EFFECT OF FEED TYPES ON GROWTH PARAMETERS AND HATCHING RATE IN NATIVE CHICKEN, *GALLUS GALLUS DOMESTICUS* (LINNAEUS, 1758)*

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Abstract

The demand for chicken's meat and eggs has increased substantially due to its good quality and nutritive values. The low productivity of native chicken is primarily attributed to low genetic potential, poor nutrition and disease control. Nutrition is a major influence on growth rate and egg production for breeding. This study aimed to identify the low-cost chicken feed with high profit that can yield favorable growth parameters and hatching rates for the farmers in the rural areas. The study was carried out from December 2023 to September 2024 in Bagan Village, Waw Township, Bago Region. A total of 27 (3-month-old) native chickens with initial weight of 540.00 ± 11.06g were randomly selected for three treatments. One male and eight females (1:8) were reared in each poultry house. The treatments were denoted as the birds fed commercial diet (T1), commercial diet substituted by 50% of locally available ingredients – broken rice, rice bran, snail shell powder and shrimp meal powder (T2) and a formulated diet including maize, broken rice, rice bran, snail shell powder and shrimp meal powder (T3), respectively. Throughout the grower stage, the growth parameters (body weight and weight gain) of all treatments were not significantly different from each other. The results of feed intake and FCR were influenced by feed types among three groups. The result also showed that the fertility rate of the native chickens fed three different diets was similar although there were significant differences in the laying and hatching rate of the eggs. In terms of net return and hatching performance, the native hens fed T2 diet exhibited the highest profit and those fed T1 diet obtained the highest proportion of hatched chicks (62%). This study concludes that the T2 diet is the most viable option for rural farmers, as it effectively reduces feed costs while maintaining growth performance and providing a high profit margin.

Keywords: nutrition, growth parameters, hatching rate, net return

Introduction

Poultry makes a substantial contribution to food security and nutrition, providing energy, protein, and essential micro-nutrients to humans. Poultry meat and eggs are among the most common animal source food consumed at the global level, through a wide diversity of cultures, traditions and religions, making them key to food security and nutrition. It is particularly important for small holders and poor rural and urban communities producing in large scale and intensive operations (Mottet and Tempio, 2017). In recent years, the consumer demand for chicken's meat and eggs has increased substantially.

Native chickens are an affordable and important source of protein for the people of Myanmar. The consumption of chicken's meat and eggs increased substantially in Myanmar, up to 72% and 40% respectively, between 2010 and 2015 (Fang *et al*., 2021). They are reared throughout the country in small flocks for home consumption and for sell. They are well-known

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for their hardiness, disease resistance, with good foraging ability and free ranging. Their meat is more delicious than that of commercial chickens because it is delicious, low fat and cholesterol.

Typical growth rate of native chickens is much lower than that of commercial broilers. Native hens lay small sized eggs when compared to layer hens but are popular for good broodiness and mothering ability. They usually lay the first eggs at the age of 22-28 weeks. A native hen will typically lay a clutch of between 10 and 14 eggs depending on season and in particular availability of feed (Henning and Pym, 2019). Broodiness is a natural behavior to incubate a clutch of eggs for the purpose of getting offspring. The farmers in rural areas usually use broody hens without using artificial incubators to hatch the chicks at very low costs (Sarkar, 2022).

The supply of native chickens is often inadequate to meet consumer demand due to traditional production methods, such as natural mating and egg incubation under broody hens which results in high chick mortality rates. Nowadays, there are three types of poultry production system could be found in Myanmar: (1) free range production or traditional/backyard production system; (2) Semi-intensive (range plus intensive) production system of small-scale commercial production and (3) intensive production system (Win, 2012).

The productivity of native chickens under traditional production is generally considered low. For better production, they are offered water and balanced nutrients, improved shelter and vaccination. Zainudin (2005) said that local chicken breeding pattern in villages is more extensive way (80%) than intensively or semi-intensive (20%) and chicken performance was better maintenance in intensive and semi-intensive.

The feed is the largest cost component, which is about 70% of the total production cost in poultry (Teguia and Beynen, 2005). The price of commercial feed is considered very expensive for rural villagers. Therefore, an alternative way that can reduce the feed cost is using the local ingredients instead of commercial feed. The purpose of mixing commercial feed with other local feed is to lower the feed prices, while still taking into account the nutritional content.

Feeds are derived from two sources, agriculture and fisheries. Agricultural by-products such as broken rice, rice bran and maize are used as energy feed. These products come from the middle and upper parts of the country where crops are extensively grown. Fish and prawn meals are derived from the fisheries sector (Myat Kyaw, 2003).

Maize is one of the most crucial feed ingredients with easy digesting and palatable quality in poultry. Broken rice and rice bran are the by-product of rice milling used in poultry. Shrimp meal powder is high in nutritional value, palatable and pleasant aroma. Snail shell powder has only been used as a calcium source in the diets.

