

***In situ* conservation and improvement of endangered Poultry and livestock species (Aseel bird and Gayal) in Bangladesh**

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Abstract

This study is being conducted for *in situ* conservation of two endangered livestock (Aseel and Gayal) in their home tract. To achieve this goal, the distribution, total population number, morphology, productivity, behavior and local adaptability of Aseel and Gayal are being studied. Attempt has also been taken to grow awareness and seed stock of these species.

The average number of Gayal was found to be 4.95. The coat of adult Gayal was black. White stocking in the lower part of the legs was observed in all adult Gayal. Coat colour of new born calf was red or coffee. The height at wither was from 126 cm to 136 cm and weight for adult males ranged from 490 kg to 577 kg. The PVC and haemoglobin value was found to be $33.5 \pm 5.71\%$ and 13.43 ± 2.9 g/100ml respectively. Gayal was found to be used as sacrifice animals during "Oros" in Chittagong.

The average number of Aseel per house hold was 7.32. The plumage colour of cock was white or red in the wing region and black in the breast region. The plumage colour of hen was usually brown. Pea comb was common in Aseel. Ear lobe colour was red. Shank colour was yellow. Skin colour was white except the breast portion of cock. Egg shell colour was white to light brown. Weight of male ranged from 2.5 kg to 4.7 kg whereas that of female ranged from 1.5 to 3.5 kg. Number of egg per clutch ranged from 6 to 21 while pause period within a clutch was only 1 day. Egg weight ranged from 42 gm to 56 gram where as average egg weight was 48 gm. The average egg shape index, average egg volume and average egg surface were 74.25%, 38.07 cm^3 and 165.73 cm^2 respectively.

Genetic variation on the control of Nematodes (*Haemonchus contortus*) in the small ruminant in Bangladesh

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Abstract

To quantify relative resistance to gastrointestinal parasite (*Haemonchus contortus*) of different populations of Black Bengal goat, artificial challenge trial and field trial are being run in BBH (Black Bengal goat of Hilly region) and BBW (Black Bengal goat of western region). Artificial challenge trial was carried out in Natore with 5 months old 20 BBH goats and 20 BBW goats for period of 45 days following protocol given by International Atomic Energy Agency. There was no significant difference between BBW and BBH goat for resistant to

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Haemonchus contortus. So field trial is being carried out with 5 months old BBW goats in Natore following protocol given by International Atomic Energy Agency. The field trial will continue until samples are collected from 500 kids. In field trial, body weight, FEC, PCV and Hb are being detected at day 8 and day 28 of deworming. Blood samples of kids are being taken at day 28 of deworming. DNA of artificial challenge trial has been sent to *International Atomic Energy Agency's Laboratory in Austria* for genotyping and association study. FEC, PCV and Hb were detected in Animal Genetics and Parasitology Laboratory of Bangladesh Agricultural University. In artificial challenge, average PCV of BBH was $27.06\% \pm 5.72$ with a range of 20% to 40%. The same was $22.36\% \pm 4.13$ on an average with a range of 15% to 35% in BBW. In artificial challenge, fecal egg counts (FEC) was almost 0 at 0, 28, 35, and 42 days after artificial infection in BBH population whereas FEC ranged from 200 to 500 in few individuals of BBW population though FEG count of the most individuals had zero value.

Studies on the Quantitative Trait Loci (QTL) of economic traits in Black Bengal goat

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Abstract

This experiment is being carried out in to produce seed stock and to detect Quantitative Traits Loci (QTL) of economic traits in Black Bengal goat. Two flocks of goats are being reared through contact farmers in Natore and Bandarban Hill district respectively. Growth rate, carcass yield, meat quality, litter size and kidding interval are the traits of interest for QTL study and selection criteria. Ear tags have been set to all the selected goats for proper identification and record keeping. The recording of productive traits is being carried out using standard record sheets. Farmer's volunteers in cooperation of contact farmers maintain the records on productive traits.

