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India's Approach to Cattle Development: Heifer Project As Catalyst In India's White Revolution

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India—1970	
Human Population	550 million
Cattle Population	250 million
Annual Milk Production	25 million tons
Daily per capita availability of milk	140 ml.
Per capita income per year	\$78

Statistics can be misleading and these are not 100% accurate, but even allowing for such limitations, it is clear that:

- a. There is scarcely half enough milk to meet the recommended minimum requirement of 250 ml. per person per day.

- b. The income of millions of India's people are below the subsistence level.

Background

These are two basic facts of present day India. It was not always so. Two hundred years ago India's population was probably not more than 20% of its present level. Apart from periodic and regional famines, there was probably sufficient food for everyone. Cattle have always been one of India's great assets, providing draft power, transport, fuel, fertilizer and milk. It is

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significant that India's farmers have always taken great pride in the strength and endurance of their cattle and have regarded them primarily as draft animals with the exception of a few breeds maintained specifically for milk. There was a process of deliberate selection for the best draft animals, and, simultaneously, natural selection in the remainder resulted in the survival of those best able to endure harsh conditions. It did not matter at that time that this automatically resulted in the survival of animals having very low milk producing potential.

Since then much has changed. Human population has risen quite rapidly, and simultaneously cattle population has risen with it. This process inevitably placed much greater stress on the available resources so that the standards of nutrition for both men and animals has declined. At these lower nutrition levels only the very hardiest animals survived and these were naturally the poorest milk producers. Today even 250 million cattle (i.e. one for every two persons) are not able to meet India's demand for milk. The average Indian milk cow now produces only 500 liters of milk per lactation.

A Solution?

There would appear to be an obvious solution to all this, namely, to selectively upgrade the animals for higher milk production and thereby not only increase the production of milk, but also increase the income of farmers. But it is not so easy. India's only good breeds of milk cattle come from those areas which are now part of Pakistan, and only a negligible number remain in India. European breeds of milk cattle were introduced to India about the beginning of this century by the British army for their military farms. They carried out cross breeding work in many areas, but finally abandoned this in the 1930's, primarily because they were unable to cope with the disease problem. The Indian cattle after centuries of natural selection had developed very high resistance to these diseases, but the imported cattle

and their cross-bred progeny could not withstand them.

A further set-back to the livestock industry came as a result of an acute shortage of food grain resulting from the ever increasing population and the failure of the agricultural production to keep pace. By the 1950's most authorities declared that India could not afford a livestock industry due to its relatively inefficient utilization of resources, and the pressing need for more food grains.

The Beginning

Nevertheless there were some who held to the belief that there was a place in India for milk cattle, and even for cross bred cattle. A long term experiment was being conducted at the Allahabad Agricultural Institutes, and their work indicated that substantial benefit could result from crossing imported cattle with Indian breeds. A report of this work came to the attention of the Indian Council of Agricultural Research and they were sufficiently impressed to make a request to Heifer Project Incorporated (H.P.I.) through the Agricultural Institute for Jersey bulls for field experiments.

On March 10, 1955 six Jersey bulls arrived in India as a gift from H.P.I. To most people in India at the time this was nothing more than an experiment. Few thought it would work. The problems of disease coupled with the harsh environment were thought to be too great; and besides this many nationalist spirited people in newly independent India were quite opposed to adulterating the pure breeds of India with foreign breeds.

But these bulls did not die. They were used in an artificial breeding program, and produced 30,000 offspring. Not only did the cross bred heifers survive but they produced 4 to 5 times as much milk as their native dams.

Much credit should be given to the veterinarians and the veterinary institutes of India who, in a relatively short space of time, devised ways and means of protecting the imported cattle and their progeny from most of the problem diseases.

A Program

The success of this experiment inspired all concerned to press ahead with large scale cross breeding work. H.P.I. was asked to assist in this program by supplying some of the necessary breeding stock, both bulls and heifers. Since 1961 H.P.I. has supplied to the government of India 719 cattle. Initially these imported cattle were used in two directions. Most of the bulls were located in selected key villages in areas more favorable to milk production, where they were used for artificial breeding programs in inseminating the indigenous cows. Most of the female stock and a few bulls were located at Central Government farms where they were used to produce more pure bred exotic cattle for use throughout India.

