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Research Article
Effects of Dietary Supplementation of Wet Fermented Feed with Probiotic on the Production Performance of Akar Putra Chicken

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Abstract

This study was conducted to investigate the effect of Solid State Fermented Feed (SSFF) with and Without Prepared Probiotic (PP) on the live body weight, weight gain, feed intake and feed conversion ratio of a local Malaysian chicken (Akar Putra). A total of 96 day-old Akar Putra chicks, were randomly assigned to four dietary treatments (24 chicken/treatment), with 3 replicates for each (8 chicken/replicate). The four dietary treatments were the control T1 (no supplement), diet supplemented of SSFF with probiotic in the second treatment was prepared at the rate 1:1:1 (1 kg of commercial broiler feed+1 L tap water+1g PP). While the rate was 1:1:2 (1 kg of commercial broiler feed+1 L tap water+2 g PP) in the third treatment. The chickens in fourth treatment were fed on SSFF without probiotic. The feeding mixtures of T2, T3 and T4 were placed in a plastic tray which closed ad incubate for 38 h at 37±2°C for complete fermentation and used without drying. Supplementation the SSFF with PP resulted in a significant ($p<0.01$) increase in the males' and females'live body weight. Furthermore, ($p<0.01$) enhancement in the females' feed conversion ratio of supplemented treatments was observed. It can be concluded that using wet fermented feed with 1 and 2 g of prepared probiotic caused significant improvement in the production performance of Akar Putra chicken especially in the live body weight and growth rate traits.

Key words: Akar Putra chicken, fermented feed, probiotic, *Lactobacillus acidophilcs*, lactic acid

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Probiotics have been used as growth promoters to replace the widely used antibiotic and synthetic chemical feed supplements. However, there are few published reports of well controlled field experiments and the comprehensive assessment of their value has not been attempted in the form of a large-scale co-ordinated field trial. The results of probiotic supplementation of diets have been variable but there have been reports of statistical effectson growth (Dilworth and Day, 1978). Furthermore, probiotic is a mixture of benefit microbes (bacteria yeast and mold) which mixes with fed of animals in order to make a benefit and healthy microbial balance in the intestine this balance lead to improved animal productivity, especially in stressed animal, which faces a heat stress, fed on toxic or improper diets (Mojgani *et al*., 2007). Inclusion the probiotic inthe poultry diet seemed to improve broiler performance (Manafi, 2015), increased egg production in layer, enhanced fertility and hatchability in broiler breeders (Zanqana, 2007). The outstanding probiotic strains include Lactobacillus, Saccharomyces, Streptococcus and Aspergillus. Presently, Bacillus, Lactobacillus and Saccharomyces are the major strains applied in broilers (Chen *et al*., 2009).

The main concept of fermenting feed with probiotic is increasing the activity of probiotic. In other words, provide appropriate circumstances to increase the numbers of bacteria involved in the probiotic. That application was practiced first time by Lokman *et al*. (2015) when 1 and 2 g of prepared probiotic were fermented with the daily feed of Akar Putra chicken. The authors reported that noticeable enhancement in the production parameters was obtained especially in using 2 g of probiotic. Basically, fermentation is the chemical transformation of organic substances into simpler compounds by the active enzymes, complex organic catalysts, which produced by microorganisms such as bacteria, yeasts, or molds. Although most microbial fermentations are an accomplished in liquid phase, several advantages occur for solid-state fermentations: (1) Low medium cost, (2) Low water output, (3) Low capital investment and (4) More practical when carried out in the fields (Adams *et al*., 2002). Moreover, fermented feed influences the bacterial ecology of the gastrointestinal tract and reduced the level of Enterobacteriaceae in different parts of the gastrointestinal tract in pigs (Van Winsen *et al*., 2001) and broiler chicks (Heres *et al*., 2003). In same regard, fermented feed causes a reduction of pathogenic bacteria, including Salmonella and Campylobacter in the digestive tract, most particularly in the crop and gizzard. Because the crop often ruptures during slaughter, the decrease level of pathogens in this area, in particular, makes contamination of meatless likely (Yamamoto *et al*., 2004, 2007).