Several previous studies have shown that replacing some commercial rations with locally available feed ingredients gave similar growth performance of the chickens. Gulilat *et al.* (2022) carried out a study that the effects of substitution of different levels of commercial starters with a homemade ration on the growth performance of Sasso and indigenous chickens and indicated that one alternative can be done in an effort to reduce the cost. Erwan (2020) reported that corn

could be used at 30% to substitute commercial feed without significantly affecting growth performance and plasma total cholesterol (TCHO) concentration of KUB chickens in Indonesia.

It is imperative to find out cheaper source of protein and to reduce feed cost for poultry to formulate economic diet with conventional feed like maize, broken rice, rice bran, shrimp meal powder and snail shell powder. The present study aims to identify the low-cost chicken feed that can yield favorable growth parameters and hatching rates with the following objectives: to record the growth parameters of native chickens treated with different feed types, to evaluate the hatching and survival rate of native chickens and to determine the fertility of the eggs by candling.

Materials and Methods

Study area and period

The experiment was carried out in Bagan Village, Waw Township, Bago Region, locating about 93 km far from Yangon city between latitude 17° 28' 38" N and longitude 96° 40' 33" E (Fig. 1).The present study was conducted from December 2023 to September 2024.

Housing

In this study, three poultry houses were constructed. Each house has a thatched roof and bamboo slatted floor with an area of 180 cm length × 180 cm width and 60 cm above the ground. A green shade net roofing fence has an area of 270 cm length × 180 cm width with wire mesh for ventilation. A total length of 180 cm bamboo perches was provided and the distance between each house is 240 cm. A round feeder was placed to one side of the house and a drinker on the other side.

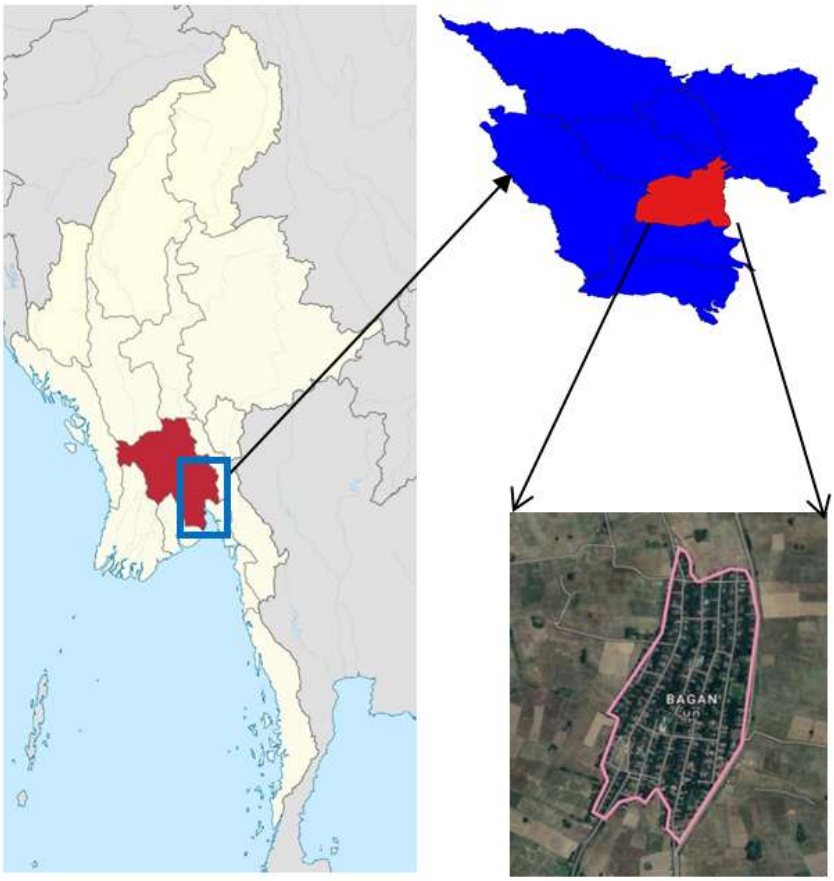


Figure 1. Map of Bagan Village, Waw Township in Bago District (Source: Google)

