

## FEED AND FODDER AVAILABILITY IN THE PABNA MILK SHED AREA, BANGLADESH

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### Summary

The study was conducted at village level in Pabna milkshed areas of Bangladesh to assess the existing feed and fodder sources of cattle. The results showed that the overall number of cattle per farm family was 7.17 and chicken represents highest number (15.57) per farm family in this area. The results also indicated that during monsoon season the bathan is planted with *Vigna mungo* and *Lathyrus sativus* and average grazing hours per day varied from 1.1 in October to 5.6 in February. In Summer, they were offered naturally grown *Cynodon dactylon* with supplementary feeding of rice straw. The study further showed that the highest (65.7%) feed scarcity was found during mid April to mid May followed by mid June. The cultivation of *Vigna mungo* was highest (76.71%) compared to *Lathyrus sativus* by the farmers in the bathan areas. The major constraint to cattle production is the scarcity of quality feed during mid October to mid November.

(Key Words : Milkshed Area, Feed and Fodder, *Vigna mungo*, *Lathyrus sativus*)

### Introduction

At Pabna milkshed area, there is an emerging group of farmers having long experience in small and large scale dairying. In this area, farmers have developed a more specialized dairy type of animal popularly known as the Pabna Milking Cows (PMC). This cattle is originated from crossing local cattle with Shahiwal, Hariyana, and Red Sindhi bulls (Udo et al., 1992; Ghosh, 1981; Vaughan and Islam, 1980). Dairying is traditionally practiced in low lying reverine areas which are not suitable for cropping because of seasonal flood. In these villages, where cattle have no access to grazing during flood, farmers usually keep their deshi cattle in the farmyard. In a study (Udo et al., 1992), it was indicated that there is a pronounced seasonal pattern in cattle production, milk production and use of draught animal. Animal do not achieve body weight gain in monsoon. During the monsoon the bathan land along rivers become flooded. The bathan is cultivated with matikalai (*Vigna mungo*) and keshari (*Lathyrus sativus*) at zero tillage method when flood water recedes in October. These legumes are the basic feed for cattle grazing from November to March. Thereafter, the legumes are replaced

by the naturally grown common grasses, which can be grazed up to end of monsoon. From July to October cattle are stall fed on the farmyard. In villages without access of bathan land, cattle are mainly reared in semi intensive management over the year, although, occasionally they graze around the homestead.

Seasonal changes in cattle production also suggest seasonal difference in feeding practices. Moreover, proper feeding and planning of diets is seriously lacking in this area. Therefore, to make their farms a profitable enterprise it is utmost necessary to develop a feeding system by using the existing feed ingredients. Considering the above view, an investigation has been conducted to evaluate the existing feeds and fodder situation over the year at Pabna milkshed area for suggesting the farmers to formulate the diet.

### Materials and Methods

A survey was conducted at the adjacent villages of Baghabari Dairy Plant (the centre of Pabna milkshed area) including Nukali, Shelachapri, West Baghabari, Saktola and Boholbari during August to December 1992. One hundred (100) farm households taking 20 from each category of farmers representing large (above 2.00 ha), medium (1.01-2.00 ha), small (0.51-1.00 ha), marginal (0.21-0.50 ha) and landless (owning up to 0.20 ha of land) from five villages were randomly selected using random

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sampling technique. The data on feeds and fodder were collected with a pre-designed and pre-tested questionnaire through survey method from the farmers by interviewing with the head of the households. The data were processed, analyzed and presented in the tabular form by using simple statistical tool (Steel and Torrie, 1980) and chemical composition of feed ingredients was determined by AOAC (1975) and NDF was determined according to Georing and Van Soest (1970).

### Results and Discussion

The findings of the studies are presented in the

following headings :

#### Ownership pattern of livestock

Distribution of different type of livestock at Pabna milkshed area are exhibited in table 1. Average number of cattle per farm family was 7.17. Chicken was the highest (15.57) per farm family which represents 93.15% farmers of the area and 93.28% farmers have goat with an average number of 3.41. Only 2.73% and 2.41% farmers have sheep and pigeon respectively. It was also found that 34.15% farmers reared ducks having on an average 8.96 duck per farm family. As a low lying area, Pabna milkshed area has the potentiality of duck rearing.

