EFFECTS OF VARYING DURATIONS OF SYNBIOTIC USE ON GROWTH PERFORMANCE IN COBB-500 BROILERS

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ABSTRACT

Synbiotics, a combination of probiotics and prebiotics, are increasingly being explored as alternatives to antibiotics in poultry nutrition due to rising consumer demand for antibiotic-free products and concerns about antibiotic resistance. With these issues, and the ban on antibiotics as growth promoters, the poultry industry is shifting toward natural feed additives. Synbiotics have gained attention for their potential as an effective growth promoter. Broiler growth performance, a critical factor for profitability, can be enhanced using synbiotics, which improve gut health, increase feed efficiency, and boost overall growth. The effectiveness of synbiotics, however, is influenced by the method, timing, and duration of administration. This study focuses on determining the optimal duration of synbiotic supplementation to maximize weight gain, feed conversion ratio (FCR), and gut health, aiming for more efficient and sustainable poultry production. To evaluate the impact of varying supplementation durations, a trial was conducted with day-old Cobb-500 chicks (420 in number), divided into seven treatment groups with six replicates of 10 chicks each. The study was carried out at Fewa Group of Poultry Industries Pvt. Ltd., Pokhara, Nepal, over six weeks, with weekly treatments lasting from the 1st to the 6th week, including a control group without synbiotic supplementation. Weekly performance parameters such as feed consumption, weight gain, and FCR were recorded. The results demonstrated that continuous synbiotic supplementation in feed throughout the rearing period of 6 weeks at the recommended levels significantly improved growth performance. Feed consumption increased notably in the fifth and sixth weeks, while weight gain was positively influenced from the third week onward. Additionally, cumulative feed intake, average weight, and FCR at 42 days showed substantial improvement, indicating that synbiotics are a viable alternative to antibiotics for promoting growth when used throughout the rearing periods of 6 weeks in broiler production.

Keywords: *Synbiotic, Broiler performance, Antibiotic alternatives, Optimal duration*

INTRODUCTION

Commercial poultry farming in Nepal has emerged as a significant sector within the agricultural landscape, contributing approximately 4% to the national Gross Domestic Product (GDP) and providing substantial employment opportunities. The sector has experienced rapid growth, particularly in urban areas such as Kathmandu, Pokhara, and Chitwan, which are densely populated regions with high poultry production and consumption (Dhakal & Gompo, 2022; Poudel et al., 2021). The increasing demand for poultry products, including meat and eggs, has led to the establishment of numerous commercial farms, which now

account for about 54% of total poultry production in the country (Poudel, 2024; Poudel et al., 2021). The growth of commercial poultry farming in Nepal faces significant challenges, particularly in biosecurity and disease management(Marahatta, 2023; Napit et al., 2023). Despite these challenges, the poultry sector continues to be a dynamic part of Nepal's agricultural economy, with opportunities for expansion and improvement in production practices (Adhikari, 2023; Dhakal et al., 2019). Moreover, commercial poultry farming is vital to world food production because it provides readily available protein for human consumption (Hunter et al., 2017). As one of the most efficient sources of animal protein, poultry farming provides a sustainable solution to meet the increasing global demand for meat and eggs, driven by population growth and changing dietary preferences (Corrêa-Junior, 2024; Marinchenko, 2023). The poultry sector is characterized by its rapid production cycles and relatively low resource input compared to other livestock, making it a vital component of modern agriculture (Mohamed, 2023). For rapid growth and disease prevention, antibiotic growth promoters(AGPs) have been associated with several benefits, including increased weight gain and improved feed efficiency in broilers (Szabó et al., 2023). However, the adverse effects of antibiotic use, such as the development of resistant bacterial strains and potential residues in meat products, have raised significant health concerns(El-Ghany & Eraky, 2020; Mahfuz et al., 2018).

