Comparative Meat Production Performance Evaluation of Buffalo with Cattle at Different Ages

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Abstract: An inquisitive on-station feeding trial was carried out to identify the dexterous species and age for beef production with same plane of nutrition. A 2×3 (2 species × 3 ages) factorial experiment was settled for a period of 105 days with eighteen native buffalo and 18 BCB-1 (BLRI Cattle Breed-1) bulls of three age groups (18 months, 24 months and 30 months) and distributed them randomly in six treatment groups having an equal number (6) of animals in each. Intake of nutrients i.e.: DM, CP of buffalo bulls was significantly ($p<0.001$) higher than BCB-1 bulls in all the cases. The buffalo bulls had significantly higher digestibility of DM (68.0%, $p<0.001$), OM (67.9%, $p<0.001$), CP (66.3%, $p<0.05$), ADF (59.8%, $p<0.001$) or NDF (59.6%, $p<0.001$) than cattle (63.0%, 62.7%, 63.6%, 52.4% & 49.6%, respectively). But, the digestibility of DM, OM, CP, ADF or NDF was not affected significantly ($p>0.05$) by the age of the bulls with any cases. Buffalo bulls gained body weight more rapidly ($p<0.001$); 1.11 & 0.88 kg/day, respectively and showed a better FCR ($p>0.05$; 6.72 & 6.86, respectively) than cattle with low feed cost of per kg gain (US$ 1.62 & US$ 1.69, respectively). ADG ($p<0.01$), FCR ($p<0.05$) and estimated feed cost ($p<0.05$) affected significantly and increased linearly by the age of bulls, where 18 months bulls of buffalo and BCB-1 performed best. In an aggregation, it revealed that, buffalo performed better than BCB-1 cattle and 18 months age of both species was more responsive for profitable meat production.

Keywords: Species, Age, Meat production, Nutrient utilization, Growth performance.

1. INTRODUCTION

Buffalo, a unique livestock, nowadays draws a rapt attention for boosting strategic meat or buffen production of Bangladesh when the country forwards to be a middle-income country in 2021 with 160 million of dense population and a great concern of ensuring their food security. In the coming decades simultaneous growing population (1.60% per annum at present), poverty reduction, increase in middle class and their increased income occurred a vital change on their food preferences and thus, this drawn a major impact on demand for animal derived products such as milk, meat etc [1]. For this, the public sector development plan identified beef production as the potential income generating and poverty reduction good practices, and targeted to promote sustainable improvements in animal productivity including product processing and value additions [2]. On the backdrop of a slower growth of beef meat but, hiking of market prices [3] particularly, fattening of buffaloes of the south and river deltas and evaluation of their meat quality may help the strategic improvement of beef productions of the country. Presently, Bangladesh having 23.20 million of cattle and 1.46 millions of buffalo and cattle contributes 0.40 million metric tons meat annually where buffalo contributes only 0.01 million metric tons [3]. Buffalo raised through-out the country with some specific distribution of concentration which are fully depends on feed resources availability [4]; mainly for milk, meat and draft power [5] but as a neglected species who are never been addressed for the improvement of their quality potentials. For having the notable quality of utilization of coarse feeds by converted into protein rich lean meat [6], nowadays buffaloes are considered as a most promising resource. To assess the better fattening performance of buffaloes than cattle, various experimented results ratify the supremacy of buffaloes. Up to 1.01 kg of daily growth rate [7] and feed conversion ratio up to 7.2 from male buffalo calves [8], in both cases is obtainable. In comparison of buffalo to cattle, buffalo calves could gained live weight (375.8 g/ day) as fast as cattle (268.9 g/ day) with almost half of the FCR of cattle calves [9, 10]. Buffalo has high competing potentials to other species and/or crossbred in profitable fattening business criterion as they could draw ADG and FCR near or sometimes better to native or crossbred cattle [8, 11, 12]. Besides these, buffalo meat is higher in protein, low in calories, fat and cholesterol and richer in β-carotene and minerals than high grade beef [6, 13], which marked it as healthiest meat among red meats for human consumption. But then, buffalo meat is marketed under the outfit of beef due to consumer`s delusions in Bangladesh whither within the livestock GDP; buffalo individually contributes 27.0%, 23.0% and 28.0% of meat, milk and skin, respectively [1]. So, highest emphasis should employ to enhance buffalo meat production at sustainable rate and awaking consciousness.