Experimental design and management

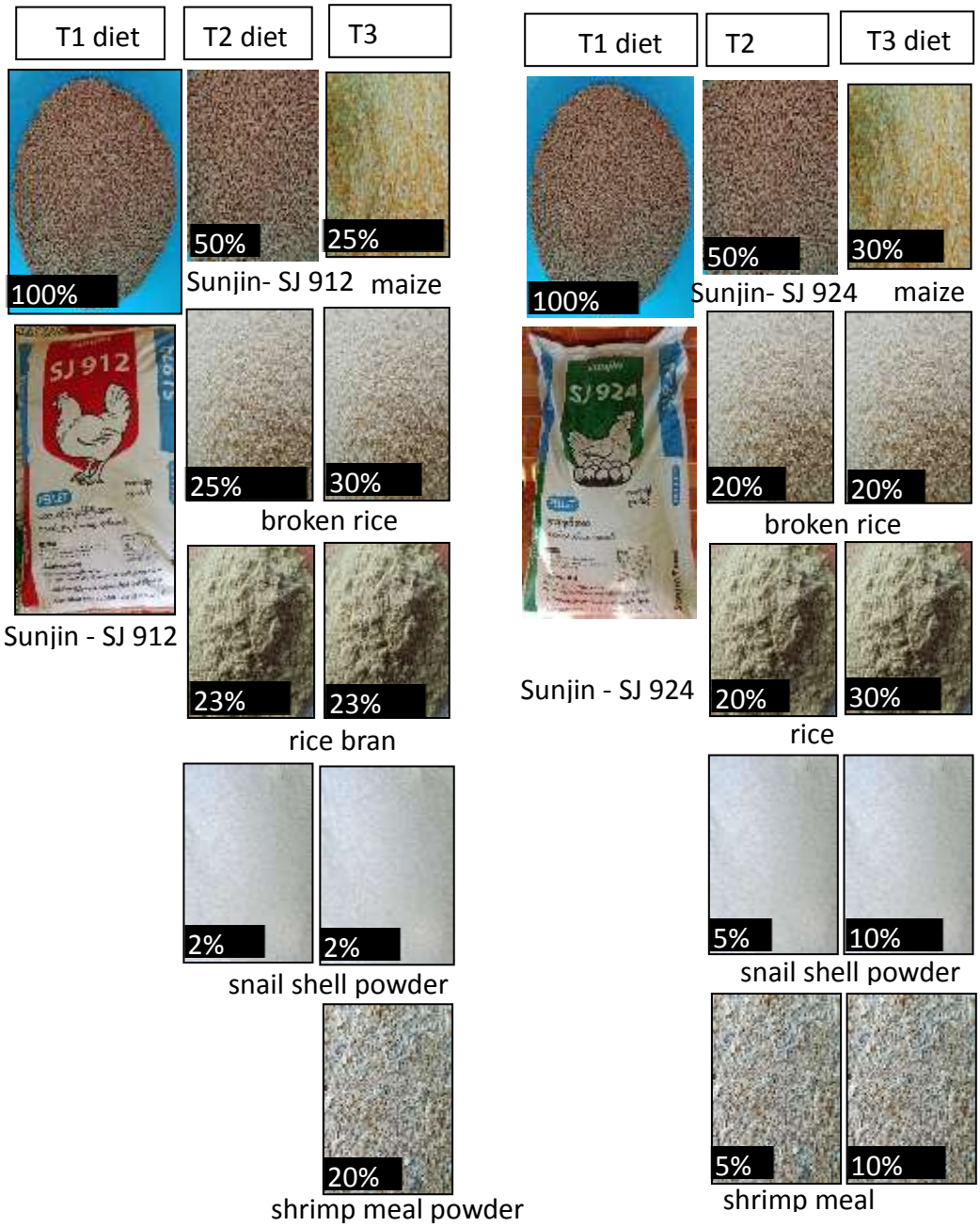
A total of 27 native chickens (3-month-old) were purchased from the villagers. On arrival, all chickens were individually weighed. They were vaccinated by eye drop with La Sota vaccine against new castle disease. Chickens were raised under natural light without using artificial bulbs during the nighttime. The manure of the chickens was swept twice a week.

The chickens having the initial weight (540.00 ± 11.06g) of three males and 24 females were randomly selected for three treatments. For each treatment, one male and eight females were reared in each poultry house.

The nutrient composition of the feed ingredients for T2 and T3 was analyzed in Assay Laboratory of Ministry of Livestock, Fisheries and Rural Development in Myanmar. During the grower stage, the chickens on T1 group were fed commercial diet-Sunjin (SJ 912-100%). For T2, commercial diet-Sunjin (50%), broken rice (25%), rice bran (23%) and snail shell powder (2%) were given. The birds of T3 were provided broken rice (30%), maize (25%), rice bran (23%), shrimp meal powder (20%) and snail shell powder (2%). The protein levels of three diets are 19%,14% and 12%, respectively (Table 1 and Plate 1 A).

During the laying stage, the chickens were provided with commercial diet-Sunjin (SJ 924-100%) for T1, commercial diet-Sunjin (50%), broken rice (20%), rice bran (20%), shrimp meal powder (5%) and snail shell powder (5%) for T2 and broken rice (30%), maize (30%), rice

bran (20%), shrimp meal powder (10%) and snail shell powder (10%) for T3. The protein levels are 17%, 13.85% and 9%, respectively (Table 1 and Plate 1 B).



A. The raw ingredients for grower stage(meat) B. The raw ingredients for layer stage(eggs)

Plate1. The percentage of raw materials for three dietary treatments

Feeding

The experimental diets were given three times a day of (6:00 am, 10:00 am and 2:00pm). Clean and fresh water was provided with vitamin powder diluted 1 gram/liter in drinking water. Before giving the diets to the chickens, the amount of feed was weighed using a 5kg digital balance every day. The left-over feed was weighed back at the end of the feeding time (6:00 pm)

before new feed was given to each group. The daily record sheet was used to note the feed issues on a treatment group. In this study, the chickens were fed a maximum of 10% of the body weight. The quantity of the feed given to the chickens was evaluated by multiplying the average body weight of the female with 10% (Table 2 and 3).

Preparation of brooding boxes

A total of 24 boxes with a length of 46 cm and width of 30 cm x breadth of 20 cm were made for the hens to be comfortable. All boxes were filled with clean and soft straws on top up to 2/3 of the depth after spraying 10g of anti-lice medicine powder around the boxes. Nesting straws were changed twice a week.

