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F1 Friesian X Boran

Effective Micro Organism

Highlights

Aquatic Biodiversity Analysis

Performance of Broiler Breeders

Discovering Thoughts, Inventing Future

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Growth Performance of F1 Friesian X Boran Crossbred Dairy Calves Supplemented with Effective Micro Organism (EM) Fermented Wheat Bran (Bokashi) in the Central Highlands of Ethiopia

By Aemiro Kehaliew, Getu kitaw, Getnet Assefa, Dereje Fekadu & Zewdie Wondatir

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Abstract- This experiment was designed to investigate the biological and economical response of feeding effective microorganisms treated wheat bran provided at different level to young crossbred calves. Twenty crossbred Frisian*Boran calves weighing (100± 10.85) kg and 6 months of age were selected and divided randomly in to 4 similar treatment groups (5 animals each group) in 100 days feeding trial. All the calves in the different groups were fed similar basal diet of native pasture hay. The first group (T1, control) fed native hay as a basal diet and concentrate mixture as a supplement. Group 2, 3 and 4 (T2, T3 and T4) fed the same basal diet and concentrate mixture replaced by 33, 66 and 100 % EM treated wheat bran, respectively.

Keywords: calves, efficiency, effective microorganisms, weight gain.

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Aemiro Kehaliew [α], Getu kitaw [σ], Getnet Assefa [ρ], Dereje Fekadu [ω] & Zewdie Wondatir [¥]

Abstract- This experiment was designed to investigate the biological and economical response of feeding effective microorganisms treated wheat bran provided at different level to young crossbred calves. Twenty crossbred Frisian*Boran calves weighing (100± 10.85) kg and 6 months of age were selected and divided randomly in to 4 similar treatment groups (5 animals each group) in 100 days feeding trial. All the calves in the different groups were fed similar basal diet of native pasture hay. The first group (T1, control) fed native hay as a basal diet and concentrate mixture as a supplement. Group 2, 3 and 4 (T2, T3 and T4) fed the same basal diet and concentrate mixture replaced by 33, 66 and 100 % EM treated wheat bran, respectively. Based on these treatments, the response of growing calves in terms of dry matter and nutrient intake, daily weight gain, feed conversion efficiency and economic feasibility were evaluated. The CP content of effective microorganisms (EM) treated wheat bran was lower than that of the concentrate mixture and wheat bran. However there was no significant difference in organic matter digestibility between the EM treated wheat bran and the concentrate mixture (65.26 Vs 65.61%), respectively. There was also no significant (P>0.05) difference in live weight change, dry matter and metabolizable energy intake among the different treatments. The highest daily body weight gain and better feed conversion efficiency was observed in T2. Among the different treatments the lowest feed cost per daily intake was encountered in T2. In general EM treated feed supplementation had positive effect on growth performance of calves.

Keywords: calves, efficiency, effective microorganisms, weight gain.

I. Introduction

Successful strategies for increasing the efficiency of utilization of low quality roughages include supplementation, chemical treatment, biological treatment and manipulation of the rumen ecosystem. Among the biological treatment methods, use of effective microorganism is one of the options for improving feed quality. Effective Microorganisms (EM) are a mixed culture of aerobic and anaerobic types of microbes living symbiotically with each other. These microorganisms are beneficial types, natural, free-living and safe. They can withstand a wide variation of environmental conditions making them consistent and stable. Modern animal production requires use of safe and effective additives to stimulate feed consumption and destroy harmful microorganisms of the diet in addition to be used as rumen manipulators to increase animal productivity.

According to Saili et al., 2010, fermentation of feeds with microorganisms had resulted in increased live weight gain. Probiotics are live microorganisms that often result in increased feed conversion efficiency and live weight gain (Sissons, 1989). They also introduce beneficial microorganisms into the gut which act to maintain optimal conditions within the gastrointestinal tract and inhibit the growth of pathogenic or other undesirable bacteria. Several functions of probiotics have been proposed, including the protection of young animals against enteropathic disorders such as diarrhea by inhibiting the colonization of the gut by coliform bacteria and an increase in feed conversion efficiency and live weight gain in growing animals (Fuller, 1990 and Saili et al., 2010).

Studies have shown that large mixtures of microorganisms can be used with superior results to single bacteria strain or simple mixtures of few types of bacteria (Mead and Impey, 1986; Stavric et al., 1991). The same authors also reported that the success of complex mixtures appears to be due to interactive effects of anaerobes and facultative anaerobes. As a mixed culture of beneficial and naturally occurring microorganisms, Effective Microorganisms (EM) contain selected species of microorganisms including predominant populations of lactic acid bacteria and yeasts and smaller numbers of photosynthetic bacteria, actinomycetes and other types of organisms. The use of EM in animal husbandry nowadays is very well identified in many parts of the world. In a study conducted in Belarus by Konoplya and Higa (2000), EM was successfully used in poultry and swine units as feed

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constituent and sanitation spray. In South Africa EM was used to increase productivity in integrated animal units and poultry farms (Hanekon et al., 2001). In a sudy conducted by Maqbool etal.,2001, the use of EM treated rice straw proved to be beneficial for the prevention of disease probably by virtue of its ability to check the growth of mycotoxin producing fungi. This agent not only controls the disease but also increases the growth rate, feed consumption and feed efficacy. Similar results were also recorded in broilers by Khan et al. (1992) and Haddadin et al. (1996).

Thus, the objectives of the present study was to evaluate the effect of the supplemental value of different levels of EM treated wheat bran on feed intake, growth performance and economic benefit of F1 crossbred Friesian* Boran calves .

II. Material and Methods

a) Location and treatment description

This study was carried out at Holetta Agricultural Research Center (9^{O}N latitude; 38^{O}E longitude). The experimental site lies at an altitude of 2400 meters above seas level. In this study, twenty Fresian* Boran crossbred calves with an average live weight of 100 ±10.85 kg and six month of age were used. The experimental calves were divided randomly in to four treatment groups (five animals in each group). Calves of the first group (TI, control) fed native hay as a basal diet and concentrate mixture of 43% noug seed cake (Guzotia abyssinica), 55% wheat bran and 2% salt. Calves of the 2^{nd}, 3^{rd} and 4^{th} treatment group received the same basal diet with 33, 66 and 100% of the concentrate mixture replaced by effective microorganism (EM) treated wheat bran, respectively.

b) Experimental treatments

1. *Treatment 1:* native hay adlibtium + concentrate mixture(control)
2. *Treatment 2:* native hay adlibtium + 33% of the Concentrate mixture replaced by EM treated wheat bran
3. *Treatment 3:* native hay adlibtium + 66% of the Concentrate mixture replaced by EM treated wheat bran
4. *Treatment 4:* native hay adlibtium + 100% of the Concentrate mixture replaced by EM treated wheat bran

c) Activated solution and EM treatment preparation procedures

Bokashi (40% moisture) is an EM treated wheat bran that was prepared from; 1 lt EM1(stock solution) + lt molasses + 50 g table sugar + 18 lt chlorine free water + 50 kg wheat bran. The mix was allowed to ferment for about three weeks in a large plastic barrel of capacity 150kg before it was being fed to the animal. The EM stock solution was provided by Woljjejji private limited company. Bokashi (EM treated wheat bran) was self prepared based on the procedures as follows:

