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“Dairy Industry in Bangladesh: Problems and Prospects”

Paper for AARES 2000 Conference

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Abstract

Although, dairying is the most ancient occupation established in the rural setting of Bangladesh, its development is unsatisfactory due to several problems. The main problems concern breeding, feeding, management, diseases and marketing. The dairy sector has also not received adequate attention in respect of information and research with present policies and issues. National milk production can only meet 13% of the current milk consumption. The demand for milk is growing at a faster rate than supply because of the rapid increase in population, creating a widening imbalance between demand and supply. There is a need to have knowledge of the existing demand, its growth over time, and the existing supply possibilities. There are also many types of information needed for proper functioning of markets. In the light of such knowledge it would be necessary to take policy measures for providing strong institutional support to increase domestic production and reduce the imbalance between supply and demand. To address the industry's problems effectively, sources of market failures and of government policies in contributing to its poor performance are discussed in this paper.

“Dairy Industry in Bangladesh: Problems and Prospects”

Introduction

The economy of Bangladesh is based primarily on agriculture, and livestock is an essential component of the rural economy and the livelihood of the subsistence farmers. The country has a sub-tropical monsoon climate and 84.4% of its population is living in rural areas. The demand for milk and milk products is increasing because of the rapid increase in population, the spread of education and growing nutrition awareness. National milk production can only meet 13% (approx.) of the current milk consumption. In addition, Bangladesh has a suitable environment for cattle. Therefore, the need for developing the dairy industry, especially, in the rural areas, has been recognised. Although, dairying is the most ancient occupation established in the rural setting of Bangladesh, its development is not satisfactory due to a number of problems. These concern information, breeding, feeding, management, diseases and marketing. To address the industry's problems effectively, it will be helpful to have an assessment of the role of market failures and of government policies in contributing to its poor performance. Providing small on assessment of market failures and government policies is the main aim in this paper. An attempt is also made to build on this assessment to consider the ways in which government could assist in improving the operation of markets and of policy for developing the dairy industry.

The plan of the rest of the paper is as follows. In the next section, background information is given on the Bangladesh economy and the present status and potential for developing the dairy industry is outlined. In the subsequent section, an attempt is made to identify the sources of market failures and government failures in dairy production and marketing. Ways of correcting those failures are discussed in the recommendation section. A summary of the study is presented in conclusion.

Present Status and Potential for Dairy Industry Development

Bangladesh is predominantly an agrarian economy with 84.8% of its population living in villages and depending on agriculture and allied activities for their livelihood (Bureau of Statistics 1992). Per capita Gross National Product is US \$ 240 (World Bank, 1996). The total labor force is estimated at 32.5 million of which 21 million are women (Harun-Ar-Rashid, 1989:45). About 61% of the labor force is engaged in agriculture (Bureau of Statistics 1992). The agriculture sector cannot absorb surplus manpower. Many landless laborers find it hard to obtain employment.

Bangladesh primarily consist of low, flat and fertile land. A network of rivers and their tributaries flow down to the Bay of Bengal. It has a sub-tropical monsoon climate. Bangladesh is under The Great River Valleys topographical region in tropical Asia (Payne, 1970; 7). The zone is characterised by seasonal differences in rainfall. There are usually three seasons: cool-dry, hot-dry and hot-wet. Total annual rainfall varies between 305 and 2032 mm. and in general decreases with increasing distance from the equator (De La Rue, 1957). All livestock need food, water and a suitable environment for survival. In this sense, Bangladesh has a suitable environment for the survival of cattle. Moreover, recent trials have also shown that rapid improvement of the local cattle in the tropics can be attained by cross-breeding, using semen from high quality animals. Such cross-bred animals produce satisfactorily, survive well under the local conditions and have the necessary heat tolerance. There are other factors, which favour livestock production in the tropics. The capital investment for buildings, etc. need not be so high as in the temperate zones. Only a simple building with a floor and a roof is required, as against the expensive building to keep out the cold in temperate countries. Similarly, due to the heavy rains that occur throughout the year, capital cost for irrigation, etc. need not be as high. These factors help to reduce costs of milk production.

In low-income countries dominated by agriculture, growth in a large domestic market is only possible if incomes are rising in the agricultural sector. Therefore,

technological change in agriculture, which boosts production, incomes and consequently demand in rural areas, is central to a strategy that produces high rates of economic expansion and broad participation in the development process. By spreading productive resources over the largest possible segments of the population, such a strategy creates large, direct increases in agricultural employment and incomes. More importantly for poverty reduction, the linkage and multiplier effects of agricultural growth, by generating increased demand for labor-intensive goods and services produced in the non-agricultural sectors, indirectly stimulates further employment and income growth throughout the economy.

