REASONS FOR SHORTSUPPLY OF MILK

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Inferior Genetic Constitution of Animals

A local milch cow with an average carcass weight of about 188 Kgs. provides about 270-450 Kgs. of milk per lactation and a local cow buffalo with an average carcass weight of 300 Kgs. is capable of giving about 500 Kgs. of milk per lactation. The per lactation milk production of a superior bread cow in a temperate climate is over 2,000 Kgs. (Pagot, 1977). In terms of daily production of milk a local cow produces 2-5 pints where as a cow in a temparate climate produces well over 15 pints.

Climatic Constraints

There appears to be a positive correlation between the animal's size and climate (Pagot, 1977). Hot weather affects dairy cattle by making it more difficult for the animals to lose heat from their bodies. At air temperatures below 26.5°C (79°F), heat can be lost readily by natural processes. As air temperatures rise above this limit, heat lost by natural processes becomes inadequate and more heat has to be eliminated by a greater expansion of lungs involving increased respiratory rates. When the temperature of the air reaches or exceeds the body temperature and radiation spill acts, all heat must be lost by evaporation. It is at the higher air temperatures that humidity becomes important because as the water vapour content of the air rises, its capacity to absorb water from the animal's body falls (Johnston et al., 1954). As air temperature rises in the humid tropics, the problems of heat disposal become more urgent and appetite is often reduced in order to reduce the "heat increment" arising from digestion (Whyte, 1967). These problems could be clearly seen in most parts of Sri Lanka where temperatures often remain well over 80°F and humidity remains uniformly high throughout the year.

Poor Animal Health

The list of cattle diseases in the hot humid tropics is a long one. It includes most of the viral bacterial diseases of the temperate countries in addition to diseases that have disappeared there (rinder pest, bovine pleuro-pneumonia etc.), and also specifically tropical or those diseases whose severity is greater in the tropics than in the temperate countries (typarasomiasis, tick-borne fever, blood and intestinal parastic diseases etc.)

Adaptation Difficulties of Better Breeds

Harsh climate and diseases being two major constraints in rearing cattle in the tropics, animal breeders still have problems in deciding the best livestock to be adopted to the tropical areas. Some types such as imported Zebu varities tolerate high temperature and low humidity but they often fall sick when humidity is high (Pagot, 1977). Sahival, Sindhi and Tharpakar are few varieties which have the ability to tolerate high temperature and somewhat high humidity and as such those varieties seem to be ideal for cross breeding with local varities in the Dry Zone. The European varieties adapt somewhat satisfatorily to cool temperate climates in the tropical highlands (e.g. Ambawela) but at lower altitudes (Mid Country and Coconut Trinagle etc.) their adaptability becomes weak due to increasing heat, humidity and tropical diseases.

Because of these climatic limitations, genetic improvement of animals brought to Sri Lanka from the temperate countries, becomes difficult. Such animals register a late age of first calving in Sri Lanka. Nadarajah (1970) observes that jersey heifers imported from New Zealand experienced first calving at an average age of 35 months in Sri Lanka whereas they would have normally experienced their first calving at 24-30 months in their country of origin. Similar observations were made by Mahadevan in 1956.

European animals when brought to tropical lands show initial difficulties in re-productive functions, frigidity in males and irregular ovarion cycles in females etc. Even long after the imported animals' settle down in the tropical environments, they show humoral problems, cutaneous or skin disorders and coat shedding (hypertichosis).

Poor Quality of Fodder

When temperature and humidity fluctuate, particularly due to the alternate rainy and drought periods as in the Dry Zone of Sri Lanka, the quality and quantity of natural accessible forage vary considerably. After the rainy season's abundance, there is the dry season's scarcity.

Apart from the quality of forage, the movement required in the hot sun for grazing during the dry season also affects the animal. In the Dry Zone from about the middle to the very end of the rainy season, water holes are numerous and grasses are abundant and of reasonably good quality. Hence, the animals can easily find the quantity of grass needed for its mainatenance and growth. However, by the middle of the Dry Season, grasses have nearly disappeared in the Dry Zone in particular. As shown in Fig 1 a dry season could vary from 8 months in Jaffna to 3 months in Polonnaruwa and Batticaloa. (Domoros, 1974). As a result, only a few leaves of browse are acceptable and the animal, in spite of a large daily grazing period, is unable to find sufficient forage for its maintenance. It also loses weight due to the amount of energy needed in its search in the hot sun for palatable grass and water to quench its thirst. Sometimes more than 10 Kms. must be travelled daily[1].

