EFFECT OF SUPLEMENTING DIET WITH DIFFERENT LEVELS OF DRIPED KEFIR MILK ON PRODUCTIVE PERFORMANCE OF LAYING HENS

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ABSTRACT

This work was carried out to study the effect of supplement diet of laying hens with dried Kefir Milk the on their productive performance. A total number of 144 laying Lohmann brown hens aged 22 weeks were, distributed randomly to four treatment with three replicates per treatment (12 hen/ replicate) The first treatments served as control group and was fed basal diet (no Kefir), The second treatments was fed the basal diet supplemented with 2 g, of dried Kefir milk/ kg feed the third treatments was fed the basal diet supplemented with 4 g dried Kefir milk/kg feed, while the fourth treatment was fed the basal diet supplemented 6g dried Kefir milk/kg feed .The experiment lasted for 16 weeks till the age of 38 weeks. The results revealed significant improvement of the productive traits of the treatment received dried Kefir milk compared with the control group ($P < 0.05$) It may be concluded that rate of egg production (% hen day production) number weight mass of eggs. And feed efficiency during the production periods under study were significant better due to inclusion of dried Kefir milk to layers diet.

Key words: Kefir milk, laying hens, productive traits.

INTRODUCTION

Animal health and growth are affected by many factors such as diet, stress, antibiotics and modern breeding systems, The health of birds is maintained and made stable using antibiotics in preventive doses, However, antibiotics may have indirect side effects, which affect human health through consumption of animal origin food, Increase antibacterial resistance to antibiotics in humans, Some diseases may cause harm to public health. Prompting some researchers in the developed world to reduce the use of antibiotics, and the use of alternatives. The use of Kefir milk can be considered as one of the alternative methods to replace the added chemicals by adding lactic acid bacteria. These bacteria have been used in foods and feed without having any obvious negative effects on the

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consumer (Yaman *et al*., 2006), Kefir is a fermented milk product used in the North Caucasus and in Central Asia for thousands of years (Rodrigues *et al*., 2005). The word Kefir originated from the Turkish word (Keyif) (Chaitow and Trenev, 2002). Kefir milk is produced from milk fermentation with prepared Kefir grain, Kefir appears to be a piece of coral or small blocks of cauliflower (Bensmira *et al*., 2010). Kefir contains more than (50) species of microorganisms useful for human and animal health, these include biology Aspergillus, Streptococcus, Saccharomyces and Lactobacillus (Karademir, 2008). It was reporedly that the milk of Kefir leads to improve the efficiency of food conversion, increase live weights, and reduce cholesterol, Lipid levels in the blood serum in birds (Karademir, 2008 ; Cenesiz *et al.*, 2008). Bird performance and feed conversion are closely related to the microbiology of the digestive system and the structure of the intestinal wall and the activity of the immune system (Huyghebaer *et al.*, 2011). The strains Lactobacillus isolated from Kefir milk has significant probiotic properties and is useful for improving intestinal microbial balance (Santos *et al.*, 2003). It ensures the promotion and development of beneficial bacteria; these bacteria live in the mucous membrane of the small intestine, it also prevents the growth of pathogenic microorganisms by forming a beneficial microbial community against harmful microorganisms (Golowczyc, 2007 ; Santini *et al.*, 2010). In addition, Kefir contains vitamins, minerals and essential amino acids that lead to the maintenance of healthy body, It is as well also contains complete proteins that are easily digestible (Semih, 2003). This study aims at comparing effect different levels of diet to dryer Kefir milk on the productive performance of laying hens.

MATERIALS AND METHODS

This study was conducted in the poultry farm of Animal Production Department - College of Agriculture - University of Diyala in the period from 12/9/2016 to 8/1/2017, for a period of 16 weeks. It aims to study the effect of adding different levels of milk powder Kefir on the productive performance of laying hens. The experiment was carried out on 144, laying at the age of 22 weeks. After a week of adjusting to the conditions and symptoms of the experiment, the experiment began at the age of 23 weeks, the average live body weight of the hens was 1650 g the birds were randomly distributed in four treatments with three replicates per treatment (12 birds each). The first treatments served as control group and was fed basal diet (no Kefir) (Table1). The second treatment was fed the basal diet supplemented with 2g of dried Kefir milk/ kg feed; the third treatment was fed the basal diet supplemented with 4 g

dried Kefir milk/kg feed; while the fourth treatment was fed the basal diet supplemented with 6 of dried Kefir milk/kg feed. The experiment lasted for 16 weeks till the age of 38 weeks.