Animal production is one, and a very important, facet of agriculture. In the tropics it is no less important than in developed countries. Among the animal products, milk contains a high nutritional value. It contains all ingredients required by the human body in proper proportions and in a very easily digestible form. Also the inclusion of milk in the diet increases the digestibility of others types of food which are included in the diet. The demand for milk and milk products is increasing because of the rapid increase in population, the spread of education and growing nutrition awareness. In fact, in most of the cities milk supply at present is short of requirements. For these reasons, dairy development has assumed a position of paramount importance in the rural economy of Bangladesh. It is essential that this sector, like every other sector of tropical agriculture, should be modernized and made more productive as quickly as possible.

Dairying is a good source of income to the small and marginal farmers. The feeds required for milk production can be met from their limited land resources as most of the milch animals are ruminants and the majority of their food can be derived from forages, coarse roughages and byproducts not utilised by human beings, without incurring much additional cost. Dairy animals, comprising cows and buffaloes, are the major livestock and hold a very important place in the national economy of Bangladesh. Apart from their role in milk production they contribute a huge quantity of organic manure, which is one of the major inputs in Bangladesh agriculture. Dairying is a subsidiary occupation of almost all farmers of Bangladesh. More than 60% of the families involved in dairying consist of small and marginal farmers and even agricultural laborers. Most of the small-farmers and landless labourers are under-

employed and there is also surplus labour in the rural areas. Therefore, the supply of such labour for dairy development or the involvement of rural farmers in the dairy industry would not only create employment but raise the standards of living of the rural people.

The total number of cows and buffaloes is 24 million and 1 million respectively. Among them, 2 million are improved breed cows (Livestock Directory, 1992-93). The contribution of livestock in the GDP is about 6.5% (Alam, 1994). About 20% of Bangladesh's population is directly or indirectly engaged in the livestock sector. Its share in the foreign exchange earnings in terms of exporting leather and other live stock by-products is about 9%. It provides 80 million tones of dung which, is 10% of the total fertilizer used in agriculture per year (Agriculture Diary, 1998).

Total annual national production of milk in Bangladesh is 1.338 million metric tons out of which 97% is produced in rural areas and 3% in urban areas. About 83% of the milk is obtained from non-commercial livestock enterprises. The quantity of national milk production can only meet about 13% of the actual demand for milk of the population. See table 1.

Consumption and Production:

Per capita need	Per capita availability	Total need (Year)	Total production (Year)	Total deficit (Year)
250 ml/day	33.95 ml/day	9.855 mmt (100%)	1.338 mmt (13.58%)	8.517 mmt (86.42%)

Mmt = Million metric ton.

Source: Alam, J (1994),

Table: 1.

The deficit in production is met by bulk imports of milk powder, mainly from Australia, New Zealand, Holland, Denmark, Poland. The quantity of powder milk

imported by Bangladesh during the last few years is shown in the following table, although the country-wise and detailed breakdown of the importation of milk powder from individual countries has not been possible due to inability to access relevant data and information.

Powdered milk imports by Bangladesh:

Year	Quantity (Metric ton)	Taka (In million)
1985-86	64.821	1,828
1986-87	69.640	2,067
1987-88	66.000	2,120
1988-89	70.000	3,200
1989-90	72.000	4,100
1990-91	73.000	4,300
1991-92	75.000	4,500

Source: Livestock Directory, 1992-93.

Milk can provide a regular supply of the most critical nutrients to the most vulnerable sections of society. For producers it provides a daily source of income with a relatively low risk factor. In non-commercial farming the base diet for milking animals can be supplied from otherwise unusable crop residues and forages. In many instances the modest cash flow from milk sales has been the key to increased use of fertilizer and other inputs that enhance crop production. Another advantage is that the care and management of milking animals provides socially desirable work opportunities. Besides providing meat and milk, livestock is the most important source of draft power. In addition, the rising cost of high protein fish feed and inorganic fertilizer as well as the general concern for energy conservation, and recycling of materials has brought about increased interest in the utilization of animal manure in aquaculture. The integration of crop and livestock farming can help to ensure that the fertility of the soil is maintained and that crop yields are improved. Moreover, cattle produce very palatable foods with a high protein, mineral and vitamin content that are demanded by the consumer once he can afford to purchase

them. In summary, cattle do make a considerable contribution to tropical agriculture and may be kept as a source of food (milk and meat); as a source of industrial raw materials (horn, hair and hide); as a source of motive power; and as a store of wealth. For all these reasons, the development of milk production is a central part of the drive for food security and economic growth of the country.