Intensive Cattle Development Projects

Towards the end of 1965 it became obvious that it would not be sufficient to be concerned only with breeding. For the program to be a success it would have to be concerned with breeding, feeding, fodder production, disease control, management and marketing. For this purpose, the Government of India set up a series of Intensive Cattle Development Projects (ICDPs), each of which would be staffed with trained personnel in each of these fields, so that a total development program could be undertaken. Since then some 38 ICDPs have been set up in selected areas where maximum results can be achieved. These ICDPs include a total of 7 million breeding cows and buffaloes. It was obvious from the beginning that it would be impractical to attempt a program covering the whole of India's 100 million breeding cows and buffaloes, hence this area development scheme through ICDPs was the only reasonable alternative.

Success or Failure?

How successful has this been? We can be reasonably certain that the imported livestock have now produced some half million cross bred progeny which did not exist 5 years ago and are producing 3 to 4

times as much milk as their dams. Some evidence that the program is working at the grass roots level are new reinforced concrete houses to replace the mud huts, fields of fodder for use as feed, cross bred heifers producing 15 to 20 liters of milk per day, demand from the farmers for artificial insemination with semen from exotic bulls, and the pride and enthusiasm with which the farmers display their newly acquired cross bred cows and heifers. The production of milk has risen by about 1½ million tons in the past two years.

Difficulties

There are many problems which still need solutions. Artificial insemination is widely accepted throughout India but there are many exceptions, and there are cases where farmers have rejected the method. This is primarily because conception rates have been extremely low in some instances due to insufficiently trained and experienced or insufficiently motivated technicians and veterinarians. It is frequently very difficult for the technician to inseminate the cow at the correct time. Most farmers are not yet skilled in detecting heat. This is not easy under Indian conditions where most animals are kept tethered and in isolation. Poor communications often makes it even more difficult to achieve correct timing. Conception rates with first insemination are normally between 40 to 50% , and this is considered good. Usage of bulls is low since A.I. is carried out with fresh semen. Efforts are being made to introduce frozen semen.

In some areas insufficient attention is given by farmers to the feeding of quality nutrients to cross bred calves and milking cows. Traditionally, cows have been left to scrounge for themselves. Even when they are taken out to graze, the grazing fodder available is of inferior quality. Continued emphasis must be given toward educating the farmers concerning the nutritional requirements of the cross bred animals.

A great deal of progress has been made in controlling India's worst diseases. Rinderpest has been virtually eliminated by a massive vaccination program. Reliable

vaccines are available for most other diseases, with the important exception of Foot and Mouth disease. Foot and Mouth disease is of major economic importance and especially so with the introduction of more exotic blood. A limited supply of vaccine is being produced in India to protect exotic and cross bred animals against the four most common strains. Production is being accelerated and it is expected that in a few years there will be sufficient quantities available to meet anticipated needs. Unfortunately, this vaccine does not give positive protection against foot and mouth because the disease has many antigenic strains, and the vaccine at present is able to protect against only a limited number of these.

For centuries milk production has been only a by-product of India's livestock industry; hence, the farmers are not accustomed to looking after their cattle in such a manner as to ensure maximum production of milk. There is a need for more and more training in basic management techniques. Many farmers have a regrettable tendency to breed young heifers as soon as they come in heat, thus robbing them of the opportunity to develop fully so as to achieve their genetic potential. The ICDPs are tackling these problems but many of the government officers themselves are not sufficiently trained in the practical management of high producing dairy cattle.

It is obviously essential that the farmers must be able to sell milk at reasonable profit to themselves if they are to increase substantially their production. Each ICDP is linked with a system of milk collection and processing. However, this marketing infrastructure is far from complete and in many cases is operating rather inefficiently. This is partly the result of difficulties of communication and partly caused by low levels of production in certain areas. Until a certain minimum quantity of milk is produced in a district, it will not be economic to provide facilities for its collection. This whole infrastructure is still very new, and it is understandable that it is not yet complete.