Pervious work demonstrated that using a dry form of fermented feed with probiotic had highly significant improvement on the production performance parameters of Akar Putra chicken (Lokman *et al*., 2015). So, present research was planned to investigate the effects of fermented feed with probiotic in a wet form on the production performance of local Malaysian chicken (Akar Putra).

MATERIALS AND METHODS

Preparation of fermented feed: A commercial broiler starter and finisher diet (Table 1) was purchased from local markets. Akar Putra chicks were fed on a starter diet during the first three weeks and then transferred to finisher diet were used for the reminder of the experimental period which was lasted for 12 weeks.

The fermented feed (solid-state state fermentation feed+ prepared probiotic) was prepared at the rate 1:1:1 (1 kg of commercial broiler feed+1 L tap water+1 g prepared probiotic) in the second treatment. While the rate was 1:1:2 (1 kg of commercial broiler feed+1 L tap water+2 g prepared probiotic) in the third treatment. The SSFF in the fourth treatment was prepared at the rate 1:1 (1 kg of commercial broiler feed+1 L tap water). These mixtures were placed in a plastic tray which closed ad incubate for 38 h at 37±2°C for complete fermentation and used without drying.

Table 1: Composition of basal diet

	Basal diet	
Items	1-22 day	23-84 day
Corn	44.9	53.1
Wheat	18	15
Soybean meal (45%)	33	27
Mineral and vitamin premix	1	1
Oil	2	3
Limestone	0.8	0.6
Dicalcium phosphate	0.3	0.3
Total	100%	100%
Calculated analysis		
Crude protein (%)	21.92	19.7
Metabolism energy (kcal kg^{-1}) diet	2990	3100
Calcium (%)	0.93	0.85
Phosphorus (%)	0.48	0.45
Methionine (%)	0.55	0.5
Lysine (%)	1.35	1.25
Methionine+Cysteine (%)	0.85	0.91
Folic acid	1.1	1.2

*Calculated analysis according to NRC (1977)

The probiotic was prepared in the Laboratory of Poultry Technology at Agriculture Faculty, University of Baghdad. According to the manufacture information label, each 1 g of PP contains at least 10^9 CFU of *Lactobacillus acidophilus*, *Bacillus subtilis*, Bifidobacterium and at least 10^8 CFU of *Saccharomyces cervisia*. Fermented feed was characterized by high lactic acid concentration (up to 260 mmol kg^{-1} feed) and moderate amounts of acetic acid (20-30 mmol kg^{-1} feed), high number of lactic acid bacteria (Log 9-10 CFU G^{-1}. feed) and pH of approximately 4.5-5.0 as described by Cutler *et al*. (2005).

Chicken husbandry and experimental design: The experiment was carried out at the poultry farmof Veterinary Medicine faculty in University of Putra Malaysia (UPM), Malaysia, during the period from 15th December 2014 to 15th March 2015 and aimed to study the appropriate proportion of wet feed replacement with fermented feed. A total of 96, one-day oldAkar Putra chicks were randomly assigned (CRD) chicks in the four experimental groups were fed as follows:

T1 : Control group fed on dry feed
T2 : Fed on wet feed mixture was prepared at the rate 1:1:1 (1 kg of commercial broiler feed+1 L tap water+1 g PP)
T3 : Fed on wet feed mixture was prepared at the rate 1:1:2 (1 kg of commercial broiler feed+1 L tap water+2 g PP)
T4 : Fed on wet feed mixture was prepared at the rate 1:1 (1 kg of commercial broiler feed+1 L tap water)

Each treatment group was replicated three times with 8 (4 males and 4 females) chicks per replicate. The chicks were reared in battery cages (5″×4″). The chicks were raised at a temperature and humidity controlled room with a 24 h constant light schedule and *adlibitum* access to water and feed throughout the experiment.