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Therefore, to make an actual illustration of fattening performance of buffalo compare to cattle, this study was undertaken to determine the differences of i) intake and digestibility, ii) growth performances and iii) feed cost of the two species at different slaughter ages fed a common diet.

2. MATERIALS AND METHODS

2.1. Place, Animals and Design of Experiment

The experiment was carried out at the Cattle Research Farm, Pachutia, Bangladesh Livestock Research Institute, Savar, Dhaka, Bangladesh with different age group of cattle and buffalo bulls keeping in a single plane of nutrition comprising 50:50 roughage to concentrate ratio for 120 days including maiden 15 days of adjustment period. Following 2×3 (species × ages) factorial design, eighteen native buffalo and 18 BLRI Cattle Breed-1 (BCB-1) bulls of three successive ages (18 months, 24 months & 30 months) were placed into six treatments keeping six animals in each. Prior to onset of trial, animals were de-wormed with Endex ® (Levamesol BP 600 mg per bolus) at a rate of 20 mg per kg live weight.

2.2. Fodder Preparation and Diets of Experiment

From local authorized dealer Maize fodder (*Zea mays*; BARI hybrid) seeds were procured and cultivated in station fodder field following recommended agronomic practices and harvested at 90 days of sowing at dough stage manually. Harvested maize fodder was chopped into 6-8 cm and ensiled for 30 days in earthen pit. During the whole experimental period, ad *libitum* feeding of Maize (*Zea mays*; BARI hybrid) silage was confirmed by supplying at least 10% more roughage and desired roughage to concentrate ratio was adjusted by altering the daily allowances of each animal, in where 18.3 % CP of conventionally mixed concentrate mixture was assured. The ex post facto amount of total DM (ad lib intake of roughage and concentrate) of each 10 days was measured and augmented amount of diets maintaining 50:50 roughage to concentrate ratio was ascertained for subsequent 10 days. Daily ration as two equal meals was offered at 9:00 and 16:00 h to animals stalled individually with available abundant clean and fresh water for whole time.

2.3. Composition of Concentrate Mixture with Market Price

Concentrate mixture composed of crushed wheat (20%), wheat bran (40%), khesari bran (20%), soybean meal (15%), common salt (1.0%), di-calcium phosphate (3.0%), limestone (1.0%) and vitamin mineral premix (0.1%) was used in this experiment by mixed manually in every two weeks. The required feed cost for per kg live weight gain was determined through dividing the cost of consumed feed by kg of live weight gain. All the ingredients of concentrate mixture along with its market prices have been presented in Table **1**.

2.4. Measurement of Intake, Live Weight Gain and Feed Conversion Ratio

The daily feed intake was measured by subtracting the amount of refusals from offered feed of previous day and the actual intake of roughages and concentrate of two different species were recorded on daily basis during whole experimental period; where the DM content of offered feed and refusals were measured once per week. Passed to 15 days of adjustment period, the initial live weights of animals were taken before inserted in treatments and subsequent weights were taken at 10 days intervals by a platform digital electronic scale with weighing range

Table 1: Ingredients Composition of Concentrate Mixture and its Market Price

Ingredients	Inclusion level (%)	Price (US$; April-August, 2016)
Crushed wheat	20	0.293 (23.00)
Wheat bran	40	0.281 (22.00)
Khesari bran	20	0.421 (33.00)
Soybean meal	15	0.485 (38.00)
Common salt	1.0	0.166 (13.00)
Dicalcium phosphate	3.0	0.561 (44.00)
Limestone	1.0	0.115 (9.00)
Mineral premix	0.1	1.658 (130.0)

1 US$ = BDT. 78.40 (Source: Bangladesh Bank); Parenthesis in table indicates Bangladeshi currency, Taka.

0.00 kg to 1000 kg and minimum graduation of ± 0.1 kg. Each bull was weighed before morning feeding. The total body weight gain was measured by subtracting the initial weight from the final weight taken at experimental site and the average daily gain (ADG) was calculated through dividing the total weight gain by the duration of experiment (days). Feed conversion ratio (FCR) was estimated based on the DMI per kg of live weight gain.

