THE EFFECTS OF STATE INTERVENTION IN PUBLIC PARASTATALS: THE CASE OF TANZANIA DAIRY FARMING COMPANY LIMITED - TANZANIA

By

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ABSTRACT

The study aimed at analyzing the effects of state intervention on the performance of public parastatals in Tanzania with special reference to the Tanzania Dairy Farming Company Limited (DAFCO). The specific objectives of the study were to:

(a) Describe the milk production trends, marketing and pricing arrangements;
(b) Analyze the effects of government intervention policy on the performance of marketing and pricing of milk;
(c) Determine alternative Marketing and pricing arrangements of milk and other dairy products (heifers and bulls) from DAFCO farms;
(d) Develop a dairy subsector policy in marketing and pricing;

Both primary and secondary data were collected and analyzed by employing both qualitative and quantitative methods.

The results on trends of milk production in DAFCO farms, revealed two phases of production i.e. an increasing phase between 1976 and 1982 and decreasing one between 1982 and 1991. Milk production increased from 1 220.2 thousand litres in 1976 to 4 570 thousand litres in 1982 and decreased to 2 371 thousand litres in 1991.

The study showed that production performance of DAFCO has deteriorated greatly compared to the original design and objectives, (milk production decreased from highest of 4 571 to 2 371 thousand litres (-48%), milk yield per cow per day decreased from highest of 7.7 to 6.8 litres (-12%), total herd decreased from highest of 5 592 to 3 633 heads (-35%) and milking cows decreased from highest of 1 686

to 930 heads (-45%). It was also found that the company has been making financial losses in all fiscal years except for 1977 when it reported a net profit of Tshs 23.8 million.

The study also revealed that through Government intervention policy DAFCO was directed to sell all its milk to TDL as its sole marketing channel and milk prices were determined and fixed by the government. This policy was found to be detrimental to DAFCO.

Results of regression analysis model indicated that price of milk is negatively related to quantity of milk produced which is contrary to economic theory. This indicated how firms which are protected through state intervention are not sensitive to market signals. Other variables i.e. price of feed, the minimum wage rate and trend variable were found to have the right relationship to quantity of milk produced as implied by economic theory i.e. increase in feed price will result into decreased milk production, increase in wage rate will lead to increased milk output and that for trend variable, improvement in dairy technology will result into increased milk production. All these variables were found to be significant at 0.05 significance level in determining milk production in DAFCO farms with the explanatory power of 87.6% which shows that they are all important factors to be considered for decisions involving milk production.

Policy recommendations include:

(a) DAFCO to be given sole autonomy in decision making on its own policies, objectives and strategies and planning process;

(b) The company should take the open market as the only marketing channel for its products. The prices of milk

and other dairy products should also be determined by open market forces of supply and demand;

(c) DAFCO should seek for funds from internal and external as well as from its own sources. It should also look for both internal and external joint ventures;

(d) Husbandry aspects i.e. disease control and feeding procedures should be improved to reduce cattle's high mortality rates;

(e) Technological improvement is required to increase production;

(f) Managerial skills should be improved through recruitment of qualified and experienced staff and offering further training;

(g) All farms need to be well equipped with adequate farm machinery and equipments for their development;

DECLARATION

I, URUGHU EMMANUEL NG'UI do hereby declare to the Senate of Sokoine University of Agriculture that the work presented here is my own, and has not been submitted for a higher degree in any other University.

Signature: .....

Date: 10/11/1994

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ABBREVIATIONS

BoT - Bank of Tanzania.
CRDB - Cooperative and Rural Development Bank.
DAFCO - Tanzania Dairy Farming Company Ltd.
DDP 1 - Dairy Development Project Phase 1.
EASHZ - East Africa Short Horn Zebu.
ECF - East Coast Fever.
EEC - European Economic Community.
FAO - Food and Agriculture Organisation of the United Nations.
LIDA - Livestock Development Authority.
MALD - Ministry of Agriculture and Livestock Development.
MALDC - Ministry of Agriculture, Livestock Development and Cooperatives.
MDB - Marketing Development Bureau.
NARCO - National Ranching Company.
SCOPO - Presidential Standing Committee on Parastatal Organisations.
TDL - Tanzania Dairies Limited.
TSHZ - Tanzania Short Horn Zebu.
TRDB - Tanzania Rural Development Bank.
WFP - World Food Programme.

CHAPTER I
INTRODUCTION

1.1. Introduction

This chapter gives the background information on Tanzania economy and the livestock sector, which includes both the traditional and improved dairy sector. It also presents the importance of the dairy industry in Tanzania and a review of Tanzania Dairy Farming Company Ltd (DAFCO). The chapter concludes by presenting the problem statement, objectives and organisation of the study.

1.2. Background Information

1.2.1. Tanzania Economy

Tanzania has a population of 23 174 336 (1988 census) with an increase of 2.8% annually. About 80% of the population are farmers, growing subsistence crops like maize, rice, millet, sorghum, cassava, bananas, beans and vegetables (MDB, 1988) and cash crops which include coffee, tea, sisal, cotton, tobacco and sugar. Other economic activities, are mining, fishing, pastoralism and agropastoralism.

The major occupation of the farming community, however, is crop and livestock production. Of the two, crops sector is more predominant in terms of the proportion of the population engaged in it than the livestock sector.

1.2.2. The Livestock Sector

The livestock sector to a large extent is undertaken by the pastoralists and agropastoralists, being practised under

traditional production system. The most predominant cattle type found in this system is known as the East African Shorthorn Zebu (EASHZ), which is also known as the Tanzania Shorthorn Zebu (TSHZ), this accounts for 98 percent of cattle kept under this system(MDB,1988).

There is a smaller portion of the 'improved sector' consisting of graded and pure exotic breeds cattle. Most of these cattle are kept basically for business purposes to generate cash income and are mostly kept by the state farms,secondary schools, prisons, missions, cooperative unions,ujamaa villages and smallholder individual farmers.

Tanzania livestock population according to the 1984 census was put at 12.7m heads of cattle, 6.4m goats and 3m sheep. The cattle population is composed of 12.5m indigenous cattle, 99 472 'improved beef types' and 143 400 'improved dairy cattle', i.e. representing 98% , 0.8%, and 1% of the total respectively.

1.2.2.1.Traditional sector

Most of the livestock are found in the pastoral and agropastoral production systems.

Pastoralism is practised by the nomadic tribes dominated by Masai, whose herds are concentrated in their traditional grazing areas of the northern plains, though currently they migrate all over the country in search of green pastures. Livestock meets the pastroralists' subsistence needs of milk and meat, provide fuel, building materials, clothing and bedding and acts as a store of wealth and source of liquid cash. Their cultural and social heritage is bound to livestock with the utmost importance attached to ownership of large numbers which attest to wealth and social

standing.

Agropastoralism is typified by the system, such as that practised by the Sukuma, the largest group in Tanzania, found in Mwanza and Shinyanga. Under this system, livestock while kept under similar management and nutritional conditions as those of pastoralists, they fulfil the additional role of draught power for both subsistence and cash crop production.

Both pastoralists and agropastoralists, endeavour to build up numbers during favourable seasons, and in this way seek to ensure the survival of their herds in case of inevitable drought and disease outbreaks. This practice has earned them (especially pastoralists) a criticism of overgrazing and lack of commercial inclination. Livestock offtake (especially for agropastoralists) has been found to slump in times of harvest, as cash needs are being met from other sources of cash crops(MDB,1988).

All owners of indigenous cattle, use their cattle to satisfy the needs of their families. Those within the reach of markets, sell fresh milk when surpluses are available. Surpluses are turned into preserved products by souring or making ghee, while others, not favourably situated, do produce sour milk and ghee for sale when an opportunity arises.

The level of total milk production from the traditional herd is difficult to estimate and the amount available for human consumption is even more so. The amount in both cases varies considerably depending on the severity of drought and the outbreaks of diseases which occur from year to year (MDB,1988).

Livestock production is constrained by a combination of factors which adversely affect growth and reproduction, these being headed by drought and diseases(MDB,1989). Approximately, two thirds of the country is exceedingly sparsely populated due to the presence of tsetse fly and East Coast Fever (ECF). Of the twenty one species of tsetsefly in the world, seven are found in Tanzania, infesting an estimated 60% of the country. This constitutes the main constraint to the expansion of livestock numbers and productivity (MDB 1989).

From the cattle breakdown given earlier it is clear that, Tanzania's meat and fresh milk supply for the bulk of her population depends heavily on the pastoral and agropastoral production systems and the situation will continue to be so for the foreseeable future (Ministry of Livestock Development 1983).

1.2.2.2. The 'Improved Dairy' Sector

The improved dairy sector comprises of the upgraded and pure exotic breeds of cattle , which, according to the 1984 census, accounts for only 1 percent of the total national herd. These cattle are basically kept for business purposes to generate cash income to the producers.

The most popular dairy breeds found in Tanzania are; Friesian, Ayrshire, Jersey and Guernsey, Sahiwal and their crossbreeds with the local TSHZ(MDB,1989).

The 'improved dairy cattle' are found in large scale state dairy farms, schools, prisons, missions, cooperative unions, ujamaa villages and individual smallholder.

Most state dairy farms are situated in the higher rainfall

regions such as Kilimanjaro, Tanga, Coast, Musoma, and the southern highlands regions of Iringa, Mbeya and Sumbawanga. In addition a few private, medium sized and specialized dairy farms, do exist in the same areas. Also dairy farming is incorporated on some sisal and wattle estates. Both production and livestock numbers in state farms are experiencing a decline (MDB,1989).

Smallholder dairy farming is carried out in the higher rainfall, fertile cropping zones, where both stall-fed and free range dairy production is incorporated into the mixed cropping systems. It is also practised in and around urban centres throughout the country where a ready and profitable market exists for fresh milk(MDB,1989).

The improved dairy sector is the most important sector being encouraged and undertaken by the Government in order to have increased milk production in the country due to its superior potential in milk production. While the traditional cattle (TSHZ) is able to produce per lactation yield of 100 litres, the improved cattle produces 1,600 litres per lactation (MDB 1989).

According to the Tanzania Livestock policy of 1983, majority of the milk in Tanzania comes from the traditional herd. Emphasis on expanding the size and increasing the productivity of the grade dairy herd is therefore stressed.

1.2.3. Importance of the Dairy Industry in Tanzania

The Tanzania dairy industry is of great importance in terms of income, nutrition and employment. Dairy products include milk, butter, ghee, cheese, dried and concentrated products and ice cream. These products form part of the main

consumer items which provide protein and other essential nutrients needed to balance the diets of many people.

In Tanzania Dairy industry is still at its infancy, and it has not been able to meet the national demand for milk. During the colonial period, dairy industry was not given much emphasis, except the little attention given to European settlers in the northern and southern highlands. There was limited dairy production in the pastoral groups of central Tanganyika and northern and lake regions, where livestock were largely kept for subsistence needs and as store of wealth to satisfy social needs and obligations.

After independence, efforts have been made to develop the dairy industry yet it has not been possible to meet the national demand, and projections show that even by the end of this century the demand for milk will not be met. Currently production is projected to be 2 055 000 metric tons while demand is 2 192 000 metric tons (FAO, 1982).

The efforts which have been undertaken to improve the situation include; importation of dairy breeds and semen for artificial insemination, improvement in nutrition, management and husbandry practices and disease control measures (MDB, 1988).

Despite all these efforts, it has not been possible to meet the national demand for milk which is comparatively low. Milk consumption has remained low at 21 litres of milk per person per year in rural areas and 58 litres of milk per person per year in urban areas (Mpelumbe,1978). Macha (1984) projected milk consumption in 1986 to be 22.5 litres of milk per person per year in rural areas and 39 litres of milk per person per year in urban areas.

Recommended consumption to be met is 0.5 litres of milk per person per day for daily requirement of essential amino acids (Macha 1984). This amount is equivalent to 182.5 litres of milk per person per year.

Tanzania has been forced to import dairy products in order to meet the demand pressure. In 1972/73 and 1979/80, the country spent TShs 72 million and 80 million respectively on dairy products imports (Msolla,1987). Considering the ever increasing demand for dairy products and the ever increasing costs of imports, there is a strong need to develop the alternative local sources in order to save the meagre foreign earnings and stop dependence by striving hard to become self sufficient. In response to this need the Tanzania Livestock Development Authority (LIDA), was established in 1974.

1.2.4. The Tanzania Dairy Farming Company Ltd

Following the establishment of LIDA in 1974, dairy development became a major aspect of development policy. The government concern was to provide cheap milk and milk products to consumers and to increase producers' income simultaneously. The government started the Dairy Development Phase 1 (DDP 1) with the aim of producing adequate amount of milk for local consumers and reduce milk imports.
The objectives of the DDP 1 were as follows:

(a) Development of seventeen large scale dairy farms with 350 cows each;
(b) Development of small scale dairy farms with 20 cows each in 50 Ujamaa villages;
(c) Establishment of dairy heifer breeding units;
(d) Expansion of milk processing facilities and

improvement of collection and distribution services;

(e) To teach technical assistants in dairy farms;

In order for the Government to achieve these goals under the DDP 1, DAFCO was established in 1975 with the responsibility of increasing milk production through the establishment of large scale dairy farms and by providing dairy cattle for sale to other milk producers. The Government also established the Tanzania Dairies Limited (TDL) in the same year, with the primary responsibility of constructing and operating milk processing plants throughout the country.

DAFCO acquired farms from the Government National Ranching Company Limited (NARCO) and private owners. Most of these farms became operational from January 1976. Todate the company has a total of 7 dairy farms and 2 Heifer Breeding Units (HBU). The dairy farms are; Kitulo (Iringa), Iwambi (Mbeya), Malonje (Sumbawanga), Rongai (Kilimanjaro) and Utegi (Mara). The two HBUs are Ngerengere (Morogoro) and Utegi (Mara).

The appraisal phase of the DAFCO project was undertaken by the World Bank in 1974. During this appraisal phase, the World Bank recommended and stressed on the need of highly technical and managerially demanding features of the dairy development project by pointing out that the principal factor of the project was managerial skills which were by then not locally available. The final agreement of the project therefore included the technical assistance component where by professional farm managers were to be internationally recruited to run the large scale farms in the initial stages including three expatriate chief accountants between June 1975 to September 1983.

The functions vested with DAFCO are among others to:

(a) Develop large scale dairy farming in the country in order to meet the ever increasing demand for milk and milk products and thus reduce the volume of imported milk;
(b) Supply breeding stock (bulls, cross bred and pure bred heifers) to the national herd;
(c) Increase the contribution of the dairy sector to the national economy and improve the nutritional standards of the rural areas;
(d) Increase employment opportunities for the nation;

Although Tanzania has the natural advantages that favour dairy farming and a strong tradition of cattle husbandry, the production performance of DAFCO farms in general has been unsatisfactory. Total milk production increased from 1.2 million litres in 1976 to 4.6 million litres in 1982, after which, it decreased progressively. The same trend is also observed for the average milk yield per cow per day which increased from 6.0 litres in 1976 to 7.7 litres in 1982, and dropped thereafter (Mwakatundu and Masanje, 1984). This production performance is most likely to continue for the near future, if nothing is done to rescue the situation(Mwakatundu and Masanje,1989).