Traditionally, antibiotics were widely used as growth promoters (AGPs) in poultry diets to enhance growth rates, improve feed conversion efficiency, and prevent diseases (Costa et al., 2017; Szabó et al., 2023; Tajodini et al., 2015). However, the overuse and misuse of these growth promoters have led to the development of antimicrobial resistance (AMR), which is another pressing issue in the poultry sector. Studies indicate that a significant proportion of poultry farmers in Nepal are unaware of the implications of AMR, which poses risks not only to animal health but also to public health (Lambrou et al., 2021; Poudel et al., 2023). Therefore, there is an increasing trend in the use of antibiotic alternatives in broiler production due to increased awareness of antibiotic resistance and the widespread ban on antibiotic growth promoters (AGPs)(Obajuluwa et al., 2021). Probiotics and prebiotics have been used as substitutes for antibiotics to improve the intestinal health and overall performance of poultry(Karar et al., 2023). As a result, antibiotic-free rearing methods and the use of probiotics and prebiotics are becoming more common(Siwek et al., 2018).

Probiotics and prebiotics are generally accepted by consumers as safe and natural feed additives. When consumed adequately, probiotics improve host health through intestinal maturation, increasing immunity, reducing inflammation, and maintaining a healthy intestinal microbiota, improving bird's performance without residual effects and benefiting both host health and performance (Bhagwat et al., 2023). Similarly, prebiotics are indigestible substances that support the activity or growth of beneficial bacteria in the intestines(Żbikowski et al., 2020). Prebiotics alone also improve the growth performance of broilers when applied in feed (Osman et al., 2024). Therefore, possible alternatives to antibiotic-based additives banned in feed include prebiotics, probiotics, and synbiotics (Markowiak & Śliżewska, 2018). The combination of probiotics and prebiotics, known as synbiotics, increases the implantation and survival of beneficial microorganisms in the gastrointestinal tract of poultry(Śliżewska et al., 2020). When applied in a mixed form, probiotics and prebiotics showed better results than when applied separately (Dunislawska et al., 2017).

In the gastrointestinal tract (GIT), the microbiota of birds plays a critical role in the development and control of the immune system, as well as in the digestion, absorption,

and metabolism of nutrients (Patterson & Burkholder, 2003). Bioactive compounds such as probiotics, synbiotics, and prebiotics can influence the microbiota of the gastrointestinal tract (GIT). These bioactive substances can modify the host microbiome directly, which has an indirect impact on host organisms. Prebiotics and probiotics can work synergistically with each other (De Vrese & Schrezenmeir, 2008; Yang et al., 2009). Chicks are susceptible to environmental diseases during the early stages of hatching mainly due to their undeveloped immune system (Duan et al., 2021). Enhancing nutrient availability through adequate nutrition before hatching can reduce disease threats. An effective way to compensate for energy deficits during hatching is to introduce nutrients directly into the amniotic cavity via *in ovo* injection (Cardeal et al., 2015; Hou & Tako, 2018). The use of *in ovo* and early feeding of synbiotics in broiler chicks presents a promising approach to enhance growth performance and gut health. These methods contribute to improved digestive efficiency, better nutrient absorption, and a healthier gut microbiota, ultimately leading to enhanced productivity in broiler production systems. The mechanism behind these improvements can be attributed to the modulation of gut microbiota and enhancement of digestive enzyme activity. Synbiotics can alter the activity of digestive enzymes such as trypsin, amylase, and lipase, which are crucial for nutrient breakdown and absorption (Kołodziejski et al., 2018).

Prebiotics, probiotics, or synbiotics are frequently administered in feed or water as soon as the chicks hatch (Alloui et al., 2013). The duration and method of administration of bioactive compounds determine the extent to which the GIT microbiota is modulated (Yang et al., 2009). The period from hatching to the second week is critical for the initial colonization of the gastrointestinal tract (GIT) by bacteria for it to reach functional maturity. During this time, early post-hatch supplementation with bioactive substances can be highly beneficial(Dunislawska et al., 2017).

Several studies have demonstrated the beneficial effects of synbiotics on intestinal health and overall performance, but there remains a gap in understanding the impact of varying weekly feeding durations on growth performance in broilers. Previous research has shown that even short-term synbiotic supplementation, such as for seven days, can positively influence intestinal health, body weight, and feed conversion ratio, at five weeks post-supplementation (Abdel-Hafeez et al., 2017; Żbikowski et al., 2020). This study aimed to investigate the effects of various synbiotic feeding durations on the performance of broilers.