1. One liter of molasses and 50 gm of sugar was added in to 18 liters of water and it was stirred very well.
2. One liter of EM-1(stock solution) was added in to the mixture
3. Stirring continue until a homogeneous solution was attained
4. The container was covered with the plastic sheet and it was very well tied to prevent the entry of air.
5. It was stored in shaded place with ambient temperature for 20 days.
6. After 20 days the resulting mixture known as EM Activated Solution (EMAS) was ready for use.
7. EMAS was viable for 15 to 20 days after fermentation. Always keep in anaerobic condition.

d) Treatment of wheat bran with Activated solution

- Molasses was dissolved in the 20 liter of water.
- EMAS was added into the above prepared molasses solution.
- The diluted EM solution was poured into 50kg of wheat bran and mixed well. EM diluted solution was added gradually and mixed well while checking the moisture content. The moisture content should be about 30-40%.
- The mixture was put into a plastic container that did not permit air entry to maintain an anaerobic condition
- The plastic container was stored in a place away from direct sunlight
- It was allowed to ferment for 21 days.
- The Bokashi was ready for use when it gives a sweet fermented smell. If it produces a rotten smell, it is a failure.
- The Bokashi should be used soon after preparation. If storage is required, spread it on a concrete floor, dry well in the shade and then put into vinyl bag.

e) Feeding management

Twenty calves were assigned in to four experimental treatments in RCBD design. Each calf was kept in a separate pen in a well ventilated barn. Native hay and water was provided ad libitum. Concentrate mixture including the EM treated wheat bran was provided twice a day early in the morning and late in the afternoon. The concentrate mixture (43% noug seed cake, 55% wheat bran and 2% salt) was formulated to meet the daily nutrient requirement of calves according to Kearl, (1982). The feed offered and refusal was recorded daily. Data on live weight change was recorded fortnightly.

f) Analysis of feed chemical composition and digestibility

Samples of native hay, wheat bran, noug seed cake, EM treated wheat bran and concentrate mixture were analyzed for dry matter (DM), crude protein (CP) and total ash using procedures described by AOAC, (1990). The neutral detergent fiber (NDF) and acid detergent fiber (ADF) concentrations in feed samples were determined according to the procedure of Van Soest and Robertson (1985). In-vitro organic matter digestibility (IVOMD) was determined according to the procedure of Tilley and Terry, (1963)

g) Data analysis

The calves were randomly assigned to the different dietary treatments in Randomized Complete Block (RCBD) design. The data was analyzed using SAS statistical software (SAS, 2002) as per the following model.

$Y_{ij} = \mu + B_i + T_j + e_{ijk}$ .Where, Y_{ij} = Response variables, μ = Overall mean, Bi = The effect of i^{th} block, T_j = The effect of j^{th} treatment and e_{ijk} = Random error.

III. Results and Discussion

a) Chemical composition of experimental feeds

The chemical compositions of experimental feeds are shown in Table 1. Dry matter content of experimental feeds was in the range of 89.39 to 91.69%. Among the experimental feeds, Bokashi (EM treated wheat bran) had lower dry matter content. The CP content of EM treated wheat bran was lower than that of the concentrate mixture and wheat bran. In a similar study by Bruchem, (1998) CP and ME content of EM treated silage was slightly lower than that of untreated silage. This might be due to the fact that part of the nutrients is utilized by the microbes for their growth and multiplication. However there was no difference in organic matter digestibility between the EM treated wheat bran and the concentrate mixture (65.26 Vs 65.61%), respectively. EM treated wheat bran had higher NDF content than un treated wheat bran and concentrate mixture. The current result is also in agreement with the report of Bruchem, (1998). On the other hand higher ADF content encountered in concentrate mixture than EM treated and un treated wheat bran.

Table 1 : Chemical compositions of experimental feed ingredients

Feed ingredient	Chemical compositions (% DM)						
	DM	Ash	CP	NDF	ADF	Lignin	DOMD
Noug seed cake	91.69	8.93	37.23	38.63	25.52	4.71	56.19
Wheat bran	88.97	4.77	16.27	43.48	12.66	3.35	70.89
Bokashi	88.39	6.75	15.39	46.65	13.66	3.53	65.26
Concentrate	89.26	8.26	24.79	36.09	21.93	4.30	65.61
Natural pasture hay	90.65	8.58	6.10	74.40	43.83	7.24	46.02

b) Dry matter and nutrient intake

As shown in Table 2, total dry matter (DM) intakes of calves were in the range of 3.68 to 4.43 kg/day. In a similar study by Khin et al., (2008), the DM intake was in the range of 3.75 to 3.92 kg/day. The highest and the lowest DM intake was observed in treatment 1and 4, respectively. There was no significant ($P>0.05$) difference in dry matter intake among the different treatments. Among the EM treated feed supplemented groups 100% replacement had lower DM intake than the other groups.

There was significant ($P<0.05$) difference in crude protein intake (CPI) among the different supplements. The highest CP intake was obtained in concentrate mixture supplemented group. Among the EM treated feed supplemented groups 100% supplemented ones had the lowest CPI. The difference in CPI was due to replacement of the protein sources of the concentrate mixture at different level by EM treated wheat bran. Metabolizable energy intake (MEI) was not significantly ($P>0.05$) varied among the different treatments.

Table 2 : Voluntary feed dry matter and nutrient intake Feed DM Intake

Feed DM Intake	Treatment				Mean	SE
	1	2	3	4		
Concentrate (kg/d)	2.08	1.27	0.596	0	1.32	
Bokashi (kg/d)	0	0.717	1.30	1.88	1.30	
Hay (kg/d)	2.34[a]	2.07[a]	2.05[a]	1.80[a]	2.07	0.217
TDMI (kg/d)	4.43	4.06	3.95	3.68	4.03	0.449
Hay intake, %BWt.	1.58	1.52	1.63	1.46	1.55	
TDMI, %BWt.	2.99	2.98	3.15	2.99	3.03	
CPI (gm/d)	657[a]	550[ab]	471[ab]	396[b]	519	0.06
CPI(gm/kg MBW)	15.47	13.79	12.75	10.72	13.25	
MEI (MJ/d)	38.39	35.65	34.73	32.82	35.40	4.01
MEI(MJ/kg MBW)	0.90	0.89	0.93	0.89	0.90	

[a-b] ,means in the same row with different superscripts are significantly different each other (P<0.05), kg/d: kilogram per day, BWt: body weight, TDMI: total dry matter intake, CPI: crude protein intake, MEI: Metabolizable energy intake, MJ/d: mega joule per day, gm/d: gram per day, SE: Standard error, gm/kgMBW: gram per kilo gram metabolic body weight, MJ/Kg MBW: maga joule per kilo gram metabolic body weight

c) Live weight change

There was no significant (P>0.05) difference in live weigh change among the different treatments (Table 3). Daily live weight gain was in the range of 696.7 to 823.3 gm/day. The highest daily body weight gain was obtained in T2, where 33% of the concentrate supplement was replaced by EM treated wheat bran (Bokashi). A similar work reported by Maqbool et al., (2001) indicated that 39.2 percent of body weight increase (600 gm/day) in live weigh gain was encountered in calves fed EM treated straw compared to other forms of feeding. Previous finding by Bruchem (1998) also indicated that higher growth rate was obtained from EM treated feed. The finding of this study indicated that in spite of replacing the protein source in the concentrate mixture by 100% EM treated wheat bran, daily weight gain was not affected markedly compared to concentrate mix supplemented groups. This implies that EM treatment improved the quality of the treated feed particularly CP content of the ration as was also recorded by Maqbool et al., (1997). In another study, Khin et al., (2008) obtained a weight gain of 300 gm/calf/day with the supplementation of 6 cc probiotics. These findings showed that supplementation of probiotics had positive effect on growth performance of young calves. EM treatment in addition to increasing growth rate, feed consumption and feed efficacy, it also helps to control disease (Maqbool et al..,(2001). Similar results were also reported in broilers by Khan et al., (1992) and Haddadin et al., (1996). According to Saili et al., (2010) treatment of cocoa-pods with micro organisms (A. niger) also result in increased live weight gain.

