A DIAGNOSTIC STUDY ON
ANIMAL BASED FOOD INDUSTRY

FINAL REPORT

Prepared for:

THE MINISTRY OF INDUSTRIAL DEVELOPMENT IN COLLABORATION WITH THE MINISTRY OF PLANNING AND NATIONAL DEVELOPMENT

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1. INTRODUCTION

FEKAGI INVESTMENT CONSULTANTS were contracted by the Ministry of Industrial Development (MID) in collaboration with the Ministry of Planning and National Development (MPND) to undertake a diagnostic study on the Animal Based Food Industry comprising of Slaughtering, Preparing and Preservation of Meat; Manufacture of Dairy Products, Canning, Preservation and Powering of fish; and Manufacture of Animal Oils and Fats Sub-Sectors of Phase One of Sessional Paper No. 2 of 1997 on Industrial Transformation to the year 2020 which targets promotion of micro, small and medium scale industries, utilising and adding value to local raw materials. This phase of Kenya's Industrialisation strategy is to focus on revitalisation and expansion of sub-sectors and enterprise in which Kenya has already experience and comparative advantage.

2. OBJECTIVES OF THE STUDY

- Examine current government policy as regards industrial development and make recommendations as to their suitability.
- Consult with beneficiaries in the animal based food industry including stakeholders.
- Examine the industrial investment practices in Kenya vis-a-vis trend in the Newly Industrialised Countries (NICs).
- Identify target sub-sectors for investment in respect of the animal based food industry sub-sectors.
- Make recommendations that will include:
- Current status and constraints facing the industry;
- Raw materials sources, supply and problems;
- Potential levels of production and export;
- Potential employment generation, direct and indirect;
- Appropriate technology for the industry;
- Requirement for public infrastructure, fiscal and other public policy support;
- Financial and budgetary requirements;
- Potential benefits and costs to the nation;
- Target for the industry;
- Potential additional benefits in linkage industries;

- Environmental impact and measures to ameliorate environment damage, spatial implications, etc;
- Mechanisms to help infant industries to develop products;
- Capacity-installed, actual operating etc;
- Market orientation for the major operators
- Technology basis - restructuring or Re-engineering;
- Potential for forward/backward linkages;
- Environmental generation - level of skill in use - training mode;
- Economic and financial analysis - opportunities for growth;
- Small Scale and Jua Kali Enterprise sector.

- Present the findings and recommendations to separate workshops and for the Animal Based Food Industry Sub-sector and thereby transform the participants into a Sectoral Consultative Group.

3. MAJOR ISSUES

Major issues identified in the animal based food industry sub-sectors include:

- Lack of specific sub-sector policies.
- Inadequate supply of good quality raw materials.
- Costly input (feeds, drugs/chemicals).
- Low returns.
- Poor infrastructure (needs, electricity, water, storage facilities, extension services).
- Weak marketing channels.
- Lack of suitable and appropriate credit facilities, especially for small scale operators.
- Research and Development.
- Inadequate and unreliable data.
- Weak regulatory and monitoring systems (inadequate capacity)
- Out-dated laws.
- Mismatch of location of processing facilities and raw material sources.
- Low capacity utilisation.
- Lack of appropriate technologies.
- Sub-division of ranches.
- Lack of suitable incentives to investors.

- Inadequate market information due to poor market surveys.
- Importation of competing products.
- Unfair competition.
- Weak co-operative societies.
- Environmental issues.
- Gender issues.
- Inadequate utilisation of by/waste products.
  Low value addition.
- Global uncompetitiveness.

4.0 RECOMMENDATIONS ON FUTURE PLAN OF ACTION

4.1 PREAMBLE

The study has highlighted many constraints facing the four sub-sector of the animal based food industry. It is to be assumed, and quite rightly that constraints have arisen due to:

- lack of appropriate policies to address the particular constraints
- defective policies
- failure to implement policies due to lack of clear guidelines.

What the study has attempted to do is to identify various policies on the sector, looked at areas where there are policy gaps and weaknesses and recommended the "way forward"

Although the government has an obligation to improve the business environment, it is handicapped by shortage of funds. Therefore prioritisation is important as the Government is never in a position to do everything. It is prudent governance to utilise limited resources efficiently in order to get maximum impact. At the same time there are some actions which the private sector, as a partner with Government, are mandated to take. Inevitably taking action will increase costs for the private sector and therefore prioratisation is again important and dependent on costs.

The study has recommended intervention focusing on each of the four sub-sectors comprising the animal based food industry, and suggestions have been put forward on how policies can be changed or formulated to facilitate industrial development in each of the four sub-sectors. Some of the policy recommendations are short-term while others are of a long-term nature.

