body weight at the beginning of week or period.

W2 = body weight at the end of week or period.

B. Feed intake and feed conversion:

1. Feed intake/gm:

The daily feed intake was calculated by the difference between the weight of offered feed and the remained part. The total feed

consumption per day was divided by the number of birds of each group to obtain the average daily feed consumption per bird per group.

2. Feed conversion ratio (FCR):-

FCR was recorded every week according to Wanger et al. (1983) by dividing the amount of feed consumed (gm) during the week by the gain in the weight (gm) during the same week.

II. Evaluation of carcass quality:-

At the end of growing period, 5 birds from each dietary treatment for three breeds were randomly taken, fasten for 12 hours then each bird was weighed live, slaughtered by neck cut and allowed to bleed according to the methods of Brake et al. (1993) to determine the following:

A. Dressing percentage:

Each bird was defeathering and processed by removing the head, neck, shanks and feet and eviscerated by cutting around the vent and carefully removing the viscera, then the dressed carcass was weighed and the dressing percentage was obtained by expressing the dressed carcass weight as a percentage of live body weight according to Brake et al. (1993).

B. Relative internal organs weight:

Heart, gizzard (empty gizzard), liver (without gall bladder), spleen, thymus, bursa, abdominal fat and gizzard fat weights were recorded individually and their percentages in relation to live body weight were calculated.

3. Economic measures:

A. Costs of Broiler production (LE/bird).

1. Variable costs include feed costs, labor costs, total veterinary management costs (service, treatment, disinfectant and veterinary supervision cost), uncertainly costs that calculated as the value for the cash price and includes the value of bird died, and other variable costs as costs related to production cited by Atallah, (2004).
2- Fixed costs include building and equipment depreciations

The depreciation rate calculated based on 25 years for buildings and on 5 years for equipment cited by Omar, (2003).

3. Constituents of total costs: That inculdes the sum of the variable and fixed costs.

B. Income parameters of broiler production (LE/ bird)

1.Variable factors of return

- Total returns = Litter sale + broiler sale.
- Litter sale = Litter sale price / No. of broiler
- Broiler sale = Body weight at end of fattening x kg price.

2. Net income, it was calculated according by using the following equation

Net profit = Total returns – Total costs

2.3. Statistical analysis:

The following computer programs were used for make economical and statistical analysis (M. Stat 1984 and SPSS/PC+ 2001).

3. RESULTS

1. Effect of Breed and Probiotic (L. acidophilus) on Productive traits of different broiler breeds (Mean ± SE).

Results from Table (1) showed significant differences ($P < 0.05$) for the average final body weight where, the treat Ross was the largest (2128.28 gm/ bird) and the second was the treated Hubbard group (2045.28 gm/ bird).Meanwhile the lowest final body weight was the control Cobb group, it was (1899.2844 gm/ bird). The relative growth rate (percentage) showed non-significant differences among all groups. The average body weight gain (gm/bird) showed significant difference among groups where the treated Ross groups was the largest than all groups (2066.52 gm /bird). The treated

Table (1): Effect of Breed and Probiotic (L. acidophilus) on Productive traits of different broiler breeds (Mean ± SE).

Breed	Group	No.	Average body weight (gm)	Average body weight gain (gm)	Relative growth rate (%)	Average feed consumption (gm)	Feed conversion ratio (FCR)
Ross	Treated	75	2128.28^{a} ± 49.30	2066.52^{a} ± 39.16	190.01^{a} ± 0.18	4327.63^{a} ± 35.92	2.17^{a} ± 0.04
	Control	75	2029.48^{b} ±48.51	1977.41^{c} ± 38.31	189.62^{a} ± 0.18	4242.45^{c} ± 9.18	2.15^{a} ± 0.01
Cobb	Treated	75	2018.45^{cb} ± 44.19	1966.52^{c} ± 34.09	189.70^{a} ± 1.73	4236.50^{c} ± 17.53	2.14^{a} ± 0.03
	Control	75	1899.44^{c} ± 49.71	1844.67^{cd} ± 29.18	190.52^{a} ± 0.15	4066.95^{c} ± 11.24	2.18^{a} ± 0.006
Hubbard	Treated	75	2045.67^{b} ± 58.41	2002.30^{b} ± 28.13	190.19^{a} ± 0.13	4312.77^{b} ± 23.79	2.08^{a} ± 0.02
	Control	75	1932.41^{c} ± 68.34	1888.14^{cd} ± 28.15	191.11^{a} ± 0.11	4127.02^{c} ± 27.69	2.12^{a} ± 0.02

Means within the same column carrying different superscripts are significant at ($P \leq 0.05$).