The above discussion indicates that there are several factors favouring dairy production in Bangladesh. The environment, with its abundant rainfall and sunshine can be a factor for increased livestock production, possibly on an intensive basis. Moreover, there is a bright market for dairy products and a great employment opportunity. However, for the full exploitation of the potential, there appears to be a need for large numbers of improved stock, an increase in cattle numbers and the continued expansion of backstopping facilities including training institutions, diagnostic and research facilities and a good extension service.

Market failures and Government failures in dairy production and marketing

Market failure is “the failure of a more or less idealized system of price-market institutions to sustain ‘desirable’ activities or to stop ‘undesirable activities’ (Bator, 1958). On the other hand, (Arrow, 1971) gives market failure a wider meaning “the failure of markets to exist”. Thus, market failure is the inability of private enterprise to provide goods and services efficiently in the public interest. Similarly, government failure means that government has failed to accomplish its economic purposes in the public interest. When government fails to define or protect public and private property, economic players may try to take that property. Sometimes, government fails in its roles, such as antitrust or consumer protection, to promote efficient market competition. This often happens as an accidental result of poor legal or administrative process. It can also occur because governments accede to pressures for assistance from well-organized groups. The market failures come in many forms externalities, the insufficient provision of a public good, inadequate information and inefficient marketing. Whatever form they take, market failures may adversely affect many

members of the community. Causes of market failures and government failures in dairy production and marketing in Bangladesh are discussed below:

1. Information Problems

The most important input to production now is knowledge, rather than capital and labor as in an industrial society, or land, as in an agricultural society. Information is not the same as knowledge. Information is the medium in which knowledge is processed, stored, and communicated. Knowledge is the content (Chichilnisky, 1999). Information technology is the most obvious manifestation of this change, but the real change is in human knowledge, its creation and distribution, and the corresponding changes in the organization of society. Knowledge has always been the force driving change in the world economy. However, by releasing the constraints on the ability to reproduce, store, and communicate knowledge, information technology fuels knowledge today as never before. Information fuels the engine of economic progress, knowledge.

Uncertainty is lack of information. Thus information and uncertainty are two sides of the same coin. The problem of uncertainty is part and parcel of the human condition. It originates in the fact that time is a dimension in which we are short. Humans live only for a few years and cannot travel across time. In geometrical terms, we are “flat” in the time dimension. Because we cannot observe well through time, we cannot predict. Due to this lack of information, we are uncertain (Chichilnisky, 1999).

A central problem of market theory is that it presumes buyers, sellers and producers have perfect information. There are many types of information needed for proper functioning of markets. Buyers and producers require different types of knowledge about goods. Buyers need to know what the good will do for them, but producers need to know how it is made. Production technology must be known to potential producers, and the characteristics or qualities of available goods must be known to potential buyers. This knowledge allows market production and trade to be efficient.

Information is becoming one of the most valuable “commodities” in the industrial world. Though costly, once produced the same piece of information can be used over and over again, by the same or different producers because it can be shared without being diminished (Chichilnisky, 1999). Furthermore, the use of information leads to the most extreme form of economies of scale, the existence of fixed costs. Therefore, the role of information as a source of productivity and as a source of value is increasingly exemplified in many markets and is increasingly an important component of economic analysis.

It should be mentioned that the livestock sector has also not received adequate attention in respect of information and research. Bangladesh is known as one among the developing countries which has a network for regular collection and analysis of data on agriculture. Till recently, however, no attempt was made for regular collection and analysis of data on livestock, though their number is obtained through the Livestock Censuses. A major deficiency is the lack of analysis of consumer demand and farmers’ supply responses to price as well as problems in the production, distribution, processing, and trade in feedstuffs and livestock products. Moreover, there is complete lack of information about the utilization pattern of milk, marketing of milk and milk products in the country. As a result, the livestock sector continues to have several areas of darkness. Little is known about many aspects of the livestock economy, particularly about milk-yield, meat-output, output quantities of by-products like hides and skins, feed consumption by various categories of animals, the relationship between feed and milk-yield, work-output of working animals, the availability of various types of feed, morbidity and mortality of animals, number according to types of breeds, etc. Neither is the information available on income and employment generated by various livestock activities. Market information on present and future supplies, current prices and present or future changes in demand help sellers and buyers reach decision. A better knowledge of the economics of milk production in the rural areas would be of immense help for planning for improvement of dairy animals and in formulating animal husbandry plans on sound lines.