2.5. Digestibility Trial

A conventional digestion trial was ran on 40-47 days of feeding trial and throughout the eight days; amount of ingested feed and quantity of fecal output of 24 hours of each animal was recorded individually. DM of offered feed and refusal were determined daily and composite samples of feed, leftover and feces of individual animal were stored at -20 ^{0}C for further chemical analysis.

2.6. Sample Analysis

Samples of offered feeds, left residue and feces were oven dried at 60^{0}C for 72 hours and ground to pass through a 1 mm screen before analysis. The samples were analyzed for dry matter (DM), organic matter (OM) and crude protein (CP) [14]. DM contents of fresh sample were determined by oven drying at 105^{0}C for overnight. Ash determination was done at 550^{0}C for 8 h, total nitrogen (N) by Kjeldahl procedure and CP calculated from N content (CP = N × 6.25) according to the methods described by [14]. The content of neutral detergent fiber (NDF) and acid detergent fiber (ADF) were determined by the procedure described by [15]. Apparent digestibility coefficient for DM, OM, CP, NDF and ADF was calculated from dietary intake of constituent and amount recovered in feces. The gross energy (GE; MJ/kg DM) of the feed samples were determined by an adiabatic bomb calorimeter (Model no. IKA*C5000).

2.7. Statistical Analysis

The data collected were subjected to analysis of variance [16] using univariate GLM procedure based on Completely Randomized Design (CRD). Age of the animal and species were included as the main effect. A least squares regression approach in SPSS, 17 computer software packages was used to describe statistical relations between the treatment responses of a 2×3 factorial experiment with two species and three age groups as the main factors. Least Significant Difference (LSD) test at 5% level of probability was applied as a post hoc test to compare the differences among treatment means. The statistical model applied for all parameters was; $y_{ijk} = \mu + y_k + \alpha_i + \beta_j + \alpha_i \times \beta_j + e_{ijk}$.Where y_{ijk} was the dependent variable, μ was overall mean, y_k is the random effect of kth treatment (k=1, ……, 6) and e_{ijk} was the random error, α_i (i= 1, 2; two species i.e., BCB-1 and buffalo bull), β_j (j=1,2,3; three age groups i.e., 18 months, 24 months and 30 months) and $\alpha_i \times \beta_j$ were the fixed effects of i^{rh} animal species (BCB-1, buffalo) jth age group (18 months, 24 months and 30 months) and their interaction, respectively.

3. RESULTS AND DISCUSSION

3.1. Intake of Nutrients

The DM, OM, CP, ADF & NDF of maize silage and concentrate mixture, used in the experiment, was 22.63, 93.94, 8.09, 53.29, and 72.38 and 88.83, 85.45, 18.30, 24.80 and 28.15 percent, respectively (Table **2**).

Daily intake of feed nutrients by BCB-1 and buffalo bulls of different ages is shown in Table **3**. Buffalo bulls had a significantly (p<0.001) higher total DM intake expressed both in terms of daily total intake per head (7.52 kg) or % live weight (2.60%) or per kg metabolic body weight (106.7 g) or total daily CP (1.01 kg/head) intake than BCB-1 bull (5.90 kg/head, 2.26%, 90.49 g and 0.80 kg/head, respectively). With the increase of age, the total daily DM or CP intake of both the animal increased significantly (p<0.001) but, the DM intake as % of live weight decreased linearly (p<0.001) with the increase of age or cumulative live weight. However, when the intake was expressed as per metabolic body size, the total DM intake did not differ significantly (p>0.05) among the different age groups of animal. The

Table 2: Chemical Composition of Maize Silage and Concentrate Mixture Fed to Experimental Animal

Diets	DM, % of fresh biomass	Chemical composition (% DM)				
		OM	CP	ADF	NDF	Ash
Maize silage	22.63	93.94	8.09	53.29	72.38	6.06
Concentrate mixture	88.83	85.45	18.30	24.80	28.15	14.55

DM=Dry matter; OM= Organic matter; CP-=Crude protein; ADF= Acid detergent fiber; NDF= Neutral detergent fiber.