Every two weeks, the powdered Kefir milk loaded on soybeans was mixed with a small amount of feed manually, then gradually increased in order to obtain desired homogeneity, thereafter, mixed with the rest of the feed until the desired homogeneity of the feed particles is achieved, after the completion of the mixing, it was packaged in bags each according to the treatment to which they belong until the feed is presented to the birds.

Kefir granules were brought from the College of Science - University of Babylon, which was used in the preparation of Kefir milk loaded on soybeans, this mixture was placed in aluminum dishes, and enter it in the incubator in the nutrition lab In the Faculty of Agriculture - University of Diyala, the incubator temperature was 37 °C, and for 48 hours to remove the moisture to complete dryness.

The statistical analysis was performed using the full random design (CRD), and ANOVA to study the main effect of the factor under study using the statistical program, (SAS), (SAS, 2004). The significance of the differences between the averages were tested using Duncan test, 1995 (Duncan, 1955) at a significant level 0.05.

Table 1. Ingredients (%) and chemical composition of the mixture used in the experiment

Components	%
yellow corn	63.7
Soybean Meal 44%	26
Premixes (*)	2.5
Limestone	7.5
Common salt	0.3
Total	100
Calculated chemical composition	
Crude protein,%	17
ME Kcal / kg	2740
Methionine%	0.41
Methionine and Cysteine %	0.70
Lysine %	0.92
Calcium %	3.45
Available phosphorus %	0.36

(*) premix contained 5.9%, protein, 1074 kcal / kg energy, 2.3%, lysine, 5.4% methaneine 5.8% methionine and cysteine 0.3%, threonine 0.1%, tryptophan 26.3% calcium 9.5% phosphorus available and all the minor mineral elements and vitamins required.
Chemical analysis of the ingredients of the bush according to NRC (1994).

RESULTS AND DISCUSSION

1. Egg production (H.D %)

The results presented in Table 2 indicate that there were no significant differences between all treatments and control group in egg production during the first four weeks (23-26 weeks). However; during the second four weeks (27-30 weeks) all Kefir supplemented groups were significantly higher in egg production (hen per day percent) than the control group (P <0.05) The highest rate of production was recorded for T4 91.06%, followed by T3 90.17 T2 89.77% Respectively, compared to the control group 88.78%. This positive effect of Kefir on egg laying rate continued through the third and fourth four weeks of the (P <0.05), T4, the fourth treatment continued to record the highest rates of egg production, 93.04 and 94.04 (%), respectively. In regard to the whole experimental period (23to38weeks of age) all treatments were significantly higher in laying rate then the control group (P <0.05), where T4 92.71 followed by T3 91.66% then T2 91.06% compared to their control 89.01%.

Table 2. Effect of different levels of the dried Milk Kefir supplementation on egg laying H.D (%), Average ± standard error

Treatments	Experimental periods (weeks)				Overall rate
	26-23	30-27	34-31	38-35	
T1 control	80.35 ±2.07	88.78 ^{c} ±0.17	88.88 ^{d} ±0.22	89.37 ^{d} ±0.30	89.01 ^{d} ±0.14
T2	84.61 ±1.03	89.77 ^{b} ±0.34	91.06 ^{c} ±0.17	92.35 ^{c} ±0.17	91.06 ^{c} ± 0.22
T3	84.32 ± 0.87	90.17 ^{b} ±0.25	91.75 ^{b} ± 0.17	93.04 ^{b} ± 0.13	91.66 ^{b} ±0.22
T4	83.92 ±1.22	91.06 ^{a} ±0.27	93.04 ^{a} ± 0.13	94.04 ^{a} ±0.12	92.71 ^{a} ±0.23
significance	N.S	*	*	*	*

*Means in the same column with different superscripts are significantly different (P <0.05).
(N.S): There are no significant differences within the single column.