1.3. The Problem Statement

Since its inception in 1975, and when it started operations in 1976, DAFCO has been obliged to sell all its milk to TDL milk processing plants. This was through the Government directive of the parent ministry, then Ministry of Agriculture and Livestock Development (MALD). Following this arrangement, TDL had the sole right of collecting and grading all milk from DAFCO (and other producers) and effect payments according to grades it determined. This was one of the ways through which Government intervened in the

operations of the dairy company. This is what is referred to as state intervention in this study.

The other form of intervention, coupled with the fore mentioned, and which is more serious and sensitive , is milk pricing. Prices of milk were solely controlled by the Government (especially for parastatals). Usually MALD used to announce the prices at the beginning of every financial year. A provision was made for the setting of "Pan Territorial" milk prices in the annual local products price review in July. The "Farm Gate" producer price was arrived at after taking the cost of production from state dairy farms into consideration. To these were added an operating margin of between 10 and 15 percent to allow for the possibility of some build up of farm development capital. The "Factory Door" price included a margin over Farm Gate price to cover transport cost. These prices (Farm Gate and Factory Door) were the highest prices TDL was obliged to pay for milk purchased from all kinds of producers (MDB, 1989).

Price setting, unfortunately, however, was not carried out on a regular basis. In fact, the last official price was set in 1984 and was followed by a series of interim rises in 1986, 1987 and 1988 pending a full review which was never made (MDB,1989). Due to the fact that, these prices took long time to be reviewed, they were in most of the times far below the open market prices(MDB,1989). For example, in 1988 while Government controlled prices at the factory door was Tsh 25/50 and farmgate price was Tsh 23/= per litre, in places such as Dar-es-salaam, Arusha, Kilimanjaro and other areas that have hire incomes and denser population, open market prices ranged from Tsh 45/= to Tsh 60/= per litre (MDB, 1988). However, in areas where cattle numbers per head of population are high, and road

communications are poor, milk prices were considerably below the official price level eg. in Mara region.

The Pan_Territorial price was abandoned in 1988, and instead official producer prices of milk are currently set regionally by committees under the chairmanship of regional price commissioners. The cost of milk production of state and larger private dairy farms within a Region forms the basis on which the prices are determined.These prices however are still set below the open market prices(MDB,1989). DAFCO is yet bound to sell its milk at these regional prices. Each DAFCO farm, therefore,is obliged to sell its milk at the prevailing respective regional prices.

State intervention is also demonstrated in fixing prices of breeding heifers and bulls which are alternative sources of income to DAFCO.

The Government also intervenes in the planning process of the company. This is evidenced by the fact that, all company development plans, proposals and budgets have to be forwarded to the parent Ministry (MALDC) for scrutiny and approval. The state is also involved in monitoring and evaluation of company operations as it should be supplied with progress reports of farms on quarterly and annual basis.

The top management of the company is also dictated by the state. The chairman of the Board of Directors, which is the top most management organ in the company,is appointed by the President of the United Republic of Tanzania, and Board members are appointed by the Minister of MALDC. The General Manager, who is the chief executive of the company is also a presidential appointee, while the top management of the

company is employed and confirmed by the Board of Directors. The Chairman and his Board of Directors have to see to it that, Government interests in as far as policies, objectives and goals of the company are concerned, are fulfilled. This is regardless of any economic impact they might have on the performance of the company.

Intervention by the Government is also in the form of salaries and conditions of service of staff in parastatal organisations being set and examined by the Government through the Presidential Standing Committee on Parastatal Organisation (SCOPO). The members of this committee are also appointed by the President.

These Interventions by the Government, i.e. obligation of DAFCO to sell all its milk to TDL, fixing of prices of milk and other products, appointment of its top leadership and determination of salaries and conditions of service of staff employed in these parastatals, are considered by the author to have been and continue to be detrimental to the wellbeing of the company operations.

1.4. Objectives of the study

The main purpose of the study is to analyze the effects of state interventions in the production of milk and other dairy products in DAFCO farms. Specific objectives of the study include the following:

(a) To describe the milk production trends, marketing and pricing arrangements;

(b) Analyze the effects of Government intervention policy on the performance of marketing and pricing of milk;

(c) To determine alternative marketing and pricing

arrangements of milk and other products (heifers and bulls) from DAFCO farms;

(d) To develop a dairy subsector policy in marketing and pricing;

1.5. Organisation of the study

The whole study is organised into six chapters. The first chapter is the introduction which discusses the background information on the country's economy, the livestock sector, the place of dairy sector in the economy and the problem and objectives of the study. Chapter two presents the theory of public enterprises and the conceptual framework of state intervention. The third chapter presents the literature review, while chapter four gives the methodology. Chapter five details the presentation of results and their discussion and chapter six presents the summary of main findings and policy recommendations.

CHAPTER II

2.0 THEORY OF PUBLIC ENTERPRISES AND CONCEPTUAL FRAMEWORK OF GOVERNMENT INTERVENTION

2.1 Introduction

This chapter gives the theory of public enterprises, its range of activities, definition, genesis and origin. It also provides the conceptual framework of state intervention.

2.2 Theory of Public enterprises

Public enterprises differ from private enterprises from the ownership in a simple point of view. i.e. public enterprises are owned by public authority while private enterprises are owned by private authority. The major difference between the two, however, is the extent to which the multitude of political and economic determinants influence the respective enterprises. Thus for public enterprises, political factors play a major role as compared to the mainly commercial determinants of the activities in private enterprises.

The differences between public and private enterprises, has necessitated the development of special theory on public enterprises. The consequences of government objectives and constraints for an enterprise that tries to "make the best of it" are the centre of an economic theory of public enterprises. Prices are the best indicators of the consequences of combining such political and economic determinants of public enterprises (Bös,1986).

From the existing literature two theories are known to

exist for public enterprises. These are the Normative theory and positive theory.

2.2.1 Normative theory

This theory states that Public enterprises ought to maximise welfare.

"Normative" means that the application of the respective pricing rules can be justified by some higher - order value judgements as formally expressed by social welfare functions. As "ought" implies "can", normative pricing rules are empirically applicable.

Public enterprises supply both publicly supplied goods, i.e. goods which individuals consume in different quantities and where people who do not pay are excluded from consumption; and public goods i.e. those supplied at zero or low price and therefore everybody gets access to consumption.

Marchand et al (1984) when discussing the normative theory stated rules that a public enterprise should follow if it is concerned with efficiency in the allocation of resources (i.e. Pareto optimality). These rules are that, the public enterprise should:

(a) choose input combination that minimizes its production costs;
(b) price its outputs at their marginal cost of production;

They also gave the hypotheses that need to be fulfilled to validate the two foregoing rules. These hypotheses are related to:

(a) the objectives of the government and the public enterprises:
  - do they share common goals
  - if so, do they care only about efficiency (i.e. the allocation of resources amongst alternative uses) or

also about equity (i.e. the distribution of real income).

(b) the instruments available to government in particular;
- -can it use lumpsum transfers to redistribute income among individuals,
- -can it cover through lumpsum taxes the deficit of a public enterprise caused, for instance, by increasing returns to scale,

(c) the economic environment of public production;
- does the rest of economy behave in a competitive way?
- are the price flexible enough to clear up all the markets, in particular the labour market?

2.2.2 Positive theory

This theory states that Public enterprises maximize particular managerial or political objectives. "Positive" means that the respective objective functions are meant as an actual description of economic reality. Pricing rules of this positive type cannot be justified by means of higher order value judgements. But they are, of course, a good basis for an analytical investigation of actual public pricing policy.

The basic view of public enterprises adopted here is that it is a type of firm which seeks to act in the interests of those who work in it - its managers and its labour force - subject to constraints arising out of market conditions, technology and government control (Marchand, et al 1984).

This view adopts a setting in which managers, government, labour, consumers, may have conflicting interests and targets of which the public enterprise should achieve.

2.2.3 Socialization of commodities

Public enterprises operate within the framework of what in known as socialization of commodities. A commodity is defined as socialized if every consumer is given the opportunity of equal access to the consumption of the good or service regardless of his income or wealth. eg. medical treatment, primary and secondary education or universities.

The means of socialization are low price or zero price policy and sufficiency of quantities supplied. Government may establish public enterprises and oblige them to meet demand at very low or zero prices. e.g. museums, schools and universities. Alternatively production may remain in private hands, but government purchases the goods and reallocates the supply to consumers or consumer purchase commodities, government pays subsidies either to private producers or consumers. the financial means for the necessary subsidization come from general or special taxation.

Socialization gives equal opportunity to equal access. Thus, socialization usually follows an egalitarian objective; e.g. equal education and equal medical care for everybody which are postulates implying:

- a public good component, as a normative concern
- a redistributional objective, so as to avoid worse medical treatment or education for the poor
- a merit of want component, so as to achieve certain consumed quantities notwithstanding differing individual preferences.

2.2.4 Range of activities of public enterprises

Public enterprises can be found in almost every sphere of economic activity. However, looking across countries, there are particular areas where public enterprises are more likely to be found than others. These areas are closely associated with supplying essential goods and services, either to industries or directly to consumers. "Essential" means that they cannot be cut off without danger of total or partial collapse of an economy. From allocative point of view, the importance of these goods and services is part of the infrastructure for producers and consumers. From distribution point of view, we stress their importance for providing consumers with necessities of life.

Essential goods and services are almost the same in all countries. Hence, it is possible to present a fairly general basic catalogue of candidates for public enterprises.

The basic catalogue is as follows:

(a) Public utilities include;

- energy, such as electricity, gas, water,
- communication, such as telephone, postal services, radio, television.
- transportation, such as airlines, railroads, traffic, toll bridges, stockyards, refuse collection.

All these industries are publicly priced.

(b) Basic goods industries include activities such as Producing coal, oil, atomic energy and steel.

(c) Finance

Savings banks are often established as local public enterprises, hence their interest rates are public prices.

Public insurance companies are extensively regulated from

rates to terms of policies and the calculation of policies and the calculation of risks and reserves.

(d) Education and Health

We refer to fees at publicly owned schools and universities and pricing of publicly owned hospitals.

2.2.5 Characterization of the means and ways of how government influences the enterprises

The appropriate government authorities may exercise their influence on public enterprisesin different ways. Among them are;

- Directly, by taking entrepreneurial decisions, for instance on prices, on investment programs, or on financing deficits;
- Indirectly, ex-ante, by appointing the enterprises board (in case of partial ownership by appointing enough members of the board to ensure effective control);
- Indirectly, ex post, by criticisms and inquiry as well as by adjudication on disputes with third parties e.g. consumers.

2.2.6 Institutions of public enterprises

The "board" may be thought of as the management of single public enterprise or group of related public enterprises, or as the composite management of the total public enterprise sector.

The "government" will be interpreted as the sponsor department of a single public enterprise, or group of public enterprises, or as a representative govt agency of the public sector.

The principal - agent relationship exisists between the government as principal and the board of a public

enterprise as agent. Government and board should agree upon guidelines which encourage the board to optimize government objectives whenever the board wants to optimize its own interests. e.g. in social welfare maximization. The board has to achieve optimal prices, input and output quantities in the light of social welfare considerations. But will the board have the necessary incentive to act along these lines? Therefore the aim of maximising Social welfare is often entrusted to the government, which in turn will try to implement "incentive - compatible" regulatory rules to induce the board to act according to managerial targets under constraints formulated by government. Special incentives may be introduced.

2.2.7 Definition of public enterprises

The following definition is put forward by the International Centre for Public Enterprises in developing countries (ICPED), (Fernandes and Sicherl, 1981).

2.2.7.1 Conceptual definition

A public enterprise is an organization which is:

- Owned by public authorities including central, state or local authorities, to the extent of 50 percent or more;
- Is under the top managerial control of the owning public authorities, such public control including, inter alia, the right to appoint top management and to formulate critical policy decisions.
- Is established for the achievement of a defined set of public purposes, which may be multidimensional in character.
- And is consequently placed under a system of public accountability
- Is engaged in activities of a business character
- Involves the basic idea of investment and returns

- and which markets its outputs in the shape of goods and services.

2.2.7.2 Statistical definition

With elimination of three variables - i.e. public purposes, financial and social returns, public control, the resultant definition of public enterprises for statistical purposes would emerge as follows:
"A public enterprise is a productive organizational entity which engages in activities of a public character and markets any of its output which is publicly - owned to the extent of 50 percent or more."

2.2.7.3 Definition given by the International Labour Organization (ILO)

Powel, 1987 pointed the following definitions as given by the ILO;
a) Public enterprises are organisations that have primarily economic, but additionally social and political objectives and characteristics which distinguish them from other type of organisations.

b) A public enterprise is an enterprise with a corporate identity, whose capital is wholly or substantially provided by a central or local government authority. The enterprise is accountable to the central or local government, which acts as trustee for the community. The enterprises will have objectives that are primarily economical i.e. it will be engaged in the production and marketing of goods and services, and designed to add wealth to the community. It can also be used as a vehicle to achieve both social and political objectives of the government.

2.2.8 Genesis and origin of public enterprises

Public enterprises could stem from a general public policy approach and may also stem from ad-hoc responses by governments to public pressures.

A basic classification of the genesis of public enterprises, is as follows:

(a) by inheritance; on the date of independence the newly established countries acquired by heritage public institutions and public enterprises set up by the previous colonial regimes,

(b) by historical circumstances; set of private enterprises which were acquired by the state on the departure of their private owners,

(c) by expropriation of the domestic or foreign private sector - This would cover the cases of conscious act of nationalization i.e. the compulsory transfer of the enterprise from the private to public ownership, generally with full compensation;

(d) by acquisition of private enterprises through negotiation; in these cases also there is a transfer of ownership from private to public hands, but unlike the case of nationalization which is through expropriation process, the acquisition through negotiations has an element of business flavour;

(e) by the take over of sick units;
these are cases where a private enterprise on the verge of bank-rupticy or closure is taken over by the state to protect employment or essential production

(f) by state entrepreneurship; in these cases, the state acts as an entrepreneur and creates new productive entities through its own investment.

(g) by expansion, growth and diversification of existing public enterprises; this represents the dynamic aspects

of public enterprises growth and reflects entrepreneurial ability and skill.

(h) by establishment of joint ventures; these are also symptomatic of the entrepreneurial approach, but in these cases the factor of joint entrepreneurship with the private sector is an additional ingredient.