MATERIALS AND METHODS

Study area and duration

The study was carried out in April 2023 at the Fewa Group of Poultry Industries Pvt. Ltd. premises at Pokhara, Nepal, up to 6 weeks of age using deep litter and open-sided buildings. Chicks were weighed at the start of the experiment, and weekly weight and feed consumption were also recorded. Mortality and feed waste during the study period were adjusted and recorded accordingly.

Experimental birds management and research design

A total of 420 Cobb-500 chicks, sourced from 35-week-old breeders, were obtained from the same hatchery where the study was conducted. The chicks were randomly assigned to seven treatment groups, with each treatment having six replicates of 10 chicks per unit, arranged in a completely randomized design. The compartments were prepared with the

use of locally available green nets and ropes that were adequately tightened maintaining adequate ventilation. The chicks were provided a space of 1 sq. ft per bird and rice husk as bedding materials. The experimental shed was properly cleaned, and all equipment used in the experiment was fumigated with formalin and potassium permanganate at a 2:1 ratio per 100 cubic feet of space one week before the start of the experiment All management practices within the experimental site were followed according to the standard management practices required for cobb-500 broilers (Broiler Management Guide 2021).

Three vaccines were administered with strain B1 on day 7, the Gumboro plus strain on day 14, and the Lasota strain on day 26 (Ventri Biological, India). The first two were given as eye drop, and the last was provided in drinking water. PoultryStar® me was used as a synbiotic source (BIOMIN Singapore Pte Ltd, Singapore) with the probiotic bacterial strains *Enterococcus faecium*, *Pediococcus acidilactici*, *Bifidobacterium animalis* and *Lactobacillus reuteri* and a prebiotic fructooligosaccharide through feed at the recommended level (500g/t) of feed. Daily weight gain, feed, and water consumption were recorded, and weekly cumulative weight, feed, and water consumption were calculated. Daily feed consumption was calculated by adjusting the remaining feed in the feeders. The following formulas were used for the calculation of weekly weight gain, weekly feed consumption, and weekly water consumption.

Weekly weight gain:

Weekly weight gain=weight at the end of the week−weight at the start of the week

Weekly feed consumption: (measured every day and recorded weekly)

Weekly feed consumption=total feed provided−feed leftover

Weekly water consumption :(measured every day and recorded weekly)

Weekly water consumption=total water provided−water leftover

Evaluation of performance parameters

Feed intake, daily weight gain, and water consumption were recorded daily. With these data, the weekly weight gain, weekly feed consumption, weekly growth pattern, and feed efficiency were calculated. The birds were reared for up to six weeks. The feed was prepared with a corn-soya-based diet. The ingredients used, their chemical composition, and laboratory analysis of the feed samples are shown in Table 2 and Table 3 respectively.

Statistical analysis

One-way analysis of variance (ANOVA) using R Statistics (version 4.3.2) was employed for the statistical analysis. Duncan's multiple range test (DMRT) was used to analyze variations between treatments when the *p-value* was less than 0.05. The means are displayed with calculated standard errors (SEs).The treatment details used in the experiment are shown in Table 1.

Table 2. Ingredients composition of the broiler starter (B0), grower (B1), and finisher (B2) ration used in the experiment with broiler

Ingredients	Quantity of the ingredients (in kg)			Ingredients	Quantity of the ingredients (in kg)		
	B0	B1	B2		B0	B1	B2
Maize	540	560	594	L-Lysine Hcl	2.5	2.5	2.2
Rice Polish	47.3	79.8	69.1	L-Threionine	2.4	2.1	1.6
Oil-soy	22	22	32	Choline Chloride	1	1	1
Soya DOC 46%	344	300	270	Fat Emulsifier-Lipidin	0.5	0.5	0.5
Salt	1.7	1.7	1.7	Toxin Binder	1	1	1
Sodium Bicarbonate	2.8	2.8	2.8	Tracemineral Mixture*	1	1	1
Di-Calcium Phosphate	17.5	8	7	Livertonic	0.5	0.5	0.5
Phytase(5000FTU)	0.1	.1	0.1	Vitamin Premix**	0.5	0.5	0.5
Limestone Powder	9	10.5	9.5	Acidifier	1	1	1
DL-Methionine	4.4	4.2	3.7	Antioxidant	0.1	.1	0.1
Enzyme	.2	.2	.2	Synbiotic	.5	.5	.5
Total					1000	1000	1000