Table 3: Effect of Species and Age on Nutrient Intake of Bulls Fed Common Plane of Nutrition

Species, age & their interactions			Nutrient intake										
			R:C ratio	DMI (Kg/d)	DMI (kg; % LW)	DMI (g/Kg $W^{0.75}$.d)	CPI (Kg/d)	ADFI (Kg/d)	NDFI (Kg/d)	DDMI (kg/d)	DCPI (kg/d)	DEI (MJ/d)	MEI (MJ/d)
BCB-1	Age	18M	47:53	4.72	2.39	89.54	0.65	1.68	2.16	2.92	0.40	44.15	36.20
		24M	49:51	6.43	2.29	93.61	0.86	2.32	3.06	4.07	0.55	61.62	50.53
		30M	48:52	6.54	2.11	88.32	0.88	2.33	3.06	4.24	0.57	64.08	52.54
Buffalo	Age	18M	49:51	6.30	2.71	105.7	0.85	2.31	3.03	4.32	0.55	65.42	53.64
		24M	51:49	7.46	2.67	108.9	0.99	2.79	3.65	5.06	0.65	76.86	63.03
		30M	48:52	8.79	2.41	105.3	1.19	3.21	4.20	5.97	0.79	90.27	74.02
Species	BCB-1		48:52	5.90	2.26	90.49	0.80	2.11	2.76	3.74	0.51	56.62	46.43
	Buffalo		49:51	7.52	2.60	106.7	1.01	2.77	3.63	5.12	0.67	77.52	63.56
Age	18M		48:52	5.51^{a}	2.55^{a}	97.62	0.75^{a}	2.00^{a}	2.60^{a}	3.62^{a}	0.48^{a}	54.78^{a}	44.92^{a}
	24M		50:50	6.94^{b}	2.48^{a}	101.3	0.93^{b}	2.56^{b}	3.35^{b}	4.56^{b}	0.61^{b}	69.24^{b}	56.78^{b}
	30M		48:52	7.67^{c}	2.26^{b}	96.82	1.04^{c}	2.77^{b}	3.63^{b}	5.10^{c}	0.68^{c}	77.17^{b}	63.28^{b}
SED			0.007	0.21	0.03	1.37	0.03	0.09	0.12	0.16	0.02	2.48	2.04
Sig. level	s		NS	***	***	***	***	***	***	***	***	***	***
	a		NS	***	***	NS	***	***	***	***	***	***	***
	s×a		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Means within column bearing different superscript differ significantly (p<0.05); ***= p<0.001; NS= Non significant; R:C= Roughage: concentrate; DMI=Dry matter intake; CPI-=Crude protein intake; ADFI= Acid detergent fiber intake; NDFI= Neutral detergent fiber intake; DDMI= Digestible dry matter intake; DCPI= Digestible crude protein intake; DEI= Digestible energy intake; MEI= Metabolizable energy intake; s= Species; a= age; s×a= interactions between species and age.

similar trend was observed for the intake of DM & CP, buffalo also consumed a significantly (p<0.001) higher ADF (2.77 kg/head/d), NDF (3.63 kg/head/d), DDMI (5.12 kg/head/d), DCPI (0.67 kg/head/d), DEI (77.52 MJ/d) and MEI (63.56 MJ/d) than BCB-1 cattle. However, the corresponding values for per head daily ADFI, NDFI, DDMI, DCPI, DEI and MEI in BCB-1 cattle were 2.11 kg, 2.76 kg, 3.74 kg, 0.51 kg, 56.62 MJ and 46.43 MJ, respectively. As the age of the two species increase, the total ADFI, NDFI, DDMI, DCPI, DEI and MEI increased linearly (p<0.001). However, neither animal species nor age had any influence (p>0.05) on the ratio of roughage to concentrate intake to the allowances as it was expected because, the desired roughage to concentrate ratio (50:50) was adjusted by changing per head intake of animals stalled individually. No differences (p>0.05) were observed between any of the animal species × age interactions for nutrient intake related parameters (Table **3**).