TABLE 1. DISTRIBUTION OF LIVESTOCK (NO.) IN DIFFERENT FARM CATEGORIES AT PABNA MILKSHED AREA

Farm category	Cattle	Sheep	Goat	Chicken	Duck	Pigeon
Large	12.55 (100)	—	5.33 (27.8)	25.2 (94.4)	13.38 (44.4)	26.7 (16.7)
Medium	5.14 (100)	—	2.66 (21.4)	16.57 (100)	8.5 (42.9)	16.1 (50.0)
Small	6.89 (100)	5.00 (5.3)	2.75 (21.1)	10.94 (94.8)	6.42 (36.9)	11.24 (10.5)
Marginal	3.91 (100)	—	3.00 (16.7)	11.45 (91.6)	2.5 (16.7)	8.0 (8.3)
Landless	4.8 (100)	3.0 (10)	2.00 (30)	10.25 (80)	8.0 (20)	8.0 (8.3)
All groups	7.17 (100)	4.0 (2.73)	3.41 (93.28)	15.67 (93.15)	8.96 (34.14)	15.6 (2.41)

No. in the parentheses are the percentage of farmers.

#### Availability of feeds and fodder

The availability of feed ingredients in the areas surveyed is presented in table 2. It was observed that almost all group of farmers used dry straw (aman and boro) as a staple feed for the animals and about 20 feed ingredients in significant amount that were offered to the animals for all categories of farmers. Aman and Boro rice straw, common grasses, coconut and sesame oil cake were supplied most commonly. Next to these items mustard oil cake, legume seed hulls and banana leaves and stalks were also offered occasionally. All feeds were grown or produced in the farm except oil cake molasses and salt. The results also indicated that at the monsoon season the bathan is planted with *Vigna mungo* and *lathyrus sativus*. The main grazing period was from October to March and grazing per day varied from 1.1 hour in October to 5.6 hour in February. Thereafter, the legumes are replaced by naturally grown *Cynodon dactylon* which can be grazed

up to June. However, from April to June the average hours grazed per day was very low; below 0.7 hd<sup>-1</sup>. This findings is in agreement with the results of Udo et al. (1992), where they reported that bathan grazing system significantly increase the CP content of the total diet. However, from April to June the average number of grazing hours is reduced and its quality declines.

#### Seasonal variation of availability of feeds

The seasonal variation of feeds and fodder at Pabna milk shed area is presented in table 3. It was found that 97.3% farmers reported that feed is the main problem for their animals and only 2.7% farmers observed that feed is not a problem for feeding their animals. The results further indicated that the highest (65.7%) feed scarcity was observed during mid April to mid May and followed by June. Similar findings also reported by (Udo et al., 1990 and Hermans et al., 1989), they have already been

found that bathan grazing leads to relatively productive cattle farming compared with systems with no grazing. The highest feed scarcity of was observed (10.95%) during mid October to mid November, this is due to the emerging of land with flood water.