2.2. The Conceptual Framework of State Intervention

The Concise Oxford dictionary of current english (1989) gives the meanings of the words, intervene and intervention as follows:

Intervene (verb)

Of person, party or state:To come between in action;to interfere,interpose; also to act as an intermediary, to take a share in.

Of a thing:to come in or between so as to affect, modify, or prevent a result, action etc.

Intervention (adjectives)

The action of intervening, 'stepping', or interfering in any affair, so as to affect its course or issue. Now frequently applied to the interference of a state or government in the domestic affairs or foreign relations of another country.

The Oxford Advanced Learners' Dictionary of Current English (1990), gives the following meanings:

Intervene (verb)

Of events; circumstances; Happen in such as to hinder or prevent something from being done.

Intervention (adjective)

Instance of interfering or becoming involved, eg.prevent something to happen.

Bibagamba, (1986) pointed that to intervene is to enter into an ongoing system of relationship, to come between, or among persons, groups or objects for the purpose of helping them. He further added that, the reasons for intervention may range from helping the clients make their own decisions about the kind of help they need, to coercing clients to do what the intervener wishes them to do. He argued that, it is the second part of definition that is pertinent to government intervention in agriculture in Africa.

CHAPTER III

LITERATURE REVIEW

3.1. Introduction

Various studies have been undertaken with regard to the effects of state intervention in the performance of public parastatals/enterprises, both in the developed and developing countries.

Specifically this review concentrates on the reasons for state intervention, and for establishment of public parastatals and experiences of state intervention in public parastatals in various countries.

3.2. Reasons/Objectives of State Intervention

Choksi, (1979) when studying state intervention in industrialization in developing countries, pointed out that there are two predominant schools of thought which exist at either extreme. "One school supports the pure laissez-faire market mechanism philosophy as the most efficient means of allocating resources and thereby contributing to economic growth. This argument is based on grounds that governments are political in nature, badly organised and administratively inefficient. The market mechanism and private sector, therefore, should be permitted to bring about the development process. The other school argues that it is the private sector that is weak, unimaginative, risk averse and too traditionally bound to conduct such a monumental effort as economic development. The state should therefore be the prime mover in this process. Thus, detailed central planning, direct controls, ownership and control of the production process, provide the most

effective route to rapid industrialization and economic growth".

The same author, further pointed out that, the justifications given by the state for intervention include reasons that are economic, political and historical in nature and in most countries these reasons are intertwined with one another. Most of the economic reasons are based on a variety of market failures including imperfections in factor markets, the paucity of information and high risk aversion on the part of private entrepreneurs. Thus, public enterprises are created frequently to promote social profit maximization but which are inconsistent with private profitability.

He further said that, "Governments in many developing countries, also choose to own monopolies rather than regulate them to ensure that profits accrue to the state rather than to the private sector". This includes the 'natural' monopolies of the public utilities and other monopolies (or oligopolies) producing tradeable outputs such as fertilizers, steel and petrochemicals. Though in many instances, the private sector is prepared to undertake the risk and invest in the similar industries, yet state ownership and monopoly of these industries exist. This is usually due to the 'commanding heights' [1] justification. This justification is usually tied up with the politics of socialism and the belief that, the state control of the commanding heights is a necessary condition for equitable growth.

Scandizzo and Sakole, (1983) pointed out that, Government intervenes in the market for food for the reasons of

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[1] The 'commanding heights' of an economy are defined as the natural resource and capital intensive sectors of the economy.

equity, efficiency and economic strategy. While Tomek and Robinson (1977) pointed out that, state intervenes in the pricing of farm products to achieve the following:

(a) to Reduce price and income instability;
(b) to improve the allocation of resources;
(c) to Increase self sufficiency in food production;
(d) to raise the average level of prices and incomes and to curb the profit of middlemen;

3.3. Reasons/Objectives for Establishing Public Parastatals

Choksi, (1979) stated that, the main reasons for the creation of public enterprises are many and varied. They are expected to fulfil a number of functions and attain, simultaneously, several social objectives. Public enterprises are created to promote those social objectives or externalities that, in general, would be inconsistent with private profit maximization. Its potential misuse lies in the attempt by the state to use this single policy for multiple, often mutually exclusive, targets or objectives.

He therefore,gave a partial list of the objectives of public enterprises as follows[2]:

(a) Provide entrepreneurial support/substitution;
(b) Control monopolies;
(c) Control commanding heights;
(d) Provide public services;
(e) Earn profits for investment;
(f) Utilise resources efficiently;
(g) Prevent business failure;
(h) Offset externalities;
(i) Train skilled managers;
(j) Increase employment;

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[2] The rank ordering is not intended to be suggestive of priority.

(k) Raise output;
(l) Reduce income inequality;
(m) Promote regional development;
(n) Stabilize prices;
(o) Subsidise necessary commodities;
(p) Set 'mordenization' example;
(q) Earn/save foreign exchange;
(r) Promote primary exports;
(s) Achieve socialism;
(t) Counterbalance power of domestic capitalists;
(u) Increase national self-sufficiency;
(v) Enhance national prestige;
(w) Implement government policy;
(x) Promote national security;
(y) Offset multinationals;

3.4. Experiences of State Intervention in Public Parastatals in Various Countries

3.4.1. Aggregate Study

Gant and Dutto, (1968) conducted an aggregate study of the financial performance of 64 Government owned corporations in 26 countries covering an average period of seven years. The countries included in the study covered the continents of Africa, Asia, Europe and Latin America. The enterprises investigated included, railways, other modes of transport, petroleum, electricity, communications and other enterprises. The results showed that, the performance of these enterprises varied substantially by enterprises and by continent. On the average, however, the profitability excluding depreciation, amounted to 8% of the 'current activity'[3]. Depreciation for the group averaged 24% of

[3] Current activity of the corporation is defined as the average of current revenues plus current expenditures i.e. half the sum of current revenues and expenditures

current activity, resulting in average operating deficit of 16% of current activity. The group as a whole, therefore, did not generate sufficient funds for replacement capital. After taking investment requirements into account, the financial position of the firms showed that on average, for each unit of current activity, the corporations needed 66% of the fund to be provided from external sources, to finance deficits and or investments. The experience of state owned corporations, therefore, showed that a developing country, on the average, can not generate internal funds from the creation of public enterprises. Based on this rather aggregate study, the authors concluded that, "Government-owned enterprises, rather than serving as focal points for collecting resources for their own investment or for other purposes, have generally become a burden on parent Governments". In addition to this aggregate study, specific country studies also tend to paint the same bleak picture as discussed below.

3.4.2 Europe

The Italian public enterprise has over the year aroused increasing international attention. It appears to be a system that is not plagued with the problems common to public enterprises in most countries. It has also been used as a model for state intervention agencies by several countries in Europe. The Italian Institute for Industrial Reconstruction (IRI), was established as a permanent agency in 1937.

This was not based on deliberate nationalisation policy, instead it was an effort to compensate for inertia or unwillingness of private entrepreneurship. It was created as a holding company with widely varying proportions of equity in operating firms across the whole economy. This

was noted according to studies done by Holland, (1972), Sheahan, (1976) and Saraceno, (1971) who found that, the typical feature of the state holding system, is that, it is organised in large-scale multisectoral groups. In this connection, it should be mentioned that, Italy has, by European standards, an industrial structure in which smallscale enterprise groups in private sector is extremely limited. The adoption of joint-stock module has determined the operational criteria for a business - like management of state - held companies. It opened up possibility of private equity participation both as a source of financing and as a means for industrial partnership.

Another characteristic of the system, is that, the state as a whole does not encourage any ideas of sectoral monopolies, nor has it dermacated any permanent boundary lines for public sector activities, instead it lets its enterprises compete with private enterprises in the same sector, applying equal treatment to all of them. Another important aspect of the system, is the group form of organisation which operates on a broad form of diversified sectors, such as manufacturing, service and construction activities. This multisectoral diversity has several advantages which are not open to single sector public enterprise`companies. In the first place, the system is able to diversify into new products and production techniques without overrunning any dermacated limits. It is also able to take advantage of interproduct and intersectoral spread and spin-off effects of innovation at the company level, rather than wait for national research and development organisation or a private enterprise to inform it of its potential. This maximised the innovation potential of the system. As large and diversified groups, they compete successfully on the world market for complex capital projects. Finally, they have also been able to

challenge the dominant positions of multinational groups. This is the scene behind the successful story of the Italian public enterprises.

3.4.3. Asia

In Turkey, the extent of state intervention in the production process is quite extensive. This was especially after the adoption of the policy of 'etatism' or Government intervention in the economic affairs. The studies done by Land, (1971), Schater, and Cohen (1971) and Walstedt, (1975), indicate that the market structure, within which the enterprises operate in Turkey, is essentially non competitive one. A monopoly position of some enterprises by the state, eliminates domestic competition. In addition, high tariff barriers and quantitative restrictions, insulate these corporations from foreign competition. Extra benefits, included tax exemptions, priority on allocations of scarce resources, first claims on foreign currency and priority access to Government credit.

The wage rates are set by legislation, the selection and promotion of managers is subject to state interference. This also extends to the pricing and investment decisions of the firms. Government pricing policies have often resulted into a lower than equilibrium price in the market, with wage rates exceeding market equilibrium. Consequently, profits and returns to capital have been depressed.

The studies also show that, a substantial amount of public enterprise investments, were financed from external sources and by borrowing from the central bank and other public financial institutions. Despite high inflation rates, the public enterprises, were unable to generate surpluses to completely finance their investments, primarily because of

the financial and pricing policies imposed on them.

3.4.4 West Africa

Killick, (1978) when studying performance of public enterprises in Ghana, found that one of the reasons for the poor performance of public enterprises, was Nkrumah's policy of building mass popular support, which lead to the alienation of significant number of educated and powerful elites. This resulted into establishing public projects that tended to be impressive and visible in order to reflect nationalistic aspirations. Although the projects were also used to generate mass employment opportunities, they however, conflicted with objectives of operating a profitable state enterprises. He concluded that, "poor project planning, overstaffing of public firms, corruption and multiple objectives expected of managers, are among the many problems that still continue to plague public enterprises in Ghana".

Studies by Helleiner, (1964a and 1964b) and Teritra, (1966) indicate that, the performance of all three development corporations (Eastern, Western and Northern regions) in Nigeria, has been reasonably poor. Many enterprises have been unprofitable and showed large accumulated losses because they were established without proper evaluation of their viability. This resulted into significant capital write-offs. The losses were attributed to poor management, planning and excess capacity in new plants. The corporations were also involved in loans and joint ventures, which were made under 'questionable circumstances'. The ubiquitous aspect of political patronage has been very dominant and benefit of powerful political figures has been a very important consideration in the poor operation of public enterprises in Nigeria.

3.4.5 East Africa

Until 1971 (when Amin took power) the major corporations in Uganda were Uganda Development Corporation (UDC) and the Uganda Electricity Board (UEB). The performance of these bodies was quite striking. This was noted by Frank, (1971), who considered Uganda's corporations to be good examples of successful use of public enterprises in economic development. In Uganda the public enterprises pattern of profitability, autonomy and exclusion from political interference was set long before independence was achieved. The colonial Government was able to operate such enterprises on 'sound business principles' and it hired skilled managers and manpower regardless of their tribe or political persuasion. This trend of operation continued after independence. The efforts of Government were helped by Asian entrepreneurs who invested their private profits in the commercial ventures of the UDC. The African entrepreneurs, were however, absent from the scene. He concluded, "This Ugandan experience gives the flavour of the economic impact of thoughtless political interference".

3.4.6 Tanzania

Orback, (1985) when doing research on agricultural price policy and incentives in Tanzania, found that, the parastatal marketing system, with the state as a monopsony in terms of crop authorities, has not been a success. Marketing costs of the responsible crop authorities have absorbed a progressively larger share of the revenue from farmers cultivation. It should be said, however, that the performance is undermined by events outside the parastatal control. A big part of, for example, the National Milling Corporation's (NMC) financial problems are brought about by their undertaking of supply of food crops at prices which

the Government finds difficult to increase because the urban consumers demand cheap food.

In the National Food Strategy of 1983, the Ministry of Agriculture stated: ....the main objective of panterritorial prices is to encourage farmers in remote areas to produce more for the market by subsidizing their transport costs. Through this policy, the Government also hoped that income differentials between regions would tend to decrease, and equal regional development attained. Although the panterritorial pricing policy for maize was untenable in the long run, it did achieve its stated goal of "encouraging farmers in the remote areas (Sumbawanga, Ruvuma etc.) to produce more for markets by subsidizing their transport costs".

Panterritorial pricing was not limited to agriculture alone. Later the policy was applied to the factor prices of specified manufactured goods as well in an attempt to alleviate the burden of relatively poor rural people at the expense of relatively better-off urban dwellers (Ministry of Agriculture, 1982).

Jasiorowski, (1986) presenting FAO policy and Tanzania dairy development, pointed out that, domestic market price policies can discourage milk production and marketing in that, when fixing milk prices, Governments have paid more attention to consumer's than producer's interests. He added that, at milk plant level, the situation is aggravated when Government fixes retail prices without having the means to control prices and quality in the private raw milk trade.

CHAPTER IV

METHODOLOGY

4.1. Introduction

This chapter discusses types of data which were collected together with the various methods which were employed in the data collection and analysis.

4.2. Types of Data

Both primary and secondary data were collected for the accomplishment of the study.

4.2.1. Primary Data

In order to carry an analysis that will give answers to the stated objectives, the following data were collected;

Personal consultations and informal discussions were carried between the author and DAFCO top management on the following issues; prices of dairy products (milk, heifers and bulls), sources and financing of company expenditures, the position of TDL as the sole market for all milk produced by DAFCO, accessibility of DAFCO to credit facilities from financial and government institutions, availability of grants and subsidies from the government and other institutions or organizations such as WFP and EEC, involvement of the government in Planning process of the company and in determining top management of the company.

Similar consultations and discussions were carried with the parent ministry (MALDC) authorities on its intervention

role into the affairs of DAFCO such as determination of prices of dairy products i.e. milk, heifers and bulls as well as the marketing channel, planning process and appointment of company's top management. The same was done with top TDL management especially on issues of it being the sole market for all milk from DAFCO and on milk prices it offers.

Personal visits and observations were carried to all DAFCO farms to see the conditions of farm infrastructures such as roads, fences, buildings, farm machinery and equipments, pasture conditions and land utilizations.This involved visits of all DAFCO dairy farms located as follows in brackets; Kitulo and Ihimbu (Iringa), Iwambi (Mbeya), Malonje (Sumbawanga), Ngerengere (Morogoro), Ruvu (Coast), Rongai (Kilimanjaro) and Utegi (Musoma). Other data were gathered from WFP and EEC offices in Dar_es_salaam and other relevant offices.