A contemporary development program must begin with setting of objectives, which are designed by careful consideration of the needs and wants of the people. A framework of consistent policies is then worked out for deciding upon issues

impinging upon the target population, so as to ensure their direct involvement in the program. A relevant information system is essential for setting of objectives and consistent policies framework. Information is also required on physical attributes of the market (the people) and their behavioural characteristics. The physical attributes include size and geographic description. The behavioural characteristics include social, cultural and psychological aspects of the target market. Information is also required for working out consistent methods, procedures, rules, and organization structure for implementing the program. Marketing research techniques may be consistently used for developing a suitable information system. Such an information system would also help the administrators in resolving critical problems affecting the markets.

The availability of relevant information is essential for sophisticated, empirical and rigorous economic analysis to arrive at the conclusions for policy formulation. Government decisions at present are frequently dominated by responses to the current situation without adequate knowledge of the industry and market. The future effectiveness of government policies depends on plans that are based on more adequate data about the livestock sector.

2. Lack of Disease/Parasites Control (Externalities)

Externalities are costs or benefits, which individual decision-makers impose or bestow upon others by their actions but for which they suffer no penalty and/or receive no reward. In consequence, decision-makers exclude consideration of these externalities when arriving at decisions. The existence of externalities in cattle disease control means that the independent actions of individual farmers undertaking control will not except by great coincidence, correspond to what would be considered socially desirable.

Diseases and parasites are a major problem for the dairy industry in Bangladesh. Diseases like rinderpest, contagious bovine pleuropneumonia, and foot and mouth disease cause high mortality and severe economic loss. Mastitis is a dangerous disease for lactating animals, and reduces milk production. In addition, the improved varieties

of cows like Australian Sabiwal, Hariana and Friesian need proper medical attention in the tropical environment. However, the medical facilities are poor at district and thana level livestock offices. The prices of essential animal drugs are high. A 30% increase in cattle production would be possible if these diseases were properly controlled (Khamar, 1995).

The vaccination program of the Department of Livestock is limited because of budgetary constraints. The animal health services need to be improved at every level. There are urgent demands in veterinary education to up-grade and in some areas the quality of training programs. Only in this way will educationists and research and extension workers reach an adequate level of competence for their important task.

Though every effort is being made to improve the animal health service by increasing the field staff, and establishing of veterinary centres, there is a great need for further strengthening of these centres and the establishment of additional facilities.

3. Shortage of Quality Breeds (Incomplete Market)

The main problem of dairy development lies in its very low production and low productivity. Breeding is the major technological improvement process in the dairy industry. A cross-breeding program for cattle was introduced in the country in 1976 with a view to improving the milk production efficiency of indigenous cows. The program serves with a network of 847 artificial insemination centres (Livestock Directory, 1992-93). The results obtained, so far, on the organized farms and research institutes, is quite encouraging. However, no systematic study has been conducted in the country to objectively evaluate the economic performance of the cross-breed cows under field conditions.

The adoption of milch crossed cattle has brought about an immediate upward shift in the threshold level of milk yield, enabling the farmers to get more milk at the existing level of input use. However, the farmers failed in consolidating such technological gain as they were unable to adjust to the new requirements of the crossbred technology. The artificial insemination centres in Bangladesh lack required amenities

and there are none experts in these centres, hampering smooth functioning of artificial insemination programs (Khamar, 1995). In addition to the technology related to breeding, a number of other areas such as feeding efficiency, processing technology, transportation, diseases and marketing efficiency also require careful analysis. Moreover, although a large number of veterinary centres and AI centres exist in the country, there seems to be no system to reach the farmers to advise them on various aspects of animal production and health.

In order to correct the deficiency of the AI facilities, it is important not only to provide adequate training to the personnel in charge of the AI stations and the farmers, but also to improve the quality of the infrastructural facilities with the AI stations.

4. Shortage of Cattle Feed (Incomplete Market)

The dairy cow requires five major classes of nutrients: energy, protein, minerals, vitamins, and water. All five are essential for normal health and productive purposes. A pregnant cow needs additional energy for building the tissues of the fetus developing in her uterus. And, finally, a lactating cow requires still more energy to manufacture the milk, which is being secreted by her mammary glands each day. Lactating cows react immediately to a reduction in the amount or quality of feed by a drop in milk production, and if the reduced ration lasts as long as a week or two, it will be difficult or impossible to bring the herd back up to the previous level of production.