Feed conversion efficiency (FCE) was not significantly (P>0.05) different among the different treatments as shown in Table 3. Relatively higher FCE was observed in T2 (5.70 g feed/g gain) and T4 (5.73 g feed/g gain) where 33 and 100% of the concentrate mixture replaced by EM treated wheat bran, respectively. A similar study by Khin, et al., (2008) showed a feed conversion efficiency of 13.08 kg feed /kg gain which was lower than the present study.

The use of EM in animal production have demonstrated beneficial effects not only on health and production but also on environmental pollution. According to Li et. al., 1994 the naturally occurring microorganisms contained in EM after they enter into the body create more effective intestinal microflora with a greater synthetic capability i.e. one that can synthesize vitamins, hormones and enzyme systems that improve digestion, enhance growth, provide disease resistance, suppress malodor, inhibit pathogen and improves product quality. In all cases the improvement were associated to a greater flow of microbial protein and aminoacid to the duodenum, increased number of rumem cellulytic bacteria which improves fiber degradation, changes in the volatile fatty acids contents, greater glucose availability and reduced mobilization of fatty acids based on glucose, insulin, non-esterified fatty acids and ketones concentration in the blood.

Table 3 : Live weight changes

Growth paramete	Treatment				Mean	SE
	1	2	3	4		
Initial weight (kg)	112.40	101.7	91.1	95.9	100.28	10.85
Final weight (kg)	185.6	175.8	161.8	158.6	170.45	19.30
1	2	3	4			64.33
112.40	101.7	91.1	95.9	100.28	10.85	0.72
185.6	175.8	161.8	158.6	170.45	19.30	
813.33	823.33	785.56	696.67	779.72	64.33	

DWG = daily weight gain, FCE = feed conversion efficiency, SE = Standard error

d) Daily feed cost of experimental calves

The price in feed cost among the different treatment groups was varied from 6.31 to 7.42 birr/day (Table 4). The lowest feed cost was encountered in treatment 4 where 100% of the concentrate mixture was replaced by EM treated wheat bran. On the other hand the cost of feed was higher in concentrate mixture supplemented group (T1). In all cases, the cost of EM activated solution treated wheat bran was lower than that of concentrate mixture supplementation. This finding also indicated that in areas where the cost of protein sources is expensive the use of EM treatment is the best option.

Table 4 : Daily feed cost of experimental calves

Feed ingredient	T1		T2		T3		T4	
	DMI (kg)	Cost (birr)	DMI (kg)	Cost (birr)	DMI (kg)	Cost (birr)	DMI (kg)	Cost (birr)
Hay	2.34	3.11	2.07	2.75	2.05	2.73	1.80	2.39
Wheat bran	1.144	2.20	0.6985	1.34	0.3278	0.63	0	0
Noug cake	0.8944	1.99	0.5461	1.22	0.2563	0.57	0	0
Bokashi	0	0	0.717	1.44*/1.59**	1.30	2.63*/2.89**	1.88	3.80*/4.17**
Salt	0.0416	0.12	0.0254	0.08	0.0119	0.04	0.0416	0.12
Total		7.42		6.83*/6.98**		6.60*/6.86**		6.31*/6.68**

* The cost for 1kg Bokashi prepared from stock solution activated to 20lt EM-2= 2.02 Eth. birr,

**The cost for 1kg Bokashi prepared from purchased EM-2 solution = 2.22 Eth. birr

Note that water and labor cost were not considered in calculating the daily feed cost

*During the study period the average exchange rate was 17.0 Ethiopian birr = 1 USD

IV. Conclusion

The highest daily body weight gain was obtained in T2 (823 gm/calf/day) where 33% of the concentrate supplement was replaced by EM treated wheat bran. Among the different treatments the lowest feed cost per daily intake was encountered in 100% of the EM treated wheat bran supplemented group. EM treated feed supplementation at different level had positive effect on growth performance of calves. Further study on improvement of poor quality feed resource particularly crop residue with EM treatment is required.

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Role of Camel's Milk in Growth Rate of *Chroococcus* Sp

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The results showed the camel's milk caused a significant increase($p<0.05$) in the rate of growth of alga over a period the experiment.

Keywords: *cyanobacteria, chroococcus alga, camel's milk.*

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I. Introduction

Cyanobacteria are a very old group of organisms and represent relics of the oldest photoautotrophic vegetation in the world that occur in freshwater ,marine and terrestrial habitats (Mundt and Teuscher, 1988).

Chroococcus, a unicellular organism that is a genus of cyanobacteria, like all cyanobacteria, *Chroococcus* is a prokaryote and therefore lacks any of the membranous organelles of eukaryotes. Known for its underwater habitat, *Chroococcus* prefers the sludge of lake and river bottoms (Ditty *et al.*, 2003).

Cyanobacterial secondary metabolites represent a vast diversity of structures and have been isolated from a number of cyanobacterial genera from different geographical locations. During the last two decades, cyanobacterial secondary metabolites have attracted the attention of researchers mainly due potential therapeutic use of several secondary metabolites include a range of compounds showing animal toxicity and antibacterial, antifungal, anti-inflammatory, antimalarial, antiprotozoal, antituber-culosis, antiviral, antitumor and cytotoxic activities (Gademann and Portmann, 2008; Mayer *et al.,* 2009)

In addition to the role of cyanobacteria in the application of biotechnology in the production of hydrogen gas and the production of ammonia and nitrogen fixation and production of enzymes and pharmaceutical products and use food protein for the treatment of heavy water and the excretion of toxins and their impact on the environment in addition to its role in the analysis of crude oil and some of its derivatives to simple compounds non-polluting (Kumazawa and Mitsui, 1989; Kostreba, 2001; Raghukumar, 2001)

The camel's milk is characterized immune-ological advantages unique, since it has a good quality of proteins of the preventive efficacy against bacteria and viruses such as lactoperoxidase, lysozyme and as well lactoferrin. It has an important role in reducing the ability of germs because of injury, inhibition of enzyme cysteine protease found in bacteria and viruses as well as some parasites, the milk also contains a high concentration of minerals(Sodium, Potassium ,iron ,copper ,zinc and magnesium) and vitamins A, B2,C and E (Ohashi *et al.*, 2003; Kamal *et al.*, 2007 ; Al-Hashem *et al.*, 2009).