Heavier bucks of pure Black Bengal goat have been produced successfully in Bandarban Hill district. This stock is being multiplied for future breeding purpose. G_2 crossbred progenies have also been produced in Natore. The crossbred progenies had more birth weight and growth rate than G_1 pure Black Bengal goat. This was due to heterosis effect. G_2 does are being mated with pure Black Bengal buck to produce back cross progenies. Husbandry of goat rearing of contract farmers has been improved resulted in increase in number of goat per family. Genotyping of bucks, does and kids is in progress. Existing molecular genetics laboratory of the department has also been modernized with the financial assistance of this project and is being utilized by the post graduate of the department.

Animal recording under semi intensive system is very difficult. An easy and economic system for animal recording of goat reared under semi intensive system has been developed. The detection of QTL for livestock in Bangladesh is of new biotechnological tool for animal breeding program. Protocol for study of QTL in small ruminants in Bangladesh is being also developed.

Performance of indigenous chicken in the rural villages of Bangladesh studied through in-depth monitoring survey

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Abstract

The in-depth monitoring data of chicken on productive and reproductive traits were analyzed to reveal performances of indigenous chicken in rural villages of Bangladesh. 100% HHs kept their birds unconfined and were interacted with neighbors and 6.90 to 13.33% kept breeding cocks. In case of age group chicks number were highest and cock were lowest. The highest number of chicks was lost in disease and predation. The lost was highest in chicks due to predation (14.3) and disease (10.9) in Shalchura, but more number of pullets was lost in disease than predation. The highest number of birds was lost in predation (18) and disease (12.9) at visit 2 in Shalchura and Rangtia respectively. The highest number of chicks (17.7) and highest (5.5) cockerels entered in the flock by birth in Rangtia. The birth type of entry was the highest (18.928) in Rangtia. Among five categories of feeds kitchen waste and food grains were the main two. The highest amount of food grain by products (0.2 kg) and food grains (0.3 kg per day) at visit 1 and kitchen waste (0.3kg per day) at visit 3 were found in Rangtia. Among the all age classes of birds chicks were highly affected. The highest (21) number of chicks were affected by viral disease in Bangaon but in Rangtia protozoa affected the maximum number (11) of chicks at visit one. Egg production per clutch was the highest in Rangtia and lowest in Shalchura. The highest number (57.5) of eggs was produced in Shalchura and the lowest (43.7) in Dudhnoi. The highest (79.6%) hatchability and survivability (43.2%) were observed in Shalchura but the lowest survivability (13.0%) was in Dudhnoi and the lowest (67.6%) hatchability was in Rangtia. The results of the study revealed that rural indigenous scavenging chicken have the potentiality of egg and meat production.

Community driven livelihood program with Red Chittagong Cattle

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Abstract

The project is aimed at conserving and improving the Red Chittagong Cattle with concomitant enhancement of the livelihood of involved community farmers. From inception of the project to date detailed individual data on parents and progeny, production, reproduction and health performance of animals over the progressive generations and farmers' economic benefits through milk and animal sale were being recorded under close monitoring. The monetary

benefits were being realized by RCC farmers through milk sale, growing bull sale, culled cow sale etc. At the beginning of the project a total of 76 animals of different ages were distributed among 67 farmers and to date a total of 128 progeny were born. From total of these 204 animals 113 were culled due to age, reproductive disorder and unused males. After 4 years, a total herd size is 115 animals which are now being reared by 65 farmers. Total livelihood (money) earned by the farmers from milk and animal sale was Tk. 19, 73,200/- (nineteen lac seventy three thousand and two hundred only). These earnings therefore indicate that farmers are being profited out of RCC farming for livelihood and concurrently conservation of the valuable cattle genetic resource is being ensured. This project also created educational opportunity of 3 PhD and 21 MS students who were involved in this project. Twenty two scientific journal publications (national and international) have already been made out of project generated research data. Further, pedigree and performance data being generated on animals of new generations are creating research opportunity for the upcoming graduates and would be very useful to standardize animal and performance recording, genetic evaluation system and operation of cattle breeding programs in Bangladesh at large.