Table 3. Nutrient composition(Calculated and analyzed values) of the broiler starter (B0), grower (B1), and finisher (B2) ration used in the experiment

Calculated values							
	B0	B1	B2		B0	B1	B2
M.E (Kcal/kg)	2999.91	3093.81	3191	Chloride %	0.16	0.16	0.16
Crude Protein %	22.04	20.97	19.03	Potassium %	0.91	0.87	0.81
Dig.Lysine %	1.26	1.16	1.06	Dig. Arginine %	1.27	1.16	1.01
Dig.Methionine %	0.69	0.65	0.60	Dig.Tryptophan %	0.20	0.18	0.17
Dig.Meth +Cystine %	0.94	0.90	0.82	Dig.Threionine %	0.86	0.78	0.69
Calcium %	0.97	0.80	0.74	Dig. Isoleucine %	0.72	0.66	0.62
Availbale Phosphorus %	0.58	0.40	0.38	Dig. Valine %	0.81	0.75	0.70
Sodium %	0.16	0.16	0.16	Linoleic Acid %	2.3	2.48	2.89
Crude Fiber %	4.7	5	4.8				
Analyzed values							
Crude protein %	20.21	19.62	17.93	Crude fiber %	3.91	4.21	4.33
Ash %	5.63	5.23	5.32	Moisture %	11.11	11.31	11.01
Fat %	4.10	4.88	6.96				

RESULTS AND DISCUSSION

The use of synbiotics in broilers has shown promising outcomes, including enhanced growth performance, increased feed consumption, and improved FCR. These positive effects are attributed to the enhancement of intestinal health, inhibition of pathogenic bacterial

growth, and promotion of beneficial microbial populations, which together facilitate better nutrient absorption and utilization. The findings showed positive results in boilers in feed intake, growth performance, and feed conversion ratio.

Feed consumption

Cumulative feed consumption increased significantly at the fifth and sixth weeks (p<0.05) of age as shown in Table 4. However, feed consumption between treatments was similar in the control and treatment groups up to the first four weeks. Weekly feed consumption was also found to be significantly greater in the fifth and sixth weeks, as shown in Figure 1. Synbiotic increase antioxidant levels in broilers, which improves general health and meat quality by increasing water retention and oxidative stability as well as boost the immune system (Dev et al., 2020; Nisar et al., 2021; Prentza et al., 2022; Żbikowski et al., 2020). Feed consumption was significantly increased when prebiotics, probiotics, or synbiotic combinations were added to the broiler diet during in-feed supplementation(Mousavi et al., 2015) which is in line with the present findings. On the contrary, when compared to the control group, synbiotic treatment at 35 days of age dramatically decreased feed intake (Al-Sultan et al., 2016). Similarly, Sarangi et al. (2016) also noted that there was no effect on feed intake with the use of synbiotics in feed consumption. However, feed intake depends upon various factors like housing, and temperature variation. The improvement in feed consumption with the use of synbiotics in broilers is the result of a balanced microbial population, healthy gut, and production of digestive enzymes and short-chain fatty acids, which enhances appetite, digestion, and utilization of nutrients (Nisar et.al. 2021; Acharya et.al. 2024).

Table 4. Status of cumulative feed intake of cobb-500 broilers in the experiment

Treatments	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
T1	158.94	501.57	1131.22	1885.18	2826.98^{c}	3886.95^{c}
T2	158.87	504.98	1132.26	1929.66	2866.92^{abc}	3966.25^{bc}
T3	159.32	501.67	1110.61	1888.70	2854.33^{bc}	3965.81^{ab}
T4	159.02	511.22	1123.09	1921.09	2874.21^{abc}	3964.67^{ab}
T5	158.89	494.42	1125.18	1913.56	2916.58^{ab}	4047.44^{a}
T6	160.92	504.52	1145.12	1937.76	2921.72^{ab}	4047.48^{a}
T7	161.75	508.92	1147.53	1941.37	2950.75^{a}	4091.97^{a}
Average	159.67	503.90	1130.72	1916.76	2887.36	3995.80
CV (%)	1.85	1.52	1.94	2.43	2.35	7.44
F test	0.065	0.406	0.067	0.043	0.0006	0.000
SEM(±)	0.44	2.07	4.85	8.49	16.46	26.36

T1 = control, T2 = synbiotic for 1 week, T3= synbiotic for 2 weeks, T4= synbiotic for 3 weeks, T5= synbiotic for 4 weeks, T6= synbiotic for 5 weeks, T7= synbiotic for 6 weeks. In the same row, values with letters or the same letter superscripts indicate no significant difference (p > 0.05), while those with different small letter superscripts indicate a significant difference (p < 0.05).

