



Effects of Provet Probiotic on The Growth and Gut Microflora of Pekin Duck (*Anas Platyrhynchos Domesticus*)

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ABSTRACT

The study was conducted to evaluate the effect of Provet probiotics on the growth performance and gut microflora of Pekin ducks. Specifically, it aimed to determine which inclusion level or dosage of Provet probiotic produced the best results in terms of initial and weekly body weight, gain in weight, percentage rate of growth, feed consumption, feed conversion ratio and efficiency, return above chick, feeds, and additive cost, and gut microflora of Pekin ducks. The study was conducted from March 28 to April 25, 2026 at the Department of Agriculture–Research Outreach Station, Tumog, Luna, Apayao. Treatments included 5 grams commercial probiotic mixed with feeds and water (T_1), 10ml Provet probiotic mixed with feeds and water (T_2), 20ml Provet probiotic mixed with feeds and water (T_3), and 30ml Provet probiotic mixed with feeds and water (T_4). All data gathered were analyzed using the Analysis of Variance (ANOVA) under the Completely Randomized Design (CRD). Differences between treatment means were determined using the Least Significant Difference (LSD) test when results were significant. Results revealed that Provet probiotic has potential as a dietary supplement for Pekin ducks. Although no significant differences were observed among treatments in terms of weekly body weight, gain in weight, percentage rate of growth, feed consumption, feed conversion ratio, and feed efficiency, the 20ml Provet probiotic treatment numerically obtained a higher return above chick, feeds, and additive cost compared to the commercial probiotic, indicating its economic advantage in Pekin duck production. On the other hands, Provet probiotics serve more as a preventive and supporting measure than a direct antiparasitic therapy. This indicates that probiotics function more as a supportive and preventive strategy rather than a direct antiparasitic treatment.

Keywords: Provet Probiotic, Growth, Gut Microflora, Ducks



INTRODUCTION

The world's production of poultry is expected to rise this 2026 by about 2.5 percent, with broiler production leading the way. Poultry is predicted to surpass beef and pig as the fastest-growing animal protein source, which is crucial to ensure global food security. Demand and consumption are anticipated to rise. In the Philippines, 80percent of rural household are engaged in poultry production (UN-FAO). Pekin ducks (*Anas platyrhynchos domesticus*) are recognized as practical and resilient poultry species (Underwood, W.J. et.al. 2014). In the Philippines, particularly in rural and upland areas. compared with chickens, Pekin ducks exhibit greater flexibility in feeding management, as they can efficiently utilize locally available feed resources such as rice bran, corn, and agricultural by-products. This characteristic makes them suitable for smallholder and semi-intensive production systems, especially in regions where access to commercial feeds is limited (PCCAARD DOST). In terms of environmental adaptability, Pekin ducks show higher tolerance to the Philippines' tropical climate, including fluctuations in temperature and humidity. Their ability to cope with environmental stress allows them to maintain stable growth and productivity under conditions that often negatively affect other poultry species. In the Cordillera Administrative Region (CAR), where cooler temperatures and low-input farming systems are common, Pekin ducks demonstrate consistent growth performance and offer a viable alternative to broiler chickens (DA.gov.ph 2018). However, poultry raising is prone to unpredictability because of high input costs and diseases. Health and growth performance in ducks are closely linked to gastrointestinal function and gut microflora balance. While ducks generally possess stronger innate disease resistance than chickens, gut health remains a critical factor influencing nutrient absorption, immune response, and carcass quality. Traditionally, synthetic antibiotic growth promoters (AGPs) have been used to enhance performance and control intestinal pathogens. However, growing concerns regarding antimicrobial resistance, food safety, and antibiotic residues have led to increasing restrictions on AGP use [4]. Probiotics are live microbial feed supplements that improve gut health. *Lactobacillus*, *Bacillus*, and *Saccharomyces* are popular strains and are frequently added to water or feed (Lutbul Kabir, S.M. 2009). Probiotics help improve gut microbial balance, enhance immunity, and support better nutrient utilization, resulting in improved growth and carcass traits. Compared to AGPs, probiotics do not pose risks of antimicrobial resistance or chemical residues, making them more acceptable to consumers and aligned with sustainable livestock production goals (Yaqoob, M.U. et.al. 2022). Locally produced probiotics (Rodzi et.al 2021), offer advantages in affordability, accessibility, and adaptability to local environmental and management conditions. Apayao State College have developed the Provet Probiotic for the same purpose as well as to make products available and accessible to the local farmers (Villanueva, M.D. 2026). The Provet probiotic was developed by Villanueva, M. D., prepared using various herbs to include: garlic (*Allium sativum* L.), hot chilies (*Capsicum spp.*), ginger (*Zingiber officinale* L.), papaya (*Carica papaya* L.) peel, indigenous microorganisms, molasses and Yakult. Said mixture has been subjected to studies on farm animals, particularly on pigs (Villanueva, M.D. 2026). Given the availability of the Provet probiotic, there remains limited scientific evidence on the effects of locally produced probiotics on the growth and gut microflora of Pekin ducks. Majority of studies available are focused on broiler chickens using commercial probiotics, creating a gap in duck-specific and location-specific application studies. The Sustainable Development Goals (SDG 2) of access to safe food, ending hunger, achieving food security, and promoting sustainable agriculture will all be addressed by testing the