4.2 SPECIFIC RECOMMENDATIONS

4.2.1 RECOMMENDATIONS FOR MANUFACTURE OF DAIRY PRODUCTS:

ANIMAL BREEDING

- The Government should continue to support privatisation of A.I services. However, production of semen should be left to the Government.
- Private sector should distribute and provide A.I. services and ensure provision of proper equipment and education. Co-operative societies should also be involved.
- Government to review policy of AGRICULTURAL DEVELOPMENT COOPERATION (ADC) farms for agricultural development. Sub-division of dairy farms should be discouraged while more farmers should be encouraged to become breeders to reduce importation of resources. Government to take steps to halt anymore sub-division of ranches, whether Government owned or individually.

DAIRY CATTLE FEEDS

- Government to encourage small scale animal feed processors subject to Kenya Bureau of Standards (KEBS) scrutiny. Affordable and good quality animal feeds could be manufactured using waste products from sisal or high protein plants for early maturity of calves. Farmers to be encouraged to add high protein concentrates to feeds for improved milk yield.

DISEASE CONTROL

- Government to consider reducing taxes on inputs for veterinary drugs and duty on imported veterinary drugs.
- Sensitisation of farmers on the importance of disease control measures through barazas or extension workers.
- Strict re-enforcement of rules/regulations governing cattle movement.

- Government to promote research for cheap sustainable and environmentally safe drugs.
- Government to encourage innovative research.

- Funding for research to be adequately addressed by the Government - current provision is too low.
- Explore possibility of private extension services by qualified people i.e. vets at a fee.
- Co-ordination system of A.I. and extension services to be set up by Government or body to license those providing these services i.e. vets services Board to be re-enforced.

YOUNG STOCK MANAGEMENT

- Farmers to be sensitised on benefits accruing from proper management of young stock.

POOR RELATIVE PRICES

- Government and private sector to facilitate efficient marketing system.

UNAVAILABILITY OF SUITABLE CREDIT

- Since commercial banks not sensitive to farmers needs, the Government should facilitate formation of a Farmers Bank. In this respect setting up of the proposed Agricultural Development Bank should be speeded up. The proposed bank would be best suited to lending to farmers.
- Ways to be explored on how the insurance industry can be facilitated to proved cover to dairy farmers as financial institution are reluctant to lend to dairy farmers without an insurance cover for cattle.
- Minimum guarantee returns system to be renewed.

POOR STATE OF INFRASTRUCTURE

- Cess or presumptive tax to be put in a special fund to be used by farmers to improve infrastructure, especially roads.
- A deliberate effort to be made to provide electricity and water in milk producing areas by the Government. In this connection the rural electrification programme should give priority to milk producing areas.
- Local authorities to make all-weather roads in milk producing areas. Cess money to be ploughed back to local authorities to facilitate maintenance of rural roads.
- Allow private investors to make all-weather roads in milk producing areas on cost-recovery basis.

LACK OF TIMELY PAYMENT

- Co-operative Bank to ensure money gets to farmers or co-operative societies with minimal delay.

INCOMPLETE INFORMATION ON INVESTMENTS AND MARKETS

- The Kenya Dairy Board to be facilitated to have a Management Information System in place. The Board in conjunction with the Dairy Training Institute in Naivasha has taken the first initiative by launching a publication called "Maziwa News".
- The Ministry of Agriculture and the Kenya Dairy Board to be facilitated to provide relevant information/data to the mass media for dissemination to dairy farmers and processors.
- Information dissemination to be re-enforced especially by KIPO on appropriate packaging technology. KIRDI should make more efforts to disseminate information on appropriate milk processing technologies.

LACK OF APPROPRIATE TECHNOLOGIES

- If not locally available, the Government should assist dairy farmers and other willing investors to acquire appropriate dairy processing technologies from outside Kenya. Such imports should attract zero duty and VAT rating.

- An evaluation be undertaken to compare the economics of adopting specific alternatives for milk packaging. The Kenya Dairy Processors Association in collaboration with the Kenya Dairy Board and the Ministry in charge of Livestock Development to take the lead in this effort. Policy should also be geared towards encouraging the processors to adopt cheaper, domestically available packaging materials, The goal should be to encourage competition and efficiency in packaging across the country.

UNFAIR COMPETITION FROM MILK VENDORS

- This should not arise if the necessary laws are enforced as "milk hawking" is illegal.
- Government to speed up finalisation of Kenya Dairy Development Policy Paper as well revision of the Dairy Industry Act, CAP. 336 in view of the liberalisation of the industry since May 1992. The broad objective of the dairy policy is to ensure an orderly development of the dairy industry in Kenya in relation to the vision, mission and core functions of the Ministry of Agriculture, Livestock Development and Marketing.
- Government to speed up restructuring of the Kenyan Dairy Board so that it is able to effectively regulate the sector. A lot has taken place since liberalisation of the industry and the Board has to be more empowered and capacity built to be able to perform its role more effectively.

4.2.2 RECOMMENDATION FOR FISHERIES SUB-SECTOR

There are two sources of fish:-

- Catches from inland lakes and Indian Ocean.
- Fish Farming.