Sampling procedure and analytic methods: Body weight, weight gain, feed intake and feed conversion ratio for males and females were recorded separately from week 1 until week 12. Growth rate was calculated at the marketing age based on the formula which reported by Brody (1945). In the same regard, the variation ratio of the production performance parameters recorded based on the formula which mentioned by Jawad *et al*. (2015).

Statistical analysis: All the data were analyzed with one-way ANOVA and Duncan's multiple range tests were used to elucidate differing means (SPSS, 17.0).

RESULTS AND DISCUSSION

There was highly significant interaction for using probiotic compare with the control group, which indicates that fermenting 1 and 2 g probiotics in the diet had dependent effects on the evaluated characteristics. Table 2 and 3 show that the highest body weight at the end of the experimental period was1495.3 g for maleswhen used 2 g of PP and 1238 g for females when used 1 g of PP. Interestingly,using SSFF mixture without PP in T4 did not achieve any positive results in the production parameters of both sexes compared with the control treatment. These

Table 2: Effect of diet supplementation with probiotic at the rate of (1 and 2 g PP: 1 kg food: 1 L water) on mean weekly body weight (g) of males Akar Putra chicks reared to 12 weeks of age

	Treatments			
Weeks	T1	T2	T3	T4
1	62.7±3.48	62.67±3.76	63.3±3.48	54.7±2.96
2	104.0±2.89^{b}	129.00±2.08^{a}	130.3±2.33^{a}	108.7±2.6^{b}
3	150.0±4.04^{b}	184.70±2.96^{a}	157.7±3.76^{b}	128.3±2.73^{c}
4	277.0±6.93^{a}	247.30±5.55^{b}	254.7±5.81^{b}	213.3±4.81^{c}
5	345.0±11.55	348.00±9.87	359.3±10.98	319.3±10.14
6	499.0±14.43^{c}	548.30±11.41^{b}	593.0±11.93^{a}	462.0±10.41^{c}
7	610.0±9.82^{c}	653.70±8.69^{b}	712.3±9.24^{a}	631.7±9.53^{bc}
8	869.0±11.55^{a}	830.00±8.69^{b}	822.0±10.69^{b}	751.3±10.98^{c}
9	1041.0±17.9^{a}	922.00±15.37^{bc}	971.0±16.2^{b}	909.3±15.65^{c}
10	1165.0±19.05^{a}	1085.00±17.35^{bc}	1140.3±16.8^{ab}	1033.3±15.98^{c}
11	1290.0±20.21^{ab}	1235.30±18.78^{b}	1313.7±18.22^{a}	1127.0±17.67^{c}
12	1390.0±20.79^{b}	1406.00±19.93^{b}	1495.3±20.21^{a}	1248.3±19.36^{c}
Growth rate	190.3±0.34^{bc}	191.20±0.43^{ab}	191.5±0.35^{a}	189.8±0.28^{c}

Mean values with common superscript in row differ significantly ($p<0.01$), Values of growth rate differ significantly ($p<0.05$)

Table 3: Effect of diet supplementation with probiotic at the rate of (1 and 2 g PP: 1 kg food: 1 L water) on mean weekly body weight g of females Akar Putra chicks reared to 12 weeks of age

	Treatments			
Weeks	T1	T2	T3	T4
1	61.7±3.76	62.0±3.22	62.7±2.96	54.3±2.73
2	104.2±3.06^{b}	129.0±2.08^{a}	130.7±2.6^{a}	108.3±2.33^{b}
3	178.3±4.3^{a}	185.3±3.48^{a}	157.7±3.76^{b}	129.0±3.22^{c}
4	277.1±7.04^{a}	248.7±6.64^{b}	254.3±5.55^{b}	215.0±6.08^{c}
5	344.7±11.26	348.7±10.41	359.0±10.69	319.3±10.14
6	468.3±13.86^{a}	422.0±11.93^{b}	425.7±12.47^{b}	367.7±12.47^{c}
7	516.7±9.53^{a}	544.3±9.24^{a}	520.5±9.39^{a}	470.7±8.69^{b}
8	624.3±11.78^{b}	668.7±10.41^{a}	639.0±10.69^{ab}	569.7±11.26^{c}
9	714.7±17.61	763.3±15.65	735.3±16.48	692.0±16.2
10	815.3±18.48^{b}	892.7±17.07^{a}	839.3±17.63^{ab}	779.0±18.19^{b}
11	876.7±19.92^{b}	1058.0±18.5^{a}	927.0±17.67^{b}	877.7±18.22^{b}
12	937.3±20.21^{c}	1238.0±19.08^{a}	1028.7±19.54^{b}	987.7±18.8^{bc}
Growth Rate	186.2±0.52^{c}	190.2±0.34^{a}	188.063±0.32^{b}	187.325±0.32