The present study aimed to investigate the role of camel's milk in the growth of moss through by addition of different concentrations of milk to the farmer of *Chroococcus sp.*

II. Materials and Methods

a) Isolation and purification of algae

Isolated and scrubbed algae according to (Stien,1973), as was access to unialgal cultures were then purified for the purpose of obtaining axenic cultures depending on the method of (Al-Arajy, 1996) and then diagnosed based on)Desikachary,1959; Prescott, 1975).

b) Development and propagation of algae

Algae were grown using a the middle Chu-10 axis by (Al-Arajy, 1996) and after obtaining sufficient amounts transferred to the 100 ml bottles filled with 70 ml of the former the middle and incubated at a temperature (25 ±3) ˚ C .

c) Measuring the rate of growth

The growth rate of algae counted directly by Chamber Shidu (Coombs et al., 1986).

d) Camel's milk

Milk samples were collected early in the morning from camel farm in the Al-Nassiriya city, Thi-Qar province, Iraq. Milk was collected from camel by hand milking as normally practiced by the farmers. The

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samples were collected in sterile screw bottles and kept in cool boxes until transported to the laboratory.

e) experimental groups

Different concentrations of camel's milk and added to the algal farms which were divided into five groups as following:

Group I : control group, contained 100 ml from Chroococcus sp. only.

Group II : contained 100 ml of Chroococcus sp. alga with 1 ml of camel's milk (1%).

Group III : contained 100 ml of Chroococcus sp. with 2 ml of camel's milk (2%).

Group IV : contained 100 ml of Chroococcus sp. with 3 ml of camel's milk (3%).

Group V : contained 100 ml of Chroococcus sp. with 5 ml of camel's milk(4%).

III. Results

The results of the present study shown in table (1). The results indicated the camel's milk caused a significant increase($p< 0.05$) in the growth of algae Chroococecces for the duration of the experiment with different concentrations of milk (1, 2, 3and 5ml/100ml of farms) compared with the control group . The highest rate of growth of algae on the first day in group(V).

Results showed the first day a significant increase ($p< 0.05$) in the growth of rate of Chroococecces in groups (II,III ,IV and V) compared with group (I) after one day of treatment with different concentrations (1 %, 2 %, 3 % and 5 %) of camel's milk . Also , there was a significant increase ($p< 0.05$) in the growth rate groups(III) and (V) compared with group(II) ,While, the results recorded a significant decrease ($p <0.05$) in the growth of rate of Chroococecces in group(IV) compared with group(II) the same day .

After third day of treatment , the results ¡ndicated a significant increase ($p< 0.05$) in the growth of rate of Chroococecces in groups (II,III ,IV and V) compared with control group (group I) , Also , there was a significant increase ($p< 0.05$) in the growth rate groups(III) and (V) compared with group(II) ,While, the growth rate in group(IV) decreased significantly ($p <0.05$) compared with group(II) .

After fifth day of treatment , the results indicated a significant increase ($p< 0.05$) in the growth of rate of Chroococecces in groups (II,III ,IV and V) compared with control group (group I) , Also , there was a significant increase ($p< 0.05$) in the growth rate group (III) compared with group(II).While , the results recorded a significant decrease ($p <0.05$) in the growth of rate of Chroococecces in groups (IV) and (V) compared with group(II).

After seventh day of treatment , the results indicated a significant increase ($p> 0.05$) in the growth of rate of Chroococecces in groups (II) and (III) compared with control group , While , the results recorded a significant decrease ($p <0.05$) in the growth of rate of Chroococecces in groups (IV) and (V) compared with group(I). The growth rate of Chroococecces decreased significantly ($p <0.05$) in groups (IV) and (V) compared with group(II). While, the results recorded a significant increase ($p< 0.05$) in group (III) compared with group(II).

After ninth day of treatment , the results indicated a significant increase ($p< 0.05$) in the growth of rate of Chroococecces in groups (II) and (III) compared with control group , While , the results recorded a significant decrease ($p< 0.05$) in the growth of rate of Chroococecces in groups (IV) and (V) compared with group(I). Also, there was a significant decrease ($p< 0.05$) in the growth of rate of Chroococecces in groups (IV) and (V) compared with group(II). While , the results recorded a significant increase ($p< 0.05$) in group (III) compared with group(II).

Table 1 : Role of camel's milk in growth rate of chroococcus sp

treatments	Growth rate (cells\1 ml)				
	1 day	3 days	5 days	7 days	9 days
Group I	93.00 ±1.73 ^{A}	65.33 ±2.91 ^{D}	71.33 ±0.88 ^{D}	86.00 ±3.06 ^{B}	78.00 ±5.77 ^{C}
Group II	125.67 ±2.96 ^{A}	80.00 ±2.89 ^{D}	119. 0 ±0.58 ^{A}	109.67 ±5.78 ^{B}	100.00 ±4.62 ^{C}
Group III	139.67 ±2.91 ^{B}	152.00 ±1.15 ^{A}	145.00 ±2.89 ^{B}	127.33 ±1.45 ^{C}	109.67 ±5.78 ^{D}
Group IV	109.67 ±5.78 ^{A}	78. 0 ±1.15 ^{C}	94.0 ±1.15 ^{B}	73.00 ±1.73 ^{CD}	70.67 ±1.76 ^{D}
Group V	195.67 ±2.96 ^{A}	92.00 ±1.15 ^{B}	91.33 ±0.88 ^{B}	73.33 ±0.88 ^{C}	68.00 ±1.15 ^{D}

Differences letters refers to a significant differences at $p<0.05$

IV. Discussion

Algae are many benefits as a source for the production of many materials economically important, which encouraged the cultivation and production of biomass, has been used for the production of pharmaceuticals, cosmetics different materials other industrial as well as animal feed and food additives for human food (Grima *et al*., 1990). As it raises to the surroundings of many materials, such as simple sugars and multiple, alcohols and enzymes, and some of which secreted material impact of anti-bacterial, fungi and tumors (Moore *et al*., 1996).

The increase of growth rates of *Chroocecces* sp. may be attributed to supply of algae with nutrients and minerals important for growth, where is the camel's milk is rich in minerals (sodium, potassium, iron, copper, zinc, magnesium) and vitamins (A, B2, C, E) also contains a high concentration of a protein similar to insulin (Kamal *et al.,* 2007; Al-Hashem *et al.,* 2009). These materials play a fundamental role in the increase of cell divisions and increase the breadth and elongation of the cells and thus increasing the effectiveness of the physiological processes photosynthesis thus, a supply algae carbohydrate materials manufactured in this process and this in turn improves the rate of growth (Sahaf , 2000)

V. Conclusion

Our results demonstrate that camel milk is able to events noticeable change in the rate of growth of algae. Algae contains many chemical compounds that can be used in medical, economically and industrially. Further studies are required, using a human population, to confirm theses protective effects.

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Aquatic Biodiversity Analysis of Four Rice Terraces Clusters in the Cordillera Region, Northern Philippines

By Robert T. Ngidlo & Nestor M. Baguinon
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Abstract- An aquatic biodiversity analysis was conducted in four rice terraces clusters in the Cordillera region in the northern central part of the Philippines. Data was obtained using the quadrat sampling method. The location of sampling activities are the four rice terraces clusters namely: (1) Asipulo, Ifugao; (2) Natonin, Mt Province; (3) Bagumbayan, Kalinga; and (4) Tanglagan, Apayao. Each place of sampling had two (2) blocks: (1) Rice paddy fields and (2) Irrigation canals/creeks. The number of quadrats randomly taken in each block was ten (10) plots with each quadrat measuring 1m x 1m. The number of plots in all places was 4 sites x 2 blocks x 10 plots = 80 plots. Individuals of shell, crab, fish and frog species circumscribed within plot/quadrat boundaries were counted, identified and sorted according to species. The importance value (IV) of each species in each block was determined. This was done by taking the sum of Relative Density (%) and Relative Frequency (%) of each species in a given block. Importance Value = Relative Density + Relative Frequency. The Shannon Wiener Diversity Index (H), Evenness Index (E) and Simpson's Index (C) was obtained for each species. The higher values of H, E and C means the greater diversity character of the community being evaluated.