effectiveness of Provet probiotic on the growth and gut microbiota of Pekin ducks. Additionally, carrying out this study in the Cordillera Administrative Region (CAR) will yield locally pertinent data that will assist sustainable duck production, lessen reliance on antibiotic growth boosters, and enhance food safety and rural livelihood in the Philippines.

Generally, the study was conducted to evaluate the effect of Provet probiotic on the growth, and gut microflora of Pekin Duck. Specifically, it aimed to determine what Provet probiotic dosage gave the best results in terms of growth performance in terms of initial and weekly body weight, gain in weight, percentage rate of growth, feed consumption, feed conversion ratio and efficiency, return of investment, above expenses on chick's cost, feeds, additive cost, and to determine the gut microflora of Pekin ducks treated with commercial and Provet probiotic.

METHODOLOGY

The materials used in the study were day-old Pekin ducklings, black canvass, chicken net, feeders, waterers, formulated and synthetic probiotics, commercial feeds, incandescent and LED bulbs, and stranded wires.

This study was conducted at the Department of Agriculture-Research Outreach Station in Tumog, Luna, Apayao, from March 28 to April 25, 2026. The location was chosen because it has the amenities and surroundings needed to raise Pekin ducks in controlled experimental environments, guaranteeing precise data gathering and appropriate management during the project.

A total of 120-day-old Pekin ducklings were purchased from a reliable dealer and utilized as experimental animals.

Before treatments were applied, day-old ducklings were kept in the brooder for 14 days. The heat source was an electrically powered cage-style brooder that had been thoroughly cleaned and ready before the ducklings arrived. During the first week, rice hulls were spread out on the ground and covered with newspaper to make feeding easier. As soon as the chicks arrived, they were given water with molasses to replenish their energy, and then they were given chick booster feed.

Restricted feeding was used to feed the experimental birds in accordance with their needs. Feeds supplemented with Provet probiotic, and water were fed in the morning after being fermented overnight. To avoid digestive shock, proper feed shifting was used, progressively switching from chick booster meals to prepared diets. One probiotic feeding was given per day to the various treatments.

During the first two weeks or brooding period, Pekin ducks were fed chick booster feeds through ad libitum feeding to ensure continuous access to nutrients necessary for early growth and development. Starting on the third week until the sixth week, the ducks were given formulated home-mixed ration containing 19% crude protein (CP) at scheduled feeding times of 8:00 AM and 3:00 PM. The approximate daily feed allocation per duck was gradually increased according to age, with 100 g during the third week, 120 g during the fourth week, 150 g during the fifth week, and 180 g during the sixth week.



Provet probiotic developed by Apayao State College and tested by the Bureau of Animal Industry was administered through feed and water after the 14-day brooding period until market age. Feed mixtures were prepared in the evening, fermented overnight, and fed the following morning. A formulated home-mixed ration containing 20.21% crude protein, 2771 kcal/kg metabolizable energy, 0.72% calcium, and 0.54% phosphorus was used throughout the study.