3.2. Apparent Digestibility

The buffalo bulls had significantly higher digestibility of DM (68.0%, p<0.001), OM (67.9%, p<0.001), CP (66.3%, p<0.05), ADF (59.8%, p<0.001) or NDF (59.6%, p<0.001) than cattle (63.0%, 62.7%, 63.6%, 52.4% & 49.6%, respectively; Table **4**). However, the digestibility of DM, OM, CP, ADF or NDF was not affected significantly (p>0.05) by the age of the bulls. No significant (p>0.05) interaction effects of the two (animal species × age) was found.

3.3. Growth and FCR Performance

Animal species and age had significant effect on initial and final live weight of the beef animal. Buffalo presented the highest (p<0.01) values (250.9 kg and 367.2 kg, respectively) for the above parameters than BCB-1 cattle (219.8 kg and 311.8 kg, respectively). These parameters were also influenced (p<0.001) by the age of the animal and the average initial and (p<0.001) final weight (p<0.001) of both the animal increased linearly with the increase of their age till 105 days of the trial. But, animal species × age interaction had no effect (p>0.05) on initial, final live weight (Table **5**). The average daily gain of BCB-1 bulls at 18, 24 and 30 months ages was 0.77, 1.00 and 0.86 kg, respectively. Similarly, the ADG of Buffalo bulls at 18, 24 and 30 months age groups were 1.00, 1.08 and 1.24 kg, respectively. Irrespective of age, Buffalo bulls had a significantly (p<0.001) higher daily live weight gain (1.11 kg) than that of BCB-1 cattle (0.88 kg). The

Table 4: Effect of Species and Age on Apparent Digestibility of Diets for BCB-1 Cattle and Buffalo Bull

Species, age & their interactions			Nutrient digestibility (%)				
			DM	OM	CP	ADF	NDF
BCB-1	Age	18M	61.8	63.68	62.5	50.8	45.6
		24M	62.5	64.40	63.5	50.9	49.1
		30M	64.6	66.14	64.7	55.4	54.1
Buffalo	Age	18M	68.6	70.11	65.3	60.1	61.0
		24M	67.6	69.23	66.6	59.9	60.1
		30M	67.8	69.12	66.9	59.4	57.8
Species	BCB-1		63.0	62.96	63.6	52.4	49.6
	Buffalo		68.0	67.99	66.3	59.8	59.6
Age	18M		65.2	65.16	63.9	55.4	53.3
	24M		65.1	65.06	65.0	55.5	54.6
	30M		66.2	66.22	65.8	57.4	55.9
SED			0.71	0.69	0.85	1.17	1.35
Sig.lev.	s		***	***	*	***	***
	a		NS	NS	NS	NS	NS
	s×a		NS	NS	NS	NS	NS

Means within column bearing different superscript differ significantly *= p<0.05; ***= p<0.001; NS= Non significant; s= species; a= age; s×a= interactions between species and age. DM=Dry matter; OM= Organic matter; CP-=Crude protein; ADF= Acid detergent fiber; NDF= Neutral detergent fiber.

Table 5: Effect of Species and Age on Daily Weight Gain and FCR of Bulls Fed Common Plane of Nutrition

Species, age & their interactions			Parameters		
			Initial LW (Kg)	Final LW (Kg)	Total Gain (Kg)
BCB-1	Age	18M	164.3	244.9	80.60
		24M	230.3	335.8	105.5
		30M	264.7	354.7	90.07
Buffalo	Age	18M	200.7	306.7	106.0
		24M	237.6	350.7	113.06
		30M	314.3	444.3	129.93
Species	BCB-1		219.8	311.8	92.02
	Buffalo		250.9	367.2	116.33
Age	18M		182.5[a]	275.8[a]	93.27[a]
	24M		234.0[b]	343.2[b]	109.26[b]
	30M		289.5[c]	399.5[c]	110.0[b]
SED			7.99	9.25	3.21
Sig.lev.	S		**	***	***
	A		***	***	**
	s×a		NS	NS	*

Means within column bearing different superscript differ significantly (p<0.05); *= p<0.05; **= p<0.01; ***=p<0.001; NS= Non significant; LW= Live weight; ADG= Average daily gain; FCR= Feed conversion ratio; s= Species; a= age; s×a= interactions between species and age.