Keywords: rice terraces, aquatic biodiversity, biodiversity indices, importance value, evenness index.

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Keywords: rice terraces, aquatic biodiversity, biodiversity indices, importance value, evenness index.

I. Introduction

Over the years, traditional agricultural systems steadily gained recognition and prominence in the national and international development discussions. Their recognition came primarily due to the relevance of knowledge reposed in these agricultural systems and their possible contribution to sustainable development. The Cordillera region in the northern central part of the Philippines is home to the largest and most extensive traditional rice terraces cultivation in the Philippines and perhaps throughout the Asia-Pacific region. The region is politically subdivided into six provinces and occupy a total land area of 19,294 km^2 made up of rows of great mountain ranges occupying half of Northern Luzon in the Philippines. Its rugged mountainous backbone contains many peaks exceeding 2,000 meters in height with rolling hills and stretches of river valleys along its flanks. With its rugged mountainous backbone, the early settlers of the areahas no other option but to build rice terraces along the slopes for their own survival. Acknowledged to be more than 2,000 years old, the rice terraces represents an indigenous farming system which reflects the people's history and culture. Its management is governed primarily by indigenous systems and institutions which is purely organic in nature. Past literatures written on the rice terraces invariably described them as stable and resilient agro-ecosystem. Some of the rice terraces clusters have been declared as World Heritage site by the United Nation Education, Scientific and Cultural Organization (UNESCO). However, over the last 50 years, there were a series of changes that had occurred in the rice terraces. Foremost of these changes is that farmers are shifting to modern farming systems (Ngidlo, 2013). Today, the rice terraces represents a miniature of both modern and traditional farming systems. The use of high yielding rice varieties, commercial fertilizers, pesticides and the adoption of hand tractors are the leftovers of modern agriculture replacing the traditional organic system.

Aquatic biodiversity is a major food item in the rice terraces. Local people depend much on these biodiversity's to sustain their diet and protein requirement (Ngidlo and Ngohayon, 2009). The loss of aquatic biodiversity may mean a significant loss in the food security status of the local people. The study was conducted to determine aquatic biodiversity indices and to identify factors contributing to the loss of biodiversity in the rice terraces. In the end, the paper will hopefully

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provide a platform for discussions on traditional agricultural systems among various stakeholders.

II. Materials and Methods

The organisms subjected to biodiversity analysis were mollusks, gastropods (snails) namely (1) Agurong, *Jagora asperata (Lamarck)*, (2) Birabid, *Lymnaea (Bullastrus) cumingiana* (3) Bisukol, *Pila luzonica Reeves* , (4) Golden Apple Snail, *Pomacea canaliculata ,* (5) Liddeg, *Angulyagra oxytropis (Benson)* Geslacht and pelecypods (bivalves) namely (6) Tukmem, *Turbicula manilensis* . The lone arthropod was the crustacean (7) Talangka, *Sundathelphusa cagayana* . Vertebrate species consists of the following fish species: (8) Jojo fish; *Anquilla japonica* (10) Mosquito carp, *Gambusia affinis,* (11) Million fish, *Poecilla reticulata* (12) Frog/tadpole (*Rana* sp).

The location of sampling activities are four rice terraces clusters located in four provinces in the Cordillera region in the northern central part of the Philippines. The rice terraces clusters are: (1) Asipulo, Ifugao; (2) Natonin, Mt Province; (3) Bagumbayan, Kalinga; and (4) Tanglagan, Apayao. Each place of sampling had two (2) blocks: (1) Rice paddy fields and (2) Irrigation canals/creeks. The number of quadrats randomly taken in each block is ten (10) plots with each quadrat measuring 1m x 1m. Hence, the number of plots in all places was 4 sites x 2 blocks x 10 plots = 80 plots. Individuals of shell, crab, fish and frog species circumscribed within plot/quadrat boundaries were counted, identified and sorted according to species. The importance value (IV) of each species in each block was determined. This was done by taking the sum of Relative Density (%) and Relative Frequency (%) of each species in a given block. Importance Value = Relative Density + Relative Frequency.

The Shannon Wiener Diversity Index (H), Evenness Index (E) and Simpson's Index (C) was obtained for each species. The higher values of H,E and C means the greater diversity character of the community being evaluated.

Ten (10) key informants were interviewed to identify factors contributing to the loss or increase of aquatic biodiversity in the rice terraces.

III. Results and Discussion

a) *Profile of the Rice Terraces Clusters*

The rice terraces of the Cordillera region in the Philippines has evolved in recent years and no longer the same organic system they used to be prior to the 1980's. Demographic pressures associated with the need to produce more food escalated the adoption of modern farming practices for the last 50 to 70 years. Three of the selected study sites shifted to modern farming practices similar to that of lowland agriculture while one site still adhere to the traditional farming practices. The profile of the rice terraces clusters are indicated in Table 1.

Table 1 : Profile of the rice terraces

Study Site	Status of Farming System
Asipulo, Ifugao	Adopted modern farming system in the early 1990's
Natonin, Mt. Province	Still continuing with the traditional farming system
Tanglagan, Apayao	Adopted modern farming system in the 1980's
Bagumbayan, Kalinga	Adopted modern farming system in the 1980's

b) *Aquatic Biodiversity Analysis*

The result of analysis in Table 2 shows that the four sites differ with respect to diversity values. For comparing Rice Paddy versus Canal/Creek, Kalinga and Apayao have higher canal/creek diversity than the rice paddy diversity, i.e. Canal/Creek (H=1.55, E=.97, C=.78) versus Rice Paddy (H=1.04, E=.94, C=.62). The case of Mt. Province is similar, except that the difference between Canal/Creek and Rice Paddy diversities are not so much, or in other words, the former is slightly more diverse than the latter. However, the Ifugao case demonstrated a reverse, H and C diversity indices is greater in the Rice Paddy than in the Canal/Creek although the E at the Canal/Creek had greater value. These aforementioned results are expected since the Canal/Creek cases approximate the usually richer natural ecosystem as opposed to the Rice Paddy agroecosystem (man-made). Translating the above table into a line graph (Figure 1), the pattern becomes obvious, for example, the values are down with Rice Paddy then up with Canal/Creek for Mt. Province, Kalinga and Apayao. The lesser H and C in rice paddies in Mt. Province, Kalinga and Apayao is indicative of the continuous collection for food and or given as feed to animals.. In the case of Apayao, the higher H and C for the irrigation canal/creek is that during the time of sampling there was a *lapat* in force for almost 3 months covering the whole stretch of the sampling area (almost 2 kms. of creek) thus, aquatic biodiversity was protected from exploitation during that period of time. Rice paddies are not covered by the *lapat* and the lesser value of H and C can be attributed to the continuous spraying of pesticides in rice paddies. The lesser H and C in Ifugao can be attributed to the excessive collection for food and for sale in the market. It may also be attributed to the presence of invasive alien species (e.g. Golden Kuhol) in the Ifugao Rice Paddy having spread into the Canal/Creeks. The Golden Kuhol's presence is highest in Asipulo, Ifugao and

negligibly present in the Rice Paddies of Natonin, Mt. Province and Bagumbayan, Kalinga, but absent in their respective Canals/Creeks. Golden Kuhol was not found in Tanglagan, Apayao. The graph showing the H, E and C of the four study sites is shown in Fig. 1