Egg candling method

On day 18, egg candling was performed to examine the development of embryos, infertile eggs and dead embryo in shell. All the eggs from the wooden brooding boxes were checked by using the flashlight in the dark room. If the fertile eggs were visible with a network of blood vessels indicating the growing embryo and the embryo was found at the center of the network. It was rather small or lacking embryo which showed nothing but the outline of the yolk or a dark floating mass were designated as infertile eggs. Infertile and other eggs with dead embryos were removed.

Data collection

Growth Parameters

Body weight: The body weight of the chickens was taken using a digital balance at resting time at night and recorded at weekly interval from 13 week to 20 week. The mean body weight of chickens was determined weekly by dividing the total weight per house by the number of birds.

Growth rate: The body weight gain was calculated by (Kumar *et al*., 2023),

Weight gain=Body weight in particular weight-Body weight of previous week

Feed Intake: Weekly feed intake of all the chickens was recorded up to 20 week of age and those of the native hens was done for laying stage by the following formula.

$$\text{Average daily feed intake} = \frac{\text{the given feed - the left - over feed}}{\text{Number of birds}}$$

Feed Conversion Ratio (FCR): FCR was calculated by dividing the total quantities of feed consumed by total gain in body weight during the same period. According to Aviagen (2018),

$$\text{FCR} = \frac{\text{Total feed intake}}{\text{Total weight gain}}$$

Fertility

Fertility of the eggs was calculated by using the following formula, (Islam *et al*., 2014)

$$\text{Fertility (\%)} = \frac{\text{Total number of fertile eggs}}{\text{Total number of eggs set}} \times 100$$

Hatchability

The chicks come out of the shell on 21st day of incubation were recorded as hatched chicks. Hatchability of eggs was calculated on the basic of eggs set and on fertile eggs was calculated by the following formulae (Islam *et al.*, 2014).

$$\text{Hatchability on eggs set (\%)} = \frac{\text{Total number of chicks hatched}}{\text{Total number of eggs set}} \times 100$$

$$\text{Hatchability of fertile eggs (\%)} = \frac{\text{Total number of chicks hatched}}{\text{Total number of fertile eggs}} \times 100$$

Statistical analysis

Microsoft Excel (Office, 2019) was used for data collection and the creation of the selected diagrams. Statistical analysis of data was undertaken by using IBM SPSS statistics version 26. All the data were analyzed to compare with the One-way Analysis of Variance (ANOVA) method. In all of the described inferential statistical analyses, differences were considered statistically significant for $p \leq 0.05$ and tended to be significant at $0.05 > p$. Significant differences among the means of the treatments for growth parameters (body weight, weight gain, feed intake and FCR) were performed at p value of 0.05 using Duncan's Multiple Range Test. The differences for all significant effects on egg characteristics and hatching parameters were analyzed by using Turkey's honestly significant difference test.

Table 1. Nutrient composition of experimental diets

Nutrient Composition	Grower diet			Layer diet		
	T1	T2	T3	T1	T2	T3
Crude protein (%)	19	14	12	17	13.85	9.50
Metabolizable energy (kcal/kg)	3200	3100	2950	2700	2740	2800
Calcium (%)	0.8	1.1	1	3.80	3.85	3.81
Available phosphorous (%)	0.4	0.25	0.28	0.45	0.36	0.26

Table 2. The formulation of the experimental grower diet

Age (week)	Total no. of chicken	ABW (g)	10% of ABW (g)	One day(g) for 9 birds	T1	T2				T3				
					SJ-912 (100%)	SJ-912 (50%)	BR (25%)	RB (23%)	SSP (2%)	BR (30%)	Maize (25%)	RB (23%)	SMP (20%)	SSP (2%)
13	9	617	62	558	558	279	140	128	11	167	140	128	112	11
14	9	740	74	666	666	333	167	153	13	200	167	153	133	13
15	9	814	81	729	729	365	182	168	14	219	182	168	146	14
16	9	896	90	810	810	405	203	186	16	243	203	186	162	16
17	9	973	97	873	873	437	218	201	17	262	218	201	175	17
18	9	1048	105	945	945	473	236	217	19	284	236	217	189	19
19	9	1133	113	1017	1017	509	254	234	20	305	254	234	204	20
20	9	1223	122	1098	1098	549	275	252	22	329	275	252	220	22

Note: ABW = Average Body Weight, g = gram, M = Maize, BR = Broken Rice, RB = Rice Bran, SMP = Shrimp Meal Powder, SP = Snail Shell Powder, SSP = Snail Shell Powder, SJ = Sunjin

Table 3. The formulation of the experimental layer diet

Age at first eggs laid (Week)	Total no. of chicken	ABW (g)	10% of ABW (g)	One day (g) for 8 birds	T1	T2					T3				
					SJ-924 (100%)	SJ-924 (50%)	BR (20%)	RB (20%)	SMP (5%)	SSP (5%)	BR (30%)	M (30%)	RB (20%)	SMP (10%)	SSP (10%)
21	8	1339	134	1072	1072	536	214	214	54	54	322	322	214	107	107

Note: ABW = Average Body Weight, g = gram, M = Maize, BR = Broken Rice, RB = Rice Bran, SMP = Shrimp Meal Powder, SP = Snail Shell Powder, SSP = Snail Shell Powder, SJ = Sunjin

Results

Effect of three diets on the body weight and of native chickens

The result showed the live body weight of chickens generally increased with age (Table 4). No significant differences ($p>0.05$) in body weights among three treatment groups. However, the birds fed the diet T1 (commercial feed-100%) gave the better growth performance in comparison with those fed other dietary treatments. At the age of 14 and 15 week, T2 group had the higher body weight than T3 group and vice versa. It was observed that the native chickens attained the body weight of 1.2kg in week 20 (Plate 2).