The availability of feed and fodder is a major constraint in developing the full potential of the livestock sector. Improvement in breeding to be stable should go along with adequate feeding. Even the best animal deteriorates soon in the absence of a sufficient and balanced ration. Unless adequate feeding is first provided for, no substantial improvement in milk yield could be achieved. While the excessive number of animals in relation to available feed supply has been identified as one of the major causes of the low productivity of cattle, better-fed animals could be more healthy and productive. Estimates of feed availability based on supplies of straw, bran and husk of

food grains, whole grain and oil cake used in animal feed indicated that the total availability is much less than what is required for meeting the nutritional requirements of animals. Chronic shortages of feed and fodder, together with poor nutritive value of such feeds as are available, have lowered the productive capacity and fertility of Bangladesh livestock. The important sources of fodder are: a) fodder from forest, b) fodder from open grazing grounds, c) fodder from the fallow lands and areas sown once, d) fodder from weeding of major crops, e) fodder from forage crops, and f) fodder from semi-forage crop residues. With the increasing number of dairy farms, the demand for fodder has increased but supply in the local markets is inadequate to cater to the growing demand. Expert opinion is that the present total feed need is 30 million tons whereas supply is less than 15 million tons (Khamar, 1995).

5. Lack of Research and Training (Public Goods)

Livestock, in spite of its importance, has been a neglected area of agricultural research in Bangladesh. No visible improvements can be made because of the absence of a sense of urgency and low investment in research. Scientific research studies relating to economic aspects of dairying and the dairy industry are not adequately available. Moreover, due to a lack of effectiveness in its research and extension services, it has not yet been demonstrated that livestock farming, and particularly dairy farming, can be transformed into an attractive and profitable business.

To increase livestock production, particularly dairying in Bangladesh, it is necessary to overcome economic as well as technical constraints. Although livestock research has generally been neglected in favour of research into crop production, the livestock research that has taken place has thus far focused on technical issues. It includes such important matters as improved breeds, feed, and production methods. A research-caused improvement in production confers economic benefits on the industry. However, research into economic aspects of dairying is lacking. In addition, there is a lack of trained personnel at all levels as well as a lack of training facilities.

6. Lack of National Milk Grid and Processing Plants (Public Goods)

A milk grid is a system under government for moving milk from the remote rural milk sheds to urban milk consuming demand centres. This has helped producers get a good price and simultaneously in developing a regular market for their milk. Therefore, milk production is geared to meet fresh daily requirements of the population. However, there is no national milk grid. The development of a milk grid would help to increase milk production, and current losses in milk would be reduced. Attention should be given to their establishment.

Processing involves pasteurising the milk and packaging into glass, paperboard or plastic containers for sale to consumers. If milk is to be consumed as fresh liquid milk, its perishable nature requires it to be processed generally within 24 hours of being produced. During this time the milk must be stored below 4 degrees Centigrade. Lack of installation of processing plants is another constraint for the efficient and profitable working of dairy enterprise. In fact, the installation of a processing plant is the first sign of modernization of the dairy industry, because a processing plant can play a positive role in a number of ways. Firstly, the milk industry is subject to seasonality and particularly in the flush season farmers face the problem of surplus of milk, because of the perishable nature of the commodity. Secondly, in remote rural areas producers are forced to convert surplus milk into ghee (butter) but it is found that economic returns from ghee are lower than the sale of liquid milk. Thirdly, traders who supply milk to the urban areas and sweetmeat markets exploit small milk producers. Thus milk-processing facilities are an important economic necessity for the small milk producers whose bargaining power is low and local demand for their products is limited.

7. Inefficient Marketing

“Marketing makes the exchange process more meaningful to the parties involved in the exchange. One party gains in term of needs and wants satisfaction and the other gains profit by promoting satisfaction (Kotler, p.22)”. The goal of any marketing program is to move the product from the producer to the consumers in an economical

and orderly manner, which satisfies the customers and provides a reasonable profit to the producer and processor. Therefore, with a proper perspective, marketing as an approach can provide a meaningful direction to the dairy development effort. Given that 97% of milk is produced in rural areas while the profitable market for it exists largely in the urban areas, most of the daily production of milk of the farms is brought to different markets of the urban area for sale. Due to the dearth of marketing facilities, the dairy farm owners are compelled to sell the bulk of their milk to the tea stalls at a cheaper price. Marketing channels for livestock products are also very poor, particularly for perishable products of animal origin. This severely restricts production and results in unmarketable surpluses in some areas and shortages in main consumption areas.