TABLE 2. AVAILABILITY OF FEED INGREDIENTS USED BY DIFFERENT FARM FAMILIES IN THE EXISTING FEEDING SYSTEM

Name of the ingredients	% of responded farmers					All group
	Large	Medium	Small	Marginal	Landless	
Rice straw (Aman)	100.0	100.0	100.0	100.0	100.0	100.0
Rice straw (Boro)	94.4	85.7	94.7	83.3	100.0	91.8
Common grass	77.8	71.4	31.60	50.5	90.0	61.6
Weeds of crop fields	27.8	28.6	21.1	50.0	80.0	37.0
Rice polish	16.8	28.6	41.1	83.3	80.0	45.2
Rice bran	66.7	85.7	10.5	16.7	—	38.4
Wheat bran	100.0	85.7	73.7	8.3	—	61.6
Kheshari bran	44.4	42.9	21.1	33.3	10.0	31.5
Mushor bran	11.11	7.14	—	—	—	4.10
Mustard oil cake	16.7	14.28	—	—	—	6.84
Til oil cake	66.7	14.28	52.63	—	—	20.6
Coconut oil cake	100.0	100.0	94.7	91.7	60.6	91.8
Molasses	44.4	28.6	47.4	33.33	—	34.24
Kheshari plant	100.0	85.7	100.9	33.3	40.4	78.1
Matikalai plant	100.0	85.7	100.9	58.3	70.0	86.3
Matikalai plant	27.8	21.4	10.5	8.3	—	15.1
Sweet potato leaves	11.1	—	—	8.3	—	4.1
Dhaincha seed meal (boiled)	11.1	7.14	—	—	—	4.1
Rice gruel	5.6	7.1	12.7	33.3	—	12.3
Banana leaves	5.5	—	—	—	—	1.3

TABLE 3. SHORTAGE OF FEEDS AND FODDER IN DIFFERENT PERIOD ACCORDING TO FARM CATEGORY

Name of the ingredients	% of responded farmers					All group
	Large	Medium	Small	Marginal	Landless	
Mid February to mid March	38.9	21.4	26.3	33.3	40.0	31.5
Mid March to mid April	50.0	21.4	42.1	33.3	30.0	36.9
Mid April to mid May	66.7	57.1	78.9	66.7	50.0	65.7
Mid May to mid June	33.3	42.9	63.2	66.7	30.0	47.9
Mid June to mid July	22.2	42.9	42.1	50.0	11.0	34.24
Mid July to mid August	26.7	42.8	31.6	50.0	50.0	35.6
Mid August to mid September	27.8	57.1	36.8	41.7	20.0	36.9
Mid September to mid October	22.2	50.0	26.3	41.7	30.0	32.9
Mid October to mid November	16.66	7.14	5.26	8.3	10.0	10.95

#### Cultivation of fodder crops

The cultivation of fodder crops by different categories of farm families is presented in table 4. It was observed that 78.1% farmers cultivated fodder crops. It further indicated that the cultivation of *Vigna mungo* was highest

(76.71%) followed by *Lathyrus sativus* in the bathan areas. Only (5.55%) large farmers cultivated maize as a fodder crops. The present findings is agreement with the results of Udo et al. (1992) and Islam et al. (1991).

TABLE 4. CULTIVATION OF FODDER CROPS ACCORDING TO DIFFERENT TYPES OF FARM CATEGORY AT PABNA MILKSHED AREA

Item	% of farmers					Overall
	Large	Medium	Small	Marginal	Landless	
Grow fodder crop	88.9	85.7	94.7	66.7	30.0	78.1
Do not grow fodder crop	11.9	14.3	5.3	33.3	70.0	21.9
Land use for fodder (ha)	1.21	0.48	0.26	0.12	0.06	0.37
C of <i>Vigna</i> sp.	88.88	85.71	94.73	58.33	30.0	76.71
Cultivation of <i>Lathyrus</i> sp.	88.88	85.71	94.73	33.33	10.0	69.86
Maize / Cowpea	5.55	—	—	—	—	—

### Use of the leaves

Farmers preference to use of tree leaves as fodder during crisis period is exhibited in table 5. Only 35% farmers willing to use tree leaves as fodder. Preference for the use tree leaves (*Artocarpus heterophyllus*, banana leaves and sweet potato leaves) varied with size of the farm. Highest preference was observed in the large farm and lowest in the landless group, this because of availability of trees in the farmers homestead and land used for cultivating different varieties crops. Generally, it was found that the large and medium farmers have the ability to cultivate different types of trees in their homestead and as well as different crops in their land. On the other hand, marginal and landless farmers have no sufficient area for cultivating various trees in their homestead and their crop land is also limited. As a result, availability of tree leaves were limited in those groups. This findings conforms the results of Udo et al. (1992), where they found that during April to the second half of June the average amount of DM offered was 5.4 kg, which consisted 32.0% Straw, 2.4% by-products, 0.4% oil cake, 57.8% weeds and 7.4% leaves.