Mastitis management and growth performance of crossbred cattle in peri-urban dairying system

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Abstract

Animal registration and data recording through Herd book in a farmer participatory approach have been pursued to produce quality dairy seed bulls under a peri-urban dairying system. Registered elite cows/heifers were bred with superior known merit semen on priority basis. Alongside, contractual agreement with owners, registration of superior calves born (82 to date) using known merit semen by the project and testing registered animals for their freeness from major diseases e.g. mastitis, TB, brucellosis and parasitic infestation had been carried out on regular basis. Mastitis of HYV cows was a big threat in the sub-project area (mastitis prevalence was 55% SCM). Five different modalities and management tools were: (i) cleaning of cow shed by disinfectant Vircon-S twice in a week, (ii) using towel for cleaning udder of cows with antiseptic potassium permanganate in slightly warm water and without introducing calf to cow before and after milking and hence used bottle milk and milk replacer for feeding of calves, (iii) using towel for cleaning udder with antiseptic potassium permanganate (pp) in slightly warm water without introducing calf with udder before milking, (iv) not allowing cow to touch udder into floor within 2 hours before and after milking and (v) use of plastic mat in the floor of lactating cows. Out of 68 lactating cows, only 6 (i.e. 11.5%) were affected by mastitis. As a result, a significant reduction in mastitis occurrence was observed. The average birth weight of 75% Holstein Friesian (HF), 62.50% HF and 50% HF calves were 26.52±0.75, 24.37±0.62, and 25.63±0.75 kg, respectively. The average 3 month body weight of 75% Holstein Friesian (HF), 62.50% HF and 50% HF calves were 60.45±1.86, 59.60±1.49 and 57.03±1.69 kg, respectively. The average 6 month body weight of 75% Holstein Friesian (HF), 62.50% HF and 50% HF calves were 85.25±2.95, 84.34±2.9 and 85.78±3.20 kg, respectively. The average body weight of 75% Holstein Friesian (HF) genotype was higher at weaning (168.82±28.76 kg) than 50% HF (128.71±23.09 kg) and 62.50% HF (138.98±21.65 kg). Genotype had non-significant effect on body weight at birth

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($P < 0.09$), three-month ($P < 0.36$), six-month ($P < 0.15$) and at weaning ($P < 0.14$). The average daily gain (ADG) of male and female calves from birth to weaning was 487.59 ± 12.08 g/day and 496.05 ± 16.79 g/day, respectively. The average testis size of Friesian-Local (75% HF), Friesian-Local (62.50% HF) and Friesian - Local (50% HF) male calves at birth, one-month, three-month and six-month of age were 4.63 ± 0.18 , 4.26 ± 0.14 , 4.12 ± 0.13 cm, 5.72 ± 0.25 , 5.26 ± 0.22 , 4.88 ± 0.18 cm, 7.45 ± 0.31 , 7.26 ± 0.46 , 6.25 ± 0.34 cm and 9.57 ± 0.38 , 8.99 ± 0.30 , 7.90 ± 0.61 cm, respectively. Based on the mastitis freeness record of dams and growth and testis size data of their male progeny, 17 (seventeen) young dairy seed bulls produced at the farmers herds were certified to date by a National Seed Certification Committee and a catalogue of qualified bulls have already been passed on to the cattle breeding service providers of the country for necessary action. Sixteen such young dairy bulls are waiting to be evaluated for second round of selection decision.