4.2.2. Secondary Data

These included, time series data on government fixed milk prices, total annual milk production for all DAFCO farms, prices of feed and minimum wage rate, total herd, total number of cows milked, milk yield per cow per day, total number of cows (milked and dry), mortality rates for adults and calves, sales of heifers and bulls and number of machinery and equipments owned by the company.

Other data were on credits, grants and subsidies that have so far been advanced to DAFCO since its inception from various financial institutions (banks and foreign agencies) and the government.

Data on company's audited accounts were collected in order

to be able to establish the financial performance of the company.

Data on the number of recruited foreign and local farm managers and other technical staff showing their respective duties were compiled for each year since inception of the company.

These data were collected from DAFCO, TDL, MALDC, EEC,and WFP offices, Banks (CRDB,BOT), treasury and SCOPO.

4.3. Methods of Data Analysis

Data analysis were handled by using both qualitative and quantitative models.

4.3.1. Qualitative Methods

Most of the primary data and some of the secondary data were analyzed by employing qualitative methods supported by Graphs, bar and pie charts, means, percentages, standard deviations and frequencies.

4.3.2. Quantitative Method

Among all variables which determine the production of milk, and which suffers government intervention to a greater extent, is the milk price.Since inception of DAFCO in 1975, and when it started production in early 1976,milk prices have been dictated by the state and the only marketing channel was TDL. This fact therefore validates employment of an analytical method which will give an indication of how government fixed milk prices influenced milk production in DAFCO farms. This analysis was carried out by fitting up a regression analysis model.

4.3.2.1. Regression Analysis Model

From economic theory, level of production of any commodity is determined by its own price, level of technology, number of firms producing it (producers) and price of other competing commodities.

Mathematically this relationship is represented as follows:

Qm = f(Pm, Po, Te, N, I).....(i)

where,

Qm =Quantity produced of commodity m.
f =function of .
Pm =Price of commodity m.
Po =Price of competing commodities.
Te =Level of technology.
N =Number of firms/producers.
I =Institutional factors.

(a) Specification of Milk Supply Model

For the purpose of the study, milk production level is postulated to be a function of government fixed milk price, price of feeds (dairy meal), minimum wage rate and time trend.

The structural equation is thus:

Qmt = f(Pmt,Pft,Wrt,Trt).....(ii)

where,

Qmt = quantity of milk produced in year t ('000 tons).
f = function of.
Pmt = price of milk in year t, (shs per litre).
Pft = price of feeds in year t, (shs per 50 kg).

Wrt = Minimum wage rate in year t, (shs per month).
Trt = Time trend variable (Tr = 1 for 1976....Tr = 16 for 1990)
t = 1975.....1990 (time span).

From the above equation the following linear model was established.

Qmt = Bo + B1Pmt + B2Pft + B3Wrt + B4Trt + Ut,.....(iii)

Ut ~ N(0,Q2)

where,

Bo = coefficient of intercept.
B1..B4 = regression coefficients to be estimated.
Ut = unobservable error term.
Pmt, Pft, Wrt, and Trt are as explained in the structural model (ii).

This model was estimated by using Ordinary Least Squares method (OLS).

(b) Justification of Variables included in the Model

All independent variables included into the model have some influence on the dependent variable i.e. volume of milk produced.

Price of milk (Pmt), which is fixed by the state, is supposed to be an incentive to producers. Thus increase in price of milk will result into increased milk production, ceteris paribus. Milk price therefore is positively related to milk production. Expected sign of B1 is positive.

Price of feeds (Pft), is important, because, for the cows to produce more milk, they require adequate and proper feeds. Price of feeds is a cost to the producer, therefore, increase in feed cost will result in less feeding and thus less milk will be produced. Price of feed is negatively related to milk production. Expected sign of B2 is

negative.

Minimum wage rate (Wrt), is an important variable, because, activities such as feeding, milking, cattle grazing or herding, fencing and all other manual activities are of crucial importance for better production of dairy cow. These activities are undertaken by the minimum wage earners in the farms. Wages are an incentive to the workers, thus, increase in wages bill will give more incentive to minimum wage earners, which will directly result into increased milk production as a result of better services rendered to the cow. Expected sign of B3 is positive.

Time trend (Trt), was taken to carter for improvement in production techniques (technology) from year to year i.e. 1975-1990. Improvement in production techniques will result into increased milk production. expected sign of B4 is positive.

CHAPTER V

RESULTS AND DISCUSSION

5.1. Introduction

This chapter presents the results of the study and discussion of the results. It starts by giving the description of milk production trend and the current status of production of DAFCO. The financial performance of the company is also discussed. The marketing and pricing arrangements for milk are analyzed and discussed with the purpose of showing how state intervention policy affects them. The results of the regression analysis are discussed and interpreted.

5.2. Milk Production Trend

Total milk production in DAFCO refers to the annual total milk produced in all its dairy farms. The farms include Ruvu, Ihumbu, Rongai, Iwambi, Kitulo, Utegi, Malonje and the then Ngerengere dairy (Now only HBU). In analyzing the production trend of DAFCO, the study looks at the performance of five indicators, that is total milk output, total herd size, total number of cows milked, milk output per cow per day and total number of dairy cows.

Trend of total milk production in DAFCO marks two significant phases of production which are opposite to one another. The first phase of production covers the period from 1976 to 1982. This phase is characterised by ever increasing milk production trend. The second phase covers the period from 1982 up to 1991. This phase is characterised by ever decreasing milk production trend.

During the first phase of production, milk production increased exponentially from the level of 1 220.2 thousand litres in 1976 (when company started production) to 4 570 thousand litres in 1982. In the second phase of production milk production decreased continuously from the highest level of 4 570 thousand litres in 1982 to as low as 2 371 thousand litres in 1991. (Table 5.1 and Fig.5.1) .

From table 5.1, it can be observed that, while milk production between 1976 and 1982 increased by 274.6%, it decreased by 48% between 1982 and 1991. The milk production trend indicates that during its first six years of operation (1976 - 82), DAFCO recorded a remarkable and encouraging milk production trend, but in the next nine years (1982 - 91) this impressive trend was reversed squarely to a decreasing one.

Table 5.1 DAFCO: Production indicators (1976 - 1991)

Indicator/year	1976	1977	1978	1979	1980	1981	1982	% change
1.Total milk production ('000 lt)	1220.2	2295.5	3428.4	4221.7	4571	4258.8	4570.5	274.6
2.Total herd (head)	3553	3972	4976	4864	5216	5305	5364	51
3.Total number of cows milked	585	875	1316	1560	1596	1682	1686	188
4.Milk yield per cow per day(lt)	6.0	7.6	7.4	7.5	7.4	7.4	7.7	28
5.Total number of cows (dry&milked)	1256	1282	1771	2356	2619	2600	2639	110

Table 5.1, continued.

Indicator/year	1983	1984	1985	1986	1987	1988	1989	1990	1991	% change
1.Total milk production ('000 lt)	3909	3571.9	3672.8	3241.8	2937.7	2851.8	2524.1	2585.2	2371	-48.1
2.Total herd (head)	5592	5435	4940	4936	4872	4572	4185	3835	3633	-32.3
3.Total number of cows milked	1638	1547	1516	1495	1493	1302	1125	970	930	-44.8
4.Milk yield per cow per day(lt)	6.9	6.2	6.3	5.4	5.4	5.6	6.3	7.0	6.8	-11.7
5.Total number of cows(milk&dry)	2503	2581	2381	2280	2300	2249	1909	1689	1628	-38.3

Source: DAFCO head office, Dar-es-salaam, 1992.

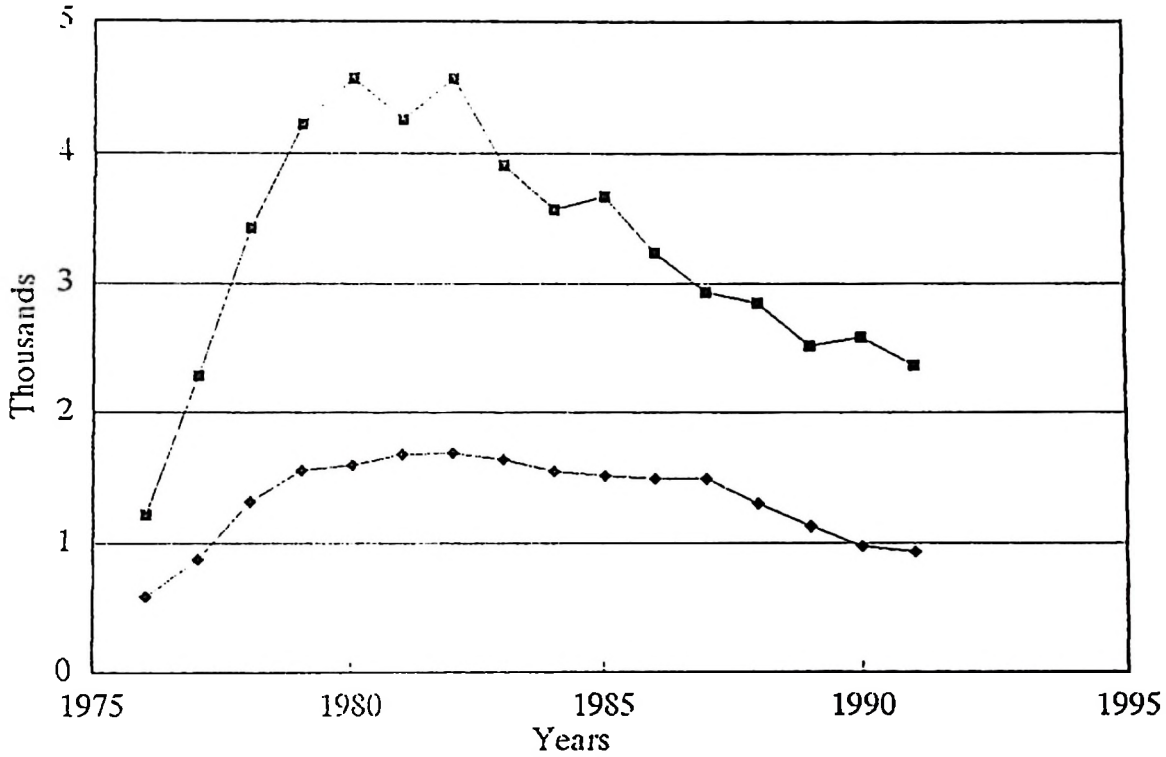

Fig. 5.1 DAFCO:Total milk produced (litres) and total number of cows milked, 19

The same production trend features are evidenced by all other production indicators (with their respective percentage changes in brackets) in the two phases of production i.e. 1976 to 1982 and 1982 to 1991. Total herd increased from 3 553 heads in 1976 to 5 364 heads in 1982 (51%) and then decreased to 3 633 heads in 1991 (-32%), Total number of cows milked increased from 585 heads in 1976 to 1 686 heads in 1982 (188%) and then decreased to 930 heads in 1991 (-45%); milk yield per cow per day increased from 6 litres in 1976 to 7.7 litres in 1982 (28%) and then decreased to 6.8 litres in 1991 (-12%) and the total number of cows (dry and milked) increased from 1 256 heads in 1976 to 2 639 in 1982 (110%) and then decreased to 1 628 heads in 1991 (-38%). These trends are shown in figures 5.2 and 5.3. All these figures show the two phases of production quite distinctively as described earlier above.

The cattle numbers in the farms have been decreasing since inception of the company due to among other reasons, high mortality rates caused by high incidence of diseases and poor feeding systems. Table 5.2 shows that pre-weaning calves mortality rate has increased from an average of 13.2 in 1978 to 18.8 in 1989, while that for post weaning calves increased from an average of 5.4 in 1978 to 9.7 in 1989, and adult mortality rate increased from 6.9 in 1978 to 8.5 in 1989. The ranges for these mortality rates are also quite high, the range for pre-weaning calves mortality is 12% to 20%, post-weaning calves mortality rate range is 5.4% to 20% and that for adults is from 7% to 14%. These mortality rates in all cattle categories are very high compared to their acceptable levels.

