# Study on on Farm Management and Production Aziz Dairy Farm in Comilla District, Bangladesh.

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**A Production Report Submitted**

**By**

**Intern ID: A-03**

**Roll No: 11/03**

**Registration No: 00639**

**Session: 2010-2011**

***The report is submitted in the partial fulfillment of the requirements for the degree of Doctor of Veterinary Medicine (DVM)***

**Faculty of Veterinary Medicine**

**Chittagong Veterinary and Animal Sciences University**

**Khulshi, Chittagong-4225, Bangladesh**

**October 2016**

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**ABSTRACT**

A study was carried out to describe management and production levels of crossbred dairy cattle in Aziz dairy farm at Sador Dhakhin in Camilla District. The objective of the study was to observe the overall farm management of 105 cattle. Reports on milk production and distribution, cleanliness and sanitation, feeding, heat detection, breeding, healthcare, preventive measures with such related activities were recorded everyday and nutritional parameter of milk was observed by milk analyzer. Average milk production is 10 litters and daily Milk production is maximum in third to fourth parity. Milk production depends also body condition score. Milk from about fifty cows contains more than 3% fat and rest contains less than 3% fat. The first fifty cows are cross breed of Holstein Friesian and others are cross of Holstein Friesian and dashy cow. The study also indicates that the conception rate is higher in natural breeding than artificial insemination.

Key words: Farm management, Parity, body condition score (BCS), Conception

rate.

# Chapter 1

# INTRODUCTION

Bangladesh is an agriculture based country and farm animals play an important role in the national economy of this country. Cattle population of our country is 23.9 million (ILRI, 2016). Bangladesh is an agro-based country. The contribution of livestock sub-sector to the agricultural production and the annual growth rate of the livestock sub sector are 12.9 and 7.6% respectively (BBS, 1998) The contribution of livestock sub-sector in GDP in the year of 1995-96, 2000-01, 2005-06 were 3.36, 2.95 and 2.93 respectively,(BBS). According to Bangladesh Economic Review (2006) and DLS (2008), per annual growth rate of 7.23% in GDP in 2004-2005 was for livestock which was the highest in all sub-sectors (Uddin, 2010).The supply of the domestically produced livestock products (Meat & Milk) is increased 1.2% annually (DLS, 2000). There are about 23 million cattle, out of which 6 million are dairy cattle of local and crossbreds (DLS, 2008). Among these population 6 millions are dairy cattle (DLS, 2008) of which 92% are indigenous and 8% are crossbred cows (BBS, 2006). The numbers of dairy farms are estimated to be 1.4 million with an average small herd size of 1-3 cows (Hemme, 2008) which is an integral part of the mixed farming systems in Bangladesh (Saadullah, 2001) and a predominant source of income, nutrition and jobs (Haque, 2009).At present there are about 41,142 dairy farms in Bangladesh (DLS-2007). Port city Chittagong is in a flashing position on this prospect. Chittagong is called one of the important milk pocket zone of Bangladesh. Because this district bearing 940 registered (±15-20% unregistered) dairy farm (DLS-Chittagong-2009) which contribute about 2.28% of total dairy farm of Bangladesh. In recent, there are many dairy farm established in Comilla district. Success in dairying depends largely on the proper care and efficient management of the herd. All dairy operation must be planned with due regard to the comfort of the animals. Care of pregnant cows during & after calving, therefore, should receive the personal attention of the dairy farmer and that is why a good & proper management is so essential.Management is the art & science of combining ideas, facilities processes, materials & labour to produce and market a worthwhile product or service successfully. For a proper management, a good qualified manager is necessary. (G.C Banerjee).