ADG was also affected significantly (p<0.01) by the age of bulls. The bull of 24 months (1.041 kg) or 30 months (1.048 kg) ages showed almost similar growth performances (p>0.05) while the bulls of 18 months (0.888 kg) age had a significantly (p<0.01) lower daily growth rate. However, Buffalo bulls (FCR, 6.72) were

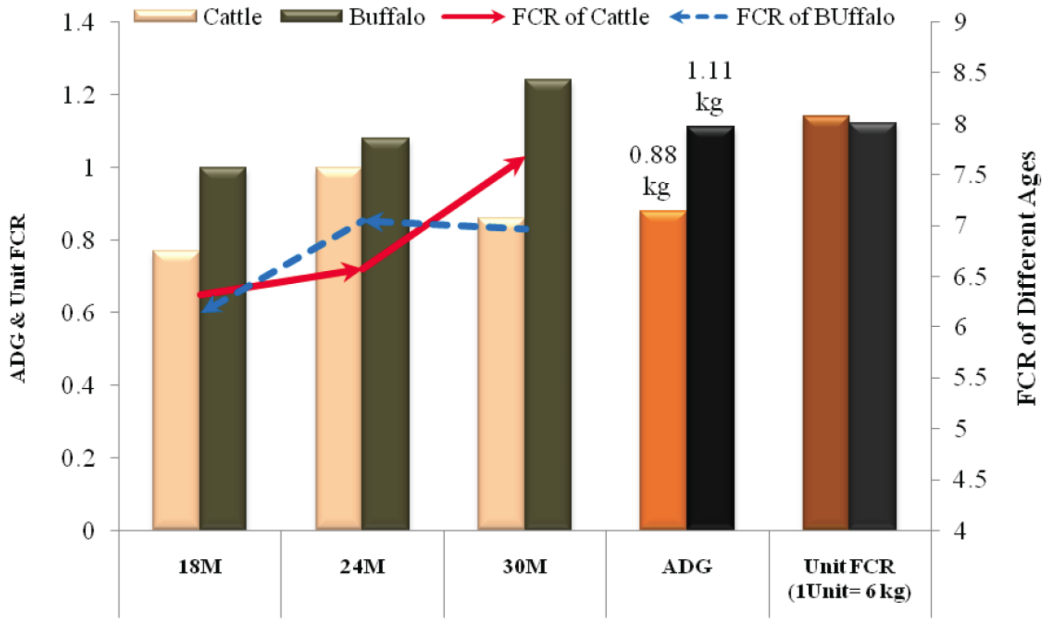

Figure 1: Performance of species in ADG & FCR with common plane of nutrition.

more efficient (p>0.05) in the conversion of feed into live weight than the BCB-1 cattle (FCR, 6.86). Irrespective of species, the bulls of 18 months (FCR, 6.24) age had a better (p<0.05) FCR than that of 24 months or 30 months of age. The FCR value of both the animal increased (p<0.05) linearly with the increase of age. However, animal species × age interaction had no effect (p>0.05) FCR but ADG (p<0.05) of the experimental animals (Figure **1**).

3.4. Cost of Feeding

The cost involvement for kg fresh biomass or kg fresh silage or kg DM yield of maize silage was estimated from inputs (variable and fixed cost) and outputs (biomass production) involved for maize fodder cultivation in a unique area of land (data not shown). In the present study, the cost involvement for kg fresh biomass, kg fresh silage or kg DM yield of maize silage were US$ 0.0177 (BDT. 1.43), US$ 0.0187 (BDT. 1.51) and US$ 0.086 (BDT. 6.93), respectively. Similarly, the prices of per kg fresh or kg DM concentrate mixture were US$ 0.339 (BDT. 27.37) and US$ 0.382 (BDT. 30.81), respectively. Table **6** shows that, species differences did not affected (p>0.05) the estimates of roughage cost, concentrate cost, refusal cost or total feed cost per kilo gain of animals. Though, the estimated feed cost was not affected significantly (p>0.05) by the animal species but buffalo (US$ 1.62 or BDT. 127.34) had lower feed cost per kilo gain than BCB-1 (US$ 1.69 or BDT. 132.23). The effect of age on cost of gain, however, were significant (p<0.05) and all of them increased linearly with the increase of their age till 105 days of feeding trial. Nevertheless, both buffalo and BCB-1 bulls at 18 months ages showed a better FCR (Table **5**) and a lower feed cost (Table **6**) than that of other ages.