Table (2): Effect of Breed and Probiotic (L. acidophilus) on Carcass traits of different broiler breeds (Mean ± SE).

Breed	Group	Dressing (%)	Gizzard fat %	Abdominal fat %	Gizzard %	Liver %
Ross	Treated	80.29^{a} ± 0.69	0.69^{a} ± 0.16	1.13^{a} ± 0.11	1.60^{a} ± 0.04	2.01^{a} ± 0.06
	Control	81.23^{a} ± 1.76	0.77^{a} ± 0.06	1.13^{a} ± 0.07	1.60^{a} ± 0.09	2.24^{a} ± 0.07
Cobb	Treated	80.29^{a} ± 0.35	0.59^{a} ± 0.13	1.22^{a} ± 0.04	1.40^{b} ± 0.07	2.16^{a} ± 0.07
	Control	81.17^{a} ±1.02	0.67^{a} ± 0.25	1.21^{a} ± 0.08	1.31^{c} ± 0.11	1.91^{a} ± 0.13
Hubbard	Treated	81.90^{a} ± 0.46	0.75^{a} ± 0.14	1.21^{a} ± 0.23	1.39^{c} ± 0.15	1.60^{a} ± 0.11
	Control	81.02^{a} ± 0.38	0.70^{a} ± 0.12	1.17^{a} ± 0.10	1.32^{c} ± 0.06	1.88^{a} ± 0.18

Means within the same column carrying different superscripts are significant at ($P \leq 0.05$).

Table (3): Effect of Breed and Probiotic (L. acidophilus) on Economic parameters traits of different broiler breeds (LE/bird) (Mean ± SE).

Breed	Group	No.	Total variable cost (LE/bird)	Total fixed cost (LE/bird)	Total cost (LE/bird)	Total return (LE/bird)	Net profit (LE/bird)
Ross	Treated	75	11.12^{a} ± 0.10	6.25	17.38^{a} ± 0.10	19.39^{a} ± 0.12	2.01^{a} ± 0.03
	Control	75	11.65^{a} ± 0.06	6.25	17.91^{a} ± 0.06	19.62^{a} ± 0.07	1.71^{b} ± 0.01
Cobb	Treated	75	11.60^{a} ± 0.10	6.25	17.86^{a} ± 0.10	19.28^{a} ± 0.18	1.42^{c} ± 0.08
	Control	75	11.39^{a} ± 0.11	6.25	17.65^{a} ± 0.11	19.07^{a} ± 0.38	1.42^{c} ± 0.07
Hubbard	Treated	75	11.18^{a} ± 0.09	6.25	17.44^{a} ± 0.09	19.39^{a} ± 0.13	1.95^{a} ± 0.03
	Control	75	11.29^{a} ± 0.03	6.25	17.55^{a} ± 0.03	18.89^{a}± 0.28	1.34^{c} ± 0.05

Means within the same column carrying different superscripts are significant at ($P \leq 0.05$).

Hubbard group was the second (2002.30 gm /bird). Average feed consumption (gm/ bird) was significant difference between all groups, the largest are the treated Ross and the smallest are control Cobb. Feed conversion ratio (FCR) ranged about 2.17 and they are non-significant difference.

2. *Effect of Breed and Probiotic (L. acidophilus) on Carcass traits of different broiler breeds.*

Table (2) showed non-significant differences ($P \geq 0.05$) for the dressing percentage for all groups where, they ranged 80.2 %; gizzard fat percentage and abdominal fat percentage are also non-significant differences. Gizzard percentage showed significant difference among groups where the Ross groups (treated and control groups) are the largest than all groups (1.6 %). Liver percentage are non-significant differences between all groups.

3. *Effect of Breed and Probiotic (L. acidophilus) on Economic parameters traits of different broiler breeds (LE/bird).*

The Results in Table (3) showed significant differences ($P < 0.05$) for the net profit (LE/ bird) where, the treated Ross was the largest (2.01 LE/ bird) and the second was the treated Hubbard group (1.95 LE/ bird). Meanwhile the lowest net profit (LE/ bird) was the control Hubbard group; it was (1.34 LE/ bird).