Mean values with common superscript in row differ significantly ($p<0.01$), Mean values at week 10 differ significantly ($p<0.05$)

Table 4: Effect of diet supplementation with probiotic at the rate of (1 and 2 g PP: 1 kg food: 1 L water) on weekly feed consumption (g) of males Akar Putra chicks reared to 12 weeks of age

	Treatments			
Week	T1	T2	T3	T4
1	44.0±4.04	45.7±3.76	44.8±3.9	47.5±3.62
2	82.0±2.89	80.7±2.6	79.9±2.77	80.8±2.72
3	126.0±6.93^{a}	99.3±6.36^{b}	99.0±6.08^{b}	103.3±5.55^{b}
4	196.0±5.2^{b}	204.0±4.36^{b}	277.7±4.91^{a}	174.3±4.63^{c}
5	270.0±6.93^{b}	247.0±6.08^{c}	222.7±5.81^{d}	317.7±6.64^{a}
6	269.0±9.82^{c}	338.3±9.24^{b}	319.7±9.53^{b}	437.7±8.69^{a}
7	407.0±11.55^{b}	389.7±19.41^{b}	419.0±10.69^{b}	502.7±11.26^{a}
8	410.0±13.28	458.7±12.14	452.7±12.99	450.3±11.87
9	500.0±12.12^{a}	429.3±10.71^{b}	459.3±11.55^{b}	528.7±11.84^{a}
10	440.0±14.43^{d}	583.0±13.58^{a}	538.3±13.01^{b}	491.7±13.3^{c}
11	534.0±16.17^{b}	504.0±15.31^{b}	588.0±14.47^{a}	384.3±15.59^{c}
12	507.0±15.59^{b}	508.7±14.45^{b}	620.0±13.89^{a}	429.0±14.73^{c}
Total	3785.0±118.93	3888.3±108.99	4121.0±109.573	948.0±110.36

Mean values with common superscript in row differ significantly (p<0.01), Mean values at week 3 differ significantly (p<0.05)

Table 5: Effect of diet supplementation with probiotic at the rate of (1 and 2 g PP: 1 kg food: 1 L water) on weekly feed consumption (g) of females Akar Putra chicks reared to 12 weeks of age

	Treatments			
Weeks	T1	T2	T3	T4
1	44.1±4.13	45.7±3.76	43.7±2.96	47.3±3.48
2	82.3±3.15	80.7±2.61	79.3±2.33	80.0±2.082
3	125.3±6.36^{a}	98.0±5.29^{b}	99.0±6.08^{b}	104.3±6.36^{b}
4	195.7±4.91^{c}	332.0±3.61^{a}	276.7±4.1^{b}	174.0±4.36^{d}
5	230.7±6.64^{bc}	246.3±5.55^{b}	221.3±4.81^{c}	315.7±5.04^{a}
6	276.3±9.24^{a}	281.3±8.41^{a}	199.7±8.69^{b}	220.0±8.15^{b}
7	248.3±10.98^{b}	302.0±9.87^{a}	209.7±10.41^{c}	247.3±10.14^{b}
8	289.7±12.99^{a}	246.3±11.05^{b}	207.7±11.32^{c}	291.3±10.27^{a}
9	266.7±11.84^{b}	293.7±10.17^{ab}	163.0±9.64^{c}	326.3±10.71^{a}
10	357.7±14.15^{a}	308.3±13.02^{b}	205.7±13.3^{c}	269.0±12.74^{b}
11	260.0±15.31^{b}	369.0±14.47^{a}	181.0±15.301^{c}	330.3±15.59^{a}
12	307.3±14.17^{b}	358.7±14.45^{a}	194.3±15.02^{c}	313.3±14.17^{ab}
Total	2684.1±113.83^{a}	2962.0±102.11^{a}	2081.0±103.74^{b}	2719.0±102.92^{a}