The experiment was arranged using a Completely Randomized Design (CRD) with four treatments: 5 g commercial probiotic (T_1), 10 mL Provet probiotic (T_2), 20 mL Provet probiotic (T_3), and 30 mL Provet probiotic (T_4) mixed with feed and water. Parameters evaluated included body weight, weight gain, percentage growth rate, feed consumption, feed conversion ratio and efficiency, return above chick, feed and additive cost, and gut microflora.

Fresh fecal samples were collected before and after treatment and analyzed at the Regional Animal Disease Diagnostic Laboratory (RADDL), DA-CAR, to determine intestinal microflora and the presence of potentially harmful microorganisms.

All data gathered were analyzed using Analysis of Variance (ANOVA), and treatment means were compared using the Least Significant Difference (LSD) test when significant differences were observed.

RESULTS AND DISCUSSION

Table 1 shows that the initial body weights of Pekin ducks were comparable among treatments, indicating uniformity of the experimental birds before probiotic supplementation. Body weight steadily increased in all treatments throughout the study, suggesting that both commercial and Provet probiotics supported normal growth performance. Among the treatments, ducks supplemented with 20 mL Provet probiotic (T_3) consistently recorded the highest numerical body weights from Week 2 until the final week, achieving the highest final body weight of 1868.00 g. This indicates that 20 mL Provet probiotic may have provided a better balance for nutrient utilization and growth performance.

In contrast, ducks given 30 mL Provet probiotic (T_4) had the highest initial body weight but recorded the lowest final body weight, suggesting that increasing probiotic dosage beyond 20 mL did not improve growth and may have reduced nutrient efficiency. Although no significant differences were observed among treatments, the results imply that probiotic supplementation positively supported bird growth, with 20 mL Provet probiotic showing the most promising numerical advantage for Pekin duck production.



Table 1. Initial and Weekly Body Weights of Pekin Ducks Treated with Provet Probiotic as Dietary Supplement

TREATMENT	Body Weights (g)				
	Initial	Week 1	Week 2	Week 3	Week 4
T ₁ - 5 Grams Commercial Probiotic	595.67	876.67	1114.33	1505.67	1822.67
T ₂ - 10ml Probiotic (Provet) mixed with feeds and water	604.00	883.33	1130.33	1514.33	1798.33
T ₃ - 20ml Probiotic (Provet) mixed with feeds and water	619.00	896.00	1161.33	1544.00	1868.00
T ₄ - 30ml Probiotic (Provet) mixed with feeds and water	640.67	888.67	1168.67	1517.67	1785.33
ANOVA	ns	ns	ns	ns	ns
CV (%)	4.36	3.05	2.54	1.69	2.72

Table 2 shows that weekly weight gain of Pekin ducks increased steadily across all treatments, although no significant differences were observed throughout the study. During the early growth stage, all birds responded similarly to probiotic supplementation, indicating minimal effect on initial weight gain. However, birds treated with 20 mL Provet probiotic (T₃) consistently showed higher numerical gains during the latter weeks, particularly in Weeks 3 and 4, where the highest weekly gains of 1001.67 g and 1325.67 g were recorded, respectively. This suggests that 20 mL Provet probiotic may have supported better nutrient utilization and sustained growth performance during the finishing stage.

In contrast, ducks supplemented with 30 mL Provet probiotic (T₄) showed higher gains during the earlier weeks but failed to maintain superior growth performance until the final week. These findings imply that increasing probiotic supplementation beyond the optimal level may not provide additional growth benefits. Although statistically insignificant, the consistent numerical advantage observed in T₃ indicates its practical potential in improving market weight and profitability in Pekin duck production.



Table 2. Weekly Gain in Weights of Pekin Ducks Treated with Provet Probiotic as Dietary Supplement

TREATMENT	Weekly Gain in Weights (g)			
	Week 1	Week 2	Week 3	Week 4
T ₁ - 5 Grams Commercial Probiotic	358.00	595.67	987.00	1304.00
T ₂ - 10ml Probiotic (Provet) mixed with feeds and water	357.00	604.00	988.00	1272.00
T ₃ - 20ml Probiotic (Provet) mixed with feeds and water	353.67	619.00	1001.67	1325.67
T ₄ - 30ml Probiotic (Provet) mixed with feeds and water	360.67	640.67	989.67	1257.33
ANOVA	ns	ns	ns	ns
CV (%)	5.10	4.36	2.54	4.02

Table 3 shows that the percentage rate of growth of Pekin ducks was generally comparable among treatments during Weeks 1, 2, and 4, indicating that probiotic supplementation produced similar growth responses during most stages of development. However, a significant difference was observed during Week 3, where ducks supplemented with 30 mL Provet probiotic (T₄) recorded the lowest growth rate and differed significantly from the commercial probiotic treatment. In contrast, ducks given 10 mL and 20 mL Provet probiotic (T₂ and T₃) maintained growth rates statistically comparable with the control treatment, suggesting that these supplementation levels were adequate to support efficient growth performance.