Effect of three diets on weekly feed intake of native chickens

Weekly feed intake of all treatment groups was gradually increased with increasing age. The result showed that the feed intake was significant different ($p<0.05$) among the chickens fed different diets (Fig. 2). But the birds under the three dietary treatments consumed similar quantities of feed at 15 weeks of age. The total amount of feed was significantly higher in the chickens fed T3 diet (5205.68g/bird). The chickens under T2 treatment (4499.97g/bird) consumed more feed than those under T1 treatment (4366.54g/bird) during the grower phase.

Effect of diets on body weight gain of native chickens

The body weight gain of experimental birds was not differed significantly ($p>0.05$) among the treatment groups (Table 5). However, the body weight gain of the chickens was significantly differed among three groups at the age of 19 week. The chickens fed T1 diet showed the best weight gain (723.30g) in comparison with other groups, followed by T3 (691.08g) and T2 (686.64g).

Effect of three diets on feed conversion ratio (FCR)

The result of weekly feed conversion ratio showed that there was significant difference ($p<0.05$) among the three groups of chickens (Fig. 3). The FCR value of the chickens under three groups ranged between 3.62-8.83 in T1, 3.93-8.05 in T2 and 4.54-10.36 in T3, respectively. The overall means were 6.41, 6.72 and 7.64 for T1, T2 and T3, respectively. Overall, the chickens fed T1 diet were obtained the best FCR and more efficient in utilizing feed compared to those fed other diets.

Effect of diets on egg parameters

The number of fertile and infertile eggs did not vary significant ($p>0.05$). There were significantly differences in the numbers of laid eggs, hatched eggs, dead embryos and survived

chicks after one month among three treatment groups. The mean number of eggs laid per hen in this study was 10.50 ± 0.76, 10.25 ± 0.46 and 9.75 ± 0.46 for T1, T2 and T3, respectively. The number of hatched eggs per hen was highest in T1 group (6.38±0.52), followed by T2 (5.75±0.71) and T3 (4.75±0.89), respectively. Moreover, the number of dead embryos per hen in this study was highest in T3 (2.63±0.52) and the lowest in T1 (1.88±0.64). The average number of survived chicks after one month per hen was maximum in T1 (4.00±0.53), followed by T2 (3.13±0.83) and T3 (2.38±0.52), respectively (Fig. 4).

Effect of diets on hatching rate

The results showed that the fertility rate of the native chickens fed three different diets was similar although there were significant differences ($p<0.05$) in the hatching rate of the hens (Fig.5). The proportion of fertility for the eggs obtained from three treatment groups was 78.50%, 76.75% and 75.75% for T1, T2 and T3, respectively. The lowest hatching rate was noted in the native hens from T3 group (48.75%) but the highest proportion of hatched chicks on egg sets was found in T1 (62%), followed by T2 (56.13%). There was a significant difference ($p<0.05$) in the percentage of embryonic mortality among three treatment groups. The embryonic mortality rate of T3 group (36.13%) was slightly higher than other treatment groups (22.50 %, 27.13% for T1 and T2, respectively) (Fig. 5).

Effect of diets on feed cost

Although the total feed cost was almost similar in all treatments, T2 diet was low-cost chicken feed. The results showed that the highest net return was obtained in chickens fed T2 diet with the mount of 43050MMK, followed by T3 with 41760 MMK and T1 with 41690 MMK. The highest net return was noted on T2 compared to other treatment groups (T1 and T3) (Table 6).

Table 4. Mean body weight (g) of native chicken on different feed types

Age (week)	N	Treatment			F-value	p-value
		T1	T2	T3		
13	9	641.11	624.44	620.00	0.321	$>0.512^{NS}$
14	9	777.77	744.44	735.55	0.924	$>0.411^{NS}$
15	9	841.11	815.55	820.00	0.545	$>0.587^{NS}$
16	9	913.33	906.66	911.11	0.016	$>0.984^{NS}$
17	9	1004.44	983.33	984.44	0.174	$>0.842^{NS}$
18	9	1100.00	1054.44	1057.77	0.394	$>0.679^{NS}$
19	9	1168.88	1137.77	1160.00	0.117	$>0.890^{NS}$
20	9	1268.88	1233.33	1237.77	0.191	$>0.827^{NS}$

NS = non-significance ($p>0.05$)

N = Total no. of chicken

Table 5. Weekly body weight gain (g/bird) of native chicken on different feed types