4. DISCUSSION

The results of table (1) showed significant effect ($P< 0.05$) of Probiotic (L. acidophilus) on the final body weight where the highest body weight was Ross treated group and lowest was the cobb control groups. This result could be attributed to action of probiotic on intestinal microflora and increasing the digestibility, absorbability and utilize ability of different nutrients in gastrointestinal tract by probiotic product enzymes of cellulose, amylase and protease (Shoeib and Madian, 2002) and the action of exogenous enzymes on improving nutrient digestibility and reduction of nitrogen and phosphorus (Bedford, 2000). These results agreed with

those of Huang et al. (2004), Sabiha et al. (2005), Kannan et al. (2007) and Kalavathy et al. (2008) who found that average live body weight improved in group feed on supplemented diet with probiotics compared with those of control group. Also, these finding are in agreement with those obtained by Nayebpor et al. (2007) who found that, feeding broiler chickens on direct fed microbial probiotic was significantly ($P< 0.05$) improved body weights. Table (2) indicated that, there was no significant differences ($P > 0.05$) among all groups of breeds in dressing percent, abdominal fat percent and gizzard fat percent. This result in agreement with Anjum (2005), Denli et al. (2005), Mehr et al. (2007) and El Sayed (2007). However, disagree with Kalavathy et al. (2003) and Homma and Shinohara (2004) who found that birds fed on diet supplemented with probiotic had significantly ($P < 0.01$) less abdominal fat than those fed control diet. Cafe (2002), Sarvestani et al. (2006) they observed that, birds fed on diet supplemented with probiotic had increased abdominal fat value. These results in table (3) indicated that addition of Probiotic (L. acidophilus) to broilers diet caused a higher improvement in broilers net profit than control which given diet without any feed additives. The Probiotic (L. acidophilus) treated groups in both Ross and Hubbard Cobb given the highest value in net profit compared with Cobb. The improvement which occurred in values of net profit of treated groups may be attributed to improvement which occurred in body weight, body weight gain, feed conversion ratio, stimulation of birds immunity and reduction of mortality rate. This result in agreement with those of Santin et al. (2001) and panda (2006) where they found a significant increase ($P < 0.05$) in net income value of supplemented group with probiotic than control group, so it was improved the economic efficiency of broilers production. Also, this result in agreement with those of Hooge et al. (2003), where they found a significant ($P < 0.01$) increase in net revenue of group supplemented with probiotic than control one.

CONCULSION

This study indicated that Probiotic (L. acidophilus**)** as a feed additives play an important role in improving the economic and productive efficiency of poultry farm although it constitute small cost from the total or variable costs of poultry production. Also, indicated that using probiotic was better for Ross breed than that of Hubbard and cobb breed.

5. REFERRENCES

Abd El-Gawad, A.M.A.; Abd–El Samee, M.O.; Abdo, Z.M.A. and Salim, I.H. (2004): Effect of dietary protein and some feed additives on broiler performance. Egyptian Poult. Sci. J., Vol. 24, No. 2, PP. 313 – 331.

Atallah, S.T. (2004). Effect of cattle diseases on reproductive, productive and economic efficiency of dairy farms. Minufiya Vet. J. (1): 99-1145.

Anjum, M.I.; Khan, A.G.; Azim, A. and Afzal, M. (2005): Effect of dietary supplementation of multi–strain probiotic on broiler growth performance. Pakistan Vet. J., Vol. 25, No. 1, Pages 25 – 29.

Ayhan, V. and Aktan, S. (2004): Using Possibilities of Dried Tomato Pomace in Broiler Chicken Diets. Hayvansal Uretim 45(1): 19-22.

Brake, J.; Havenstein, B.; Scheideler, S.E.; Ferket, B.R. and Rives, D.V. (1993): Relationship of sex, age and body weight to broiler carcass yield and offal production. Poult. Sci., 72: 1137 – 1145.

Bedford, M.R. (2000): Exogenous enzymes in monogastric nutrition – Their current value and future benefits. Livestock Prod. Sci., 86: 1 – 13.

Café, M.B.; Borges, C.A.; Fritts, C.A. and Waldroup, P.W. (2002): Avizyme improves performance of broilers fed corn-soybean meal-based diets. J. Appl. Poult. Res., 11: 29 – 33.