***In vitro* production of goat embryos**

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Abstract

The present study was undertaken to find out the effect of bovine serum albumin (BSA) and goat follicular fluid (gFF) on *in vitro* maturation and fertilization of goat oocytes using fresh and frozen thawed semen obtained from proven stud buck and to support the subsequent embryonic development of goat oocytes. Cumulus oocytes complexes (COCs) were collected from local slaughter house goat ovaries by aspiration method. COCs were matured for 48 hours in TCM-199 basic medium and supplemented with different levels of BSA (2mg/ml, 4 mg/ml and 6 mg/ml) and gFF (5%, 10% and 15%) where 0 mg/ml and 0% was considered as control. Significantly higher number ($p > 0.01$) of total, normal and abnormal COCs per ovary was obtained from ovaries without corpus luteum (5.11, 2.83 and 2.27) compared to ovaries with corpus luteum (2.67, 1.48 and 1.20, respectively). After grading, only normal quality of COCs were cultured, the percentages of COCs reached to the Metaphase-II stages were 40.78, 67.52, 68.95 and 57.74 in case of fresh semen normal fertilization (formation of 2 pronuclei) were 23.28, 35.52, 37.74 and 29.30 and the rate of development to compact morula were 14.44, 18.33, 24.89 and 16.73 and blastocyst were 7.36, 12.21, 14.45 and 9.65 for 0 mg/ml (control), 2 mg/ml, 4 mg/ml and 6 mg/ml level of BSA respectively. The results indicates that the maturation, fertilization and subsequent development rate could be significantly increased ($p < 0.01$) by supplementing 2mg/ml level of BSA in controlled media. The rates could be improved further ($p < 0.01$) by increasing the level to 4 mg/ml but no more improvement ($p > 0.05$) occurred when BSA was increased to 6 mg/ml. The percentages of COCs reached to the Metaphase-II stages were 43.33, 51.67, 66.66 and 67.79; in case of fresh semen normal fertilization (formation of 2 pronuclei) 27.47, 31.69, 36.54 and 38.69 and the rate of development to compact morula were 7.95, 10.17, 13.34 and 12.63 and blastocyst were 4.61, 6.75, 8.34 and 7.87 for 0% (control), 5%, 10%, and 15% level of gFF, respectively. The results indicates that the maturation, fertilization and subsequent development rate could be significantly increased ($p < 0.01$) by supplementing 5% level of gFF in controlled media. The rates could be improved further ($p < 0.01$) by increasing the level to 10% but no more improvement ($p > 0.05$) occurred when gFF was increased to 15%. Thus, it can be concluded that bovine serum albumin at 4 mg/ml level and follicular fluids at 10% level might be used as a supplement in maturation media of TCM-199 and it need not to

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increase further. It was observed that the rate of normal fertilization (2 PN formation) for frozen semen were 34.70 and 32.83; compact morula were 11.43 and 9.49; blastocyst were 7.62 and 5.55 for 4 mg/ml BSA and 10% level of gFF respectively. No significant difference ($p>0.05$) was observed between BSA and FF in case of frozen semen and in the efficiency of *in vitro* fertilization and subsequent development of goat embryos. Thus it can be concluded that frozen semen can be used for IVF and subsequent development of goat embryos.

Protein rich *Moringa oleifera* leaf supplementation along with *Syzygium cumini* tannin has the potential to increase production performances of Black Bengal goat

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Abstract

An experiment was conducted to investigate *in vitro* rumen fermentation pattern particularly protein degradation in the rumen and *in vivo* study to investigate growth performances of goat using protein rich *Moringa oleifera* (MO) and/or tannin rich *Syzygium cumini* (SC) leaves. The growth promoting antibiotics (GPA), Monensin (M) was used as external control to compare with the degradation of MO, SC and MO+SC. The *in vitro* gas production was highest in control (C) followed by MO, M, and MO+SC but lowest with the addition of SC. The *in vitro* gas production with MO and M showed almost similar trend of result. Addition of MO accumulated protein from ruminal fermentation by increasing soluble protein that made protein concentration very high in the soluble state and at the same time accumulation of protein in the pellets was found higher compared to M. Addition of SC protected protein from ruminal fermentation by precipitating soluble protein that made protein concentration very low in the soluble state but higher protein accumulation in the pellets were found compared to the C, MO and M while MO conserved protein in the soluble form as of M. Protein precipitation with the addition of SC started from very early hours of incubation. Since ammonia is the end products of proteolysis, this fermentation parameter is directly linked-up with protein degradation. Ammonium concentration was increased with the addition of MO as of M although the concentration was decreased with the addition of SC and SC+MO since tannins protected protein from microbial degradation. When protein rich MO was incubated with SC tannin, the protein accumulation in the pellet was found highest and at the same time soluble protein accumulation was more compared with SC only. Therefore, it can be predicted from the present findings that MO and SC may use as natural source of feed additives to alter rumen fermentation characteristics especially it increased the availability of soluble and protected protein and with the combined incubation of MO+SC may increase the availability of both soluble and protected protein in the rumen may ensure ruminant productivity. Further *in vivo* study is needed to ensure the benefits of MO and SC as an additive in the ruminant diets as of growth promoter M. The *in vivo* experiment has shown that DM intake was higher in Moringa than Napier and addition of *S. cumini* tannin decreased DM, CP and ME intake in goats. The DM and CP digestibility were increased with the addition of *S. cumini* tannin. Daily live weight gain and feed conversion ratio were shown to be higher in Moringa compared to Napier and increased with the addition of *S. cumini* tannins. It can be concluded from the present findings that *M. oleifera* is efficient than feeding Napier, moreover, use of *S. cumini* tannin as additive have shown increased body weight gain in goats and could be useful for chevon production.