Age (week)	N	Treatment			F-value	p-value
		T1	T2	T3		
13	9	95.55	77.77	73.33	1.510	$>0.241^{NS}$
14	9	136.66	120	115.55	1.463	$>0.317^{NS}$
15	9	63.33	71.11	84.44	1.094	$>0.351^{NS}$
16	9	72.22	91.11	91.11	0.795	$>0.463^{NS}$
17	9	91.11	76.66	73.33	1.430	$>0.250^{NS}$
18	9	95.55	71.11	73.33	1.328	$>0.284^{NS}$
19	9	68.88^{a}	83.33^{ab}	102.22^{b}	4.737	<0.018
20	9	100	95.55	77.77	1.196	$>0.320^{NS}$
Total		723.30	686.64	691.08		

NS = non-significance ($p>0.05$) N = Total no. of chicken

$^{a, b, c}$ superscripts on the same row indicates significant difference ($p<0.05$).

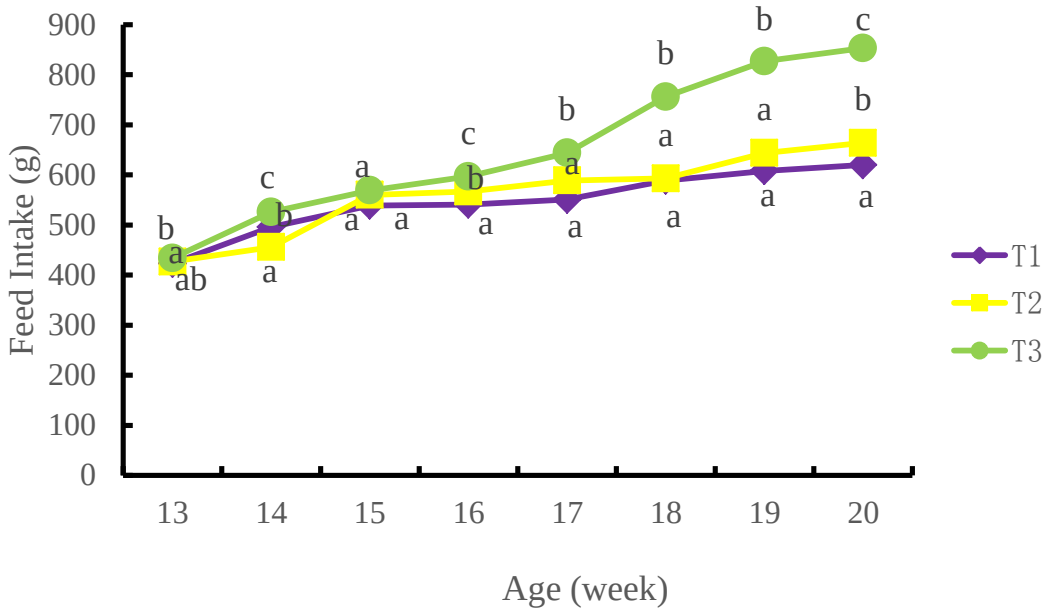
a = the lowest value, b = the highest value and ab = no significant difference between a and b

Table 6. Feed Cost for grower phase

Parameters	T1	T2	T3
Feed cost per viss (MMK)	2600	2390	2150
Total feed (viss)	24.18	24.92	28.86
Total feed cost (MMK)	62870	59600	62050
Final live weight (viss)	0.77	0.75	0.76
Sale revenue (MMK)	90090	87750	88920
Net return (MMK)	41690	43050	41760

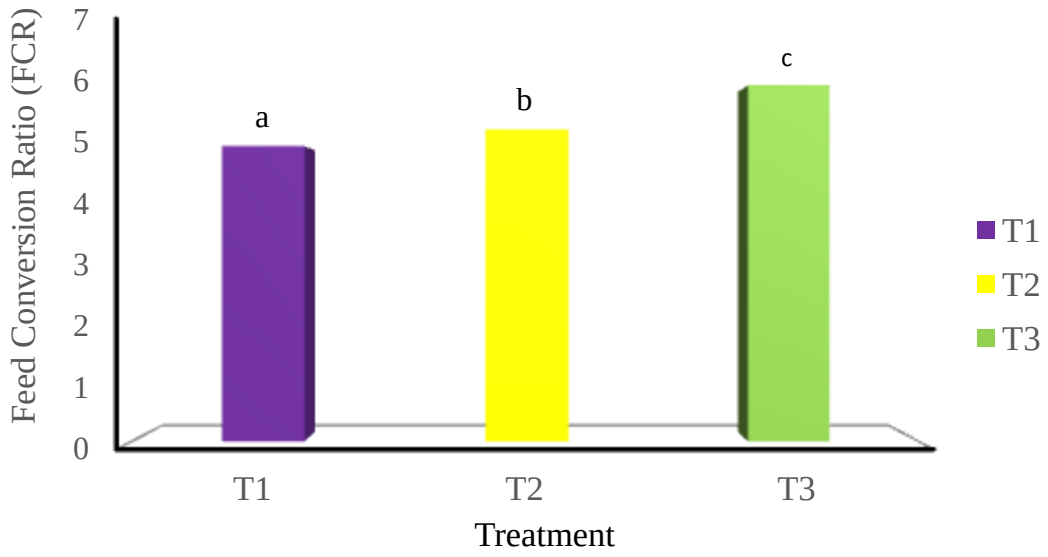
*Market price of live chicken = 13000 MMK per viss