The extreme perishability and bulkiness of milk, available from widely scattered rural sources, requires efficient methods of milk collection, processing and distribution to the urban consumers. The marketing system thus links the milk producers in the rural areas and consumers in the distant urban areas.

The productivity of the farmers on the whole is still very low due to the fact that they are small, disorganized and individually powerless against market forces in which they sell their produce and buy inputs. They are illiterate, superstitious, conservative and bounded by outmoded customs and institutions. There is only one milk producers' cooperative, named "Milk Vitae", in Bangladesh and its role is very limited. Above all, there is a lack of farmers' organization, which could help in the sale of their produce and purchase of dairy inputs.

The marketing effort has to be recognized not so much as a sales activity but as an essential pre-requisite for ultimate milk production. As indicated earlier, the absence of an efficient market is a problem for feed inputs as well as for the industry's output of milk.

Ways of Correcting Market Failure and Government Failure

An efficient dairy development program must draw its directional strength from the organizational mission, objectives, strategies and goals. The organization's mission describes the business that it is in. Its objectives are the expression in terms of financial and operational dimensions within the framework of its mission. The dairy development organization's strategy states the general direction in which it will pursue its objectives. The goals are the specific measurable quantum that are used as standards for appraising whether the strategy and programmed activities are leading toward desired objectives. It is suggested that the following policies can be recommended so that available resources, physical facilities and technological progress are utilized for developing the dairy industry.

1. Government involvement in the development of dairy industry

There are numerous causes of market failures and government failures in dairy production and marketing, which are of considerable importance, and the public interest view "... sanctions the correction of [these] as a justifiable state function" to permit maximization of social welfare (Pincus and Withers, 1983). In other words, the public interest view of government intervention requires that these market failures be corrected by appropriate regulatory action, with the overall objective being attainment of full economic (allocative) efficiency. Moreover, government intervention is vindicated in these terms for correcting of externalities and provision of public goods.

According to the public interest theory, the government is seen as a benevolent despot that perceives market failure and corrects it, in the process maximizing social welfare. The justification for intervention in the dairy industry in the presence of market failure is that welfare losses may be reduced. This may be achieved by fostering competition or otherwise improving the functioning of markets, equating marginal social benefits to marginal social costs when externalities (on either the demand or supply side) exist. It is also widely accepted that redistributing wealth efficiently in line with social values can be viewed as the correction of a market failure (Stiglitz,

1988). A major difficulty is determining when, and to what extent, government perceives market failure.

Bangladesh has great potential for increased production and use of livestock products. To meet current market demand, the government has initiated various measures including the provision of institutional loans by public sector, extension services for breeding and raising cattle and fostering commercial farms. To date, such government policies have not been very effective in alleviating the constraints faced by the industry, because they reflect a response only to the immediate situation without adequate consideration of related problem areas. Thorough and comprehensive analysis is required to formulate effective longer-term policies. Policy considerations should include stabilizing market prices, reforming inefficient marketing systems, supply of adequate information, inadequate processing, high prices of feed stuffs and medicine.

Although the Government is trying to satisfy as much as possible of the growing demand from domestic production and has developed a number of programs to do this, it has been subjected to criticism from farmers, traders and consumers of dairy product. It is quite likely that some of the Government measures could prove to be not beneficial to the producers or to the consumers. In fact, some of the measures appear to have been inefficient and not well planned (Khamar, 1995). Import tax and sales tax are controlled by National Revenue Board, but on the other hand, importation of powdered milk is controlled by Ministry of Commerce. So, farmers are not getting benefit from this type of uncoordinated Government program.

2. Remedies for Market Failure---Policy Measures

This section focuses on potential government policies designed to improve dairy industry. Six types of policy instruments, three technical and three economic, are discussed.

Technical policies

1. **Breeding policy:** Prospects for increased demand for milk in the country are very high as observed in the earlier section. This could be achieved only if indigenous cows are replaced by high yielding animals in cattle by cross-breeding the non-descript cows with exotic breeds like Holstein-Friesian and Jersey. With more nutritious feed supply and a remunerative outlet for milk, cross-breeding will have a chance to succeed. However, the country has not defined and delineated the breeding policy for the country. This needs prompt attention.
2. **Veterinary program:** The control and eradication of disease on the local and national levels creates the opportunity for the development of cooperation between farmers. Vaccination programs especially for small holders are best carried out at central points. This creates many opportunities for spreading the message of animal health and nutrition. At such gathering points the farmers' animals should be segregated until they have been examined; concomitant disease should be pointed out to individual farmers and advice or treatment given. The veterinary surgeon should be alert to signs, which may limit the animals' future value. The purposes of the vaccination program should be carefully explained. Plans for future programs should be given.
3. **Information and extension services:** Information is the lifeblood of every economy. The ways people get information, and the incentives they have to gather and provide it, are affected by the way society is organized: legal rules and social conventions, institutions and governments, all determine how much information people have and the quality (that is, the accuracy and completeness) of the information. Without reliable information, markets do not work well.