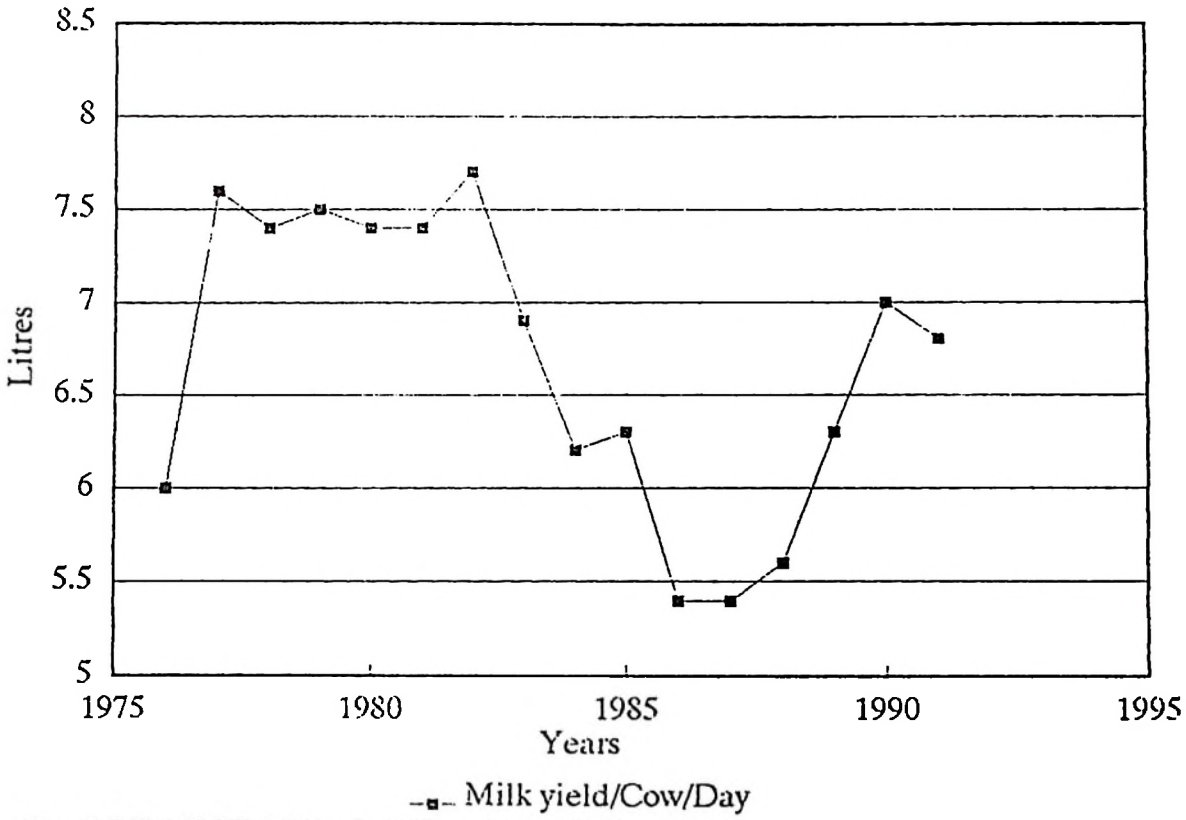

Fig. 5.2 DAFCO:Milk yield/Cow/day, 1976 – 1991

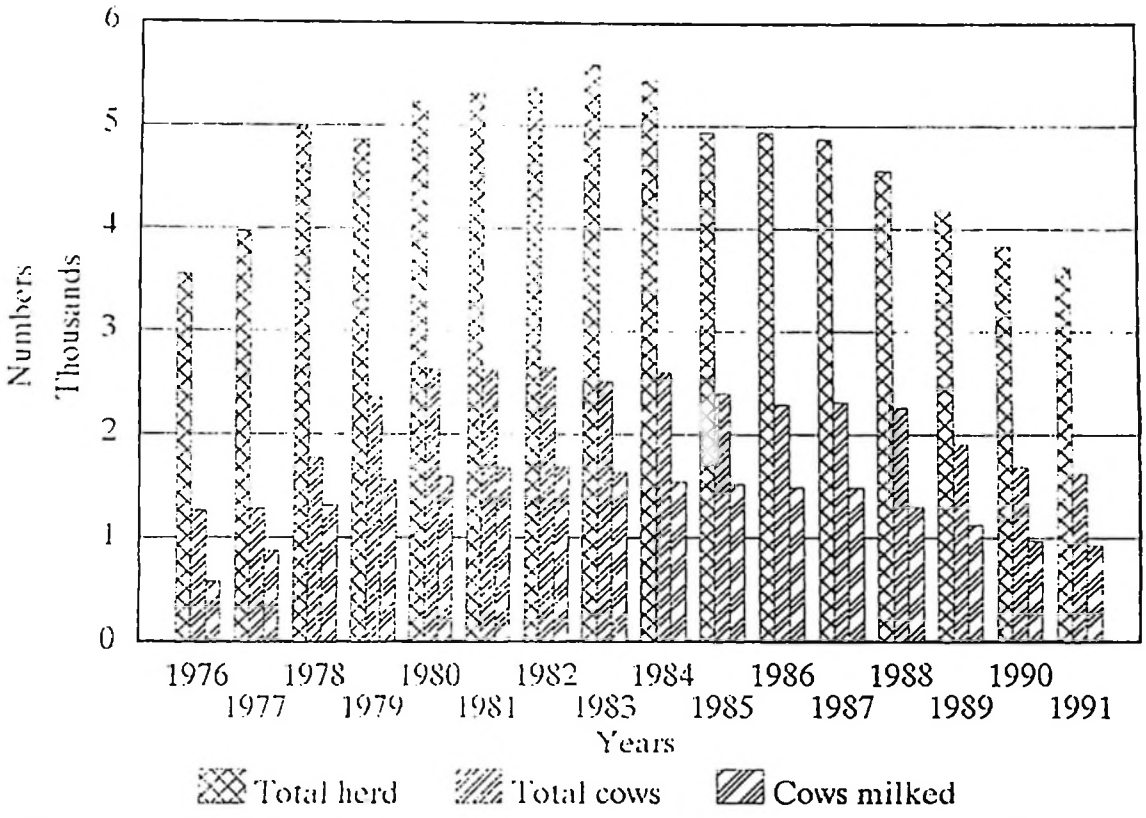

Fig. 5.3 DAFCO:Total herd, number of Cows and total cows milked, 1976 – 1991

According to Payne and Williams (1978) and Mwakatundu and Masanje (1984), the acceptable mortality rate for pre-weaning calves is 10% , and that for post weaning calves is 5% while that for adults is 3% (table 5.2). Therefore, DAFCO's mortality rates are very high compared to the acceptable levels indicating low management levels practised in these farms. This situation has lead to successive decrease in total herd of cattle in DAFCO farms since its inception as indicated in table 5.1.

Table 5.2 indicates that calving rates in DAFCO farms have been more or less constant ranging from 61 percent to 70 percent (with exception of that in 1976 which was 43 percent). These rates are a bit lower than the acceptable level of 70% (op cit).

Table.5.2 DAFCO: Production coefficients (1976 - 1989)

Year/coefficient	Calves		Adults	Calving
	pre-weaning mortality %	Post-weaning mortality (%)	mortality (%)	rate (%)
1976	-	-	-	43.0
1977	-	-	-	66.0
1978	13.2	5.4	6.9	73.7
1979	20.1	11.5	8.2	64.8
1980	15.0	10.8	4.1	61.0
1981	15.2	15.1	10.0	66.0
1982	11.9	11.7	6.4	66.4
1983	11.9	10.6	9.0	67.9
1984	15.6	19.9	13.9	65.4
1985	11.9	15.0	7.3	66.1
1986	12.9	17.5	8.0	61.6
1987	12.6	14.8	8.3	64.4
1988	13.0	13.5	7.1	66.9
1989	18.8	9.7	8.5	60.9
Acceptable levels	10.0	5.0	3.0	70.0

Source: DAFCO Head office, Dar es Salaam, 1992.

Therefore low calving rates coupled with high mortality rates have contributed to decreased total herd size in DAFCO farms as observed above. Decreased herd size was also due to two other factors that is, DAFCO had no pronounced replacement policy for its herd, and that most heifers which were produced in the farms were sold to small scale dairy producers (table 5.3), (this was one of the objectives of the company).

Table 5.3 DAFCO: Heifers and bulls sales

Year	Heifers	Breeding bulls	Total
1976	80	4	84
1977	58	1	56
1978	96	6	102
1979	69	0	69
1980	24	0	24
1981	84	4	88
1982	202	5	207
1983	228	0	228
1984	351	0	351
1985	254	12	266
1986	380	13	393
1987	346	5	351
1988	327	6	333
1989	354	35	389
1990	296	15	311
1991	273	10	283

Source: DAFCO, Head office, Dar es Salaam, 1992

There are several explanations which could be given as the main causes of the milk production situation described above.

The first phase of milk production (1976 - 1982), falls within phase one of the Dairy Development project phase one (DDP1), which was a government designed project aimed at developing large scale parastatal dairy farms in the country. This project expired in 1983. During this period and through this project DAFCO received the World Bank credit which was channelled through the then Tanzania Rural Development Bank (TRDB) at 4% interest rate per annum for 20 years with 5 years grace period. Loans for large scale dairy farms were to be given by TRDB at 8.5 percent interest for 15 years with 4 years grace period. During the first disbursement DAFCO was financed by longterm loans, share capital and grants from various donors as shown in table 5.4 amounting to Tsh 108.5 million.

Table 5.4.DAFCO: Initial financing

Source	Amount (million Shs)
Share capital	59.5
Longterm loan	
(IDA 580TA/TRDB)	17.3
WFP grants	21.7
Dutch government	10.0
Total	108.5

Source: DAFCO head office. Dar es Salaam 1992.

During the whole period of DDP1 DAFCO managed to secure loan and grants worth Tshs 166.85 million from various sources as shown in table 4.5.

Table 5.5 DAFCO: Total financing

Source	Grant/Loan	Amount (Shs)
World Bank	Loan	28 202 292.00
WFP TAN project 2247	Grant	93 092 810.00
Treasury	"	23 532 265.00
EEC counterpart fund	"	6 200 000.00
Government of Holland	"	15 822 482.00
Total		166 849 849.00

Source: DAFCO head office, Dar es salaam 1992.

Therefore during phase one of project, there was a heavy financial assistance to the company. This adequate supply of funds through various sources to DAFCO enabled it to sufficiently finance both investment (capital) and operational (recurrent) expenditures. By using these funds, the company managed to establish good pastures, control diseases, supply adequate supplementary feeds, maintain fences, milking machines, tractors and other equipments. During this period, the company also paid its employees better than now. This was the period when the company had enough funds to cover all costs of the farms. These conditions favoured increased milk production in DAFCO farms.

The other factor which contributed to the increased milk production is the importation of heifers from abroad for DAFCO farms (Appendix. 1). From this appendix it can be seen that in each year fresh heifers of exotic breeds were imported from various countries such as USA, Kenya, New Zealand and Zimbabwe. These heifers were distributed to all DAFCO farms. The Breeds which were imported were crosses of Holstein Friesian, Friesian/Jersey, Friesian/Ayrshire and Ayrshire breed. A total of 2 915 heifers were imported between 1974 and 1982, while 721 heifers and 697 heifers were imported in 1983 and 1985/86 respectively, making a total of 4 333 heifers imported for DAFCO farms. All these

are high yielding breeds of dairy cattle. The importation of heifers for DAFCO farms served both as a source of dairy herd build up and as a replacement stock to the aging cows which the company started with. This move justifies the ever increasing milk production trend observed for the period 1976 to 1982.

The set - up of management (especially at the farms) which existed during this period contributed to the good performance of DAFCO farms observed during 1976 - 1982. During the appraisal phase of the project in 1974, the World Bank stressed the highly technical and managerially demanding features of dairy development by pointing out, that the principal risk factor of the project was managerial skills which were by then, not locally available (Mwakatundu, 1985). The final agreement of the project, therefore, included a technical assistance component where by expatriate farm managers were to be internationally recruited to run the DAFCO dairy farms in the initial stages while the company recruited and trained local managers to take over from the expatriates. DAFCO therefore started running the dairy farms with the help of expatriate farm managers under group farm managers supervision. There were only 4 local farm managers employed by the company in 1976. The farm management was backed up by a team of expatriate technical staff within the then LIDA. The

Accounts department was also headed by an expatriate chief accountant. At the completion of phase 1 of the project (DDP1) in 1983, the company had already developed local manpower to man the management of the farms and by the end of 1984 all farm management posts were localised (DAFCO 1992). From this source a total of 49 expatriate personnel were recruited, including seven group farm managers, 25 farm managers, all being degree holders. Others were agricultural engineers, automobile engineers, chief accountants , dairy husbandry advisers and pasture agronomists all being highly qualified. It can therefore be argued that presence of these expatriate farm managers, which were picked from those who had adequate knowledge and vast experience on dairy production, contributed to better performance of DAFCO farms observed in the period 1976 - 1982.

Better production trend observed during the period 1976 - 1982, can also be attributed to the availability of farm machinery and equipments which were in good working and running condition. Between 1976 and 1983 a total of 40 tractors, 32 vehicles, 16 motorcycles, two caterpillars, 10 milking machines and 120 units of various equipments and implement were purchased (Table 5.6 and Appendix 2). All these machines and equipments were purchased during the period 1976/77 to 1983. The availability of these

equipments made it possible for farm operations such as land preparation and tillage for pasture establishment, preservation of pastures in forms of hay and silage, transportation of feed and milk to markets, to be handled more efficiently and conveniently. This easy operation made it possible for the farms to acquire increased production of milk.

Table 5.6 DAFCO: Machinery and equipment owned

Machinery/equipment	Amount purchased in 1976/77 and 1983	Amount available in 1990	%age of initial amount purchased
Tractors	40	13	32.5
Vehicles	32	11	34.4
Motorcycles	16	0	0.0
Caterpillar	2	0	0.0
Milking machine	10	9	90.0
Equipments/implements	120	62	51.6

Source: DAFCO, Dar-es-salaam 1992.

The contrasting production trend to that explained above, is observed in the period 1982 to 1991. DAFCO being a production unit was supposed to operate its business efficiently so as to be able to earn profits and raise enough funds for financing both its replacement capital and recurrent expenditures. This was not the case for DAFCO, because it was forced by government to sell all its milk to TDL plants and at official fixed price which is lower than open market price. Moreover since 1983, DAFCO faced several problems with TDL as its only marketing channel. TDL had the mandate to grade all milk received from DAFCO. Due to this monopoly there were cases of milk being degraded by TDL and consequently offered lower prices than that expected by the farms. The other problem was that of delayed payments for all milk received by TDL plants from various DAFCO farms. The delays in payments often took several months, sometimes up to six months, very much affecting the financial position of DAFCO farms and consequently their operations. The problem of low official prices is a very serious one for DAFCO as a production unit. The government controlled official prices were very much below the open market prices (section 5.6 and appendix.3). Further more milk pilferage, adulteration and losses in transit from DAFCO farms to TDL plants also signifies the problem of milk marketing. All these problems associated with problems of official marketing and prices

contributed quite significantly to failure of DAFCO to earn any profits and hence to raise enough funds for replacement capital and recurrent expenditures (section 5.4 and appendix 4).

Coupled with the problems of marketing and prices together with stoppage of flow of loans and grants from various donors particularly after expiry of DDP1 in 1983, the company since 1983 was in a critical financial situation such that it failed to accomplish any further development or investment expenditure leave alone the operational or recurrent expenditures. This marked the period of successive deterioration of DAFCO farms in all aspects. Pasture establishment and supply of other feeds were hampered and farm machinery and equipments including other infrastructures continuously deteriorated. As a result cattle number and quality also declined quite significantly. This finally resulted into decreased production performance to todate.

Cessation of importation of heifers from abroad especially after DDP1 in 1983, and failure of getting enough heifers from local Heifer Breeding Units (HBUs) coupled with the government directive that DAFCO had to sell its Heifers to smallscale producers, the company failed completely to replace its stock of dairy cows affecting greatly its total

milk output as reflected in the period 1983 to 1991.

Replacement of foreign expatriate farm managers by locals in 1983 created another problem in the farm management cadre. The local farm managers had low qualifications (mostly diplomates) and limited experience in dairy industry as compared to the expatriates. This management was also recruited and started work at the time when all farm machinery and equipments were old and needed replacement but due to financial problems, this was not done and Consequently they had to work with worn out machinery and equipments. The new management team also entered into business at the time of financial crisis and so could not adequately finance their plans as deemed to be. This team of local farm managers also worked under unconducive pressures from the state. The government through scopo and board of directors, issued a multitude of directives and objectives to be achieved by the 'empty' handed farm managers. These directives (interventions) include, sale of all milk to TDL at official prices, produce and sale all heifers to small scale producers also at official price, scrutiny of all plans and targets of the company by the parent ministry who also set goals and targets to be achieved by the company. Intervention by these higher authorities was so critical that company management and those of farms was confused as to what to do

in order to achieve the targets. These interferences gave no chance for the company and hence the farms to have their own concrete plans and targets to achieve. Therefore change in farm management coupled with these problems contributed into a decreased production trend observed in the period 1983 to 1991.