With the beginning of the rainy season following a long spell of drought, there is an abundance of grass and the animals too are expected to gain growth rapidly. But contrary to expetation they

continue to lose weight for sometime after the commencement of the season' rain. The new grasses have a high moisture content and the amount that one animal can eat is still less than its normal requirement.

The crude protein content of many tropical grass varieties is said to be less than 14 per cent. Some varieties have a very low protein content of 4 per cent only. As already noted, the proper use of this limited protein content in natural grasses for the growth, maintenance and production of animals is hindered by the harsh climate and poor animal health. However, several studies point to the fact that there is a remarkably higher protein content in the herbage produced by most of the grasses introduced into the Mid-counry and the Hill country of Sri Lanka (Sivalingam, 1964; Fernando, 1969; Appadurai, 1977; Sivasupramaniam and Sithamparanathan, 1974).

In those pastures in the arid and dry regions of Sri Lanka, there is rapid growth of grass during the short seasonal rain, after long periods of dormancy in growth due to moisture shortage. Grass matures quickly and also reaches the stages of flowering and seeding faster. Hence, stocks have to be grazed during most part of the year on standings of very low moisture value. In these grasses the dry matter content is high and it causes digestive problems because of the all round low intake of watery forage.

Scarcity of Fodder

Scarcity of fodder arises out of two factors. First, there is the seasonal scarcity, the magnitude of which varies with the length of drought differing from region to region and from year to year in a region. The dry season's fodder scarcity is highest in the Dry Zone and least in the Wet Zone.

Second is the limitation of large grasslands itself. Sri Lanka being a thickly populated country has a total extent of 1.07 million acres under permanent meadows and pastures somewhat suitable for year round grazing. However, except for a few large grazing lands such as the 'villus' in the Polonnaruwa district, the other small and highly scattered grass patches in crown lands and private properties inhibit the maintenance of large herds. About 80 per cent of land holdings are under 2 acres in extent (Census, 1973). As the population increases, the land holding sizes would continue to decrease unless economic opportunities in the non-agricultural sector expand sufficiently to relieve population pressure on the cultivable lands. In small land holdings under existing levels of fodder production the permissible herd numbers are very small. Most of the small properties permit the maintenance of only two or three animals. Some of these holdings are so small that no grazing is practised in them by the peasants.

Though the estate land holdings are large, the placing of crops in them is such that either the space available for fodder growth is limited (tea estates) or the existing tree crops form dense shady canopies (rubber) prohibiting the undergrowth of grasses. The workers in these estates, therefore, resort to limited grazing of their animals. Some sort of grass cultivations as under-crop is possible only in the coconut estates.

In the less populated Dry Zone, where the pressure on land is less acute than in the Wet Zone, irrigable lands are cultivated with cereals once or twice a year. Irrigated fodder cultivation still remains a costly business. Even the marginal lands are used for highland paddy or subsidiary food crops posing limitations to grazing lands.

The Dry Zone farmers are not accustomed to the integration of animal husbandry with cereal farming. They will concentrate on cereal cultivation in limited irrigable and marginal lands until such time as they are convinced that an intensive combination of farming and cattle breeding would permit a higher return than from cereal cultivation alone.

Inadequate Concentrate Feed

A low nutrient value of indigenous grasses (protein content less than 14 per cent) requires supplementation of cattle food with concentrates to provide the minimum of 16 per cent protein required by milch cows (Ten Year Plan, 1959). Coconut cake (poonac) is the familiar concentrate feed in Sri Lanka with about 20 per cent protein in it. The neglect of coconut plantations in the wake of Land Reform, cyclone devastation of about 400,000 coconut plants in the Chilaw area, and severe drought conditions that prevailed during the early 1970s reduced coconut production, while prices escalated (Table 4). In 1977, the black market coconut cake prices varied from Rs. 2,000/- to Rs. 2,400/- per ton. In 1978, a ton of coconut cake which cost Rs. 3,700/- rose to Rs. 4,500/- in some areas in 1980. The recovery of the domestic coconut cake production was so low that a part of the domestic requirements of it was imported in 1979.