Major source is Lake Victoria - over 90 per cent.

Stocks of each type of fish found in the lake is unknown. The Government should take immediate steps to carry out this stock assessment in conjunction with Tanzania & Uganda. This assessment will give an indication of the composition of each species of commercial importance. Further recommendations are:

- Ascertain maximum sustainable yields of Kenya's 10,000 km^2 of inland waters and 6500km^2 of fishable offshore waters.
- Formulate a stock management system/plan that will ensure that overfishing is curtailed, particularly for Nile perch.
- Water hyacinth - control spread of this weed.
- Re-examine the licensing system such that instead of using it as a Government revenue source, it should be designed in such a way that it is used to collect data in order to upgrade fisheries database to all international level.
- Infrastructure: The handling of fish at harvesting/landing points needs to be improved and therefore encouragement of the setting up of small scale cold storage facilities along the landing beaches is necessary. The encouragement could be in the form of reducing
- waiving tax on imported processing machinery/equipment.
- Rural electrification be deliberately intensified in fish production areas.
- All weather roads be deliberately constructed in fish production areas through the partnership of local authorities and the local fishing community.
- Deliberate efforts be made to identify investors to carry out deep sea fishing and processing and give appropriate incentives.
- Draw up and implement environmental protection programmes in and around fishery water bodies.
- Government should review existing fish harvesting registration and standards and respective compliance and monitoring procedures.
- Government involve services of third parties in the monitoring and meeting the quality specifications.
- Government should review its policy on staff transfer and mobilization in order to promote specialization for effective use of its human resource.
- Government should design and implement appropriate credit schemes targeted at the fishing industry.
- Fish processors and public institutions should join together in order to enhance research and development.

FISH FARMING

Catches in natural waters in the world are reducing. Therefore, deliberate efforts should be mad to promote local fish farming as an economic and commercial venture. Originally, fish farming was initiated, designed and planned without concern for profitability. It was essentially regarded as a family subsistence activity. It is therefore recommended that:-

- Fish farming be prioritized
- Research and Development on fish farming be intensified.

4.2.3 RECOMMENDATIONS FOR MEAT AND MEAT PRODUCTS SUB-SECTOR

- The few remaining ranches should not be sub-divided.
- Quality enforcement of feeds be intensified by the Kenya Bureau of Standards and there is urgent need to educate the feed manufacturers on the importance of keeping the set minimum standards and their maintenance.
- There is need for the sensitization of the farmer on the importance of practicing disease control measures.

- Vaccination is an infrastructural problem and therefore it should remain a Government undertaking.
- Privatise and re-open the Kenya Meat Commission (KMC).

4.2.4 RECOMMENDATIONS FOR ANIMAL FATS AND OILS

- **Sensitisation:** The public be sensitised on the nutritional importance of fats and oils consumption.
- **Research:** Further research and studies be undertaken in order to identify all possible uses/demand locally of animal fats and oils.
- **Local Resource:** Fish with a lot of oil e.g. shark, should be utilized as a raw material for fat extraction.
- **More information:** Kenya Industrial Property Office (KIPO) avail information on small-scale technologies relating to animal fats and oils.
- Privatize and re-open the Kenya Meat Commission (KMC) which has a capacity to produce tallow.
- Encourage the setting up of modern small scale slaughterhouses capable of

separating fat from meat and further refining it.

1.0 INTRODUCTION

1.1 BRIEF PROJECT DESCRIPTION

The Project aims at strengthening the capacity of the Ministry of Industrial Development (MID) and other public sector industrial support institutions in their facilitative and promotion role for private sector development. It is envisaged that by the end of this pilot project, an interactive policy framework for coordinating and monitoring the industrial transformation will be established.

1.2 BACKGROUND AND JUSTIFICATION

The Government of Kenya has adopted the Sessional Paper No. 2 of 1997 with a view to provide the basis for the transformation of the Industrial Sector to the Status of an N.I.C. by 2020. Although the importance of industrialization has always been recognised, beginning with the 8th National Development Plan, growth in the industrial sector will be the prime means for achieving sustained economic growth and employment generation. However, a major constraint is the lack of comprehensive policies and institutional infrastructure capable of implementing the policies and backstopping the main streaming of those policies within other development activities. To achieve the national goal of industrial transformation, the Sessional Paper provided for two levels of action - at the policy level and at the sub-sector and sectoral levels to create specific programmes and projects. This also required that a new implementation strategy be adopted.