Deterioration of farm machinery and equipments is another factor which affected the production performance of DAFCO farms. These farms have very old trucks or lorries to transport milk to markets and feeds and farm inputs to farms; tractors were too old to carry out pasture establishment activities, other farm equipments were also very old or grounded (Table 5.6 and Appendix 2). According to this appendix, there were only (with their percentage to the initial number bought in brackets), 13 tractors (32.5), 11 vehicles (34.4), 62 units of various equipments and implements (51.6) with no motorcycles and caterpillar. Nine or (90%) milking machines are still operating though in bad conditions. Frequent and constant maintenance and repairs of these machines and equipments brought unpreceded high costs to the farms. Many activities in the farms are hence not handled efficiently. The end result is decreased milk production.

Mwakatundu, (1985 & 1986), summarised the major problems of the company in the following statement '.....Though Tanzania has natural advantages that favour dairy farming and a strong tradition of cattle husbandry, it has been observed during the implementation of the project that the principal constraints to the dairy development include the following:

(a) Poor management skills.

(b) Location of high potential areas far away from markets

(c) Poor rural roads

(d) Shortage of dairy stock

(e) Limited milk collection services.

(f) Low milk yield during the dry season due to poor nutrition

(g) Animal health problems

(h) Shortage of inputs, eg. farm machinery and equipments, fertilizers, veterinary drugs etc. due to foreign exchange constraints.

(i) Weak extension services for dairying.

5.3. The Current DAFCO Production Status

Based on the original design and objectives as well as the historic performance of DAFCO, the most outstanding feature of DAFCO's current production in general terms is the

overall deterioration of the main production resources.

In terms of Land utilisation, of the estimated total land owned by DAFCO (48 089 Ha), approximately 7901 ha, or 16.4 percent, are being utilized for productive activities (table 4.7). This is mainly due to the extremely low utilization levels at DAFCO's two largest farms, Kitulo and Malonje. The existing operational infrastructure (roads, buildings, machinery and equipments, pastures and fences) are inadequate to support the minimum requirements of an efficient dairy production system.

Table 5.7 DAFCO: Farms Land Utilization

Farm	Size (Ha) total	developed	Percentage of total
Ruvu	827	350	42.3
Rongai	2 800	790	28.2
Utegi Dairy	2 600	867	33.3
Ihimbu	266	222	83.5
Kitulo Complex	18 500	2 652	14.3
Iwambi	606	400	66.0
Malonje	15 000	400	2.6
Ngerengere HBU	5 090	1 500	29.5
Utegi HBU	2 400	720	30.0
Total	48 089	7 901	16.4

Source: DAFCO head office, Dar_es_salaam 1992.

All current (1991) production indicators are substantially lower than the highest levels actually achieved in the past (table 5.8), providing a clear indication of the overall reduction interms of production resources in DAFCO farms.

Milk production decreased from highest of 4 571 to 2 371 thousand litres (-48%), while milk yield per cow per day decreased from highest of 7.7 to 6.8 litres (-12%), total head decreased from highest of 5592 to 3633 heads (-35%), and milking cows herd decreased from highest of 1 686 to 930 heads (-45%).

The figures included in this table further more, are illustrative of the potential production levels the company achieved, and which could have been sustained if the managerial, genetic and infrastructural resources initially planned and allocated had been adequately maintained.

Table 5.8 DAFCO: Past and current production indicators

Indicator	Unit	Highest level achieved (Year)	Current level (1991)	Percentage change
Total herd	head	5 592 (1983)	3 633	-35
Cow herd	head	2 639 (1982)	1 628	-38
Milking cows	head	1 686 (1982)	930	-45
Calving rate	percent	73 (1978)	61 (1989)	-16
Total milk yield	'000lt	4 571 (1982)	2 371	-48
Milk yield	Lt/cow/day	7.7 (1982)	6.8	-12

Source: Computed from secondary data from DAFCO Head office Dar es Salaam, 1992.

All of the seven dairy farms owned by DAFCO show considerable differences in many respects, including herd size, production and feeding systems, disease incidence and management.

Due to unreliable supply of liquid Nitrogen, artificial insemination has been discontinued on all farms, as a result, year round Natural service is practised which is less reliable due to animal and management related factors. Machine milking is practised in all farms except for Malonje farm where hand milking is practised, however the latter is usually done when milking machines are out of

order. Lack of milking machine spare parts and proper maintenance usually result in low milk output, mastitis and poor milk quality in those farms where machines are used.

Feeding systems are predominantly based on direct grazing of cattle on natural forage species, although improved pastures have been grown on some farms. Forage availability is almost entirely dependent on seasonal conditions, with only little conservation of forage for the dry season. Due to lack of enough fencing and hence lack of security and long distances to milking sheds, grazing of cattle is very poor as well as insufficient to meet the nutritional requirements of milking cows. Forage grazing also needs to be supplimented with variable amounts of concentrate feeds, but it has been found that the volume, quality and frequency of concentrate feeding for each farm is very much dependent on availability of operating funds, rather than the actual requirements of the herd.

Distinct differences exist between farms in terms of disease causes, challenge and impact. Despite of the development of comprehensive prevention and control programs, mortality rates on most farms continue to be unacceptably high, and hence a primary factor to the overall decrease/deterioration of the cattle herds. According to 1989 mortality figures, parasitic diseases

caused 12.6%, pneumonia 11.9%, undernutrition 11.7%, calf scours 11.5% and tick - borne diseases 6.9% of which together are responsible for over 50% of total deaths in DAFCO farms.

5.4. Financial Performance of DAFCO

DAFCO depends on its dairy farms and Heifer Breeding Unit (HBUs) as its main sources of income through sales of milk, heifers, bulls, cull cows, and meat. In the past DAFCO owned piggery project (now closed down) and hence pigs and pork were other sources of income. The Head office in Dar es Salaam owns a godown, vehicle workshop and a drugstore (now closed) which all serve as other sources of income.

The financial status of DAFCO since it started operations in 1976 up to 1989 is as indicated in appendix.4. From this appendix, it can be observed that:

(a) Since its inception in 1976, the company has been continuously making losses in all fiscal years, except in 1987 when it reported a net profit of Tshs 23.8 million. This observation suggests that the company has existed in a very weak financial position, given the historical pattern of annual financial losses which in 1989 totalled in excess of Tshs 85 million

(financial report and accounts of 1989);

(b) During the period (1976 - 89), total company revenue (Total Sales and miscellaneous income) increased from Tshs 2.77 million (1976) to Tshs 108.28 million (1989), representing an overall increase of 3 808.8%;

(c) Total expenses increased from Tshs 4.1 million (1976) to Tshs 122.1 million, representing an overall increase of 2 878%;

5.5. Milk Marketing Channels

In Tanzania milk is sold mainly through two major marketing channels. These include the official marketing channel and the open market channel.

The official marketing channel is one handled through the public institutions or government institution. The only institution in Tanzania which procures milk from various producers is Tanzania Dairies Limited (TDL). This is a public parastatal which owns and operates milk processing plants located in various regions in the country. These regions and towns are Dar es Salaam, Arusha, Mbeya, Tanga, Musoma, Tabora and Utegi. These processing plants are supposed to collect and process all milk produced by nearby

milk producers which include the private smallholder milk producers, institutional dairy units and from all state and public parastatal large scale dairy farms.

TDL is the only formal marketing channel for milk as it adheres to the rules and regulations governing milk hygiene through owning milk processing plants. All milk which is sold to final consumers from TDL processing is hygienically guaranteed.

All milk produced by DAFCO farms through government directive and legislation, is sold to TDL except milk from Ihimbu and Malonje dairy farms which are located in regions where TDL has no processing plants. The then Ngerengere dairy farm (now only HBU) and Ruvu dairy farm delivered all their milk to TDL plant in Dar-es-Salaam, Rongai dairy farm at Arusha plant, Utegi dairy farm at Utegi plant, while Kitulo and Iwambi delivered at the Mbeya plant.

TDL as an official marketing channel for milk is now questionable due to a variety of problems it is confronting. These include low official milk price it offers, poor milk collection services due to bad rural roads, inadequate and old trucks, worn out and old milk processing plants and equipments, which all have lead to stagnating throughput and mounting trading losses. Hence

TDL is now opening way for the open market to take its course. However, the fact that TDL plants are located in towns and not in all milk production areas, a lot of milk produced in distant rural areas and places where there are no plants, gets its way through the open market channel.

The open market channel is the most predominant one through which the majority of milk producers sell their milk. Since most of the milk produced in Tanzania comes from the traditional livestock producers, a lot of it is sold in local markets which are near to the producers such as village markets and nearby townships.

Given the current level of milk production, and also due to consumer preferences for full cream fresh milk, many milk producers sell their milk direct to consumers especially in the urban and densely settled areas where they fetch higher prices compared to official prices, while others sell to middlemen who are able to collect and bring sizable amounts to the urban markets, and sometimes to commercial manufacturers. The buoyant open market for fresh milk is responsible for the marked increase in improved dairy animal numbers in the country (MDB, 1988 and 1989), and given commercial viability of dairy enterprise this trend will accelerate.

5.6. Milk Pricing Arrangements

Milk prices in Tanzania are determined in two ways, There is official price for the official marketing channel and the open market price for the open market channel.

Official 'pan territorial' milk prices in the past were set at the annual local products price review meeting in July each year. These prices were announced by the then Ministry of Agriculture and livestock development.

The method used to determine these prices was known as cost plus pricing. Under this method, there are two types of prices, farm gate and factory door prices. Farmgate price is arrived at after taking the cost of production from state dairy farms into consideration. To these were added an operating margin of between 10 and 15 percent to allow for the possibility of some build up of farm development capital. Whereas, the 'factory door' price includes a margin over 'farm gate' price to cover transport cost. TDL consumer prices were determined by adding the company operating margin to cover costs and capital margin.

Price setting however, was not done regularly. In fact the last official price was set in 1984 at sh 9.30. This price was to run for six months until January 1985 when it was

recommended a further review would be carried out, with all subsequent reviews to follow the calendar year. This however did not materialize.

The price of sh 9.30 operated until November 1986 when an interim rise to sh 16.50 was allowed. This was followed by an increase to sh 25.50 in July 1987 followed by another rise to sh 28.50 in early 1988.

The controlled pan - territorial price setting was abandoned in 1988 and since then official producer prices are now set regionally by committees under the chairmanship of regional price commissioners. The method used to arrive at the price per litre, takes into consideration the costs of production for the state and parastatal dairy farms as well as private dairy farms as a basis on which the price is determined. On top of these costs a 10 to 15 percent margin is added to arrive at a farm gate price. These prices vary from one region to another. However these prices are ignored by producers in favour of open market prices.

Before decontrol of the official pan territorial prices, DAFCO used to sell all its milk at government fixed prices. As of 1989 todate, the prices of milk for DAFCO farms are those established through negotiations with their

respective regional price committees. This procedure requires farm managers to prepare cost of production proposal for their respective farms and present it to the regional authorities for decision making. These regional prices, according to draft of 1990 and 1991 accounts (not yet audited and approved) as presented in appendix 4, have enabled the company (DAFCO) to recover its historic cumulative loss making trend by recording net profits of Tsh 73.9 and 20.5 million respectively. These encouraging results show how liberalised prices can lead into profit making trends, and thus give much promise with the open market prices. Though these prices are better of as compared to the pan territorial fixed prices are still lower than the open market prices existing in the respective areas. Therefore though these prices have given relief to DAFCO financial accounts, they are still controlled prices and are lower than the open market prices. This procedure of regional pricing, therefore still denies DAFCO an autonomy to exploit the market forces of supply and demand.

Official producer prices however are useful for planning and budgeting purposes, but lack the backing of most producers because they do not change with the market forces (MDB, 1990). Thus official prices have not been competitive to attract milk producers. Because of this poor pricing

system less milk is delivered to TDL plants because DAFCO farms failed to make profits.

Open market prices are set and determined according to the forces of demand and supply operating in the particular open market. These prices, therefore differ from one area to another, and as well from season to season (dry and wet). These prices are more responsive to market forces than the official prices (MDB, 1990).

Today open market prices are the ones which are dominating the milk market in the country since most of milk produced in the country by the private sector is disposed off through the open market channel. For this matter private smallscale and large scale milk producers have been benefiting from these prices more than parastatal milk producers (including DAFCO) who have to sell through the official producer prices.

5.7. Regression Analysis

The aim of the analysis is to find out how government intervention on prices affect the production performance of the state dairy farms.

The regression analysis model was estimated by using

ordinary Least Squares method (refer section 3.3.2.1.). This was done by changing all the prices of milk and dairy meal (feed) and the wage rate from current (Nominal) level to real (constant) prices (1985 = 100), (appendix 5).

This model was expressed in logarithmic form as follows:

$LQ_{mt} = C + LRP_{mt}+LRP_{ft}+LRW_{rt}+LT_{rt}$.....(i)

where R = refers to real prices and the rest as in equation (ii) in section 3.3.2.1 and L = Logarithm of

The results of this model are as follows:

Number of observations = 15

variable	Coefficient	Std. error	T.stat	2 tail sig.
C	6.915	1.569	4.407	0.001
LRP_{mt}	-0.845	0.165	-5.119	0.000
LRPft	-0.206	0.108	-1.895	0.087
LRWrt	0.4314	0.188	2.291	0.045
LTRt	0.693	0.121	5.735	0.000

R^2 = 0.914

Adjusted R^2 = 0.8759

The model (i) is represented as follows:

$LQmt = 6.915 - 0.845LRP_{mt} - 0.206LRP_{ft} + 0.431LR_{wrt} + 0.6931T_{rt}$

.....(ii)

From model (ii) the constant 6.915 implies that if other factors i.e. price of milk, prices of feed, wage rate and Trend variable were kept at zero level, milk production will be at the level of 6.9 thousand litres annually in DAFCO farms.

The negative sign in the price of milk does not conform to the economic theory, that increase in price of milk will lead into increased milk production. According to this analysis, when price of milk increase by Tshs 1/lt, then production of milk will decrease by 0.845 thousand litres. This result could be explained by the fact that, public parastatal dairy production system was not operating on commercial basis i.e. according to market forces of supply and demand,therefore it was taken as a social activity which was not necessarily for profit making. This is due to the fact that DAFCO was forced through government legislation to sell all milk it produced to TDL and at unconducive low state controlled milk prices, which consequently couldn't allow the company to cover its production costs and realise profits and hence be able to build-up capital for reinvestment.

In order to confirm the effect of government intervention on the input-output relationship, one would have used "open" market prices, by removing all apparent subsidies,

and rerun the model afresh.The results would have given more explanation on this relationship, but this was limited by non availability of "open-market prices" (except for years 1987/88 through to 1989/90 as shown in appendix 3).