The findings indicate that excessive probiotic supplementation may not improve growth and could negatively affect nutrient utilization and digestive balance. Among the treatments, 20 mL Provet probiotic (T₃) appeared to provide the most favorable growth response because it maintained competitive growth performance without the decline observed in the higher dosage treatment. These results support previous studies showing that probiotics enhance digestion, nutrient absorption, and feed efficiency by improving gut microbial balance and enzyme activity in poultry.



Table 3. Percentage (%) Rate of Growth of Pekin Ducks Treated with Provet Probiotic as Dietary Supplement

TREATMENT	Percentage (%) Rate of Growth			
	Week 1	Week 2	Week 3	Week 4
T ₁ - 5 Grams Commercial Probiotic	51.34	23.90	29.89 ^a	19.02
T ₂ - 10ml Probiotic (Provet) mixed with feeds and water	50.77	24.56	29.05 ^a	17.15
T ₃ - 20ml Probiotic (Provet) mixed with feeds and water	49.18	25.79	28.29 ^a	18.98
T ₄ - 30ml Probiotic (Provet) mixed with feeds and water	50.97	27.21	26.00 ^b	16.18
LSD	-	-	2.35	-
ANOVA	ns	ns	*	ns
CV (%)	6.57	5.10		10.11

Table 4 shows the weekly feed intake of Pekin ducks whose feed were added with Provet probiotics as dietary supplement. The birds' consumption did not significantly change across treatments. From Week 1 to Week 4, all treatment groups' weekly feed consumption consistently increased. For Birds that were fed with 30 mL Provet probiotics with feeds and water, T₄ recorded the highest feed consumption. Birds given with 5g of commercial probiotic (T₁) was recorded lowest in feed consumption, followed by T₃, and T₂, respectively. ANOVA result showed no significant result which suggests that utilizing 5g of commercial probiotic or increasing the probiotic dosage from 10 ml to 30 ml Provet were not significantly change the Pekin Duck's feed consumption. This implies that the birds' hunger was neither increased nor decreased by probiotic supplementation, regardless of the kind or quantity utilized or the type of probiotic or quantity used, will not stimulate nor depress appetite of the birds. This finding indicates that the probiotics used were safe and has no detrimental effect to the birds, as they did not negatively affect palatability or feed intake. The Pekin duck's feeding behavior was unaffected by the addition of Provet Probiotic to feed and water since the birds ingested feed normally in all treatments.



Table 4. Weekly Feed Consumption of Pekin Ducks Treated with Provet Probiotic as Dietary Supplement

TREATMENT	Weekly Feed Consumption (g)			
	Week 1	Week 2	Week 3	Week 4
T ₁ - 5 Grams Commercial Probiotic	679.67	837.67	1041.67	1251.67
T ₂ - 10ml Probiotic (Provet) mixed with feeds and water	689.00	837.67	1045.00	1253.33
T ₃ - 20ml Probiotic (Provet) mixed with feeds and water	688.33	838.00	1050.00	1260.00
T ₄ - 30ml Probiotic (Provet) mixed with feeds and water	697.00	839.67	1050.00	1260.00
ANOVA	ns	Ns	ns	ns
CV (%)	1.27	0.22	0.55	0.55