1.3 THE STRATEGY

Implementation of the Sessional Paper No. 2 of 1997 requires the creation of a framework for dialogue, consultation and concerted action between the Public and Private Sectors. This interactive policy formulation and implementation strategy (also known as Strategic Management of Industrial Development) requires among other things the establishment of a National Industrial Development Council and a number of consensus building working groups known as Strategic Consultative Groups (SCGs). These SCGs form the first level of policy formulation and initial suggestions of the type of intervention necessary to enhance their competitiveness. Membership of each SCG is drawn from stakeholders in that sub-sector, industrialists, suppliers of inputs and services and public sector support institutions. This process is new in Kenya and the Government intends that it should be introduced through a learning by doing process. This then requires strengthening the capacity of MID to backstop the process by providing certain technical information and support to the consultative process. Also private sector participants will need to develop capacity to formulate policies and action programmes to improve the environment of their operations.

1.4 **EXPECTED OUTPUTS**

The expected outputs of the project will be:

- Diagnostic studies and sector analysis of the Animal Based Food Industry sub-sectors.
- Nucleus of a Technical Support Group formed and the National Industrial Development Council constituted and inaugurated.
- An interactive policy process for the industrial transformation of Kenya developed and put in place.

1.5 **TERMS OF REFERENCE FOR CONSULTANCY ON ANIMAL BASED FOOD INDUSTRY DEVELOPMENT**

The Consultant will carry out an in-depth diagnostic study assessing the global competitiveness of animal based food industry sub-sectors which comprises of:

- Slaughter, preparing and preserving of meat
- Manufacture of dairy products
- Canning, preserving and processing of fish
- Manufacture of animals oils and fats

The consultant will be expected to make use of existing reports, information and data and will;

i) Examine current Government policy as regards Industrial Development and make recommendations as to their suitability.

ii) Consult with beneficiaries in the animal based food industry sub-sectors including established private sector bodies such as KAM, FKE, KNCCI, KNFJKA, Industrial Enterprises, relevant GOK departments etc.

iii) Examine the Industrial investment practices in Kenya vis-a-vis trend in the NIC's. Identify target sub-sectors for investment in respect of the animal based food industry sub-sectors.

iv) Make recommendations that will include the following topics:-
   - Current status and constraints facing the industry
   - Raw materials sources, supply and problems;
   - Potential levels of production and export;
   - Potential employment generation, direct and indirect;
   - Appropriate technology for the industry;
   - Requirement for public infrastructure, fiscal and other public policy support;
   - Financial and budgetary requirements;

- Potential benefits and costs to the nation;
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- Environmental impact and measures to ameliorate environment damage, spatial implications, etc;
- Mechanisms to help infant industries to develop products that meet both national and international standards;
- Capacity-installed, actual operating etc;
- Market orientation of the major operators;
- Technology basis - restructuring or Re-engineering;
- Potential for forward/backward linkage;
- Environmental generation - level of skill in use - training mode;
- Economic and financial analysis - opportunities for growth;
- Small Scale and Jua Kali Enterprise sector.

v) Present the findings and recommendations to separate workshops and for the animal based food industry sub-sector and thereby transform the participants into a Sectoral Consultative Group.

6 INTERPRETATION OF THE TORs

For the purposes of guiding the consultant the TORs may be interpreted as calling for the following:

POLICY ANALYSIS

Basically this will involve an examination in detail of the GOK policy with regard to industrialization in general, the food industry in general and the animal based food industry sub-sector in particular. In so doing the consultants will be conscious of the fact that industries operate within the overall GOK economic policies and investment policies in particular. There will therefore be a need to analyse key GOK policy documents among them the following;

i) Sessional Paper No. 1 of 1986 on Economic Management and Renewed Growth.

ii) Sessional Paper No. 2 of 1992 on the Development of the Small Enterprises and Jua Kali Sector.

iii) Sessional Paper No. 2 of 1997 on Industrial Transformation to the Year 2020.

iv) Sessional Paper No. 1 of 1994 on Recovery and Sustainable Development to the Year 2010.

v) Development Plans in particular the 8th National Development Plan.

In addition to key GOK policy documents, the consultant will also attempt to relate this assignment with other on-going programmes including those funded by donors. In particular, an attempt will be made to study the various Programme Support Documents (PSDs), the Programme Support and Implementation Arrangements (PSIAs) including those of the Small Enterprise Development Programme.

ANALYSIS OF THE POLICY IMPLEMENTATION FRAMEWORK

Indeed the main shortcoming in most of the GOK policies is the implementation. It will therefore be necessary to undertake a critique of the policy implementation so far and identify gaps especially as they relate to the sub-sector under study.

ANALYSIS OF THE INSTITUTIONAL FRAMEWORK IN PLACE

Fairly good institutional framework exists in the country both in the public and private sector domains. The consultant will highlight these structures and see gaps that may need to be addressed. Of particular challenge to the consultant is relating these existing structures with the proposed National Industrial Development Council (NIDC).

ANALYSIS OF INPUTS INTO THE SUB-SECTOR

This will include a detailed examination of sources, pricing, quality, and overall availability of the inputs necessary for the proper operations of the sub-sector. These will include raw materials, utilities, labour finance, technology etc.