MMK = Myanmar Kyat



a = the lowest value, b = the moderate value, c = the highest value and ab = no significant difference between a and b

Figure. 2 Effect of experimental diets on the weekly feed intake of native chickens



a = the lowest value, b = the moderate value and c = the highest value

Figure. 3 FCR of chickens fed on three different diets

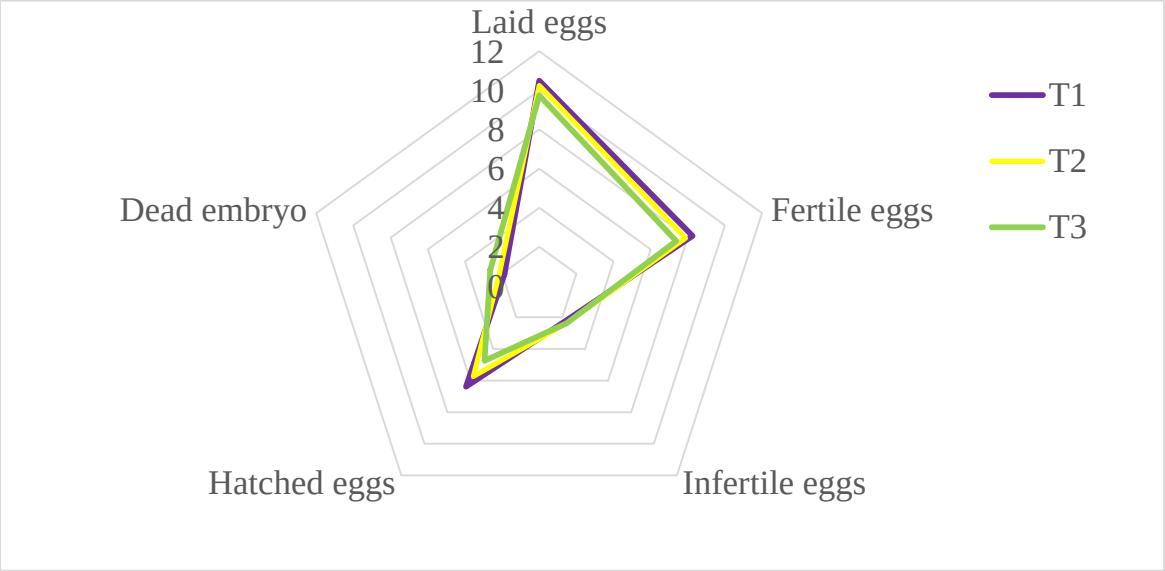
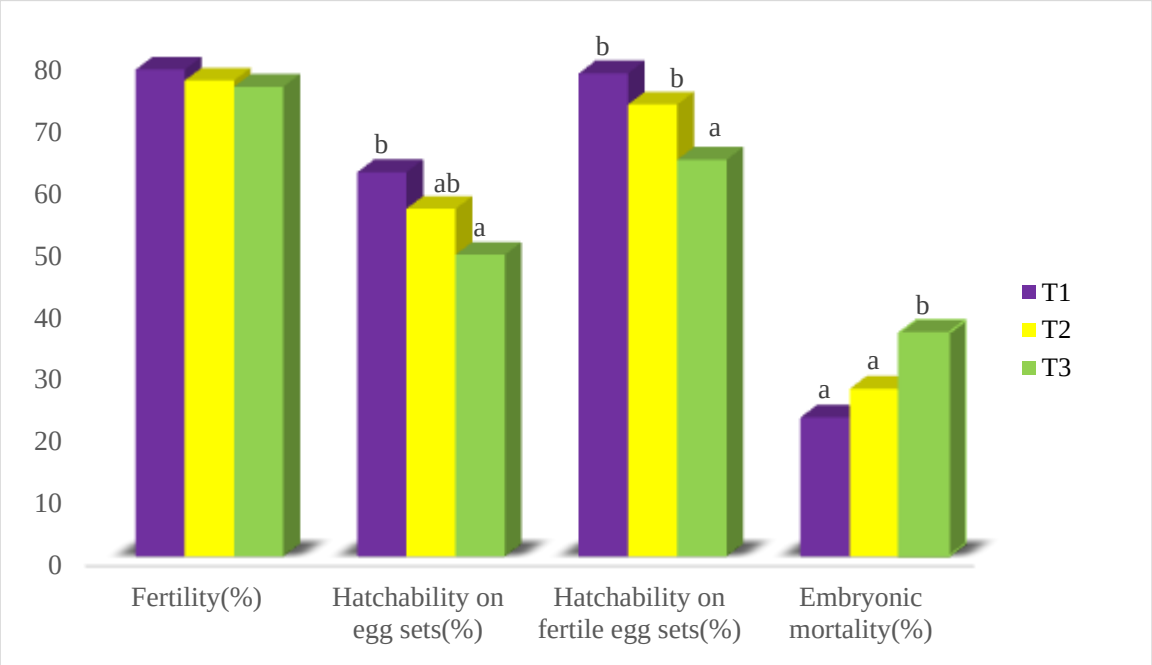