TABLE 5. FARMERS PREFERENCE TO USE TREE LEAVES AS FEED DURING CRISIS PERIOD

Farm category	% of farmers using tree leaves
Large	55.55
Medium	35.71
Small	31.57
Marginal	33.33
Landless	10.00
Overall	35.62

### Chemical composition of feeds and feeders

The fodder used by the farmers is presented in table 5.

From table, it was observed that the dry matter (DM) content of straw (902 g/kg) was similar with the findings of Saadullah et al. (1992a and 1992b), Davis and Khan (1980). There is no significant difference of chemical composition of feed ingredients which are found in other parts of the country. The results further indicated that the DM content of *Vigna mungo* and *Lathyrus sativus* was increasing with the maturity of the forage whereas, the crude protein (CP) content was decreasing with the advancement of maturity. It was also found that at 30 days of cutting CP content of *Vigna mungo* was 254 g/kg DM and it was 246 g/kg DM and 224 g/kg DM at pre-flowering and flower stage respectively. Similarly, in case of *Lathyrus sativus* the CP content at pre-flowering stage was 312 g/kg DM and at matured stage it was 297 g/kg DM, this because of advancement of maturity in forage. It generally found that percentage of protein, digestibility and the content of minerals and vitamins all decreases with the advancement of maturity. Similar findings were reported by Rahman et al. (1991) in case of *Ipil-ipil* (*leucaena leucocephala*) at 30, 45, and 60 days of cutting. In Pabna, the bathan forage production system seems to be more viable and economic but the conventional feeding of the pasture is expensive. Farmers use these quality fodder as a basal diet without any straw although result from Islam et al. (1994) have showed that straw supplementation (2.5 kg/cow/day) with these legumes could save 10-12 kg forage/day/cow and it also increased milk production. Similarly, in monsoon when farmers followed fresh straw and concentrate based diet, urea molasses straw (straw soaked with 3% urea and 15% molasses) have increased 15% milk production by replacing fresh straw. It may reduce 25% concentrate mixture as given in the diet (Islam and Huque, 1994).

The observation of this study on existing feeds and fodder situation in Pabna milk shed area may be of importance for long term research in this field. In Pabna, the bathan grazing system seems to be the more viable

and productive system. Supplementation of milling by-products, and in particular reference to soaking of straw to the animal may improve the existing production situation in the area. It must be realized that in the prevailing low input production systems most farmers are not able to invest in extra, good quality feed for their animals. Therefore, another option to make more efficient use of available feeds resources that could be select as higher diet to support a higher level of production per animal.

TABLE 6. CHEMICAL COMPOSITION OF DIFFERENT FEED INGREDIENTS AT PABNA MILKSHED AREA

Ingredients	DM %	% On DM basis			
		ASH	OM	CP	NDF
Straw	90.2	18.2	81.8	49.2	37.7
Rice polish	91.7	23.7	76.3	95.8	32.8
Wheat bran	88.3	7.4	92.6	12.5	31.8
Coconut oil cake	85.6	10.2	88.7	22.9	31.0
Til oil cake	87.8	14.8	85.2	40.4	32.1
Mustard oil cake	92.6	14.1	85.9	37.8	32.3
Mushor bran	89.5	8.6	91.4	28.1	44.0
Kheshari bran	91.4	5.8	94.2	14.8	53.8
<i>Vigna mungo</i> (30 days)	15.2	13.7	86.3	25.4	-
<i>Vigna mungo</i> (pre-flower)	18.0	13.6	86.4	24.6	-
<i>Vigna mungo</i> (matured)	21.0	9.6	90.4	22.4	30.7
<i>Lathyrus sativus</i> (pre-flower)	15.0	11.4	88.6	31.2	-
<i>Lathyrus sativus</i> (matured)	17.2	11.8	88.2	29.7	30.8
Napier (whole plant)	27.0	12.1	87.9	90.9	-

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