IDENTIFICATION FOR THE POTENTIAL IN THE SUB-SECTOR

To include an analysis of the production capacities in place, competitiveness, linkages to other manufacturing sub-sectors, linkages to agriculture and the potential thereof.

1.7 APPROACH AND METHODOLOGY

The Government of Kenya has announced in its Sessional Paper No. 2 of 1997 the intention and commitment towards converting Kenya to Newly Industrializing Country (NIC) by the year 2020.

The process of moving towards this eventual goal has commenced and the Government has announced its commitment to the goal in the 8th National Development Plan which emphasizes the role of industrialization in the generation of employment opportunities and incomes. The Sessional Paper has highlighted in detail the nature of activities and interventions that must be put in place if this very ambitious goal is to be attained.

These interventions are varied both in terms of their magnitude, their relative importance vis-a-vis the overall objective and the party expected to take the initiative. At the core of this whole process is the role of the private sector which becomes a key actor and the engine responsible for propelling the industrialization process. For the private sector to take up this challenge and responsibility, there is need to develop structures conducive to private sector development and which substantially improves the level of dialogue between the public and the private sector. To achieve this, the Sessional Paper proposes the creation of a National Industrial Development Council (NIDC) and several sectoral based Strategic Consultative Groups with the latter being composed of key stakeholders in the particular sector or sub-sector.

In order to effectively facilitate, backstop and monitor the process, the Ministry of Industrial Development has decided to carry out several in-depth sub-sectoral studies which would culminate in the formation of the Consultative Groups. Phase one of these sub-sectoral studies will cover five sub-sectors namely; Leather, Hides and Skins; cotton Ginning and Textiles; Animal Based Food Industry; Building Materials, Iron and Steel; and, Crop Based Food Industry. These diagnostic sub-sectoral studies have, in addition to the above general objectives, several other more explicit objectives with some indicative outputs that are expected. These include:

- Better environment for enhancing the role of the private sector in industrial development;
- To develop dialogue mechanisms between the government and the private sector. The sub-sectoral studies will kick-start the process;
- Strengthen the Ministry of Industrial Development so as to be able to perform its tasks effectively;
- Identify sub-sectors with potential for growth and the issues within each sub-sector;
- Identify sub-sectoral roles of Jua Kali and Small Enterprises sector.

The United Nations Development Programme focuses on poverty alleviation and uses several programmes to intervene and hope to impact possibly on poverty in the country. One such programme is the Jua Kali and Small Enterprise Programme which is executed by the Ministry of Planning and National Development (MPND). It is within this programme that the current policy study is being undertaken, undoubtedly because increased industrial growth will result in employment generation and consequently improve incomes of those directly involved and those who are beneficiaries.

1.7.1 **AREAS OF FOCUS**

The diagnostic study will focus on the areas of policy analysis; an examination of policy implementation and the bottlenecks thereof; determination of policy gaps that require additional inputs; identification of institutional infrastructure, its roles and gaps; analysis of the sub-sectors competitiveness and where this could be exploited further; and analysis of the inputs that go into the sub-sector, their sources, prices and availability; a census of key industrial enterprises operating in the sub-sector; and, a determination of existing and potential linkages in the sub-sector and how these could be enhanced.

1.7.2 **DESK RESEARCH & FIELD WORK**

The study will have two broad sources of data and information. Initially the study will concentrate on desk research and analysed within the context of the TORs. Most of this data is likely to be available within the Ministry of Industrial Development and within other GOK ministries and departments such as the Central Bureau of Statistics.

Institutions such as the Kenya Association of Manufacturers (KAM), Federation of Kenya Employers, K-REP etc are also potential sources of data and information. Institutions supporting small enterprises such as K-REP will also have their specialised data bases which will likewise be examined. Donors active in the promotion of the private sector and in the development of economic and investment related policies such as the World Bank and USAID are also seen as potential sources of information.

Secondly, a cluster of source of information and data, is the data collected from the field. This mainly refers to the data obtained from the industries themselves and from the key support institutions.

1.7.4 **DATA COLLECTION AND ANALYSIS**

A questionnaire will be developed and used in the collection of data from the industrial enterprises. The merits of using two questionnaires, one focusing on the enterprise and the other on the institutions will be considered. For purposes of getting reliable data, the questionnaires will be administered to as many enterprises as possible preferably with different levels of operations. Statistical analytical tools will be applied to analyse the data collected and graphs used to capture useful trends.

1.7.5 **CONSULTATIVE FORUM**

At the completion of the field visits and compilation of a first draft report, the findings will be presented in a workshop in order to get a feedback. This will form a basis for revising and finalizing the report. It will facilitate the Consultative Group envisaged in the Sessional Paper.