For economic purpose, milk production is an important factor in dairy farm. Milk production growth was increased from 4.1% to 7.4% per annum in 2000-2005 and 2005-2008 respectively (Hemme, 2008).About 64% milk in Bangladesh comes from cattle (FAO, 2004). But it can fulfill only 13.6% of the total requirement in Bangladesh (BLRI, 2001). Although milk from the cow is processed, it is not an engineered or fabricated food. It is about 87% water and 13% solids. The fat portion of the milk contains fat soluble vitamins. The solids other than fat include proteins, carbohydrates, water soluble vitamins, and minerals. These nutrients in milk help make it nature's most nearly perfect food.Milk products contain high quality proteins. The whey proteins constitute about 18 percent of the protein content of milk. Casein, a protein found only in milk, contains all of the essential amino acids. It accounts for 82% of the total proteins in milk and is used as a standard for evaluating protein of other foods. Protein is needed to build and repair body tissues and to form antibodies which circulate in the blood and help fight infection. Milk also contains the following nutrients: calcium, phosphorus, magnesium, and potassium. The calcium found in milk is readily absorbed by the body. Phosphorus plays a role in calcium absorption and utilization. Phosphorus is needed in the proper ratio to calcium to form bone. Milk provides these two minerals in approximately the same ratio as found in bone. Milk is also a significant source of riboflavin (vitamin B2) which helps promote healthy skin and eyes, as well as vitamins A and D. Milk production in a dairy farm depends largely on its hygienic management and proper nutritional feed supply.

**Objectives:**

The objectives of the study were

I) To assess the management status (i.e. farm management, feeding management) of

Aziz dairy farm.

ii) To record the hygienic condition of the farm and health of animal.

iii) To observe the yield of average milk production.

# Chapter 2

# MATERIALS AND METHODS

## 2.1 Study Area

The study was carried out hygienic management and production of Aziz dairy farms at Sadar Dhakkhin in Comilla district.

## 2.2 Duration of Study

The study duration was from 14th February, 2016 to10th April, 2016 when I was staying at Comilla Sadar Upazilla Veterinary Hospital internship work base learning.

## 2.3 History of Farm

In recent there are many established dairy farm in Comilla district. Aziz dairy farm is one of them which was established in 2001.The farm is located at Kamarkoha, sador dhakhin, Comilla. The farm initially started with two cows. Gradually the no. of cows is increased. The totle cattle population in this farm is about 110 in two shed. Among them there 74 lactating cows, 6 dry cows, 1 bull and 20 cows are calf. The animal record is given below

**Table 1: Record of animal**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Date | Cow | Male calf | Female calf | Bull | Death | Total |
| 18.01.2001 | 2 | 1 | 1 |  | - | 4 |
| 9.09.2002 | 4 |  | 3 | 1 |  | 8 |
| 23.05.2003 | 5 | 1 | 3 |  | 1 sold | 9 |
| 28.11.2005 | 8 | 4 | 4 | 1 |  | 17 |
| 12.06.2008 | 17 | 3 | 6 | 1 | 1 sold | 26 |
| 20.03.2009 | 25 | 5 | 4 | 4 |  | 38 |
| 19.01.2011 | 38 | 8 | 11 | 5 | 4 sold | 62 |
| 18.05.2014 | 60 | 12 | 9 |  | 6 sold | 81 |
| 14.06.2015 | 68 | 7 | 12 |  | 12 sold | 87 |
| 19.04.2016 | 80 | 15 | 10 |  | 10 sold | 105 |

2.4 Data Collection:

Data is collected by using questionnaire. The questionnaire is given belows.

2.5 Sample collection:

Milk sample is collected two times in a day (morning and evening).After collection the sample was carried in lab by using portable ice box and analysis different milk nutrient parameter by using milk analyzer.

**2.6 QUESTIONNAIRE**

Date: sample no:

1. Name of the Farm:

Owners name……………………………..……………………………………………

Address………………………………………………………………………

Farm size……………………………………………………………………

No. of Milking Animals………………………………………………………

Average Milk Production……………………………………………………

Breed: Local / Cross (Dam ID)…………………………………………………

Type of breeding: Natural/Artificial……………………………………………

2. Description of the Animal:

a) Cow ID ……………………………………………………………………

b) Date of Birth………………… Age…………………………

c) Weight………………………………

d) BCS……………………

e) Parity………………………………………………………………………

f) Status Of Animal: Non Pregnant/Pregnant (…….month)…………………

3. Description of Milk Production:

a) Frequency of Milking ………………………………………………………

b) Milk Production per Day….lit (Morning-…..lit/Evening- …..Lit)

c) Days in Milk…………………………………………………………………

d) Where Milking……. (Outside/Milk Parlor/House)

e) Type of milking………Hand milking/Machine milking

f) Any infection in Udder: Y/N

g) Any infection in Teat: Y/N (If Y then No of Teat infected……)

h) Milk Production before infection:

i) Milk Production after Infection:

j) Peri-parturient diseases during last calving….Y/N. If Y then name of the disease

4) Environment & Management:

a) Housing…stanchion(intensive)/semi-open(semi intensive)/open/other

b) Housing System……face in/face out/other

c) Floor Type…..concrete/semi-concrete/muddy/bamboo made

d) Frequency of floor washing………no/………..times

e) Washing the udder before milking……….Y/N. If Y then the name of the antiseptic solution

f) Washing the udder after milking.....Y/N. If Y then then name of the antiseptic solution

g) Washing the milker’s hand before milking…..Y/N. If Y then the

name of the antiseptic solution

h) Use of any food after milking…….Y/N

i) Source of water……………….Tube-well/river/pond

j) Practice of Dry cow therapy………..Y/N

k) How long the cow remained dry before last calving…… 3 months/N

l) Stimulation of milk let down by calf………Y/N

5) Result of WST………+/-

6) Result of CMT………. +/-

7) Result of Surf Field Test...+/-

# Chapter 3

# RESULT

## 3.1 Management of Farm:

Farm management is an important factor in dairy farm. In Aziz dairy farm they maintain proper hygienic management and following the points.

• Housing

• Feeding & watering

• Breeding

• Grazing

• Record keeping

• Treatment and vaccination

• Sanitation

## 3.2 Housing:

An efficient management of cattle will be incomplete without a well planned & adequate housing of cattle. Improper planning management of animal housing may result in additional labor charge & then reduce the profit of farm. There are two shed in Aziz dairy farm. The housing is completely intensive with face in system. The floor is concreted. The approximate length of feed alley 4 ft, manger 2.2ft, Stall 4.5 ft, Gutter 1 ft, Passage 4ft. There are different shed in Aziz dairy farm. Such as milk cow shed, dry cow shed, maternity box, Isolation shed, Calf shed, Bull shed.

**3.3 Feeding & Watering Management:**

Healthy rumen = health cattle. Although proper nutrition & cattle health goes beyond taking care of the rumen microbes reducing digestive problems & promoting a rumen with healthy microbe population can prevent many serious problems in cattle.

The nutrient guideline for high producing herds:

DM intake 4-5% of the DM.

Neutral detergent fiber (NDF) 26-30% of the DM

Forage NDF 20-22% of the DM.

Non structural CHO 35-40% of the DM

Fat 5-7% of the DM

CP 17-19% of the DM

Degradable protein 60-65% of the CP

Undegradable protein 35-40% of the CP

(Howard D. Tyler. Ensminger, P. 397)

**In Aziz farm, feed supply per day per animal:**

|  |  |
| --- | --- |
| ATI Cattle feed | 6kg |
| German grass | 20kg |
| Straw | 5kg |
| Salt | 50gm |

## 3.4 Feed analysis:

ATI cattle feed was analyzed in laboratory and following nutrient found.

DM intake 4-5% of the DM.

Neutral detergent fiber (NDF) 26% of the DM

Fat 4 of the DM

CP 18% of the DM

CF 45 of the DM

In Aziz farm, the feed ingredient is stored in feed storage room. They fed their cow ATI cattle feed. They also supply adlibitum fodder that is cultivated in their own land. Sometimes they also supply some straw.

## 3.5 Breeding:

Initially they performed artificial insemination in herd. But conception rate is poor. So they decided to perform natural breeding in their herd. They reared a bull whose mother gave more milk. Finally they used the bull for natural breeding and observed the conception rate. The conception rate is about 90%.