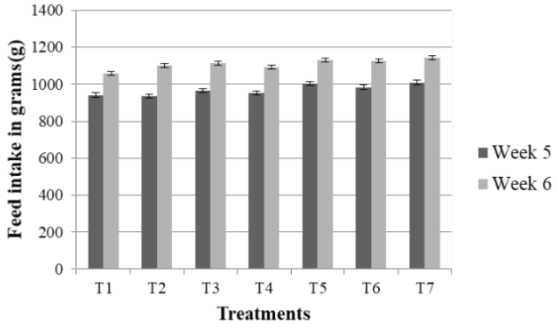

Figure 1. Weekly feed consumption of Cobb-500 broilers at 5th and 6th weeks of age

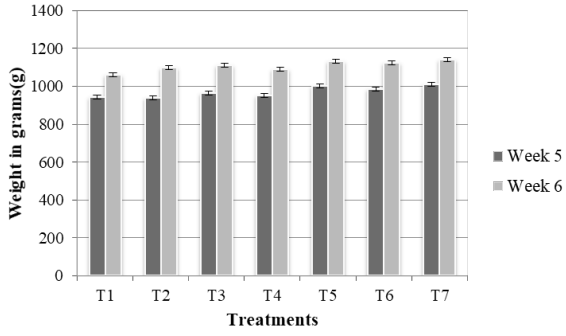

Figure 2. Weekly weight gain of Cobb 500 broilers at 5th and 6th weeks of age

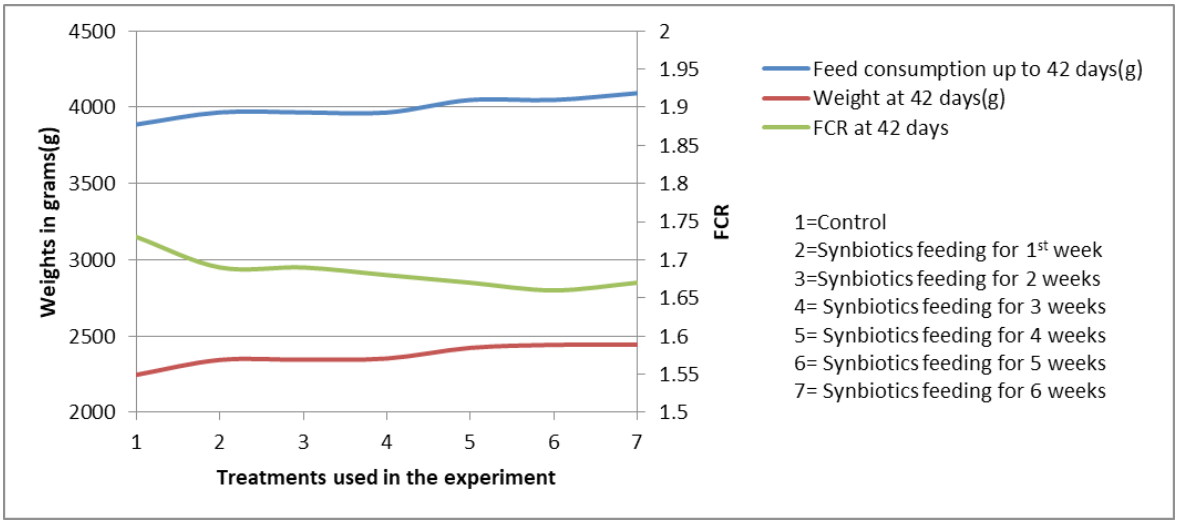

Figure 3. The overall performance (Feed consumption, Weight gain, and FCR) of cobb-500 broilers at 42 days of age