2.0 GENERAL POLICY ENVIRONMENT

2.1 INTRODUCTION

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These include:

- Better environment for enhancing the role of the private sector in industrial development;
- To develop dialogue mechanisms between the government and the private sector. The sectoral studies will kick-start the process;

- Strengthen the Ministry of Industrial Development so as to be able to perform its tasks effectively;
- Identify sectors with potential for growth and the pertinent issues within each sector;
- Identify sectoral roles of Jua Kali and Small Enterprises sector.

The United Nations Development Programme focuses on poverty alleviation and uses several programmes to intervene and hope to impact possibly on poverty in the country. One such programmes is the Jua Kali and Small Enterprises Programme which is executed by the MPND. It is within this programme that the current policy study is being undertaken, undoubtedly because increased industrial growth will result in employment generation and consequently improve incomes of those directly involved and those who are beneficiaries.

3.0 DAIRY INDUSTRY

3.1 INTRODUCTION

Kenya has a well developed dairy production and processing industry which was commercialised in the beginning of the century by European settlers who undertook the practice of livestock keeping as a purely profit making venture, as opposed to the conservative aesthetic view upheld by the local people. Lord Delamere pioneered the dairy industry in 1905 when he experimented with cross breed type, after importing a herd of exotic breeds for mating with local Boran cattle. As early as 1903 the colonial government, through the Ministry of Agriculture had found it necessary to establish veterinary services, following a diseace outbreak which threatened to wipe out livestock population. As the epidemic spread it became necessary to curb the importation of the cattle, a move started in Mombasa in 1908, although it never practically became effective until early 1920s.

The industry was expanding tremendously. In addition to crossbreeding, there was an increase in the variety of imported species while the network of the industry improved leading to establishment of livestock development centres, co-operative bull schemes, formation of breeding societies, among others.

However, the most significant development was in the area of artificial insemination where the country made landmark achievements. As a matter of fact Kenya is credited as being in the forefront line of spreading the gospel of artificial insemination and for sometimes, this feat remained unchallenged regionally.

As a step further in streamlining the dairy industry, the Government in 1958 established, through an Act of Parliament the Kenya Dairy Board (KDB) as an apex organisation of the dairy industry charged with the responsibility to organise, develop and promote the dairy industry.

Largely controlled by the Kenya Co-operative Creameries (KCC) since 1925, the dairy industry has had its share of problems. However, the Government has continued to promote and support the development of the farmers' dairy co-operatives since 1963. Such dairy co-operatives have in the past concentrated on milk procurement and marketing aspects for their farm members.

The dairy industry has witnessed a phenomenal growth since 1992 when the Government liberalised it. Competition has trippled, bringing in new players, in an elstwhile controlled sector which had been known to be largely dormant. Changes that have come with liberalisation, not only led to KCC loosing the virtual monopoly it had enjoyed for decades, but, in what is a healthy move for agriculture generally and dairy industry in particular revolutionarized opearations of this critical economic domain. Modern methods of production, packaging and marketing are being gradually adopted. As the players involved in the trade increase, sophistication follows, and the overall winner is the customer whose choice now is not restricted to a handful of alternatives.

So far, Kenya has managed to be broadly self-sufficient in dairy products, except during extreme drough periods. In the past the country has exported small quantities of dairy products while at the same time importing products like dry milk powder during extreme drought periods. The broad self-sufficiency in dairy products is not expected to last long as the demand for dairy products will outstrip the supply as population increases as well as consumer tastes. It therefore means that our dairy farmers will have to be more efficient in milk production, processing and marketing in order to meet likely shortfalls of dairy products. This implies that our dairy policy will have to be revisited so that it facilitates the development and promotion of an efficient and self sustaining dairy industry that will guarantee self-sufficiency and some surplus for exports. The long term policy goal must necessarily be geared towards achieving competitiveness grobally.

3.2 GUIDELINES FOR DAIRY DEVELOPMENT IN KENYA-THE DAIRY INDUSTRY ACT, CAP 336.

Dairy development in Kenya is guided by the Dairy Industry Act, Cap. 336. Following the liberalisation of the dairy industry in kenya in May 1992 it became necessary to revise the Act inorder to offer the appropriate guidelines for dairy development in a liberalised economy. Before the Act was reviewed, however, the Government in July 1993 released a policy paper entitled "A Strategy Towards A Self-Sustaining Dairy Industry". The paper emphasised the need to restructure the KCC and strengthen the Kenya Dairy Board as an apex organisation of the dairy industry. This paper, however, has not been implemented. Between 1993/94 and 1995/96 several workshops were held with the objective of reviewing the Dairy Industry Act Cap. 336. whose draft bill is at the Attorney General's Chamber. The objective of revising the Act was to make it relevant with the Government's policy of milk market liberalisation. In 1996, the Government realised the need to review its dairy policy before finalising revision of the Dairy Industry Act. The need to review the dairy policy paper arose from these considerations:

A close scrutiny of the dairy policy paper confirmed that the document was not broad-based since it only focused on institutional changes rather than the entire industry.

To form an adequate basis for revision of the Dairy Industry Act, which is the law to fit in the policy framework.