## 3.6 Ventilation:

Facility designs should always maximize ventilation. 100 feet of space between buildings, optimize, air flow. Stalls & feeding areas specially need adequate air movement to ensure full utilization by cows. Whatever the system, the air velocity should be 220 feet per minute. (Howard D. Tyler. Ensminger P: 329)

## 3.7 Lighting:

In each pan the proper lighting should necessary. The electrical wires should be designed properly. Not hanging any wire, otherwise, accident may occur any time. (Howard D. Tyler. Ensminger P: 333)

In Aziz dairy unit, there is enough ventilation facility in this farm. The farm located East-West in position. There is also enough lighting. There are no bedding materials in the brick floor. There is enhancing of hoof injury. Besides there no protective measure against mosquitoes and insects.

## 3.8 Heat abatement:

Although cold weather is rarely a major cow comfort issue, hot weather quite often impinges on cow comfort, reducing feed intake, impairing reproductive performance etc. Heat stress becomes apparent in dairy cattle when the total heat load exceeds the cow’s capacity to lose heat. The heat load includes the heat generated by the cow & the heat imposed on the cow from her environment. The environmental load includes any number of factors; however the temperature humidity index (THI) incorporates several of them to provide an estimate of environment heat stress.

3.9 Milking time:

There are two times for milking, one time morning and another time is evening. Washing of animal and udder is performed before milking. The floor also cleaned in this time. The type of milking is hand milking. There have 12 workers in this farm.

## 3.10 Manure disposal:

There has a gutter for disposal of manure and urine. There is a manure tank behind the farm. The manure is used for bio-gas plant and some used in fodder land. After using in bio-gas plant, the manure is sold

**3.11 Sanitation of the farm:**

The sanitary condition is quite good. Only cleaning of floor is done by washing in the morning by running tape water. In a week they cleaned the whole floor by using disinfectant (potassium permanganate). The floor is only concrete brick floor, no bedding materials used. The manure is disposed in the pit behind the room. There is only one drain which is 25cm in width and 43f in length in between paved and unpaved area.

## 3.12 Record keeping:

Record is essential to find out the best cows & can know which one is profitable & helps to cull the inferior animals. The important records are:

* Milk yield record
* Cattle feed register
* Fat % in milk
* Calf register
* Breeding record
* Health record of individual cow
* Stock register of cattle

**3.13 Treatment:**

Prevention is better than cure. Hygienic management is main factor for good farm. In Aziz dairy farm they maintain good hygienic management. If disease occurred then have to be treated properly. Seasonally FMD was found in severe form and some calf die instantly. They usually used potassium permanganate locally and antibiotic used in systemically. Some animal affected with mastitis and decrease milk production. In this case they used intramammary infusion and antibiotic used in systemically. In every three to four month deworming of all animals. Besides, treatment was given for coughing, fever, anorexia etc.

3.14 Vaccination schedule:

The healthy animal is vaccinated regularly. The schedule is given below both bacterial and viral.

**Table 2: Bacterial vaccine (LRI)**

|  |  |  |  |
| --- | --- | --- | --- |
| Vaccine | Preservation | Dose & route | Booster |
| Anthrax live spore vaccine | 3-6 month | 1ml s/cly | Yearly |
| Black quarter killed | 6 month | 5ml s/cly | Ever 6 month |
| Hemorrhagic septicemia vaccine oil adjuvant killed | 6 month | 2ml s/c | Yearly |

**Table 3: Viral Vaccine (LRI)**

|  |  |
| --- | --- |
| Viral Vaccine  FMD Vaccine | Type  Monovalent 3 ml s/cly every 6 month  Bivalent 6 ml s/cly  Trivalent 9m s/cly |
| Rinderpest Tissue culture vaccine | Dissolve in 100ml distilled water & administered 1 ml/animal of 6 months old |
| Anti rabies vaccine | Calf (>30lb): 10ml daily for 7days  Heifer: 20ml for 14 days  Cattle: 30 ml for 14 day |

The vaccination schedule is maintained in Aziz dairy farm only Black Quarter and Foot and mouth disease vaccine. Now a day they also apply Mastitis vaccine.