Figure. 4 The number of egg parameter



a = the lowest value, b = the highest value and ab = no significant difference between a and b

Figure. 5 Hatching performance of native chickens under three different diets

A. The chickens at the beginning of the experiment

B. The chickens fed T1 diet

C. The chickens fed T2 diet

D. The chickens fed T3 diet

Plate 2. Poultry farms by feeding different diets

Discussion

According to the results of the present study, the growth performance parameters (body weight and weight gain) of all the treatments during grower period were not significantly different from each other. The reason might be possible that all the chickens in three treatments may get the sufficient nutrients from all the diets which are formulated with not only isocaloric and isonitrogenous level but also the similar levels of calcium and phosphorous. This result is in agreement with the finding of Mutayoba *et al.* (2012) reported that differences in growth rate between the free-range local chickens fed with commercial feed (14.6% CP/2604 kcal ME kg-¹)

and homemade feed (15.5% CP/3620 kcal ME kg^{-1}) with maize 55%, maize husks 20%, cassava leaf meal 15%, soyabean meal 7%, egg shell 2% were not significant.

The results of feed intake and FCR were significantly different among three groups. However, the chickens fed T1 diet (Sunjin-100%, 19% CP and 3200 Kcal ME/kg) showed numerically lower value in feed intake and FCR than those fed T2 and T3 diet. The reason might be possible that the commercial feeds were formulated with appropriate levels of protein, carbohydrates, fat as well as vitamins and minerals. They are available in pellet form with larger particle sizes and more difficult to digest but they can reduce feed wastage and improve feed utilization. The feed with high quality allows the chickens to absorb all the nutrients they need without wasting it.

T3 diet is mash form with smaller size and easier to eat and digest but the chickens do not get the balanced nutrients due to higher wastage. Thus, T3 group fed the diet containing broken rice (30%), maize (25%), rice bran (23%), shrimp meal powder (20%) and snail shell powder (2%) is higher in feed intake and FCR than other groups.

In the present study, total feed cost was highest in T1 diet and lowest was in T2 diet containing Sunjin (50%), broken rice (25%), rice bran (23%) and snail shell powder (2%). The highest net profit was obtained from T2 due to the usage of high nutritional value of commercial diet and cost-effectiveness of local ingredients approaches saving feed cost and maintaining growth rate. The net return of T2 treatment is similar with Ramon and Zul (2016) reported that the treatment P1 (commercial feed 40% + corn 34.7% + rice bran 25% + minerals 0.3%) generates the highest profit.

In the present study, the number of eggs produced per hen was highest in T1 group (10.50 ± 0.53) and lowest in T3 group (9.75 ± 0.46) eggs. The better efficiency obtained from T1 and T2 could be due to its sufficient quantity of multivitamins, minerals and amino acids that promotes good health and egg production. Besides, natural ingredients such as maize, broken rice and rice bran that are used as dietary products in poultry but they may not directly provide egg improvement like other nutritional additives. The present study showed that the commercial diet was more efficient than natural ingredients for egg production. Wondu *et al.* (2013) reported that the chickens fed thrice a day produced 11.53 eggs is inconsistent with this study.

According to NRC (1994), calcium is the most abundant mineral element in snail shell. In the present study, 5% and 10 % of snail shell were added in laying stage of T2 and T3, respectively. Shell thickness of the eggs in this study was 0.51mm, 0.52mm and 0.50 mm in T1, T2 and T3, respectively. According to Yamak *et al.* (2015), the shell thickness of all the eggs in this study indicated that thick shelled eggs. The shell color of the present study was brown, light brown and whitish color for T1, T2 and T3, respectively.

The present result also indicated that there is no difference in fertility rate but the highest level of crude protein obtained the best hatchability percentage. The hatchability of the T3 (CP-9%) group was significantly lower than those of the T1 (CP- 17%) and T2 (CP- 13.5%) groups during the study period. This poor performance is linked to the high rate of embryonic mortality

in this group (Larbier and Leclercq, 1992). The reason might be due to higher protein diets can improve egg quality, leading to better hatchability.

During the study period, no mortality was occurred in all treatment groups. Therefore, the survivability was 100% in all grower chicken groups.

Conclusion

According to the findings of the present study, the feed types were not influenced on the growth parameters but affected on hatching rate of native chickens. The native chickens fed three different feed types gave similar growth parameters. Therefore, T3 diet containing locally available feed ingredients is said to be sufficient for rearing native chickens with low profitability in the grower phase. It was concluded that T2 diet containing broken rice (25%), rice bran (23%) and snail shell powder (2%) could be used up to 50% to substitute the commercial feed to reduce feed cost. It can be used to yield the favorable target weight and save the feed cost in rural areas. In term of laying and hatching performance, the native hens fed the highest T1 diet exhibited the best results in comparison with those fed other diets. It is suggested that this study is able to provide food security, the improvement of income by using the least-cost feed for the rural households.

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