2. Egg weight

The result obtained for egg weight table 3 proved the positive significant effect (P <0.05) of Kefir on egg weight of the supplemented group over the control group .This impact was detected at all periods of study (23 to 26, 27 to 30, 31 to 34 and 35 to 38 weeks) and for the whole experimental periods (23-38 weeks). However, no significant differences in egg weigh was detected between the supplemented group themselves; except slight numerical difference between T2 and T4, T3 (65.47, 66.16, and 66.52 and 65.47 g, respectively.

Table 3. Effect of different levels of the dried Milk Kefir supplementation on egg weight (g/egg)(Average ± standard error)

Treatments	Experimental periods (weeks)				Overall rate
	26-23	30-27	34-31	38-35	
T1	59.12[b] ±0.47	59.41 [b] ±0.47	59.89 [c] ±0.40	61.29 [b] ±0.33	60.20 [b] ±0.26
T2	62.89[a] ±0.46	64.30 [a] ±1.13	65.24 [b] ±0.58	66.86 [a] ±0.65	65.47 [a] ± 0.49
T3	62.85 [a] ±0.70	64.69 [a] ±0.53	66.86 [a] ±0.44	67.99 [a] ±0.46	66.52 [a] ±0.35
T4	62.10[a] ± 0.72	65.26 [a] ±0.46	66.29 [ab] ±0.67	66.93 [a] ±0.81	66.16 [a] ±0.39
Significance	*	*	*	*	*

*Means in the same column with different superscripts are significantly different (P <0.05)

3. Egg mass

Table 4 present the average egg mass (g) per hen per day during the different periods of experiment. Due to the significant positive effect of Kefir supplementation on laying rate and egg weight, a similar trend was detected for egg mass (P <0.05) for each period and also for the whole experiment period where T4 and T3 recorded 61.34 and 60.98 g/hen/day, respectively; followed by T2 (59.63 g/hen/day) as compared with their control (53.58 g/hen/day).

Table 4. Effect of different levels of the dried Milk Kefir supplementation on egg mass (g/bird/day) (Average ± standard error)

Treatments	**Experimental periods (weeks)**				**Overall rate**
	26-23	30-27	34-31	38-35	
T1	47.50[b] ±1.29	52.74[b] ±0.42	53.23[c] ±0.41	54.78[b] ±0.36	53.58[c] ± 0.26
T2	53.23 [a] ±0.89	57.74 [a] ±1.16	59.41[b] ±0.58	61.74 [a] ±0.59	59.63[b] ±0.53
T3	53.04 [a] ±1.08	58.33 [a] ±0.51	61.35 [a] ±0.46	63.26 [a] ±0.40	60.98[a] ±0.43
T4	52.17[a] ±1.21	59.42 [a] ±0.43	61.67 [a] ±0.64	62.94 [a] ±0.76	61.34[a] ±0.43
Significance	*	*	*	*	*

*Means in the same column with different superscripts are significantly different (P <0.05).

4. Food conversion ratio

The results mentioned in Table 5 revealed that the feed efficiency was significant improved (P <0.05) due Kefir supplementation to the layer diet. All treatment showed loss units of feed consumed to produce unit of egg which mean better feed conversion .All treatment (T2, T3, T4) recorded better but unstable trend towards FCR during the different experimental periods; however the overall efficiency came in the following order: T4 first, T3 second, T2 third

(1.78, 1.85 and 1.89 g feed/ g egg), respectively compared to the control group (215 g feed/ g egg).