Table 2 : Importance values (IV) of species in all four sites including corresponding Shannon Wiener Diversity, Evenness and Simpson's Indices and contained IVs of exotic species

Species/Variety	Ifugao		Mt. Province		Kalinga		Apayao	
	Rice Paddy	Canal/Creek	Rice Paddy	Canal/Creek	Rice Paddy	Canal/Creek	Rice Paddy	Canal/Creek
Bisukul	3.43		20.08	35.11	38.67	23.77	52.78	42.13
Agurong	78.07	65.75	39.55	55.32	49.36	49.73	43.65	41.2
Liddig			36.17					
Tukmim						26.49		16.67
Birabid			2.18				3.57	
Tadpole/Frog	54.17	89.01		13.1	87.82	41.67		12.04
Crab				86.9		58.33		12.04
Total	135.67	154.76	97.98	190.43	175.85	199.99	100.00	124.08
Total no. species	3	2	4	4	3	5	3	5
Golden kuhol	18.50	34.25	2.02					
Dojo	20.83	10.99						
Million Fish	25				12.18		100	75.92
Mosquito carp			100					
Total	64.33	45.24	102.02	0.00	12.18	0.00	100.00	75.92
Total no. Exotic species	3	2	2		1		1	1
Shannon Div. (H)	0.7775	0.6818	1.1435	1.2129	1.0364	1.5531	0.8181	1.4552
Evenness (E)	0.7078	0.9836	0.8249	0.875	0.9434	0.965	0.7447	0.9042
Simpson's Index (c)	0.51	0.49	0.66	0.67	0.62	0.78	0.53	0.74

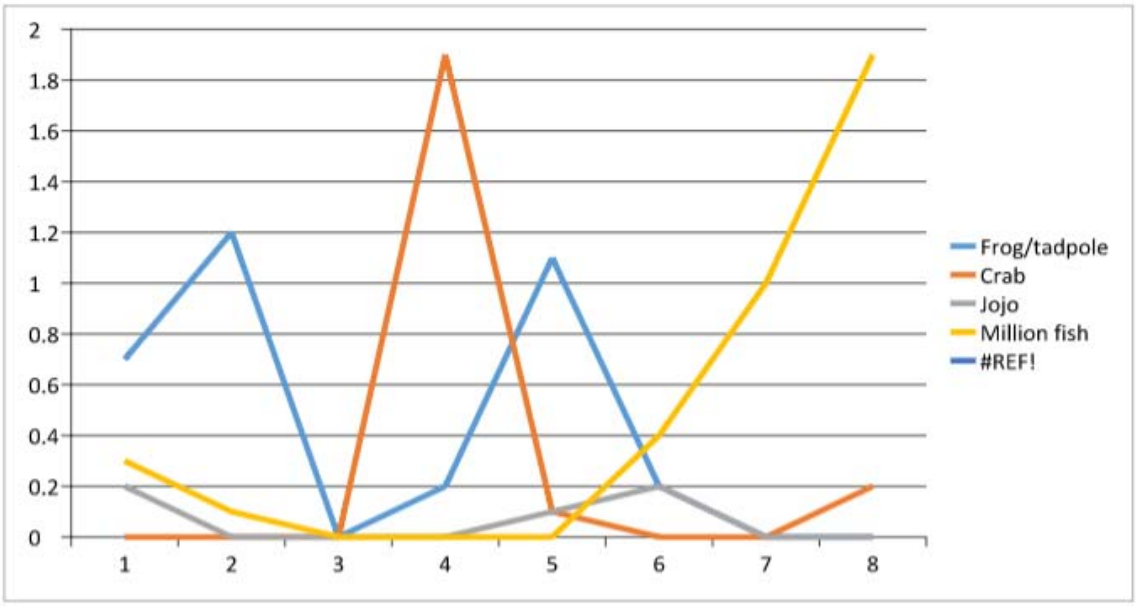

Figure 1 : Graph of Shannon Wiener Diversity, Evenness, and Simpson's Indices of all four sites and corresponding blocks including the sum IV of exotic species per block

The average number of individuals per species per plot was computed and presented in Table 3 and 4. The mollusks were tabulated in Table 3 while the non mollusks in Table 4.

Table 3 : Average number of individuals per plot (e.g. average density/plot) per block among native species of mollusks and exotic Golden Kuhol. (average number individuals/sq.m.)

SPECIES	IFUGAO		MT PROVINCE		KALINGA		APAYAO	
	Rice Paddy	Canal-Creek	Rice Paddy	Canal-Creek	Rice Paddy	Canal-Creek	Rice Paddy	Canal-Creek
Bisukol	0.2	0	4.3	1.9	3.3	1.9	6.3	2.3
Agurong	30.9	18.5	12.7	5.7	6.2	6.2	6.1	2.2
Liddig	0	0	12.9	1.8	0	0	0	0
Tukmim	0	0	0	0	0	3.8	0	0.9
Birabid	0	0	0.2	0	0	0	0.2	0
Golden kuhol	1.9	4.2	0.1	0	1.6	0	0	0

Table 4 : Average number of individuals per plot (e.g. average density/plot) per block among non-mollusk species (tadpole/frog, fish and crab)

Species	Ifugao		Mt. Province		Kalinga		Apayao	
	Rice Paddy	Canl/ Creek	Rice Paddy	Canl/ Creek	Rice Paddy	Canl/ Creek	Rice Paddy	Canal/ Creek
Frog/tadpole	0.7	1.2	0	0.2	1.1	0.2	0	0
Crab	0	0	0	1.9	0.1	0	0	0.2
Jojo	0.2	0	0	0	0.1	0.2	0	0
Million fish	0.3	0.1	0	0	0	0.4	1	1.9
Mosquito carp	0	0	84.2	0	0	0	0	0