Effects of concentrate supplementation on milking buffaloes and growth of buffalo bull calves in some selected areas of Bangladesh

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Abstract

Of the domestic livestock, buffalo form a part of the property, possession and profession of rural farmers and will still be a small-holder animal in the foreseeable future, playing an important role in the lives of resource-poor families but the production of milk and growth rate of buffaloes are very poor due to feeding low quality feeds, very poor management, inferior genotypes and poor health care measures. This research program is mainly designed to formulate and recommend cost-effective ration for increases milk production, growth and reproductive performances of buffaloes. The study areas are selected on the basis of availability of buffaloes in Mymensingh, Noakhali, Natore and Rajshahi areas in Bangladesh. Fifteen (15) lactating buffaloes was selected from each location and divided into three groups having 5 in each group. Diet-1 and Diet-2 was fed to group-1 and group-2, respectively in all the locations and group-3 was used as control (no additional feed will be administered) to compare with the treatment group. The trial with milking buffaloes was conducted for 6 months. The entire routine husbandry practices (Making, vaccination, anthelmintics, etc were administered) were done in all the locations. A practical training was offered to the Research Assistant on proper husbandry practices (Deworming, Vaccination, Marking), feed formulation and feed supply, hygienic milk production, hand milking procedure, weight determination of buffaloes by tape, data collection and recording, etc. Data collection sheets were prepared and distributed to the Research Assistant during the training. Buffalo farmers are provided necessary technical suggestions before and during the trial period. Four hundred technology leaflets were distributed to buffalo farmers. Two types of formula feeds were prepared depending on the protein and energy values of the diets. Proximate composition of four formula diets was done in Animal Science laboratory of BAU. Milk yield was measured with the help of digital balance. In Trishal, Mymensingh, the average milk production was increased by 660 and 840 g with diet D-1 and D-2, respectively. Individual highest milk production in Trishal was found to be increased by 1.5 and 2.25 L in D-1 and D-2, respectively. In Subornochar, Noakhali, the average milk production was increased by 451 and 650 g with diet D-1 and D-2, respectively, but individually highest milk production was found to be increased by 1.0 and 1.5 L in D-1 and D-2, respectively. In Lalpur, Natore, the average milk production was increased by 1.18 and 1.28 L with diet D-1 and D-2, respectively, but individually highest milk production was found to be increased by 2.2 and 2.6 L in D-1 and D-2, respectively. In Bagha, Rajshahi, the average milk production was increased by 0.680 and 1.40 L with diet D-1 and D-2, respectively, but individually highest milk production was found to be increased by 1.5 and 1.8 L in D-1 and D-2, respectively. In all the locations, the milk production was increased in D-2 than D-1 diets. Body weight gain was measured with the help of measuring tape. In Trishal, Mymensingh, the average body weight gain was increased by 17.36 and 23.37 kg with diet D-1 and D-2, respectively. Individual highest body weight gain in Trishal was found to be increased by 41.82 and 21.02 kg in D-1 and D-2, respectively. In Subornochar, Noakhali, the body weight gain was increased by 28.40 and 35.0 kg with diet D-1 and D-2, respectively, but individually highest

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body weight gain was found to be increased by 45.0 and 59.0 kg in D-1 and D-2, respectively. In Lalpur, Natore, the average body weight gain was increased by 18.0 and 17.6 kg with diet D-1 and D-2, respectively, but individually highest body weight gain was found to be increased by 19.0 and 18.0 kg in D-1 and D-2, respectively. In Bagha, Rajshahi, the average body weight gain was increased by 13.92 and 13.32 kg with diet D-1 and D-2, respectively, but individually highest body weight gain was found to be increased by 14.4 and 18.5 kg in D-1 and D-2, respectively. In all the locations, the body weight gain was better in D-2 than D-1 diets. The trial is ongoing in all the locations need time to interpret with diets and locations but the buffalo farmers are very much convinced to use formula feeds because of the tremendous increases of milk and body growth of their buffaloes.