A sound national knowledge strategy requires that governments seek ways to improve information flows that make a market economy function better. Government can greatly improve market outcomes by providing and eliciting information that would not otherwise be available.

It has been well recognized that one important limitation to the expansion of livestock production in Bangladesh is a lack of effective livestock extension services. Most farmers are very much left to their own initiatives, with no qualified guidance or supervision. It is important to organize effective promotion and extension services in the Department of Livestock, Government of Bangladesh, to work closely with small farmers and help them with ideas and advice on appropriate techniques. At present, the Department is seriously short of qualified extension personnel and those already on staff are very much loaded with administrative work. In addition, suitable manpower training and job-specific in service training are vital in personnel development for the Department of Livestock. The need for communication within the government framework of which extension is a part has been outlined above. Extension and communication are synonymous. The good extension worker will utilise every opportunity to put across his current message and both he and government should ensure that advances in communications science are available to him. Aspects which should be taken into account include: personal and group talks; farm walks and farm demonstrations; government farms and pilot farms; posters and cartoons; leaflets and “comic strips”; the farm press, both government and private; visual aids and radio. The mix will depend on local needs and local knowledge.

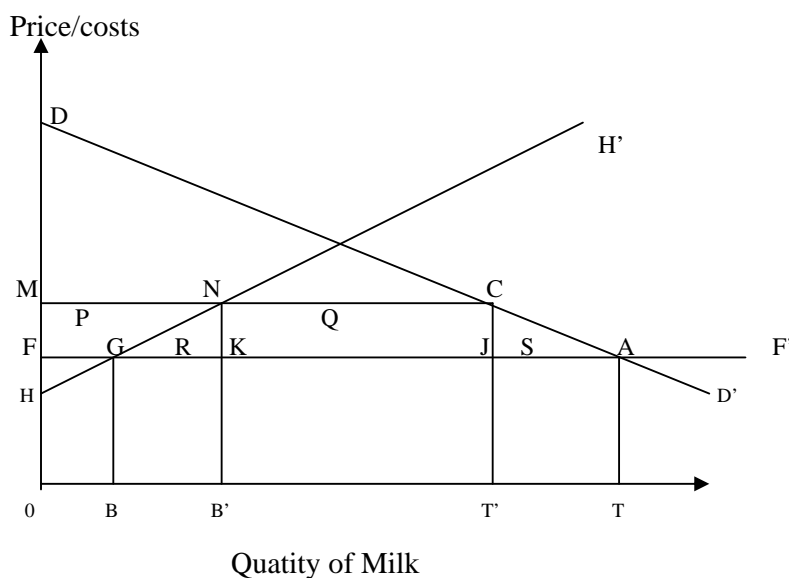
Economic policies

- 1. Production policies:** Growth of the commercial dairy industry is constrained by inadequate and irregular supplies and high costs for feed concentrates and drugs. The government has given high priority to the development of the Bangladesh dairy industry to alleviate the serious and growing gap between domestic consumption and production. The government initiated measures to increase production. These include: institutional loans to small-scale farmers for livestock production, importation of beef cattle and dissemination of hybrid beef cattle to increase beef production. However, still no steps have been taken by the government for adequate and regular supply of feed concentrates and drugs at a cheaper price. An effective measure should be taken immediately.

- 2. Marketing structure:** The bulk of milk production in Bangladesh is in the hands of a large number of small producers scattered all over the country. For balanced development of the dairy industry, the organised marketing of milk and milk products is a pre-requisite. As a result much attention should be given to the building up of liquid milk plants, milk schemes and milk product factories in major towns and cities. Dairy development programs should be adopted on an integrated view, incorporating production enhancement, procurement, processing and marketing of milk.
- 3. Trade policies:** The theoretical case for free trade is strong. Most economists agree that barriers to trade are blunt instruments with which to achieve domestic economic policy goals. If the Government chooses to protect the dairy industry more highly, this analysis helps to understand the economic effects on producers, consumers, government, and on net community welfare. Figure 1, describes the impact of a tariff on imported powder milk in the case of Bangladesh which is a net importer of powder milk. In conventional economic analysis of policy instruments it is usual to identify effects in terms of five characteristics: a) price; b) production; c) consumption; d) trade; and e) government expenditure or revenue.