Mean values with common superscript in row differ significantly (p<0.01), Mean values at week 3 differ significantly (p<0.05)

Table 6: Effect of diet supplementation with probiotic at the rate of (1 and 2 g PP: 1 kg food: 1 L water) on weekly weight gain of males Akar Putra chicks reared to 12 weeks of age

	Treatments			
Weeks	T1	T2	T3	T4
1	28.0±1.73^{a}	31.0±1.73^{a}	31.0±1.73^{a}	22.0±1.73^{b}
2	41.3±0.67^{c}	66.3±1.76^{a}	67.0±1.16^{a}	54.0±0.58^{b}
3	46.0±1.16^{b}	55.7±0.88^{a}	27.3±1.45^{c}	19.7±0.67^{d}
4	127.0±2.89^{a}	62.7±2.6^{d}	97.0±2.08^{b}	85.0±2.08^{c}
5	68.0±4.62^{b}	100.7±4.33^{a}	104.7±5.21^{a}	106.0±5.51^{a}
6	154.0±2.89^{c}	200.3±1.67^{b}	233.7±1.45^{a}	142.7±1.67^{d}
7	111.0±4.62^{bc}	105.3±2.85^{c}	119.3±2.85^{b}	169.7±2.4^{a}
8	259.0±1.73^{a}	176.3±1.2^{b}	109.7±1.45^{d}	119.7±1.45^{c}
9	172.0±6.35^{a}	92.0±5.51^{c}	149.0±5.51^{b}	158.0±4.73^{ab}
10	124.0±1.16^{c}	163.0±2.08^{b}	169.3±0.67^{a}	124.0±0.58^{c}
11	125.0±1.16^{c}	150.3±1.45^{b}	173.3±1.45^{a}	93.7±1.76^{d}
12	100.0±0.58^{d}	170.7±1.2^{b}	181.7±2.19^{a}	121.3±1.86^{c}
Total	1355.3±19.06^{b}	1374.3±17.9^{b}	1463.0±18.48^{a}	1215.7±18.19

Mean values with common superscript in row differ significantly (p<0.01), Mean values at week 1 differ significantly (p<0.05)

Table 7: Effect of diet supplementation with probiotic at the rate of (1 and 2 g PP: 1 kg food: 1 L water) on weekly weight gain of females Akar Putra chicks reared to 12 weeks of age

	Treatments			
Weeks	T1	T2	T3	T4
1	28.0±1.73^{a}	31.0±1.73^{a}	31.0±1.73^{a}	22.0±1.73^{b}
2	42.5±0.74^{c}	67.0±1.16^{a}	68.0±0.58^{a}	54.0±0.58^{b}
3	74.1±1.24^{a}	56.3±1.45^{b}	27.0±1.16^{c}	20.7±0.88^{d}
4	98.8±2.74^{a}	63.3±3.18^{c}	96.7±1.86^{a}	86.0±2.89^{b}
5	67.5±4.22^{b}	100.0±3.79^{a}	104.7±5.21^{a}	104.3±4.06^{a}
6	123.7±2.6^{a}	73.3±1.67^{b}	66.7±1.86^{b}	48.3±2.33^{c}
7	48.3±4.33^{c}	122.3±2.85^{a}	94.8±3.17^{b}	103.0±3.79^{b}
8	107.6±2.27^{b}	124.3±1.2^{a}	118.5±1.32^{a}	99.0±2.65^{c}
9	90.4±5.84^{b}	94.7±5.24^{b}	96.3±5.78^{b}	122.3±4.98^{a}
10	100.7±0.88^{b}	129.3±1.45^{a}	104.0±1.16^{b}	87.0±2.08^{c}
11	61.3±1.45^{d}	165.3±1.45^{a}	87.7±0.67^{c}	98.7±0.67^{b}
12	60.7±0.33^{d}	180.0±0.58^{a}	101.7±2.19^{c}	110.0±0.58^{b}
Total	903.7±18.19^{c}	1207.0±17.62^{a}	997.0±18.48^{b}	955.3±17.9^{bc}