Fodder production versus food crop production: an economic comparison in terms of return and land use efficiency

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Abstract

The present research was undertaken to compare the economic benefit derived from growing food crops per unit of land with that from growing fodders in the same unit of land & rearing cattle and find out the land use efficiency. In order to achieve the objectives two field sites (Muktagacha and Baghabari) were selected to grow both food crops and fodder crops. Survey studies in both areas were conducted following PRA technique on existing food cropping system, inputs required, their costs, management, profits, problems related to crop production activities, etc. with 20 farmers (10 medium and 10 small) using structured questionnaire. Then 3 farmers have been selected in each area for cultivation of fodder crops in 2 bighas of land each. The land is almost ready for cultivation. The findings so far indicated that the major existing cropping system in Baghabari milk vita area is mono cropping system: Boro – Flood – Fodder – Boro rice . Other system is: Boro – Flood – Mustard – Boro rice. Whereas in Muktagacha the major cropping system is: T. Aman – Boro – T. Aus – T. Aman. Others e.g. T. Aman – Boro – Legume – T. Aman. The inputs were seeds, fertiliser, irrigation, land preparation and labour for plantation and harvesting. The scored causal diagramme prepared from the PRA study showed that in Baghabari area the most burning problem is the shortage of green fodder during flood (98%) whereas in Muktagacha it is only 8%. On the contrary the shortage of green fodder in dry season is very high (60%) compared to only 10% in Muktagacha. Shortage of straw during February to March is higher in Muktagacha (43%) but in Baghabari is 23%. High price of feed is another big problem in both the areas which is slightly higher in Muktagacha (60%) than that of Baghabari area (52%). Lack of support facility is also a problem in both the areas with similar magnitude (55% and 58%). It may be mentioned here that the problems reported above are only those related to feeding management of the livestock in the study areas. The major findings of the above study was the identification of the problems and opportunities to intervene the feed production and feeding system of livestock in the study areas.

Integration of fodder production with rice crop production in different regions of Bangladesh for improved productivity of cattle and economic benefit of rural farmers

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Abstract

A research project funded by the Ministry of Science and Technology of Bangladesh was undertaken to mitigate the problems of feed shortage and seasonal fluctuation in supply and for improved and sustainable livestock production. The study was conducted in two villages of Baghabari Upazila of Sirajgonj district. Firstly PRA was conducted in two villages to examine the land type, cropping pattern, types of forages available (for integration), constraints of livestock rearing, etc. After PRA study 10 farmers from each village were selected for fodder production activities. Then the samples of five local leguminous fodders having possibility of integration with rice were collected and nutritionally evaluated of which two fodders were finally selected for integration. Firstly the cuttings of African Dhaincha were planted in the land just after harvesting Boro rice. After 2 months the fodder was harvested and fed to growing cattle to examine the feeding effect on animal performance. The results of PRA study revealed that the type of land in Kakilamari village was mostly low land affected heavily by flood and Nobobila village was having medium high land less affected by flood. In Kakilamari village there are two cropping patterns: Boro – Flood – Fodder and Boro – Flood – Legume. Nobobila village was also having two cropping patterns: Boro – Fodder – T. aman and Boro – Legume – T. aman. The major causes of problems of livestock rearing were shortage of fodder during flood, fluctuation of feed supply and high price of feed. The average yield of African Dhaincha fodder of all the farmers was 18.55 t/ha. Feeding dhaincha fodder to growing heifer resulted in increased daily weight gain by 25.83%. The farmers successfully made Matikalai hay and hay bales using box. It is concluded that some area of Baghabari is having mono cropping pattern and after recession of flood feeding is not a problem for 2 months due to Bathan feeding system. In contrast, during flood there exist a severe green fodder crisis which drastically reduce animal productivity since they are fed on straw and high amount of concentrate which is expensive. Here remains the opportunity to undertake feeding system intervention during the flood period by supplying fodder preserved during availability. However, there was an area (medium high land) having no Bathan feeding system and flood do not persist long. That area suffers from feed shortage and the productivity of animals is lower than Bathan area. So there is also opportunity for integration of legume fodder with rice cultivation to increase fodder supply to cows.

