**CHAPTER: 1**

**INTRODUCTION**

Feed is the most expensive input within any livestock production system ([Cruz](http://www.animal-science.org/search?author1=G.+D.+Cruz&sortspec=date&submit=Submit) *et al.*, 2009) which accounts for 60-70% of the total production cost (Bulbul and Hossain, 1989). Livestock feed provides the basic nutrients required for animal production, including energy, protein and amino acid (macro nutrients), and minerals, vitamins and other micro nutrients (FAO, 1983). Among the feeds, grains are the most important source of animal feed globally. The amount of grain used to produce the same unit of meat varies substantially for example to produce 1 kg of muscle meat; cows and sheep need 8 kg of grain/day (BBC, 2008). Grain-fed diet allowed them to fatten up cows faster for slaughter ( [Robbins](http://www.foodrevolution.org/grassfedbeef.htm), 2010). Among the two broader groups of feed, concentrates contains high density nutrients, usually low in crude fiber (<18% of DM) and high in total digestible nutrients (FAO, 1983). Concentrate may be fed in raw or milled forms as an individual item (as straights), or may be blended or formulated into balanced ration for particular production purposes (compound feeds). Compound feed may be mixed on farm but are also produced by the commercial feed compounding industry. The mixture of ingredients use varies across the different farming systems, economic status and the geographical regions (Sere, 1994).

In Bangladesh, concentrate mixture mainly composed of wheat bran, rice polish, split Red Lentil bran, Split green gram bran, Gram chuni, Oil cakes, Soybean meal, wheat flour etc. Maize grain is now somewhat available due to an increase in production in recent years. Total maize production increased by 63 percent from 2001 to 2008 (Khaleduzzaman and Khandaker, 2009). Therefore, farmers can supply dairy cows with crushed maize in addition to rice polish, wheat bran, and oil cakes. But there is scant information regarding the proportion of ingredients in concentrate feeds and nutritional demand of cows with regard to milk production (Kamal *et al.,* 2009). The supplements increase the feeding value of the entire diet by direct addition of nutrients over and above supplied by the pasture and other roughages (Crowder *et al.,* 1982). The total cropped area in Bangladesh is 13.742 million hectare (BBS, 2006) which shares the crops and/or crops by products to both of her human and livestock population. More than 80 per cent of people are involved in rearing cattle; most of the cattle are nondescript indigenous Zebu-type animals (Khan, 2006). The total milk production of the country is 2 million tons per year, which is also insufficient to meet existing demand in Bangladesh (DLS, 2009). The average live weight of Desi Zebu cows is about 150 kg, which is 25-30 per cent less than that of Indian Zebu cattle (Jackson, 1981). The poor physical condition and low reproductive performance are mostly due to consumption of insufficient and imbalanced feed along with parasitic infestation (Alam *et al*., 2009). Animals are mainly kept in stalls with limited grazing on the roadside, embankment slopes, seasonal fallow lands etc. Fibrous crop residues constitute an important source of feed for dairy cattle (Debnath *et al*., 2003). In general, paddy (rice) straw is the main source of roughage among the crop residues, contributing 87 per cent of the total dry roughage, but straw has a low nutritive value due to lower crude protein (4%) and 5 MJ ME/kg dry matter, and its digestible crude protein is near zero and total digestible nutrients content is about 48%, which is also low (Akbar and Khaleduzzaman, 2009). Green roughage and rice polish are also widely fed to cows under village conditions (Kamal *et al.,* 2009).

There is scant information regarding the proportion of ingredients in concentrate feeds and nutritional demand of cows with regard to milk production at peri-urban level. Many feed manufacturing companies are preparing concentrate feed mixtures and supplying large dairy farmers, but smallholders are unable to buy because of its high prices (Kamal *et al.,* 2009). It is estimated that the world food requirement by the year 2050 will be double that of 2010 (FAO, 2012). For livestock products, about two-thirds of this increased demand will need to be met by improving the production efficiency of feed, both forages and concentrate feeds. However, in addition to shortage of feed, it is well documented worldwide that imbalanced nutrition is a major factor responsible for low livestock productivity. Balanced nutrition contributes to improving animal output as well as to reducing both the cost of production and the emission of green house gases per unit of animal product. There are a lot of works done by researchers in different angels with peri-urban dairies in different parts of the country. But a very few of them were conducted their research work with peri-urban dairy farms at Chittagong. Therefore, present study was designed to be more acquainted with the peri-urban dairies at Chittagong metropolitan areas.

The aims of the present study include:

1. Estimation of the nutritive value of concentrate feed mixture used in peri-urban study areas.

2. Estimation of the amount of feed offered per unit of milk production at peri-urban dairies.

3. Formulation of balanced ration and feeding trial on cattle.