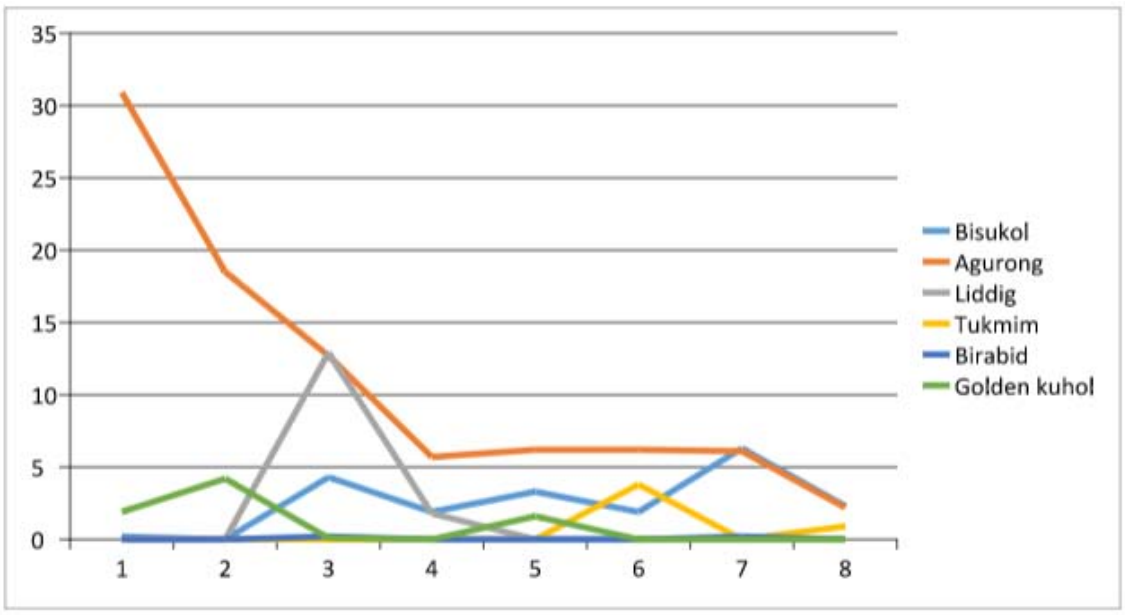

Figure 2 : The average density per plot for the mollusks

The values in Table 3 were line graphed and shown in Figure 2. Golden apple snail had the highest values in Asipulo, Ifugao. It is also interesting to note that the Native Snail (bisikul) is very low in both Rice Paddy and Canal/Creek of Asipulo, Ifugao while the population density of Golden apple snail is considerable. The data implies that Golden apple snail is outcompeting the native strains of edible snails (bisikul) and perhaps may push the latter to further endangerment or worst even possibly to extinction. The data shows that as the population of golden apple snail decline, there is a corresponding increase in the population of the native strains of the native edible snails (bisikul). Agurong, *(Jagora asperata Lamarck)* is

dominant in all the sites. Agurong is a prolific breeder and least preferred for food by collectors.

The pattern of non-mollusks show little information about the impact of alien fishes to the densities of native species. This could be explained partly by the difficulty of sampling highly mobile subjects, such as swimming fish species, unlike among mollusks which are quite sedentary. Hence, in Figure 3, there is only little pattern to merit explanation. Frogs/tadpoles are high at Canal/Creeks in Ifugao and Mt. Province than corresponding rice paddies, but the reverse is true in Kalinga while their presence in Apayao is zero. The zero population of frogs/tadpoles in Apayao can be attributed to the negative impacts of pesticides continually used by farmers. There is an extremely high density of Talangka (crabs) at the Canal/Creek in Natonin, Mt Province but in the other cases the density is negligible or absent. The rice terraces clusters in Natonin still carry 100% the traditional farming systems which is purely organic in nature. For mobile organisms, such as fishes and crabs, a zero value does not mean they are absent. The sampling method applied, such as random quadrat or plot sampling, may not be the best procedure because they are mobile and therefore their spatial distribution/dispersion in space could be extremely clumped and not normal. For mobile organisms, ecologists usually employ the so called capture-recapture method to determine their population densities. However, the capture-recapture method is applicable for terrestrial organisms and not for aquatic animals.

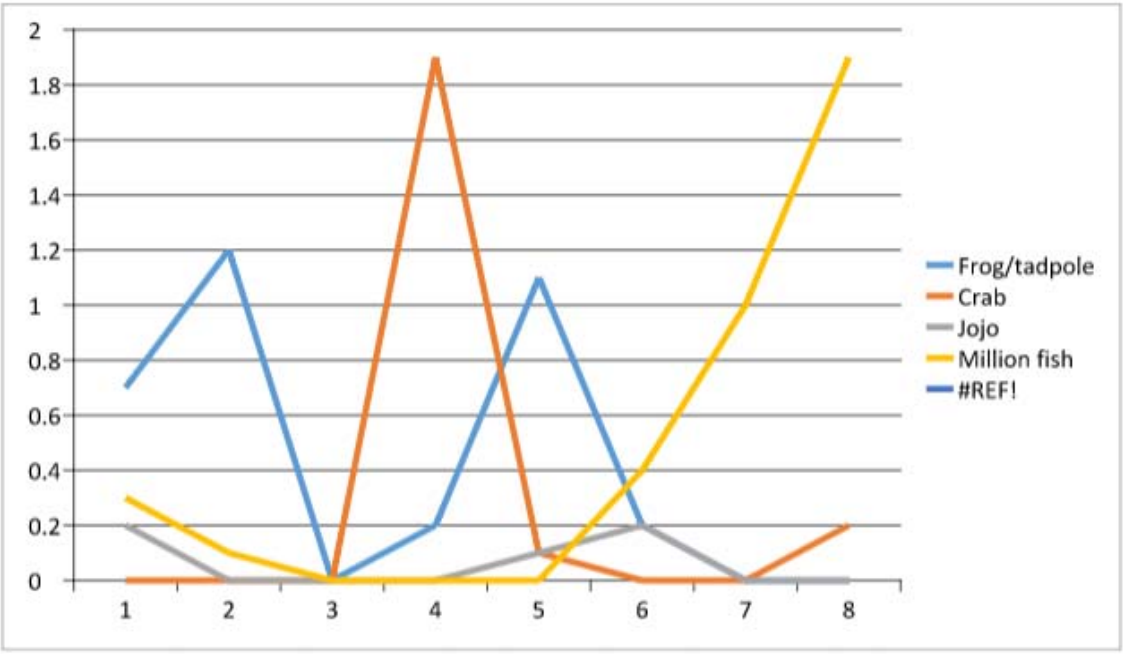

Figure 3 : The average density per plot for the non-mollusks

There are no historical data to compare the biodiversity of aquatic animals in the rice terraces before and after the transition to modern farming systems. Testimonial evidences provided by key informants confirmed a more diverse past than what it is today. Farmers ascribed the reduction in the population of aquatic biodiversity to four factors: a) impacts of pesticides applied in the rice terraces b) overexploitation or excessive collection c. frequent drought and d. replacement with introduced invasive species such as golden apple snail. For the rice terraces clusters that adopted modern farming practices, majority claimed that the use of pesticides is the primary factor causing the decline in the population of aquatic biodiversity followed by excessive collection and the impacts of alien invasive species such as golden apple snail. Farmers in Tanglagan, Apayao although they have shifted completely to modern farming systems, they still continue to practice an indigenous form of conservation which the locals call *"lapat system"* wherein a portion of a river system of about 2-3 kilometers in length is declared off limit to exploitation for several months or even years. The "lapat" is declared in honor of a person who died in the community and the length of which depends on the prominence and status of the person who died in the community. Table 5 shows the causal factors for the decline in the population of aquatic biodiversity as viewed by farmers.

Table 5 : Causal factors in the loss of biodiversity in the rice terraces

Causal factors of the loss of aquatic biodiversity	Location				Total
	Asipulo, Ifugao	Natonin, Mt. Province	Bagumbayan, Kalinga	Tanglagan, Apayao	
Use of pesticides	6	0	8	10	24
Excessive collection	3	2	2	0	7
either for human food or animal feed					
Insufficient water supply	1	0	0	0	1
Introduced invasive species (golden apple snail, torachuk)	0	8	0	0	8
Total	10	10	10	10	40

IV. Conclusion and Recommendation

The four rice terraces clusters vary in terms of their biodiversity indices. Canals/creeks are more diverse than the rice paddy system. The canals and creeks are natural ecosystems less disturbed by human activities. The use of pesticides is clearly altering the population of aquatic biodiversity. On the other hand, invasive species such as golden apple snail pose a threat to the population of the native strains most preferred by the local people for food. In areas where golden apple snail is prevalent, it may be necessary to encourage their removal not by chemical means but by manual collection and given to animals as feed materials.