Mean values with common superscript in row differ significantly (p<0.01), Mean values at weeks 1 and 9 differ significantly (p<0.05)

findings are opposite of the results described by Ahmad (2004) and Yousefi and Karkoodi (2007). The authors reported that production parameters were not affected by the dietary probiotic and yeast supplementation. In another hand, the results are consistent that the natural feed additives such as probiotic are very important materialsthat can improve, growth rate, daily weight gain, feed efficiency utilization and productive performance (Wysong, 2003).

Total feed intake in males was similar in the groups receiving probiotics and the control group (Table 4), corroborating previous results reported for feed intake at 21 days (Sato *et al*., 2002) and at 42 days of age (Mohan *et al*., 1996). Nevertheless, total feed intake was slightly higher when 2 g probiotics were administered in females (Table 5), corroborating previous finding by Lokman *et al*. (2015).

Table 6 and 7 show that the superiority in the weight gain for birds receiving probiotics than the control group was started from the starter phase (1-21 days). These findings are a contravention to the results reported by Fethiere and Miles (1987), Maiorka *et al*. (2001) and Sato *et al*. (2002). That distinction continued during the growing period until the marketing age.

Overall, the groups fed the probiotics had better feed conversion (p<0.01) (Table 8 and 9) compared to the other groups. However, the difference was not seen between probiotic treatments and control group in males at the total period of evaluation (1-84 days). Feed conversion value was higher (p<0.01) in the control group compared to the probiotic treatments in the periods from 1 to 14, 28 to 42 and 63 to 84 days of age in males. While in females, it was higher

Table 8: Effect of diet supplementation with probiotic at the rate of (1 and 2 g PP: 1 kg food: 1 L water) on weekly feed conversion ratio (g .feed/g gain) of males Akar Putra chicks reared to 12 weeks of age

	Treatments			
Weeks	T1	T2	T3	T4
1	1.6±0.05^{b}	1.5±0.04^{b}	1.4±0.05^{b}	2.2±0.01^{a}
2	2.0±0.1^{a}	1.2±0.07^{c}	1.2±0.06^{c}	1.5±0.06^{b}
3	2.7±0.08^{c}	1.8±0.09^{d}	3.6±0.05^{b}	5.3±0.32^{a}
4	1.5±0.01^{d}	3.3±0.07^{a}	2.9±0.02^{b}	2.1±0.01^{c}
5	4.0±0.17^{a}	2.5±0.05^{c}	2.1±0.05^{c}	3.0±0.09^{b}
6	1.8±0.03^{b}	1.7±0.03^{b}	1.4±0.04^{c}	3.1±0.07^{a}
7	3.7±0.26	3.7±0.19	3.5±0.17	3.0±0.09
8	1.6±0.04^{d}	2.6±0.05^{c}	4.1±0.06^{a}	3.8±0.05^{b}
9	2.9±0.04^{c}	4.7±0.17^{a}	3.1±0.04^{bc}	3.4±0.03^{b}
10	3.6±0.08^{b}	3.6±0.04^{b}	3.2±0.07^{c}	4.0±0.1^{a}
11	4.3±0.09^{a}	3.4±0.07^{b}	3.4±0.06^{b}	4.1±0.09^{a}
12	5.1±0.13^{a}	3.0±0.07^{c}	3.4±0.04^{b}	3.5±0.06^{b}
Total	2.8±0.05^{b}	2.8±0.04^{b}	2.8±0.04^{b}	3.3±0.04^{a}

Mean values with common superscript in row differ significantly (p<0.01)