The other supplementary feeds include mixtures of different ratios of cereals, wheat bran, rice bran, flour and rice sweepings locally prepared by farmers depending more on the availability of these items rather than on consideration of their nutrient values. The estimated available quantities of these items in 1977 are given in Table 5.

Table 5

ESTIMATED FOOD CONCENTRATE COMPONENTS AVAILABLE

Components	Quantity (Tons)
Cereals	10,000
Wheat Bran	25,000
Rice Bran	10,000
Flour & Rice sweepings	2,000
Gingerly meal	5,000

These ingredients are used in varying proportions by these farmers to prepare the animal feed.

1. To avoid energy waste in roaming in the hot sun in search of forage and water, in Isreal and in Queensland, Australia, night grazing was experimented with and the results were very encouraging (Whyte, 1967).

But, the appropriate ratios of feed mixture (NLDB, 1974), the minimum daily requirements per head (Ten Year Plan, 1959) and the cost are set out in Table 6.

Thus, in 1977, the minimum requirements of 3 lbs, of food mixture per head of cattle, cost Rs. 4.80 which would have imposed a considerable financial strain on the small scale dairy farmer.

Collapse of the communal grazing system in the Dry Zone

In the past cattle breeding remained an integral part of the agricultural way of life in the Dry Zone. Farmers depended greatly on animals for draught power needed in subsistence agriculture. Hence the villagers had to protect both crop and cattle.

The strategy adopted to safeguard this dual interest was a unique one. Conventionally the cultivators were required to watch their crops more closely than the cattle owners were required to watch their cattle grazing communally in the uncultivatred lands in the village. The farmers were required to erect sufficiently strong fences enclosing their cultivated fields to keep off the roaming cattle. This arrangement was necessary because apparently it was the same owners of crops who owned the cattle as well.

This community organisation showed the first sysptom of collapse in the late 1940s when the farmers began to think that cattle was no more an absolute necessity to work land. This idea originated as a result of government's propaganda to popularize the use of tractors in working farms[1]. The traditional farmers who were rather reluctant to swtich over gradually adopted the new technology being popularised by the Government.

It induced most farmers to neglect the training of animals for work in numerous field operations and finally to sell their idle cattle. With the increase of non-cattle owning farmers, there developed a conflict between the cattle owning and non-cattle owning farmers as to whether cultivated field owners should take the entire responsibility of protecting the cultivated fields from the village cattle with proper fencing or the cattle owners should keep their communally grazed cattle under strict vigilance and prevent crop damage.

With the emergence of this conflict, instead of the conventional practice of constructing strong fences to protect crops from the village cattle, the field owners built less-strong fences and compelled the cattle owners to guard their animals from breaking such weak fences into cultivated fields. When a crop damage from village cattle occured, the administrators with an avowed policy of increasing food production acted in favour of the cultivator. It discouraged cattle keeping in the village and that eventually decreased milk production in the Dry Zone to its present low level.

Table 6

PROPORTIONS OF INGREDIENTS IN FEED MIXTURE, MINIMUM DAILY FEED MIXTURE REQUIREMENTS PER HEAD COST

Ingredient	Proportion		Cost[1] (Rs.)
	Percentage	Lbs.	
Poonac	50	1.5	1.49
Wheat bran	25	0.75	2.68
Rice bran	20	0.6	0.54
Cereals	5	0.15	0.09

Note: (1) - Calculated at the 1977 price of Rs. 2,400/- per ton.

Source: NLDB (1977) & Ten Year Plan (1959).

Increasing Demand for Beef and Decline in Bovine Population

Beef remains the cheapest source of protein for urban dwellers. The price of beef of a given weight is often less than that of fish. Hence,there was always a higher demand for beef than for fish notably among the poorer majority of urban dwellers. Beef is also in great demand as other sources of animal protein such as chicken and pork are in short supply. As a result, slaughtering of cattle for beef has increased considerably amidst numerous controls placed on transportation and slaughtering of cattle. Very recently the slaughter of cows, heifers and calves was banned. Yet, it is extremely unlikely that illicit slaughtering of such animals has come to a halt. The exact nature of the decline in cattle population cannot be clearly determined, because there is no proper enumeration of the bovine population in Sri Lanka. All data, however, indicate clearly the declining trend.

[1]. The government opened tractor units in district towns in the Dry Zone to demonstrate time saving in ploughing.