4. DISCUSSION

As the result of this experiment buffalo was reported to have a higher voluntary intake than cattle and utilize fibrous feeds more efficiently [17] but it may occurred for the bigger metabolic body size of buffalo compare to cattle [18]. With more intake of nutrients buffalo showed higher digestion coefficient as like the findings of [11]. And, it had proven that, buffalo could use feed nutrients as better as cattle [19]. But, it is also possible to get reverse result with intake and digestibility [20, 21]. Again, in comparison of species of this experiment, buffalo gained more body weight than native cattle and it is observed that, buffalo bull could gain higher ADG (1.066 kg) than crossbred cattle (0.940 kg) even with a common plane of nutrition [11]. The growth performances trend of different age group of this experiment agreed with the findings of [22-24], where they showed a significantly lower daily live weight gain in the youngest group than elder age groups. Again, significantly higher food conversion efficiencies in oldest group of this study in-line with findings of [25], who observed significantly (p<0.01) higher FCR in heifers slaughtered at 18 months than in those slaughtered at 14 months. In case of FCR, buffalo showed little bit better capacity of converting feed

Table 6: Species and Age Effects on Cost (US$) Involvement of Kg, LWG of Bulls Fed Common Plane of Nutrition

Species, age & their interactions			Parameters			
			Roughage cost/Kg gain	Concentrate cost /Kg gain	Refusal cost/Kg gain	Total feed cost/Kg gain
BCB1	Age	18M	0.29	1.19	0.06	1.54
		24M	0.30	1.24	0.05	1.60
		30M	0.34	1.52	0.06	1.92
Buffalo	Age	18M	0.28	1.15	0.04	1.48
		24M	0.33	1.30	0.06	1.70
		30M	0.33	1.33	0.05	1.71
Species	BCB1		0.31	1.31	0.06	1.69
	Buffalo		0.31	1.26	0.05	1.62
Age	18M		0.289[a]	1.17[a]	0.05	1.51[a]
	24M		0.316[ac]	1.27[ac]	0.06	1.65[ac]
	30M		0.328[bc]	1.42[bc]	0.06	1.81[bc]
SED			0.007	0.05	0.003	0.06
Sig. level	s		NS	NS	NS	NS
	a		*	*	NS	*
	s×a		NS	NS	NS	NS

Means within column bearing different superscript differ significantly ($p<0.05$); *= $p<0.05$; NS= Non significant; s= Species; a= age; s×a= interactions between species and age; 1US$= BDT. 78.40 (Source: Bangladesh Bank, August, 2016).

(6.72) than cattle (6.86), in this experiment. More effective result of FCR was observed by [26]; who reported an FCR of 5.80, 6.30 and 7.85 with ADG of 1.11 kg, 1.05 kg and 0.98 kg, for buffalo calves. Beside this, with standard energy diet, [27] reported an FCR of 5.2 with ADG of 980 g/day in buffalo calves. However, due to variation in type and breed of the animal, initial body weight, age, environmental factor, feeding systems, and management; live weight and FCR may changed but most of the cases buffalo ranked than cattle and it is proven by different findings [28-32].

5. CONCLUSIONS

Wholly it may be stated that the buffalo bull, irrespective of their age, showed high efficacy ($p>0.05$) in feed utilization as they converted feed into body mass (FCR, 6.72) than cattle (FCR, 6.86) and produced a higher ($p<0.001$) average daily body weight (1.11 kg) than BCB-1cattle (0.88 kg). But, beef fattening at 18 months of ages for both species was more responsive and profitable in terms of FCR and feed cost per Kg gain than that of other ages and both the cases i.e.: FCR and feed cost of both the animal increased ($p<0.05$) linearly with the increase of age. So finally in the context of meat production performance, it can be concluded that, buffalo was relatively better than BCB-1 cattle and fattening was compatible with eighteen years of age of both species.

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