3.3 MILK PRODUCTION IN KENYA

3.3.1 OVERVIEW

Dairying is one of the major activities in the livestock sub-sector and between 300,000 to 400,000 small scale farmers in Kenya earn their livelihood through the sub-sector. Table I gives the estimated milk production in Kenya from 1987 to 1997.

TableI: National Milk Production (Million litres)

YEAR	ESTIMATED PRODUCTION (MILLION LITRES)
1987	2050
1988	2160
1989	2420
1990	2450
1991	2530
1992	2365
1993	2360
1994	2368
1995	2362
1996	2272
1997	2500*

* Estimate.

Source: MALDM, Animal Production Division Reports.

As can be noted above milk production rose from 2.05 billion litres in 1987 to about 2.53 billion litres in 1991 and hereafter stagnated while production for 1997 was about 2.5 billion litres. It has been estimated that Kenya has a potential capacity to produce about 4.0 billion litres of milk. Therefore farmers can still produce more milk given the right policy environment. Kenya milk is primarily produced from cattle (84%), camels (12%) and goats (4%).

Some countries are known to produce milk from such animals as water buffalo (Asia) and certain sheep breeds (e.g. Awasi). Although Kenya has an estimated population of about 8.1 million sheep, our farmers have not exploited this potential source of milk production.

3.3.2. PRODUCTION OF DAIRY PRODUCTS

The current milk processors, including the KCC plants have a dairy throughput of about one million litres of milk per day.

Dairy products are made from milk and a variety of products are derived from raw milk. These include:

- Fresh milk (Pasteurised)
- Ultra Heated Milk (UHT)
- Butter
- Ice cream
- Cheese
- Milk powder (dried)
- Condensed milk
- Ghee
- Mala
- Milk shake
- Yoghurt

The above products are made by over 45 processors who have been licensed by the Kenya Dairy Board while there are currently over 250 milk "bars" which sell products such as yoghurt, mala, cheese, milk shake, etc. The majority of milk "bars" are located in Nairobi, Mombasa, Kisumu and Eldoret while the distribution of milk processors is shown as table 1 below:

Table 1: Distribution of Milk processors

DISTRICT		NUMBER OF PROCESSOR
1.	Nairobi	8
2.	Kiambu	5
3.	Thika	1
4.	Muranga	1
5.	Meru	1
6.	Nyeri	1
7.	Nyandarua	2
8.	Nakuru	8
9.	Kericho	2
10.	Uasin Gishu	2
11.	Nandi	2
12.	Trans-Nzoia	3
13.	Machakos	1
14.	Taita-Taveta	1
15.	Kilifi	2
16.	Mombasa	1
17.	Bungoma	1

3.4 MILK CONSUMPTION AND MARKETING

A survey (1993/94) indicated that about 40 per cent of the milk produced in Kenya is sold locally, 30 per cent is consumed at home, 7 per cent is fed to calves while 23 per cent is sold to co-operatives. The marketed milk production is thus about 63 per cent of the estimated total milk output which was estimated at about 2.3 billion litres in 1996.

Prior to liberalization, KCC controlled the dairy industry as a monopolist. As an indication of the potential of the milk industry, the Kenya Dairy Board has licensed no fewer than 45 milk processors, each processing between 500 to 30,000 litres of milk daily since liberalization of the dairy industry. With the KCC plants having a combined daily capacity of 500,000 to 600,000 litres, it still remains the market leader, although it is losing its market share as more small scale processors enter the industry.

Latest available statistics (1990) indicate that per capita consumption of households who keep dairy cows is 45 litres while those who do not keep dairy herds have an estimated per capita milk

consumption of 19 litres. In the urban areas it has been estimated that 58 per cent of urban consumers in the lowest income group consume about 8 per cent of milk sold in urban areas while 2 per cent of urban milk consumers in the high income bracket consume about 45 per cent of the milk sold.
Although KCC dominates the processing and marketing of milk, a lot of raw milk is sold countrywide by other parties which implies that the KCC is far from meeting the demand. The emergence of milk "hawkers" especially in the urban areas is a sign of varying milk demand and consumption preferences and this should be exploited by improving the milk marketing system with due regard to health and quality standards.

Past studies have indicated that milk consumption in urban areas is 45 - 50 per cent higher than that of rural areas. With Kenya pursuing the goal of industrialization in the next two decades, a rise in the degree of urbanisation is inevitable and this is likely to result in substantial increase in milk consumption. To cope with the anticipated increased demand of milk and dairy products, appropriate measures will have to be taken to improve stock productivity, milk procurement and milk distribution system.