In its most simple partial equilibrium form the conventional supply/demand market model (Corden, 1971) can be used to provide insight into the effect of dairy policy instruments upon the five characteristics identified above.

Figure 1. Partial equilibrium analysis of the impact of a tariff on imported powder milk:



Along the X-axis is measured the quantity of powder milk and along the Y-axis costs and prices. DD' is the home demand curve for the product and HH' the home supply curve. These curves assume that everything else in the economy-- notably factor prices, prices of other goods, and money incomes-- are constant. FF' is the foreign supply curve, on the assumption that Bangladesh cannot influence world prices of powder milk. Since the demand for export will not enter this partial equilibrium picture, this assumption means that there is no terms of trade effect in the model.

In the absence of protection the price will be OF and total home consumption OT, of which OB is home-produced and BT imported. If a tariff FM/OF is placed upon imported powder milk:

Price effect: Producer and consumer price of milk increased from OF to OM (transport/processing costs, etc ignored).

Production effect: Expansion from OB to OB'. Producer income increased by area P.

Consumption effect: Reduction from OT to OT'. Consumer surplus reduced (expenditure increased) by $P+Q+R-S$.

Trade effect: Import reduced from (OT-OB) to (OT'-OB') and expenditure on imports falls from OF (OT-OB) to OF (OT'-OB').

Government revenue/expenditure effect: Revenue increased by area Q.

Conclusion

This paper aims to discuss the present situation and future prospects of the Bangladesh dairy industry. The analysis first provided an overview of the importance of the industry and the current problems facing the industry. Later, the need for government intervention in the industry is highlighted, and finally, government programs for the industry, are discussed using a normative, market failure approach.

The discussion shows that there is a vast demand for milk and a great employment opportunity in the country. Domestic production of milk constitutes only 13% of consumption. The bulk of milk production in Bangladesh is in the hands of a large number of small producers scattered all over the country. To most of them, it is a supplementary or complementary enterprise only. Therefore, except for a few commercialized dairy farms in the urban areas, there still exists vast scope for improving the lot of the country's rural folk by commercializing the dairy enterprise.

The need for developing the dairy industry, especially in the rural areas, has already been recognised. Programs have been launched to improve the milk-yielding capacity of indigenous cows and buffaloes through cross-breeding. But unfortunately, the economic aspects of milk production through indigenous and cross-bred animals still remain relatively unexplored. For the success of any dairy developmental program, therefore, it is essential to fill such gaps in economic information.

The market failures for dairy products have been discussed in the forms of inadequate information, externalities, insufficient provision of public goods, inefficient marketing and incomplete markets. A central problem of market theory is that it presumes buyer, sellers and producers have perfect information. However, it is seen that the livestock sector has not received adequate attention in respect of information. As a result, this sector continues to have several areas of darkness. Another problem is the existence of externalities in disease control. Diseases cause high mortality and severe economic loss. A 30% increase in cattle production would be possible if diseases were properly controlled. The vaccination program is limited because of budgetary constraints and the veterinary medical facilities are poor at district and thana level livestock offices.

Due to lack of research and extension services, it has not yet been demonstrated that dairy farming can be transformed into an attractive and profitable business. In addition, there is a lack of trained personnel at all levels as well as a lack of training facilities. The National milk grid helps producers to get a good price and simultaneously in developing a regular market for their milk. On the other hand, milk processing facilities are an important economic necessity for the small milk producers whose local demand for their product is limited. However, there is no national milk grid and milk processing facilities in Bangladesh.

The marketing effort has to be recognized not so much as a sales activity but as an essential pre-requisite for ultimate milk production. Due to the dearth of marketing facilities, the dairy farm owners are compelled to sell the bulk of their milk to the tea stalls at a cheaper price. Therefore, the extreme perishability and bulkiness of milk, available from widely scattered rural sources, requires efficient methods of milk collection, processing and distribution to urban consumers.

Moreover, institutional support for expansion of milk supplies for rural areas, covering issues relating to the animal health, improvement in breeding, extension services, and feed and drugs supplies is essential. Such institutional support should focus attention on the needs of small and marginal farmers, and agricultural labourers since dairy development could help relieve under-employment and low incomes.

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