The Feed Conversion Ratio (FCR) and Feed Conversion Efficiency (FCE) of Pekin duck given with Provet probiotic as dietary supplement are presented in Table 5. Based on the data, the broilers supplemented with 20ml Provet probiotic mixed with feeds and water (T₃) showed the best numerical performance in terms of FCR and FCE. Compared to the other treatment groups, birds in T₃ were shown to use feed more effectively and convert it into body mass. In contrast, birds given with 30 mL Provet probiotic (T₄) recorded the highest FCR and the lowest FCE, suggesting relatively poorer feed utilization. With FCR of 2.93 and 3.01, and FCE of 34.22percent and 33.25percent, respectively, birds supplemented with 5g commercial probiotic (T₁) and 10ml Provet probiotic (T₂) showed intermediate values. Results showed that the 20ml Provet probiotic level is the most effective dosage among the treatments examined. Increasing the probiotic level to 30 ml did not yield any extra benefits and might have slightly reduced feed efficiency. The 20ml Provet probiotic (T₃) suggest being the most physiologically advantageous dosage among the tested treatments. It generated the highest FCE and lowest FCR, indicating a possible improvement in nutrient utilization and digestive efficiency. This suggests that that 20ml Provet probiotic would be the ideal practical dosage for probiotic supplementation, particularly if it is accompanied with improvements in gut health or body weight growth in other assessed criteria.



Table 5. Feed Conversion Ratio and Feed Conversion Efficiency of Pekin Ducks Treated with Provet Probiotic as Dietary Supplement

TREATMENT	FCR (kg)	FCE (%)
T ₁ - 5 Grams Commercial Probiotic	2.93	34.22
T ₂ - 10ml Probiotic (Provet) mixed with feeds and water	3.01	33.25
T ₃ - 20ml Probiotic (Provet) mixed with feeds and water	2.90	34.56
T ₄ - 30ml Probiotic (Provet) mixed with feeds and water	3.06	32.69
ANOVA	ns	ns
CV (%)	4.11	4.10

Table 6 shows that Pekin ducks supplemented with 20 mL Provet probiotic (T₃) obtained the highest economic return among all treatments. Ducks under T₃ recorded the highest final weight (1.87 kg), highest total sales (₱560.40), and greatest return above cost (₱263.38), indicating that this supplementation level provided the best balance between growth performance and additive cost. Although feed consumption and feed costs were relatively similar across treatments, the improved body weight and lower additive expense in T₃ resulted in better profitability. In contrast, ducks given commercial probiotics (T₁) had the lowest return above cost due to the high additive expense, suggesting that costly commercial probiotics may not always be practical for small-scale duck production.

The results further showed that increasing the probiotic level to 30 mL (T₄) did not improve performance, as it produced lower final weight and economic return compared with T₃. This indicates that excessive probiotic supplementation may lead to diminishing returns rather than additional benefits. The findings support previous studies reporting that probiotics improve nutrient utilization, gut health, and feed efficiency, thereby enhancing growth performance and profitability in poultry production. Overall, the study demonstrated that 20 mL Provet probiotic is the most economically efficient supplementation level for Pekin ducks.



Table 6. Return Above Chick, Feeds, and Additive Cost of Pekin Duck Treated with Provet Probiotic as Dietary Supplement

Particulars	T ₁	T ₂	T ₃	T ₄
FINAL WEIGHT	1.82	1.80	1.87	1.79
Total Sales (₱)	546.8	539.5	560.4	535.6
Amount of Feed Consumed	3.81	3.83	3.84	3.85
Price of Feed per Kilo	41.2	41.2	41.2	41.2
Feed Cost (₱)	156.99	157.59	158.06	158.48
Amount of Additives ml	140	280	560	840
Additive Cost per ml	0.75	0.016	0.016	0.016
Total Cost of Additives	105	4.48	8.96	13.44
Chick Cost (₱)	130	130	130	130
Total Cost (₱)	391.99	292.07	297.01	301.92
Return Above Cost (₱)	154.80	247.43	263.38	233.68

Note: Current Price of Pekin Duck per kilo = ₱ 300.00

Table 7 shows that most fecal samples from Pekin ducks treated with Provet probiotic remained negative for gastrointestinal parasites after supplementation, indicating that the probiotics helped maintain good intestinal health and microbial balance. Before treatment, all samples were free from detectable parasite eggs, while after treatment only a few isolated cases of *Ascaridia* spp. and *Heterakis* spp. were observed. These minimal findings suggest that the detected parasites were likely due to environmental exposure rather than the probiotic treatments themselves.