Crampton, E.W. and Lioyd, L.E. (1959): Fundamentals of nutrition. P.217. Freeman & Company of Francisco and London.

Denli, M.; Cankaya, S.; Silici, S.; Okan, F. and Uluocak, A.N. (2005): Effect of dietary addition of Turkish propolis on the growth performance, carcass characteristics and serum variables of quail (Coturnix Coturnix Japonica). Asian - Australasian J. Anim. Sci., 18(6): 848 – 854.

El-Sayed, A.S.S. (2007): Some nutritional studies on feed additives in broiler chickens. M.V.Sc. Thesis, Dept. Of Nutrition and clinical Nutrition, Fac. Vet. Med., Zagazig Univ., Egypt.

FAO (1993): Tropical Feeds by B. Gohl. Computerized version 4.0 edited by Speedy, A. Rome, Italy.

Hassanein, E.I.; El – Kohli, M.I.; Wafaa, E. and Walaa, A.E. (2002): Basic livestock nutrition. Chapter 8, pp. 230.

Huang, M.K.; Choi, Y.J.; Houde, R.; Lee, J.W.; Lee, B. and Zhao, X. (2004): Effect of Lactobacilli and acidophilic fungus on the production performance and immune responses in broiler chickens. Poult. Sci., 83(5): 788 – 795.

Hooge, D.M.; Sims, M.D.; Sefton, A.F.; Connolly, A. and Spring, P. (2003): Effect of dietary Mannan Oligosaccharide, with or without Bacitracin or Virginiamycin, on live performance of broiler chickens at relatively high stocking density on new litter. J. Appl. Poult. Res., 12: 461 - 467.

Homma, H. and Shinohara, T. (2004): Effect of probiotic Bacillus cereus toyoi on abdominal fat accumulation in the Japanese quail (Coturnix Japonica). Animal Science Journal, 75 (1): 37 – 41.

Kalavathy, R.; Abdullah, N.; Jalaludin, S.; Ho, Y.W. (2003): Effect of Lactobacillus cultures on growth Performance, abdominal Fat deposition, serum lipids and weight of organs of broiler chickens. Br. Poult Sci., 44(1): 139 – 144.

Kalavathy, R.; Abdullah, N.; Jalaludins, S.; Wong, C.M.VL. and Ho, Y.W. (2008): Effect of Lactobacillus cultures and Oxytetracycline on the growth performance and serum lipids of chickens. Inter. J. Poult. Sci., 7(4): 385 – 389.

Kannan, D.; Viswanathan, K. and Mohan, B. (2007): The effect of feeding Virginiamycin and Lactobacillus sporogenes on broiler production and performance characters. Tamilnadu Journal of Veterinary and Animal Sciences, 3(2): 106 – 108.

M.Stat (1984): Microcomputer statistical program. Experimental design, data management and analysis. Michigan Statistical Crop and Soil Science. Agriculture Economics Institute of International Agriculture.

Mehr, M.A.; Shargh, M.S.; Dastar, B.; Hassani, S. and Akbari, M.R. (2007): Effect of different levels of protein and protexin on broiler performance. Int. J. Poult. Sci., 6(8): 573 – 577.

Nayebpor, M.; Farhomand, P. and Hashemi, A. (2007): Effect of different levels of direct fed microbial (Primalac) on growth performance and humeral immune response in broiler chickens. J. Anim. Vet. Advances, 6(11): 1308 – 1313).

National Research Council (1994): Nutrient requirements of domestic animal (Poultry) 4th edition Nat. Acad. Sci. Washinton. D.C.

Omar, M.A.E., 2003. Economic and productive efficiency of poultry farms in relation to veterinary inputs. M.V.Sc. Thesis, Fac. Vet. Med., Zagazig University.

Onilude, A. A. and Oso, B. A. (1999): Effect of fungal enzyme mixture supplementation of various dietary fibre-containing diets fed broiler chicks. 1: Performance and carcass characteristics. World Journal of Microbiology & Biotechnology 15: 353-360.

Panda, A.K.; Rao, S.V.R.; Raju, M.V.L.N. and Sharma, S.R. (2006): Dietary supplementation of Lactobacillus sporogenes on performance and serum biochemico-lipid profile of broiler chickens. Journal of Poultry Sciences, 43: 235-240.