The other explanation to this result is on the serious bottlenecks experienced on milk production capacity especially in the period between 1982 and 1991. During this period total milk production decreased continuously from the highest of 4 571 to 2 371 thousand litres. The identified bottlenecks include:

-Ceasation of financial assistances in form of grants and loans from both foreign and local institutions. These funds were essential in financing both operational and investment costs;

-Ceasation of importation of potential heifers. These were essential for replacement of existing old stock of cows;

-Replacement of foreign farm managers by the local ones, who didn't have enough qualifications, knowledge, skills and experience to manage the already problematic large scale dairy farms;

-Wornout farm machinery and equipments due to lack of adequate funds to procure the new ones. This contributed greatly to non efficient farm operations leading to deterioration of farms(these bottlenecks are discussed in much details under chapter 5).

This result therefore supports the case against government intervention which protects public parastatal firms to direct competition and thus make them not sensitive to market signals. This situation leads to resource misallocation. The actual relationship between milk price and volume of milk produced is as exemplified in fig.5.4 and appendix 5. The results have also shown that price of milk is a very significant (at 0.05 significance level) variable in the model and thus it is a substantial prerequisite for milk production. What is needed is for the prices to be made more realistic and competitive.

The negative sign in the price of feed conforms to what is implied in economic theory. This indicated that if price of feed is increased, milk production will decrease. The results have shown that, if price of feed is increased by Tsh 1/50 kg, then this will result into decreased milk production by 0.21 thousand litres. This is due to the fact that increase in price of feeds adds to the total costs of production and thus leads to decreased production. The price of feed has also been found to be significant at 0.05 level in explaining or determining the milk production.

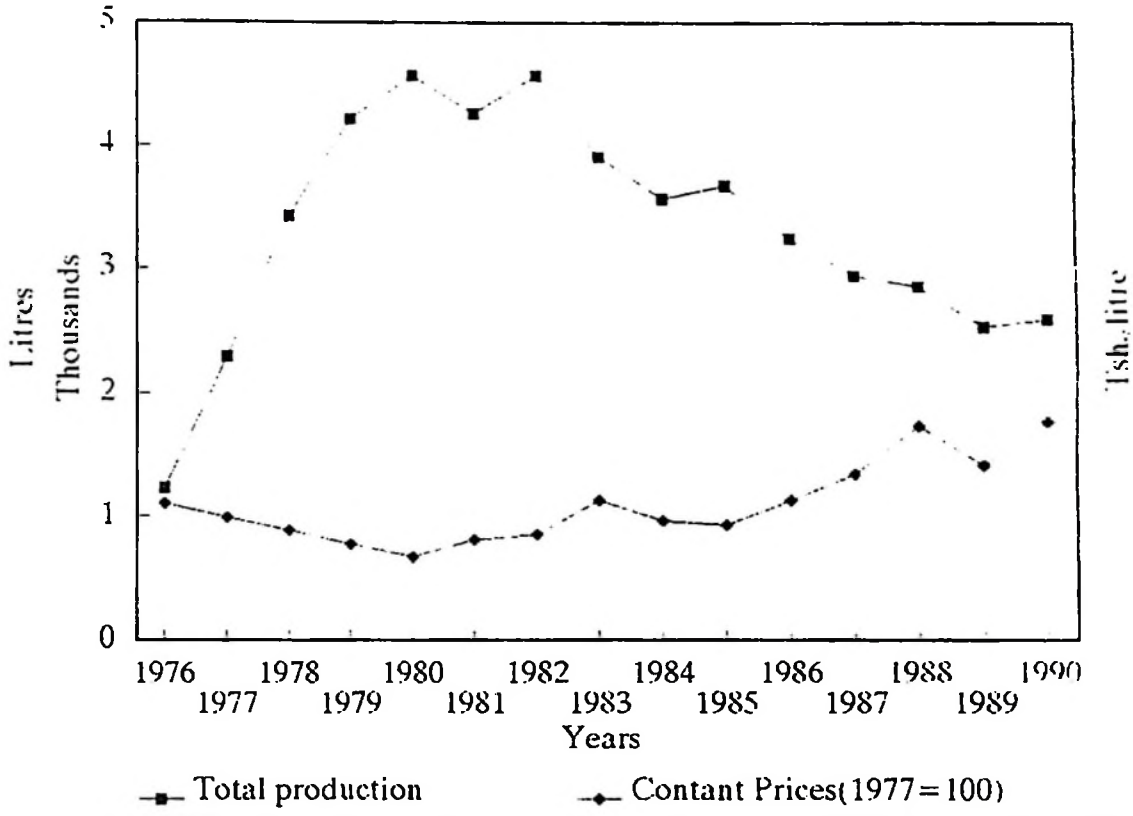

Fig.5.4 DAFCO: Total Production of milk and Constant milk Prices, 1976–1990.

The positive sign in the minimum wage rate variable conforms to what is implied in economic theory that, wages act both as an earning of living and incentive to workers, therefore if increased definitely the workers will work hard and thus increase production. From the results it is indicated that increase in wage rate by Tsh 1/month to one worker, will result into increased milk by 0.431 thousand litres. The wage rate has also been indicated to be significant at 0.05 level in determining milk production.

The positive sign in the trend variable also conforms to the economic theory, in that with time, improvement in level of technology of production results in increased milk production. Results show that unit change in trend variable by one year, results into increased milk production by 0.69 thousand litres annually. The trend variable has also been found to be very significant at 0.05 level in explaining and determining milk production.

The value of adjusted R^2 = 0.8759 indicates that, all variables included in the model explain 87.6 percent of the total variation in milk production. This shows that these variables (price of milk, price of feed, wage rate and trend variable) are of very important and significant considerations for milk production.

CHAPTER VI

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

6.1. Introduction

This chapter presents a concise summary of the main findings and policy recommendations according to the set objectives of the study.

6.2. Summary of main findings

The study aimed to find out the effects of state intervention on the performance of public parastatals in Tanzania with special reference to Tanzania Dairy Farming Company (DAFCO). Specific objectives were to:

(a) Describe the milk production trends, marketing and pricing arrangements;

(b) Analyze the effects of government intervention policy on performance of marketing and pricing of milk;

(c) Determine alternative marketing and pricing arrangements

of milk and other products (heifers and bulls) from DAFCO farms;

(d) Develop a dairy subsector policy in marketing and pricing;

Data for the study were obtained mostly from various institutions especially DAFCO head office and the farms. Other institutions are the CRDB, WFP, Treasury and TDL. Data which were collected include; official and market milk prices, quantity of milk produced, loans and grants, farm machinery and equipments, financial accounts, sizes of various farms, prices of feed and minimum wage rate, number of imported heifers and number of both foreign and locally recruited farm management personel.

Data analysis, was carried out by use of both qualitative and quantitative methods. Thus tools such as percentages, proportions, graphs and tables were employed to support the qualitative analysis. The rigorous quantitative method employed was the regression analysis, where quantity of milk produced was regressed against explanatory variables i.e. prices of milk, prices of feeds, minimum wage rate and the trend variable in order to determine quantitatively the

impact of government intrevention on milk pricing.

6.2.1 Findings of the study

Given the set objectives of the study, the following findings give answers to these objectives from which policy recommendations are deduced.

The findings of the study are briefly summarised as follows:

6.2.1.1. Production performance

Milk production trend in DAFCO was found to be made up of two contrasting phases. Phase one consisted of ever increasing trend of milk production between years 1976 to 1982. Whereas, phase two is characterised by a decreasing trend of milk production up to 1991. Various reasons for these trends of production were provided. For phase I trend of milk production, the following reasons were given; (a) the availability of funds in the beginning years, from various institutions such as WFP, World Bank, Holland Government and Dutch government, and from the Local banks such as CRDB, NBC, and the treasury and the parent ministry; (b) the importation

of potential heifers of various breeds and countries of origin; (c) recruitment and employment of experienced expatriate farm managers and (d) Availability of new and working farm machinery and equipments. However reasons for decreasing milk production trend in the second phase were essentially the opposite of the above. These include the cessation of flow of assistance funds from various institutions; cessation of importation of heifers, unconducive state controlled low milk prices which didn't allow for capital build up, worn out machinery and equipments, the other was the replacement of foreign expatriate farm managers by the local ones, who didn't have enough experience, knowledge and skills, and that they received the farms which were already problematic.

The current production status of DAFCO was also presented. The current production levels are lower and different from the original design and objectives of the company. Main production resources, particularly livestock (both numbers and production potential), infrastructure, land utilization and production schemes were found to have deteriorated. Total milk production decreased from highest of 4 571 to 2 371 thousand litres (-48%), milk yield per cow per day decreased from highest of 7.7 to 6.8 litres (-12%), total herd

decreased from highest of 5 592 to 3 633 heads (-35%) and milking herd decreased from highest 1 686 to 930 heads (-45%). Total area for all farms is 48 089 hectares but only 7 901 hectares (16.4%) have been developed.

Financial performance of the company was also presented; where it was indicated that since its inception in 1975 and when it started production in 1976, DAFCO has been continuously making losses in all fiscal years, except for 1987 when it reported a net profit of Tshs 23.8 million. However cumulatively the company still continues to make losses in all years.

6.2.1.2. Government Intervention

The only marketing channel for DAFCO products since its inception is TDL. DAFCO was directed by the government to dispose all its milk to TDL and due to this directive, all milk after being milked was the property of TDL. This lead to problems of milk degrading and offer of low prices, delays in payments, poor milk collection services, which all resulted in inefficient operations on the part of DAFCO due to lack of operating funds.

The pricing arrangement which existed was that set by the government for all products of DAFCO i.e. milk, heifers and bulls. The government fixed price despite being low compared to open market price, was rarely reviewed to match with market changes. These low prices contributed to DAFCO's loss making trends observed in all years except 1987. These prices also lead to unavailability of both adequate investment and operating funds. However, Real prices were found to be sharply decreasing from 1976 to 1980, after which they increased steadily up to 1990.

The results of regression analysis showed that milk price was found to be negatively related to quantity of milk produced which is contrary to economic theory of supply and demand that if price of a commodity increase then its supply should increase. This result has shown that milk production in DAFCO farms was not induced by the market forces of direct competition among firms, instead it was protected through government intervention which made it not responsive to market signals i.e. price of milk. All other variables which were included in the model i.e. feed price, wage rate and trend variable were found to have the right signs according to economic theory and were significant at 0.05 level in determining the production of milk with explanation power

(adjusted R2) of 85.6%.

Therefore it can be concluded that the intervention policy of the state in the production, marketing and price arrangements of DAFCO has played a significant role in getting the company in its present deteriorated production state. This is so, because all decisions on production, marketing and pricing were undertaken by the state and its organs. The end results of these interventions has been poor production and financial performance of DAFCO as found in this study. Consequently the government has never received any dividends from the company due to cumulative financial losses the company has been making, and instead the government has been forced to provide subvention funds to the company indefinitely and arbitrarily.

6.3. Recommendations

In order for DAFCO to have full autonomy in its production, marketing and pricing decisions, government intervention in the affairs of the company should be eliminated. The role of the government should be limited to be regulatory. DAFCO should therefore consult the parent ministry and the government in cases of crucial needs such as request for financial assistance from foreign agencies and governments,

where government to government communications are necessary.

For DAFCO to operate in sound economic and business conditions, it is recommended that:

(a) Production policies, objectives, plans and strategies should be left to DAFCO management to decide according to their priorities and resources available to it;

(b) DAFCO management should for the success of the company, make use of the open market for sales of its products (milk, heifers, bulls etc) in order to exploit the competitive situation with other dairy producers including imported dairy products. This competitive market environment is going to increase production efficiency. Pricing arrangements for the company's products should also be dictated by the open market. These prices should be those established through forces of demand and supply in order to be competitive. In this way the company can be in a position of making profits because it will be buying (inputs) and selling (products) in the same market (open market);

(c) Funds and hence financial sources have been found to be

limiting factors to the development of DAFCO farms. This has lead the company failing to accomplish sufficiently both its investment and operational expenditures. DAFCO management should therefore seek for funds from both internal and external financial sources in forms of grants and or loans. The assistance of the government through its parent ministry (MALDC) should be sought for this matter. When these funds are available should be strictly used for the activities they were intended and applied for. DAFCO should also seek for both internal and external joint ventures who are more liquid and so be able to offset company's liquidity problems. DAFCO management should also be keen in controlling its expenditures so as to be able to save its funds generated from the sale of its farms' proceeds (milk, heifers, bulls and others) in order to finally build its own capital base for future investment and operations;

(d) Cattle numbers have been found to be decreasing since inception of the company. This has been found to be due to high mortality rates in both cattle categories (calves, weaner and adults). These deaths have been found to be due to diseases and poor feeding practices, which are basically husbandry problems. DAFCO management

should therefore take measures to improve its husbandry practices at farm levels. These include, provision of sufficient and balanced feeds (grasses, concentrates, legumes, oil cakes, mineral and vitamin premixes), conservation of feeds in forms of hay and silage for use during the dry season, take proper control and treatment measures of diseases, provide better and clean housing and finally handle properly all routine activities;

(e) Technology has been found to have strong bearing on production of milk. It is therefore important for DAFCO management to improve and develop technological aspects in the farm levels. These include use and hence maintenance and repairs of milking machines (including replacement of old ones, buying and installing new ones to the farms where there is none), Use of tractors with mowers and slashers in cutting grass for hay and silage, use of dips and sprayers in controlling ticks, introduction and use of milk coolers in the farms, use of fertilizers and pesticides in pasture production and management and use of modern feeding facilities;

(f) Managerial skills have also been found to be crucial in dairy production. DAFCO management should thus seek and

recruit qualified and vastly experienced farm managers and the upper cadre in the farms. This calls for further training of farm staff;

(g) Farm machinery and equipments have also been found to be a serious limiting factor in dairy farms. This therefore calls for serious efforts to be undertaken to equip all farms with the necessary machines and equipments. Efforts include seeking for assistance from internal and external financial institutions and from its own sources of farm proceeds. These machines include tractors, vehicles, caterpillar, milking machines and motorcycles and equipments include disc ploughs and harrows, mowers and slashers, hay bailers and rakes, trailers and planters;

7.0 REFERENCES

Bibagamba, W. (1986) Government intervention in agriculture in Africa. Nigerian Journal of Economic and Social Studies 8. 55 - 78.

Bureau of statistics (1990) Statistical Abstract. President's office - Planning commission. Dar-es-salaam. pp 195.

Bös, D. (1986) Public Enterprises Economics - Theory and Application. North-Holland, Amsterdam. New-York. Oxford. pp 471.

Choksi, A.M. (1979) State intervention in the industrialization of developing countries. World Bank Staff Working Paper 341. Washington D.C. U.S.A. pp 260.

Cowie, A.P. (1990) The Oxford Advanced Learners Dictionary of Current English. Oxford University Press, Oxford. pp 1080.