Table 9: Effect of diet supplementation with probiotic at the rate of (1 and 2 g PP: 1 kg food: L water) on weekly feed conversion ratio (g feed/g gain) of females Akar Putra chicks reared to 12 weeks of age

	Treatments			
Week	T1	T2	T3	T4
1	1.6±0.05^{b}	1.5±0.04^{bc}	1.4±0.03^{c}	2.2±0.02^{a}
2	1.9±0.11^{a}	1.2±0.06^{c}	1.2±0.04^{c}	1.5±0.05^{b}
3	1.7±0.06^{c}	1.7±0.05^{c}	3.7±0.07^{b}	5.0±0.1^{a}
4	2.0±0.01^{c}	5.3±0.21^{a}	2.9±0.02^{b}	2.0±0.02^{c}
5	3.4±0.12^{a}	2.5±0.04^{c}	2.1±0.06^{d}	3.0±0.07^{b}
6	2.2±0.03^{d}	3.8±0.05^{b}	3.0±0.06^{c}	4.6±0.05^{a}
7	5.3±0.7^{a}	2.5±0.13^{b}	2.2±0.18^{b}	2.4±0.19^{b}
8	2.7±0.07^{b}	2.0±0.07^{c}	1.8±0.08^{d}	2.9±0.04^{a}
9	3.0±0.06^{a}	3.1±0.07^{a}	1.7±0.01^{c}	2.7±0.02^{b}
10	3.6±0.11^{a}	2.4±0.08^{c}	2.0±0.11^{d}	3.1±0.08^{b}
11	4.2±0.15^{a}	2.2±0.07^{c}	2.1±0.18^{c}	3.3±0.16^{b}
12	5.1±0.21^{a}	2.0±0.07^{c}	1.9±0.11^{c}	2.8±0.11^{b}
Total	3.0±0.07^{a}	2.5±0.05^{b}	2.1±0.07^{c}	2.8±0.06^{a}

Mean values with common superscript in row differ significantly (p<0.01)

in the periods from 1 to 14, 28 to 35 and 42 to 84 of age. The improver feed conversion seen in the groups fed probiotics if compared to the control group evidence the reason for the higher weight gain indexes, since almost the treatments had similar feed intake. These findings are similar to the results described by Jin *et al*. (1998), Besnard *et al*. (2000) and Ayanwale *et al*. (2006). The authors reported worse feed conversion in the control group when compared to groups of broilers and turkeys fed probiotics based on *Lactobacillus* sp. and *Saccharomyce scerevisiae* in the diets, respectively.

Birds fed probiotics had lower feed intake (p<0.01)associated to improve the feed conversion in almost the evaluated periods (p<0.01), which were decisive to result in the high weight gain (p<0.01) seen in these birds. Although high significant differences in performance were observed between these groups in the finisher phase (36-84 days), the increase (p<0.05) in the growing rate was enough to positively influence the performance of birds fed probiotics in the total period of rearing (1-84 days). Similar results were obtained when fermented feed with probiotic in a dry form was used as a daily diet of Akar Putra chicken (Lokman *et al*., 2015). The results of that experiment revealed remarkable significant (p<0.01) enhancing for supplementing treatments than the control group in all of males' and females' body weight, weight gain, feed intake and feed conversion ratio measurements. Furthermore, best results were indicated in the chickens fed on dry feed mixture with 1gm of probiotic. Moreover, such results corroborate the findings of Santoso *et al*. (1995), Yeo and Kim (1997) and Cavazzoni *et al*. (1998), but are nevertheless opposite to those reported by Buenrostro and Kratzer (1983).

Based on the research result and discussion, it can be concluded that using wet fermented feed with 1 and 2 g of prepared probiotic caused significant improvement in the production performance of Akar Putra chicken. The supplementing of probiotic reflection appears prominently on the live body weight, as well as the growth rate traits. It is assumed that feed fermentation generally improves bacterial ecology of the gastrointestinal tract and immunity response in AkarPutra chicks, therefore, be a new handle on future strategy to control chicken disease.

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