Weekly growth pattern of broilers

The weekly growth patterns of the broilers are shown in Table 5. The weight of the birds was significantly different in the third and sixth weeks (p<0.001). Similarly, the weekly weight gain was also found significant in the fifth and sixth weeks, as shown in Figure 2. The overall performance parameters such as cumulative feed intake, average weight, and feed conversion ratio (FCR) at 42 days were found significant (p<0.001) with the continuous use of synbiotics for longer durations as shown in Figure 3. Broiler growth was not significantly affected by any supplements (control, probiotics, Zinc bacitracin, probiotics or MOS) until day 28. However, from day 29 to day 36, the group that received *Saccharomyces cerevisiae* (SC) demonstrated significantly greater body weight gain (BWG) than the other groups (Attia et al., 2023). During the initial phase (1–14 days), diet interventions had no significant effect on broiler performance. However, from day 1 to day 21, the Body weight (BW), Body weight gain (BWG), and Feed conversion ratio (FCR) of the broilers increased significantly (p<0.001) with the addition of *P. xylanexedens* and synbiotic. A diet supplemented with *P. xylanexedens* and inulin from day 1 to day 42 resulted in a reduced FCR for the birds (Calik et al., 2017) which is in support of the present findings. With the goal of improving weight, increasing the feed conversion rate, and reducing feed production costs, the addition

of a synbiotic to feed is economical and beneficial(Abdel-Hafeez et al., 2017). It could be hypothesized that a synbiotic or prebiotic could boost growth performance by creating a healthy environment in the broiler intestine (such as balanced intestinal bacteria). This is a result of the ability of good bacterial probiotics to multiply and counteract the negative effects of harmful microbial populations in the digestive system(Dakhil & Al-Shammari, 2023). Moreover, the improved growth performance is attributed to enhanced intestinal integrity and increased activity of digestive enzymes, which facilitate the efficient utilization of nutrients (Khalid et al., 2021; Min et al., 2016). Similarly, the positive impact of synbiotics on intestinal morphology, such as increased villus height and villus-to-crypt ratio, has been linked to better nutrient absorption and overall growth performance (Chen, Cui, et al., 2018; Min et al., 2016). Therefore, the addition of prebiotics and probiotics to the diet significantly improved the growth performance of commercial broilers(Ali et al., 2023) which is in support of the present findings.

Table 5. Weekly growth pattern of broilers fed synbiotic for different durations

Treatments	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
T1	142.33	401.31	811.59^{c}	1241.72^{b}	1722.42^{c}	2246.53^{c}
T2	139.33	406.07	819.44^{bc}	1290.17^{ab}	1790.17^{ab}	2344.05^{b}
T3	145.50	404.61	805.08^{c}	1265.67^{ab}	1749.83^{bc}	2344.85^{b}
T4	138.50	400.55	817.29^{bc}	1235.17^{b}	1747.14^{bc}	2353.37^{b}
T5	143.17	411.79	831.49^{abc}	1321.33^{a}	1799.08^{ab}	2423.00^{a}
T6	142.33	408.97	839.71^{ab}	1309.34^{a}	1797.36^{ab}	2442.65^{a}
T7	143.67	409.80	852.65^{a}	1312.54^{a}	1822.43^{a}	2444.32^{a}
Average	142.12	406.16	825.32	1282.28	1775.49	2371.25
CV (%)	2.80	2.66	2.51	3.49	2.77	2.05
F test	0.037	0.108	0.0001	0.002	0.001	0.0001
SEM(±)	0.92	1.62	6.34	13.25	13.57	26.92

T1 = control, T2 = synbiotic for 1 week, T3= synbiotic for 2 weeks, T4= synbiotic for 3 weeks, T5= synbiotic for 4 weeks, T6= synbiotic for 5 weeks, T7= synbiotic for 6 weeks. In the same row, values with letters or the same letter superscripts indicate no significant difference ($p > 0.05$), while those with different small letter superscripts indicate a significant difference ($p < 0.05$).

Feed conversion ratio

There was a significant difference among the treatments in feed conversion ratio (FCR) at 21 days after hatching. No significant differences were observed in FCR among treatments before the seventh day after hatching. The average feed conversion ratio (FCR) decreased with increasing duration of synbiotic compared to that of the control group as shown in Table 6. The continuous use of synbiotic at recommended levels had shown better results in terms of FCR in cobb-500 broilers. It has been consistently demonstrated that supplementing broilers with synbiotics lowered their feed conversion ratio (FCR) which in turn improved feed efficiency and overall performance. When broilers were supplemented with synbiotics, their average daily gain and gain: feed ratio increased from 22 to 42 days in comparison to those of the control group (Chen, Wen, et al., 2018) which is similar to the present findings.