Dietary citric acid for safe and economic broiler production

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Abstract

The study was conducted for a period of 28 days to observe the performance, mineral metabolism and immune status of broiler providing low level of nutrients by replacing

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commercial diet by rice polish but using citric acid (CA) as alternate source of antibiotic growth promoter. A number of 240 day-old broiler chicks (Cob 300) were distributed into eight dietary groups (3 replicates cages having 10 birds in each) as 1=Control (commercial diet), 2=Commercial diet+0.5%CA, 3=5.0% rice polish (RP), 4=5.0%RP+0.5%CA, 5=10.0%RP; 6=10.0%RP+0.5%CA, 7=15.0%RP 8=15.0%RP+0.5%CA. Feeds were further fortified by acid insoluble ash for determination of nutrient digestibility and mineral availability. Feeds were offered to the birds as *ad libitum* basis. Birds were vaccinated against New castle disease and Gumburo. On day 0, 14 and 28 blood were collected to determine antibody titre against those diseases and mineral content (Ca and P). During last week of the trial feed and feces were collected to determine digestibility of nutrients. At the end of the trial 20 birds from control and 20 birds from citric acid group were slaughtered for carcass traits and bone mineral content in tibia. Final body weight (g/b) of broiler chicks of groups 1, 2, 3, 4, 5, 6, 7 and 8 were 1655, 1733, 1642, 1694, 1618, 1656, 1613 and 1631 g respectively ($P>0.05$). Feed intake (g/b) was 2359, 2419, 2432, 2433, 2524, 2494, 2519 and 2424 respectively ($P>0.05$). Feed conversion ratio (FCR-kg feed intake/kg weight gain) varied ($P<0.05$) among the groups like 1.48, 1.44, 1.54, 1.49, 1.62, 1.55, 1.62 and 1.54, but found improved by the addition of citric acid. Although analysis of feed, feces, blood and bone are still under consideration it may be concluded that the replacement of commercial diet by rice polish up to 15% level would be possible without depressing the growth when citric acid would be added as alternate sources of antibiotic growth promoters in broiler.

Effect of using oil extracted Koroch (*Pongamia pinnata*) seed cake in the diet of broiler

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Abstract

This experiment was carried out to determine the feasibility of using oil extracted Koroch (*Pongamia Pinnata*) seed cake as an unconventional feed resource in broiler diet. A total of 192 day-old commercial broiler chicks (Cobb 500) were purchased and randomly divided into four dietary treatment groups of 48 birds each. Each treatment group was further subdivided into four replicates each of 12 broiler chicks. Day-old chicks were randomly divided into four groups; D₁ (control, receiving 0% Koroch seed cake), D₂ (receiving 2% Koroch seed cake), D₃ (receiving 4% Koroch seed cake) and D₄ (receiving 6% Koroch seed cake). The chicks were reared under floor rearing system. Throughout the experimental period of 28 days, feed and water were offered *ad libitum*. There were significant effects of dietary treatments on body weight, body weight gain, feed consumption and feed conversion ratio. Increasing the level of Koroch seed cake resulted in decreased body weight, body weight gain and feed consumption ($p<0.01$). Feed conversion ratio was significantly better in control group and becoming worse with increasing the level of Koroch seed cake. For meat yield characteristics, live weight, dressing yield and breast meat weight was significantly higher in control group, while gizzard and liver weight increased significantly with increasing level Koroch seed cake. These result suggested that Koroch seed cake might have some anti nutritional factors, which hindrance optimum broiler performances.