DAFCO (1986) Annual Report and Audited Accounts for the Year Ended 31 December 1986. pp 26.

Economic research bureau and Planning commission (1991) Tanzania economic trends, Quarterly Review of Economy Government Printer, Dar_es_salaam Tanzania. pp 79.

FAO (1971) High prices are likely to affect production and demand. Monthly Bulletin of Agricultural Economics and Statics 11. pp 120.

Fernandes, P. and Sicherl,P.(Eds.) (1981) Seeking the personality of Public Enterprises - An Enquiry into Concept, Definition and Classification of Public Enterprises. Report and Papers of an Expert Group of the International Centre for Public Enterprises in Developing Countries (ICPED) in Collaboration with the African Training and Research Centre in Administration for Development(CAFRAD) Meeting. 15 - 19 December 1980, Tangier, Morocco. pp 315.

Fowler, H.W. and Fowler, F.G. (1989) The Concise Oxford Dictionary of Current English. Oxford University Press, Oxford. pp 1258.

Frank, Jr. C.R. (1971) Public and private enterprises in Africa in G.F.Ranis (ed.), Government and Economic Development. New Haven, Yale University. pp 250.

Gant, A. and Dutto, G. (1968) Financial performance of Government owned corporations in less developed countries. International Monetary Fund staff paper 25. pp 154.

Helleiner,G. (1964a) A Wide-Ranging Development Institute. The Northern Nigerian Development Corporation 1949 - 62. Nigerian Journal of Economic and Social Studies,6, 15 - 22.

Helleiner,G.(1964b) The Eastern Nigerian Development Corporation, A study in sources and uses of public development funds 1949 - 62. Nigerian Journal of Economic and Social Studies 8, 20 - 25.

Holland,S.(ed.) (1972) The State as Entrepreneur. Weidenfeld and Nicolson,London.pp 425.

Jasiorowski, H.A. (1986) FAO policy on dairy policy. In: Proceedings of Tanzania/Donor Agency Conference on Dairy Development, Arusha.15 - 20.

Killick, J. (1978) Development Economics in Action. St.Martin's press, New York. pp 355.

Macha,A.M. (1984) Dairy development strategy in Tanzania.

IDRC Manuscript Report on The Protein for Smallscale Production in East and Southern Africa. pp 128.

Marchand, M. Pastieau, H. and Tulkens, H. (1984) The Performance of Public Enterprises - Concepts and Measurement. Proceedings of Conference on the Concept and the Measurement of the Performance of Public Entreprises. Université de Liége, September, 1982. pp 375.

Marketing Development Bureau (1988) Review of Ruminant Livestock Industry, MALD, Dar-es-salaam. pp 127.

Marketing Development Bureau (1989) Review of Ruminant Livestock Industry. MALD, Dar-es-salaam. pp 132.

Marsan,V.A. (1978) The state holding system in Italian deve lopment. A Paper Presented at the Seminar on Private and Public Enterprises in a Mixed Economy. Mexico. pp 45.

Michael carroll and associates Ltd (1990) Evaluation of Agricultural Parastatals, Final draft report vol.2. pp 62.

Ministry of Agriculture (1983) National Food Strategy. Government printer, Dar-es-salaam. pp 138.

Ministry of Livestock Development (1983) The Livestock Policy of Tanzania. Goverment printer, Dar-es-salaam. pp 37.

Mpelumbe,I.S. and Herdley B.R. (1978) Contribution to small scale dairying. In: Proceedings of 5th Scientific Conference of Tanzania Society of Animal Production. Arusha,Tanzania. pp 168.

Msolla,P. (1981) Factors limiting dairy production in Tanzania.In: Proceedings of 8th Scientific Conference of Tanzania Society of Animal Production. Arusha, Tanzania.pp178.

Mwakatundu, A.G. and Masanje A.P. (1984) Dairy production in Tanzania with special reference to dairy farming on large scale farms. In: Proceedings of 11th Scientific Conference of Tanzania Society of Animal Production. Arusha, Tanzania. pp 166.

Mwakatundu, A.G. (1985) A Summarised Ten Years' Report of DAFCO 1975 - 1985. pp 46.

Orback, J. (1985) Agriculture and incentives, The Tanzanian case. A Report on Agricultural Price Policy in Tanzania and

its Effects on Production Pattern and Market Development. Report from a Minor Research Task. Swedish University of Agricultural Sciences. International Rural Development Centre, Uppsala. pp 65.

Payne, W.J.A. and William G. (1978) Animal husbandry in the tropics. Tropical Agriculture Series. Longman scientific and technical printer, Hongkong. pp 124.

Powel, V. (1987) Improving Public Enterprise Performance - Concepts and Techniques. Management Development Series 22, International Labour Office, Geneva. pp 280.

Saraceno,P. (1977) The Italian system of state held enterprises. The Journal of Law and International Economics 2, pp 65 - 78.

Sheahan,J. (1976) Experience with public enterprises in France and Italy. In: Shepherd, W.G. Ed. Public Enterprises. Lexington books, London. pp 368.

Teritra, O. (1966) Development strategy investment decisions and expenditure patterns of a public development institution, The case of a Western Nigerian Development

Corporation 1949-62. Nigerian Journal of Economic and Social Studies 8,

96 - 110.

8.0 APPENDICES

Appendix. 1 DAFCO: Importation of heifers and distribution between DAFCO farms

Year	Country of origin	Number imported	Breed	Farm allocated
1974	U.S.A	60	Holstein Friesian	Kitulo
1975	U.S.A	140	Holstein Friesian	Kitulo
1976	U.S.A	241	Holstein Friesian	Kitulo
	Kenya	22	Friesian/Jersey Grade	Rongai
	Kenya	380	Friesian/Jersey Grade	Utegi
1977	U.S.A.	61	Holstein Friesian	Kitulo
	New Zealand	290	Friesian/Jersey grade	Iwambi
	New Zealand	123	Friesian/Jersey grade	Rongai
1978	U.S.A	458	Holstein Friesian	Kitulo
	New Zealand	200	Friesian/Jersey	Iwambi
	New Zealand	300	Friesian/Jersey	Rongai
	New Zealand	200	Friesian/Jersey	Utegi
1979	Kenya	100	Friesian/Jersey grade	Ngerengere
	Kenya	80	Friesian/Jersey grade	Ruvu
1982	Zimbawe	260	Friesian/Jersey grade	Kitulo
1983	New Zealand	452	Friesian	Kitulo
	New Zealand	136	Friesian, Ayrshire	Rongai
	New Zealand	33	Friesian	Ruvu
	New Zealand	50	Ayrshire	Ihumbu
	New Zealand	50	Friesian	Malonje
1985/86	Zimbabwe	377	Friesian	Kitulo
	Zimbabwe	245	Friesian	Iwambi
	Zimbabwe	75	Jersey/Ayrshire	Rongai
Total		4333		

Source: DAFCO Head quarters, Dar es Salaam, 1992

Appendix. 2 DAFCO: Farm machinery and equipments available in farms.

Machinery/Equipment	Amount purchased in 1976/77 and 1983	Amount available by 1990 in good working condition
A. Machinery		
1. Tractors:		
Ford 6600	15	4
Ford 6610	9	6
Ford 4600	7	1
Ford TW10	5	2
Massey Ferguson	4	0
Total	40	13
2. Vehicles:		
Isuzu lorry (7 Tons)	12	5
Landrover P/Up	9	2
Nissan patrol P/Up 4WD	3	1
Datsun P/Up	4	1
Toyota Land Cruiser P/UP 4WD	1	1
Toyota Hilux P/Up	2	1
Peugeot P/Up	1	1
Total	32	11
3. Motorcycle	16	0
4. Caterpillar	2	0
5. Milking machine	10	9
B. Equipments/Implements:		
Disc Plough	15	7
Disc harrow	15	8
Forage harvester	10	5

Appendix 2, Continued

Machinery/Equipment	Amount purchased in 1976/77 and 1983	Amount available by 1990 in good working condition
Grass mower	7	3
Rotary slasher	12	7
Hay rake	5	3
Hay baler	5	2
Combine harvester	1	1
Fertilizer spreader	18	12
Forage trailer	14	9
Tipping trailer	11	1
Seed drill/planter	7	4
Total	120	62

Source: DAFCO head office, 1992.

Appendix 3: Official milk prices compared to open market prices, (1975 - 1990)

Dates	Farm gate	Factory door	Market price
1975	1.00	1.20	-
1976	1.30	1.50	-
1977/78	1.50	1.70	-
1978/80	1.80	2.00	-
1981/81	2.70	3.00	-
1981/82	3.70	4.20	-
1982/83	6.20	6.90	-
1983/84	7.20	7.90	-
1984/86	9.30	10.00	-
1986/87	15.00	25.00	-
1987/88	23.00	25.00	30.00
1988/89	33.00	-	40.00
1989/90	55.00	-	100.00

Source: TDL, Head office, Dar-es-salaam. 1992.

Appendix 1 DAFCO: Profit and loss accounts for years 1976 - 1991 (Tsh million)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990[4]	1991[5]
Sales	2.6	5.8	8.4	9.4	11.1	15.0	25.3	26.3	28.3	34.1	35.0	53.5	63.4	102.0	145.2	167.5
Cost of sales	-0.3	8.7	9.0	9.4	15.3	20.0	21.9	36.6	27.8	36.4	45.8	29.2	65.7	85.4	177.1	153.7
Gross profit/(loss)	2.9	-2.9	-0.6	0.0	-4.2	-5.0	3.4	-10.3	0.5	-2.3	-10.8	-24.3	-2.3	16.6	-31.9	-13.8
Administrative expenses	4.3	4.3	2.8	2.8	2.7	3.5	5.7	8.2	10.2	15.8	15.4	22.1	20.3	36.7	33.2	33.3
Net operating profit/loss	-1.4	-7.2	-3.4	-2.8	-7.0	-8.5	-2.3	18.5	-9.7	-18.1	-26.2	2.3	-22.7	-20.1	-65.1	-19.5
Miscellaneous income	0.2	0.7	1.2	0.5	0.5	0.7	8.7	2.6	2.4	7.3	9.7	6.8	5.7	6.3	11.7	18.8
Net profit/(loss) per year	-1.3	-6.5	-2.2	-2.2	-6.5	-7.8	-1.4	-15.9	-7.3	-10.8	-16.5	9.1	-16.9	-13.8	-53.4	-0.7
Accumulated loss b/f	-	-1.3	-7.8	-10.0	-12.3	-18.9	-26.7	-28.1	-43.9	-50.3	-61.9	-78.5	-54.7	-71.7	-85.5	20.5
Prior year adjustments	-	-	-	-	-	-	-	-	-	-	-	14.7	-	-	159.4	-
Items of abnormal size and incidence	-	-	-	-	-0.1	-	-	0.1	0.9	-0.8	-	-	-	-	-	-
Accumulated profit/(loss) c/f	-1.3	-7.8	-10.0	-12.3	-18.9	-26.7	-28.1	-43.9	-50.3	-61.9	-78.5	-54.7	-71.7	-85.5	73.9	20.5

Source: DAFCO Head office, 1992.

[4] Draft accounts.

[5] Draft accounts.

Appendix.4 DAFCO: Profit and loss accounts for years 1976 - 1991 (Tsh million)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990[4]	1991[5]
Sales	2.6	5.8	8.4	9.4	11.1	15.0	25.3	26.3	28.3	34.1	35.0	53.5	63.4	102.0	145.2	167.5
Cost of sales	-0.3	8.7	9.0	9.4	15.3	20.0	21.9	36.6	27.8	36.4	45.8	29.2	65.7	85.4	177.1	153.7
Gross profit/(loss)	2.9	-2.9	-0.6	0.0	-4.2	-5.0	3.4	-10.3	0.5	-2.3	-10.8	-24.3	-2.3	16.6	-31.9	-13.8
Administrative expenses	4.3	4.3	2.8	2.8	2.7	3.5	5.7	8.2	10.2	15.8	15.4	22.1	20.3	36.7	33.2	33.3
Net operating profit/loss	-1.4	-7.2	-3.4	-2.8	-7.0	-8.5	-2.3	18.5	-9.7	-18.1	-26.2	2.3	-22.7	-20.1	-65.1	-19.5
Miscellaneous income	0.2	0.7	1.2	0.5	0.5	0.7	8.7	2.6	2.4	7.3	9.7	6.8	5.7	6.3	11.7	18.8
Net profit/(loss) per year	-1.3	-6.5	-2.2	-2.2	-6.5	-7.8	-1.4	-15.9	-7.3	-10.8	-16.5	9.1	-16.9	-13.8	-53.4	-0.7
Accumulated loss b/f	-	-1.3	-7.8	-10.0	-12.3	-18.9	-26.7	-28.1	-43.9	-50.3	-61.9	-78.5	-54.7	-71.7	-85.5	20.5
Prior year adjustments	-	-	-	-	-	-	-	-	-	-	14.7	-	-	159.4	-	
Items of abnormal size and incidence	-	-	-	-	-0.1	-	-	0.1	0.9	-0.8	-	-	-	-	-	-
Accumulated profit/(loss) c/f	-1.3	-7.8	-10.0	-12.3	-18.9	-26.7	-28.1	-43.9	-50.3	-61.9	-78.5	-54.7	-71.7	-85.5	73.9	20.5

Source: DAFCO Head office, 1992.

[4] Draft accounts.

[5] Draft accounts.

Appendix 5. Data for Regression Analysis.

Year	Qmt	Pmt	Pft	Wrt	Trt	NCPI (1985=100)	Real price milk(Rpmt)
1976	1220.2	1.60	10.50	230.00	1	14.5	11.03
1977	2295.5	1.60	10.50	230.00	2	16.2	9.88
1978	3428.4	1.60	12.00	230.00	3	18.1	8.84
1979	4221.7	1.60	13.00	260.00	4	20.6	7.77
1980	4571.0	1.80	50.00	340.00	5	26.8	6.72
1981	4258.8	2.70	60.00	400.00	6	33.6	8.04
1982	4570.5	3.70	70.00	400.00	7	43.4	8.53
1983	3909.0	6.20	100.00	460.00	8	55.1	11.25
1984	3571.9	7.20	120.00	520.00	9	74.6	9.65
1985	3672.8	9.30	200.00	520.00	10	100.0	9.30
1986	3241.8	15.00	300.00	620.00	11	132.4	11.33
1987	2937.7	23.00	880.00	1060.00	12	172.1	13.36
1988	2851.8	39.00	950.00	1275.00	13	225.8	17.27
1989	2524.1	40.00	1075.00	1770.00	14	284.1	14.08
1990	2585.2	60.00	1210.00	2125.00	15	340.1	17.64

Source: DAFCO: Head office, Dar-es-salaam 1992.

N.B. $\text{Real price} = \frac{\text{current price}}{\text{NCPI}} * 100.$