The results highlight the potential of Provet probiotic as a supportive and preventive dietary supplement rather than a direct antiparasitic treatment. The probiotics may have contributed to healthier gut conditions by promoting beneficial microorganisms and suppressing harmful pathogens, thereby improving nutrient utilization and disease resistance. These findings support previous studies reporting that probiotics enhance gut health, feed efficiency, immune response, and overall growth performance in poultry. Overall, the study demonstrated that Provet



probiotic can help maintain intestinal microbial balance and support healthier Pekin duck production.

Table 7. Fecal Analysis of Pekin Ducks Treated with Provet Probiotic as Dietary Supplement

TREATMENT	Before	After	
		No. of Eggs seen per lower field (LPF)	Genus/spp.
T ₁ R ₁ - 5 Grams Commercial Probiotic	0	0	NPOS
T ₁ R ₂ - 5 Grams Commercial Probiotic	0	0	NPOS
T ₁ R ₃ - 5 Grams Commercial Probiotic	0	0	NPOS
T ₂ R ₁ - 10ml Probiotic (Provet) mixed with feeds and water	0	0	NPOS
T ₂ R ₂ - 10ml Probiotic (Provet) mixed with feeds and water	0	0	NPOS
T ₂ R ₃ - 10ml Probiotic (Provet) mixed with feeds and water	0	1	<i>Ascaridia spp.</i>
T ₃ R ₁ - 20ml Probiotic (Provet) mixed with feeds and water	0	0	NPOS
T ₃ R ₂ - 20ml Probiotic (Provet) mixed with feeds and water	0	0	NPOS
T ₃ R ₃ - 20ml Probiotic (Provet) mixed with feeds and water	0	3	<i>Heterakis spp. Larvae</i>
T ₄ R ₁ - 30ml Probiotic (Provet) mixed with feeds and water	0	0	NPOS
T ₄ R ₂ - 30ml Probiotic (Provet) mixed with feeds and water	0	1	<i>Ascaridia spp.</i>
T ₄ R ₃ - 30ml Probiotic (Provet) mixed with feeds and water	0	0	NPOS

Indicator: NPOS = No Parasite or Ova Seen, Light Load = 1-2 ova, Moderate Load = 3-5 ova, Heavy Load = 6-8 ova, Very Heavy Load = >9 ova

CONCLUSION



This study was conducted to evaluate the effect of Provet probiotic on the growth, and gut microflora of Pekin duck. The study was laid out using a Completely Randomized Design (CRD). The Least Significant Difference (LSD) test was used for comparing treatment means when significant differences were observed. The study added commercial probiotic and Provet probiotic to feed and water. Four treatments and three replications were observed. The treatments include: 5g commercial probiotic (T_1), 10ml Provet probiotic (T_2), 20ml Provet probiotic (T_3) and 30ml Provet probiotic (T_4). This study was conducted on March 28 to April 25, 2026 at the Department of Agriculture-Research Outreach Station, Tumog, Luna, Apayao. The inclusion of Provet probiotic as dietary supplement did not influence the weekly body weight, gain in weight, percentage rate of growth at weeks 1,2, & 4 in Pekin ducks. No significant differences were obtained in the feed consumption, and the Feed Conversion Ratio and Feed Conversion Efficiency of the birds as revealed by ANOVA. The highest return above chick cost, feeds, and additive cost among the treatments in the study was obtained by T_3 (20ml Provet probiotic). Fecal analysis showed the presence of *Ascaridia* spp. and *Heterakis* spp. The presence of the said strain showed unintentional exposure to infective parasite stages in the environment rather than a treatment-related increase in infestation. This indicates that probiotics function more as a supportive and preventive strategy rather than a direct antiparasitic treatment. The Provet probiotic is a promising a dietary supplement for Pekin duck growth and gut microflora, as evidenced by the statistical comparability in terms of weekly body weight, weight gain, percentage rate of growth, feed consumption, feed conversion ratio and efficiency. When compared to commercial probiotics, the 20ml Provet probiotic as a dietary supplement demonstrates a numerical advantage in terms of return of investment.

RECOMMENDATIONS

Based on the result of the study, adding 20ml Provet probiotic to water and feed for Pekin duck increases the income above chick cost, feeds, and additive cost compared to the commercial probiotic. To validate the efficacy of the 20ml dosage of Provet probiotic on Pekin duck production, it is recommended to conduct a verification trial with same treatments and methodology.

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