Most Indians prefer high fat milk such as that produced by the water buffalo (8-

9% butter fat). In some districts this has led to a procurement policy of buying milk on a butter fat basis. Such policy acts as a disincentive to the use of the higher yielding breeds with their relatively low fat milk. There seems to be every reason for changing this policy.

A problem frequently encountered in the cross breeding program is what to do with the cross bred male progeny. Most of India has no use for beef so they cannot be used for this purpose. At the moment there is considerable debate of the value of cross bred bulls for draft work. It would appear that the cross-breds can be quite useful for this purpose, but it is unlikely that they will be as good as the indigenous cattle. One important use of the cross bred bulls, which is commonly overlooked, is their value as sires. There is a very great wastage of genetic material because they are not being used for breeding. They are not as valuable as pure bred exotics, but as long as the shortage of exotic bulls exists these cross-breds can make a considerable contribution to upgrading milk animals in areas at present outside of ICDPs.

The Coordinated Approach

There is no doubt that the ICDPs are playing a key role in revolutionizing the cattle industry in India. To date the ICDPs have been responsible for artificially inseminating more than 2 million cows. These have produced at least 1½ million cross-bred progeny.

But the work of the ICDPs does not end there. They are concerned with all aspects of production, and are linked with facilities for the collection, processing and distribution of milk. This whole industry approach is vitally important for the success of the program.

The long term aim must always be to keep reducing production, processing and distribution costs. At present the cost of milk to the consumer is beyond the reach of most Indians. Yet the price paid to the producer cannot be reduced without destroying the vital incentive to produce. There appears to be plenty of scope for reducing handling costs, but the first re-

quirement to achieve this is more milk, so that processing plants can operate at close to capacity.

It is often stated that the first thing India should do is get rid of half its cows. There is some truth in this, there are far too many cows which are of no value whatsoever, but the statement is an erroneous oversimplification of the problem. As stated earlier, the Indian farmer looks to his cattle for draft power, transport, fuel, fertilizer, and only lastly for milk. The cost of the farmer of maintaining a few indigenous cows is negligible so that whatever little they return to him is clear profit. He cannot, and he will not dispose of his cows until he has alternate sources of draft power, transport, fuel and fertilizer. Tractors are becoming available, electricity is being taken to the villages, fertilizer plants are springing up and higher producing milk cows are being bred. All of these are necessary before the farmer can get rid of his so-called useless cows.

The Future

There is every reason to be optimistic that very substantial gains in per capita availability of milk will be possible in the near future. Just as high yielding cereals have made possible a green revolution in agriculture, high producing milk cows can make possible a white revolution.

The time is opportune to set about making this white revolution a reality. It has been established that growing fodder for milk production can be at least as profitable to the farmer as cereal cropping, providing he has cows of 2500 liters per lactation capacity and the necessary infrastructure. The major disease problems have been or are being overcome. With the recent introduction of high yielding cereal varieties, and modern methods of cultivation, India will soon have a sufficiency of food grains. This allows more and more land to be used for livestock production.

The time is ripe, but the size of the task

is immense. In order to have enough milk to give each Indian the recommended minimum of 250 ml. of milk per day, the present level of production must be doubled. To reach this target it will be necessary to breed at least 10 million cows, each producing 2500 liters of milk per lactation.

It is readily acknowledged that H.P.I. has played a major part in the vital pioneering work which has been done in India over the past 15 years. Most of the cross-bred cattle seen in India today have their origins in stock from H.P.I. or from For Those Who Have Less, Australia. Now that a good beginning has been made, there is widespread confidence that investment in India's livestock industry will be money well spent. Perhaps the scale of the assistance needed now is beyond the resources of voluntary agencies. Perhaps H.P.I. greatest contribution at this stage would be to encourage those with greater resources to come to the aid of India's cattle industry. Already the World Food Program is making a massive investment in "Operation Flood" which, it is hoped, will substantially increase milk production in India.

A great many small farmers already have a better way of life, thanks to a planned program of development using exotic milk cattle for cross breeding. But beside this, millions more have been given hope that a better way of life is possible for them also.

Ed. Note: Heifer Project, Inc. is a world-wide, self-help organization, founded in 1944, non-sectarian, non-profit, financed by voluntary contribution, that provides livestock, poultry, and related agricultural services to people in developing areas.

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