3.15 Deworming:

The animal is Dewormed against the infestation of internal parasites (endoparasites) three times in a year. They usually used Albendazole and triclabendazole.

|  |  |
| --- | --- |
| Name of the drug(Group) | Schedule of drug apply |
| Albendazole | 1st dose |
| Triclabendazole | 2nd dose |
| Albendazole | 3rd dose |

**Table 4: Schedule of anthelmentics**

**Table 5: Daily work schedule in Aziz dairy farms**

|  |  |
| --- | --- |
| Time | Activities |
| 5.30-6.00am | Washing of floor, removal of dung and detection of heat. |
| 6-8.30am | Washing of milk utensils and milking. |
| 8.30-10.0am | Supply of concentrate feed, Milking & supply of roughage. |
| 10.15-12pm | Bathing of animals, Grass collection from fodder land. |
| 12.00-3.30pm | Leisure period |
| 3.30-5.45pm | Washing of milk utensils & milking |
| 5.45-6.00pm | Supply of concentrate & roughage feed. |
| 6.30-7.00pm | Cleaning & washing of the floor as well as the premises, dung removal |
| 7.00-5.30am | Leisure period |

**Table 6: Body Weight and Milk Yield**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ID No | No. of Cow. | Age (Av. Year) | Av. Body Weight(kg) | No of Parity | Milk Yield(Lit/day) | |
| Morning | Evening |
| ID:1 | 16 | 5.5-6.5 | 450-500 | 4 | 8 | 4 |
| ID:2 | 12 | 5-6 | 420-450 | 4 | 6 | 2 |
| ID:3 | 10 | 5-6 | 420-450 | 3 | 7 | 3 |
| ID:4 | 15 | 5.5-6 | 400-450 | 4 | 5 | 2 |
| ID:5 | 8 | 4-5 | 380-400 | 3 | 7 | 3 |
| ID:6 | 5 | 3-4 | 350-400 | 2 | 4 | 2 |
| ID:7 | 8 | 3-4 | 200-300 | 1 | 4 | 1 |

Parity was positively associated with milk production. This finding tallies with other studies and may be partly explained by highest milk production capacity coupled with greater feed intake in older cows than young ones (Johnson et al 2002). However, cows in 5th and more lactations were no longer better producers compared to those in their 3rd lactation. The older age may contribute to reduced milk production through turnover rate of secretory cells, with higher numbers dieing compared to the newly produced active secretory cells. Fat tissue cells usually replace dead secretory cells.

In above table ID (1, 2, 3, 4, and 5) the cows are cross of Holstein Frisian and the rest is dashy Cows. In ID (1, 3, 5) the cows yield av. 10 to 12 litter per day but in ID (2, 4) the cows yield av. 6 to 8 litter due to thy affected mastitis previously. So milk production is decreased ID (2, 4) cows. In above table, milk production is high in third to fourth parity. Milk production is also increased in high body weight.

**Table 7: Nutrient Parameter of Milk**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sample no | Fat% | Solid% | Protein% | Lactose% | Density | Mineral% |
| 01 | 2.8 | 8.53 | 3.33 | 4.63 | 1.0298 | 0.72 |
| 02 | 3.27 | 8.96 | 3.55 | 4.94 | 1.0316 | 0.73 |
| 03 | 3.28 | 8.93 | 3.50 | 4.87 | 1.0311 | 0.72 |
| 04 | 3.1 | 9.08 | 3.49 | 4.85 | 1.0314 | 0.76 |
| 05 | 2.95 | 9.1 | 3.14 | 4.94 | 1.0523 | 0.70 |
| 06 | 2.76 | 8 | 3.24 | 4.70 | 1.0423 | 0.73 |
| 07 | 2.86 | 8.56 | 3.55 | 4.12 | 1.0368 | 0.78 |
| 08 | 3.2 | 9.7 | 3.34 | 4.32 | 1.0123 | 0.72 |
| 09 | 3.08 | 8.05 | 3.00 | 4.08 | 1.0456 | 0.78 |