Pettersson, D. and Aman, P. (1991): Production results, serum cholesterol concentration and carcass composition of broiler chickens fed diets based on bran or inner endosperm from oats with or without enzyme supplementation. Journal of the Science of Food & Agriculture 57: 273-286.

Sabiha, M.K.A.; Elizabeth, V.K. and Jalaludeen, A. (2005): Effect of supplementation of probiotic on the growth performance of broiler chicken. Indian J. Poult. Sci., Vol. 40, No. 1, Pages 73 – 75.

Santin, E.; Mairoka, A. and Macari, M. (2001): Performance and intestinal mucosa development of broiler chickens fed diets containing Saccharomyces cerevisiae cell wall. Journal of Applied Poult. Res., 10: 236 - 244.

Sarvestani, T.S.; Dabiri, N.; Agah, M.J. and Norollahi, H. (2006): Effect of pellet and mash diets associated with Biozyme enzyme on broilers performance. Inter. J. Poult. Sci., 5(5): 485 490.

Shoeib, H.K. and Madian, A.H. (2002): A study of the effect of feeding diets containing probiotics (Pronifer & Biogen) on growth performance, intestinal flora and Haematological picture of broiler chicks. Assiut Vet. Med. J., 47: 94.

SPSS (2001): SPSS/PC + (2001), for the PC/XT. SPSS INC.

Wanger, D.D.; Furrow, R.D. and Bradley, B.D. (1983): Subchronic toxicity of growth promoters in broiler chickens. Vet. Path., 20: 253 – 359.

التقييم الاقتصادي لاستخدام البروبيوتك في سلالات مختلفة من بداري التسمين داخل مصر.

محمد أحمد السيد عمر

قسم تنمية الثروة الحيوانية –كلية الطب البيطري–جامعة الزقازيق

الملخص العربي

يهدف هذا البحث إلى التقيم الإقتصادي لإستخدام البروبيوتك في سلالات مختلفة من بدارى التسمين داخل مصر.تم هذا البحث في الفترة ما بين الحادي عشر من شهر اكتوبر إلى الثالث والعشرين من شهر ديسمبر عام 2013 في داخل إحدى المزرعات الخاصة لدراسة تأثير إضافة البروبيوتك (البروباك®) على الكفاءة الاقتصادية والإنتاجية لسلالات مختلفة من بداري التسمين. تم استخدام عدد كلي 450 طائر من ثلاثة سلالات هي الهبرد والكوب والروس حيث تم استخدام عدد 150 دجاج تسمين من كل سلالة. ثم بعد ذلك تم تقسيم 150 داخل كل سلالة إلى 75 بدون بروبيوتك (كونترول) مع إعطائها عليقة مثالية من البادي والناهي و75 تم معالجتها ببروبيوتك مع إعطائها أيضا عليقة مثالية من البادي والناهي وبالتالي أصبح عدد المجموعات ستة. أظهرت النتائج وجود فروق معنوية لإستخدام البروبيوتك على الوزن النهائي لبدارى التسمين حيث كان أعلى وزن في مجموعة الروس المعالجة والأقل كان موجود في مجموعة الكوب الغير معالجة (الكنترول). بينما كانت الفروق غير معنوية بالنسبة إلى نسبة التصاقي ودهن البطن ودهن القانصة. كما أظهرت النتائج وجود فروق معنوية لإستخدام البروبيوتك على نسبة صافي العائد حيث كان أعلى صافي عائد كان موجود في سلالات الروس المعالجة والغير المعالجة بينما كان الأقل من حيث صافي عائد كان في سلالة الكوب المعالجة والغير المعالجة. خلصت نتائج هذا البحث إلى ان استخدام البروبيوتك في العليقة لبداري التسمين يعطي نتائج أفضل من الناحية الإنتاجية والاقتصادية. كما أظهرت النتائج وجود فروق معنوية من الناحية الإنتاجية والاقتصادية لسلالة دجاج الروس عن سلالة الهبرد والكوب وبالتالي ينصح باستخدام البروبيوتك في علائق التسمين لسلالة دجاج الروس خاصة عن سلالة الهبرد والكوب.

(مجلة بنها للعلوم الطبية البيطرية: عدد 26(2):52- 60, يونيو 2014)