For hundreds of years, the varied aquatic life found in the rice terraces customarily meets the protein requirement of the local people. The loss of these aquatic biodiversity certainly affects the food security status of rice terraces farmers and their families. Efforts should be made to protect aquatic biodiversity by limiting the use of pesticides and other forms of harmful chemicals. The farming community in Tanglagan, Apayao have shown an excellent form of conserving aquatic biodiversity through the *"lapat system"* handed down from past generations and carried over by the present generation. The *"lapat system"* can be replicated to other areas in the Cordillera region where rice terraces cultivation persists. However, since the *lapat system* is indigenous only to Apayao and not to the other provinces in the Cordillera region, their adoption requires the enactment of local policies by the Local Government Units to establish a framework for their adoption and transfer to the other provinces.

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The Effects of Feeding Time and Regimen on the Performance of Broiler Breeders: A review

By Modu, M. A, Benisheikh, A. A., Jibrin, T. A., Marte A. M. & Ali A. M.

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Abstract- Feeding time and regimen have the potentials to influence the performance of broiler breeder flocks and are thus of great importance. A literature review is presented concerning the responses of broiler breeders to feeding time and feeding regimen. There is a potential improvement in shell quality, egg weight and egg production that results from feeding later in the day (afternoon feeding)or from splitting daily feed allocation (split feeding). Broiler breeders are usually given a limited daily feed allowance in the morning. This practice does not supply nutrients to coincide with the hen's need.

Keywords: *feeding, time, broiler, breeders.*

GJSFR-D Classification : *FOR Code: 309999*

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The Effects of Feeding Time and Regimen on the Performance of Broiler Breeders: A Review

Modu, M. A [α], Benisheikh, A. A. [σ], Jibrin, T. A. [ρ], Marte A. M. [ω] & Ali A. M. [¥]

Abstract- **Feeding time and regimen have the potentials to influence the performance of broiler breeder flocks and are thus of great importance. A literature review is presented concerning the responses of broiler breeders to feeding time and feeding regimen. There is a potential improvement in shell quality, egg weight and egg production that results from feeding later in the day (afternoon feeding)or from splitting daily feed allocation (split feeding). Broiler breeders are usually given a limited daily feed allowance in the morning. This practice does not supply nutrients to coincide with the hen's need.**

Keywords: feeding, time, broiler, breeders.

I. Introduction

Genetic selection for growth parameters in meat type chickens gives rise to a parent stock (broiler breeders) that tend to lack the ability to self-regulate feed in-take. As such, their high body mass is associated with excessive fat deposition, lameness, and high mortality rate (often due to skeletal or cardiovascular disease or both). To regulate weight gain, limit health risks and also maintain high fertility for the parent stock encompass a high degree of feed restriction (Renema and Robinson, 2004). It is a common practice to feed broiler breeder flocks early in the morning, at or near the start of the photoperiod. It has been argued that this is an inefficient practice which does not supply nutrients to coincide with the hen's need Cave, (1981), and that feeding later in the day, or splitting the single feed allocation across more frequent periods throughout the day (split feeding) improves the performance of broiler breeders. This restricted amount of feed is rapidly consumed; therefore, the hens fast for an extended period of time before their next feeding resulting to improved performance. These include laying performance, shell quality, reproductive efficiency, oviposition times, birds' welfare and behavioural pattern.

II. Effects of Feeding Time and Regimen on Egg Production

Onagbesan *et al.,* (2006) reported that hens with free access to feed had comparable egg with those on split fed birds in the early production period (27 to 29 week), but their egg production decreased dramatically thereafter. Decreased egg production in broiler breeders with ad libitum feeding is well documented (Sun *et al.,* 2006, Chen *et al.,* 2006, Robinson *et al.,* 1993).Two classical studies of the effects of feeding time in laying hens Balnave, (1977); Daniel and Balnave, (1981) reported higher egg production in afternoon-fed hens than in morning-fed hens. Simon, (1973) observed a tendency for hens fed in the morning to eat smaller amounts of feed than those fed in the evening. Furthermore, Bougon, (1973) observed a greater feed intake in birds fed two hours separate meals, one in the morning and one in the evening , than birds fed a single four hours meal in the morning. Indeed in the classical studies performed by Balnave (1977) and Daniel and Balnave, (1981), the afternoon-fed hens ate more than their morning fed counter parts. Therefore, the improvements in egg production due to afternoon feeding in these studies were most likely due to increased feed intake by the afternoon-fed hens.

III. Effects of Feeding Time and Regimen on Shell Quality

The provision of a limited daily allowance of feed in the morning may not supply nutrients to coincide with the broiler breeder hen's need Cave, (1981). This is particularly the case with Calcium (Ca), an essential component of egg shells. Shell formation normally commences in the afternoon or evening and thus utilization of dietary Ca in the morning-fed broiler breeder is poor due to the inability of these birds to meter Ca from the crop to the lower digestive tract at a uniform rate Farmer *et. al.*,(1983). Feeding broiler breeders later in the day supplies dietary calcium (Ca) at times that correspond more closely to periods of shell deposition ,resulting in improved calcium utilization, which is usually manifested as an increased in egg specific gravity, shell quality, shell weight and thickness Farmer *et. al.,(*1983). Lewis and Perry showed that split feeding could improve shell quality.

Increased embryonic mortality, and thus reduced hatchability, is associated with eggs with a specific gravity ofless than 1.080, McDaniel *et.al,* (1981). Therefore,employing a later feeding time is often viewed as a way to improve hatchability, due to the positive influence that later times have on shell quality.

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IV. Effects of Feeding Time and Regimen on Egg Weight

Spradley *et al.*, (2008) reported that broiler breeders fed twice a day laid heavier eggs than those fed once a day. They also had better overall body weight uniformity. Harms et.al., (1991) reported that later feeding times or split feeding results in heavier egg weight than the earliest feeding times. Therefore, there is a general trend for egg weight to increase when birds are fed later in the day, or when the daily feed allocation is spread over more frequent feeding periods.

It is unlikely that larger eggs will provide any advantage for hatching egg producers, particularly in the later stages of the production cycle, when attempts should be made to control egg size from older flocks as much as possible. However, some advantage gained from afternoon feeding during the early phases of production in order to increase the number of settable eggs from young flocks.

V. Effects of Feeding time and Regimen on Reproductive Efficiency and Oviposition Time

Farmer *et.al*, (1983) reported that volume of semen and absolute numbers of spermatozoa yielded by males were found to be highest in the afternoon. Correspondingly, mating is more frequent in the afternoon than in the morning, Cave, (1981). The distribution of mating throughout the day is affected by the ovulatory cycle, as the oviduct is not receptive to spermatozoa near the time of oviposition Cave, (1981). Most spermatozoa deposited within 1 to 3 hours prior to or just after oviposition are eliminated by vaginal contractions involved in the process of oviposition Farmer et.al., (1983).

VI. Effects of Feeding Time and Regimen on Welfare

Numerous reports have shown that restricted fed broiler breeders experience hunger and frustration due to a high motivation for feeding Cave, (1981), Balnave, (1977) and Bougon, (1973). Split feeding offers a potential method of reducing frustration and possibly hunger, Samara *et al.*, (1996) concluded that feeding twice a day during rearing significantly improved broiler breeder welfare, at least as indicated by the parameters of hunger and frustration under study.

VII. Conclusion

The current commercial practice of feeding broiler breeders early in the day, at or near lights-on does not supply nutrients to coincide with the broiler hens needs. Afternoon feeding or splitting the daily feed allowance across more frequent regime may be options to consider, as these practices lead to improvements in shell quality, egg weight and egg production.

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1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

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- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

Procedures (Methods and Materials):

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

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	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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