In general, the gross composition of cow's milk in the U.S. is 87.7% water, 4.9% lactose (carbohydrate), 3.4% fat, 3.3% protein, and 0.7% minerals (referred to as ash). Milk composition varies depending on the species (cow, goat and sheep), breed (Holstein, Jersey), the animal's feed, and the stage of lactation. Although there are minor variations in milk composition, the milk from different cows is stored together in bulk tanks and provides a relatively consistent composition of milk year round in the U.S.

The composition of fat percentage of milk is more than 3% in sample no. 2, 3, 4, 8, 9. The fat percentage is less than 3% in sample no.1, 5, 6, and 7. The protein percentage is more than 3% in all samples.

# Chapter 5

# DISCUSSION

Milk composition is economically important to milk producers and processors and nutritionally important to consumers. It has been known for years that variations in milk composition occur; however, the composition of milk marketed nationally has been rather constant over the last 15 years, averaging 3.6 percent fat, 3.2 percent protein, and 4.7 percent lactose (Young et al., 1986), it is closely similar with in ourpresent study. Parity was positively associated with milk production. This finding tallies with other studies and may be partly explained by highest milk production capacity coupled with greater feed intake in older cows than young ones (Johnson et al 2002). It is revealed that the cow in 3rd and 4th parity produce highest volume (Avg. 10 litter) of milk in our study. Drainage/sewage system, floor management, ventilation & dimension of the sheds of a farm are the most important observation under the structural biosecurity. Sufficient drainage system helps in proper sewage disposal & it is very much necessary for Chittagong as the soil quality is clay type (Kazi Marufa-2006) which water absorbable capacity is less. But this agreement is completely different in our present study because here all the drainage system is well established. Farm owner dewormed their cattle with broad-spectrum combined anthelmintics used vaccine against infectious disease (like Foot Mouth Disease, Black Quarter) regularly. The result of this study was closely similar with Begum *et al.,* (2007) where it reported that farmer used vaccination for prevention of infectious disease. In our study revealed that 40% feed are concentrated feed and 60% feed is roughage for milk production Which is closely similar with (Saadullah and Hossain, 2000) study.

# Chapter 6

# CONCLUSION

The hygienic management of Aziz dairy is satisfactory. As a result many diseases are prevented in this farm. The milk production of this farm is satisfactory.

# Chapter 7

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# 

# ACKNOWLEDGEMENT

I am ever grateful and very much obliged to the Almighty Allah without whose grace it would have never possible to pursue this study in this field of science and to complete this production report writing for the fulfillment of the degree of Doctor of Veterinary Medicine (DVM).

I would like to show my deepest sense of gratitude, sincere appreciation and profound regard to my respectable supervisor **Dr. Goutam Buddha Das,** Professor, Department of Animal Science and Nutrition, Chittagong Veterinary and Animal Sciences University for his scholastic supervision, valuable advice, affectionate feeling, radical investigation, valuable suggestions and constructive criticisms in all phase of this study.

I am also very much grateful & would like to thank my respected teacher **DR. Mukti Barua,** Lecturer, Department of Animal Science and Nutrition, CVASU. Without his willingness to provide information & technical co-operation, valuable advice & suggestions, affectionate feeling, radical investigation, this study would not be possible to complete-successfully.

I would like to express my gratitude to manager and staff of Aziz dairy farm for helping me to carry out my research.

**The Author**

# BIOGRAPHY

I am Jafor Ahmed, son of Abdur Rob and Rahima Begum. I passed my Secondary School Certificate (S.S.C) examination from Chotosharifpur High School, Comilla in 2007and Higher Secondary Certificate (H.S.C) examination from IBN Taimia School and College, Comilla in 2009. I enrolled for Doctor of Veterinary Medicine (DVM)

degree in Chittagong Veterinary and Animal Scinces University. I have immensed interest to do clinical practice in future.