Table 5. Effect of different levels of the dried Milk Kefir supplementation on feed conversion ratio (g feed/g egg) (Average ± standard error)

Treatments	Experimental periods (weeks)				Overall rate
	26-23	30-27	34-31	38-35	
T1	2.28^{a} ±0.05	2.22^{a} ± 0.01	2.24^{a} ± 0.01	1.99^{a} ± 0.11	2.15^{a} ± 0.04
T2	1.96^{b} ±0.01	1.99^{b} ± 0.04	1.93^{b} ± 0.02	1.75^{ab} ± 0.09	1.89^{b} ± 0.03
T3	1.99^{b} ±0.03	1.97^{b} ± 0.03	1.86^{c} ± 0.02	1.71^{c} ± 0.08	1.85^{b} ± 0.03
T4	2.06^{b} ±0.04	1.84^{c} ± 0.02	1.79^{d} ± 0.01	1.71^{c} ± 0.08	1.78^{b} ± 0.03
Significance	*	*	*	*	*

*Means in the same column with different superscripts are significantly different (P <0.05)

The positive impact of Kefir on the different studied criteria may be due its probiotic effect since Kefir a source of good bacteria such *Lactobacilli* and *Streptococci*. These bacteria counteract the effect of bad bacteria and improve the function of the gastrointestinal tract. (Mehmet, 2014) Probiotic, Which works to increase the useful microorganisms, which exist in intestinal flora, such as Lactobacilli bacteria, which secrete lactic acid, which provides an environment conducive to their growth, which works to remove harmful bacteria, (coliform) in the process of competitive exclusion, by covering the receptors on the epithelial cells present in the gastrointestinal tract, as well as prevent the arrival of harmful bacteria to these receptors, thus facilitating the process of displacement and discourage its work, making it more advantageous than the digested food (Saad, 2011). Also, Kefir is good source for different minerals and water soluble vitamins. Therefore, our results agree with the findings of Abdelqader *et al*., (2013). However, these results disagree with those reported by (Horniakova *et al*., 2006).

Therefore it could be concluded that supplementing layers diet with 6 gram dried milk Kefir kg feed is recommended for better egg production.

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إضافة مستويات مختلفة من حليب الكيفير المجفف للعليقة ومعرفة تأيرها في بعض الصفات الإنتاجية للدجاج البياض

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المستخلص

أجري هذا البحث في حقل الطيور الداجنة التابع الى قسم الانتاج الحيواني/ كلية الزراعة/ جامعة ديالى خلال المدة من 2016/9/12 ولغاية 2017/1/8، بهدف دراسة تأثير إضافة مستويات مختلفة من حليب الكيفير المجفف في الأداء الإنتاجي للدجاج البياض. استخدمت في هذه الدراسة 144 دجاجة بياضة سلالة لوهمان البني بعمر 22 أسبوعاً، وزنت فرديا ووزعت عشوائيا عند عمر 23 اسبوعاً على اربع معاملات بواقع ثلاثة مكررات للمعاملة الواحدة (12 دجاجة/مكرر) وكانت المعاملات: المعاملة الاولى بمثابة مجموعة السيطرة إذ غذيت الطيور على العليقة القياسية (بدون اضافة الكفير)، اما المعاملة الثانية فقد تم تغذية الطيور العليقة القياسية المكملة بـ 2 غرام من حليب الكفير المجفف/ كغم، وفي المعاملة الثالث تم تغذية الطيور العليقة القياسية المكملة بـ 4 غم حليب الكفير المجفف/ كغم في حين تم تغذية طيور المعاملة الرابعة على العليقة القياسية المكملة 6 غم حليب الكفير المجفف/ كغم من الأعلاف واستمرت التجربة لمدة 16 أسبوعاً حتى عمر 38 أسبوعاً، وقد أظهرت النتائج تحسناً معنوياً في الصفات الإنتاجية للمكمل الذي تلقاه (حليب الكفير المجفف) مقارنة مع المجموعة السيطرة ($P < 0.05$) إنتاج البيض (% الدجاجة يوم الإنتاج) عدد الوزن كتلة البيض. وكانت كفاءة الأعلاف خلال مدد الإنتاج قيد الدراسة أفضل بشكل ملحوظ نظرا لإضافة حليب الكفير المجفف إلى عليقة الدجاج البياض.

الكلمات المفتاحية: حليب الكيفير، دجاج بياض، الصفات الإنتاجية.