Several other research results suggested that the gastrointestinal microbiota can be favorably altered by supplementing with synbiotics, which can eventually result in better FCR readings (Brugaletta et al., 2020). In particular, notable distinctions were observed

between the probiotic and synbiotic groups, especially in BWG and FCR (Duan et al., 2021) similar to the findings of our research. The study on the use of synbiotics in broiler feed revealed that adding synbiotic preparations for 42 days significantly increased the amount of lactic acid in bird excreta and significantly decreased the amount of potentially harmful bacteria, such as *Clostridium spp*. and *Escherichia coli*, in bird intestinal contents and excreta(Śliżewska et al., 2020), which ultimately helps improve gut health and helps weight gain and other performance parameters in broilers, which is in line with the present findings. Broilers supplied with synbiotics in their diet had increased cecal Lactobacillus and Enterococcus counts and improved growth performance (Tarabees et al., 2023).

Table 6. Average feed conversion ratio (FCR) of the broilers fed synbiotic for different durations

Treatments	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
T1	1.12	1.25	1.40^{a}	1.52	1.64	1.73^{a}
T2	1.14	1.24	1.38^{ab}	1.50	1.60	1.69^{b}
T3	1.10	1.24	1.38^{ab}	1.49	1.63	1.69^{b}
T4	1.15	1.28	1.37^{ab}	1.56	1.65	1.68^{b}
T5	1.11	1.20	1.35^{ab}	1.45	1.62	1.67^{b}
T6	1.13	1.24	1.36^{ab}	1.48	1.63	1.66^{b}
T7	1.13	1.24	1.35^{b}	1.48	1.62	1.67^{b}
Average	1.12	1.24	1.37	1.50	1.63	1.69
CV (%)	3.51	3.39	2.41	3.76	2.82	1.76
F test	0.812	0.386	0.005	0.11	0.75	0.000
SEM(±)	0.01	0.01	0.01	0.01	0.01	0.01

T1 = control, T2 = synbiotic for 1 week, T3= synbiotic for 2 weeks, T4= synbiotic for 3 weeks, T5= synbiotic for 4 weeks, T6= synbiotic for 5 weeks, T7= synbiotic for 6 weeks. In the same row, values with letters or the same letter superscripts indicate no significant difference ($p > 0.05$), while those with different small letter superscripts indicate a significant difference ($p < 0.05$).

Synbiotic supplementation increased feed intake and body weight in broilers (Dakhil & Al-Shammari, 2023; Rudoy et al., 2023) similar to our findings. Feed intake was not affected in birds fed a diet with different levels of synbiotics or in the control group during the initial or finishing phase. In contrast, (Sarangi et al., 2016) reported that supplementing feed with 500 g/t synbiotic did not affect feeding intake. Synbiotic supplementation was found to have the potential to improve FCR (Raksasiri et al., 2018). The application of synbiotics in the hatchery and the diet may improve the feed conversion ratio in broilers, but the FCR was not affected in the first two weeks of age (0-14 days) (White et al., 2024), which the present findings support. Similarities in early performance may be associated with the proliferation of synbiotic group microorganisms in the intestine, which may cause the body to redirect its energy resources away from the development of muscles and tissue. Findings of the other research also revealed that conventional chicks grow more slowly during the first weeks of life than germ-free birds (Dibner & Richards, 2005; Lan et al., 2005) which is in line with our research findings. The feed conversion ratio of broiler birds was neither negatively influenced by the addition of a synbiotic nor was it improved (Sarangi et al., 2016), which is in contrast with the present findings.

CONCLUSIONS

The growth performance of broilers- body weight gain, feed conversion ratio, and feed consumption- can be improved by adding synbiotics to their feed at the recommended level (500gm/t) throughout the rearing period. These benefits of supplementation with synbiotics highlight their potential as a feed additive in broiler production, which, when applied consistently through feed in broilers, can boost their growth and efficiency as an alternative to antibiotic growth promoters.

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