During the drought the country normally faces a milk shortage, with the milk intake by main processors experiencing a shortfall of between 45 to 75 million litres. This calls for maintenance of strategic reserves of milk, preferably in powder form in order to meet the shortfall. Since the Government of Kenya is committed to ensuring food security, it will have to support private sector initiatives by promoting rational dairy import and export policies. Imports/exports of dairy
products will have to be rationalised in the light of prevailing marketing situation. There is need to ensure food security in dairy products and also to protect the domestic industry from unfair competition while taking into account the protocol of the World Trade Organization (WTO).

3.5 **CONSTRAINTS / ISSUES**

Our research findings identified the following constraints:

3.5.1 **FARM LEVEL**

- Animal breeding due to poor and inadequate breeding service such as Artificial Insemination (AI) services; expensive quality breeding stocks.
- Dairy cattle feeding due to deficiency in quality and quantity of commercial feeds available; inadequate mineral supplements; inadequate conservation of feeds for

the dry season; and inadequate supply of clean water.

- Disease control due to infrequent spray of animals; high cost of drugs and Vaccines, and poor control of cattle movement; inadequate and inefficient dipping facilities.
- Your stock management due to inadequate management of young stock.
- Poor relative output prices as compared to high prices of inputs.
- Unavailability of suitable credit for dairy and/or livestock farming especially to the small scale sector.
- Poor state of infrastructure, especially rural roads, co-operative societies and other marketing facilities
- Lack of timely payments.

3.5.2 PROCESSING LEVEL

- Poor infrastructure such as roads, electricity and clean water.
- Incomplete information on investments, particularly on profit margins.
- Inadequate market information due to poor market surveys.
- Lack of suitable credit for setting up small-scale processing plants.
- Lack of appropriate technology suitable for small-scale processing.
- Unfair competition by milk vendors, especially in the urban centers. (It has been estimated that raw milk "hawking" has taken over 30% of raw liquid milk market in Nairobi.)

3.6 PROPOSED SOLUTIONS

3.6.1 ANIMAL BREEDING:

- Deliberate and intensive rehabilitation of A.I. services by Government since privatization seems to have collapsed.
- Government to still play a leading role in provision of A.I. services but on a commercial basis.
- Sub-division of ranches should be discouraged.

3.6.2 DAIRY CATTLE FEEDING:

- Quality enforcement by the Kenya Bureau of Standards to be intensified.

3.6.3 **DISEASE CONTROL:**

- Government to consider reducing taxes on inputs for veterinary drugs and duty on imported drugs.
- Sensitization of the farmer on the importance of practising disease control measures.
- Strict enforcement of rules/regulations governing cattle movement.

3.6.4 **YOUNG STOCK MANAGEMENT:**

- Farmer to be sensitized on benefits accruing from proper management of young stocks.

3.6.5 **POOR RELATIVE OUTPUT PRICES:**

- This should really not be a problem if marketing system work efficiently.

3.6.6 **UNAVAILABILITY OF SUITABLE CREDIT**

- Government to speed up the setting up of the proposed Agricultural Development Bank which would be best suited for lending to dairy farmers.
- Ways to be explored on how the insurance industry can be facilitated to provide cover to dairy farmers as financial institutions are reluctant to lend to dairy farmers without insurance covers.

3.6.7 **POOR STATE OF INFRASTRUCTURE**

- Cess or presumptive tax to be put in a special fund to be used by farmers to improve infrastructure, especially roads.
- A deliberate effort to be made to provide electricity and water in milk producing areas.
- Allow private investors to make all-weather roads in milk producing areas on cost-recovery basis.

3.6.8 **LACK OF TIMELY PAYMENT**

- This problem is mainly with the cooperatives and should not really arise with proper management.

3.6.9 **INCOMPLETE INFORMATION ON INVESTMENTS AND MARKET**

- The Kenya Dairy Board to be facilitated to have a management information system in place. The Board in conjunction with the Dairy Training Institute in Naivasha has taken the initiative by launching a publication called "Maziwa News".

- The Ministry of Agriculture and the Kenya Dairy Board to be facilitated to provide relevant information/data to the mass media for dissemination to dairy farmers and processors.

3.6.10 **LACK OF APPROPRIATE TECHNOLOGY**

- If not locally available, the Government should assist dairy farmers and other willing investors to acquire appropriate dairy processing technology from abroad. Such imports should attract zero duty and VAT rating.
- An evaluation be undertaken to compare the economics of adopting specific alternatives for milk packaging. The Kenya Dairy Processors Association in collaboration with the Kenya Dairy Board and the Ministry in charge of Livestock Development to take the lead in this effort. Policy should be geared towards encouraging the processors to adopt cheaper, domestically available packaging materials. The goal should be to encourage competition and efficiency in packaging across the country.

3.6.11 **UNFAIR COMPETITION FROM MILK VENDORS:**

- This should not arise, as milk "hawking" is illegal.

3.7 POTENTIAL AREAS FOR SMEs INVESTMENTS

Although the Kenya Dairy Board has so far licensed 45 new milk processors since liberalization of the milk industry our research findings indicated that there are still potential areas for SMEs investments in:

- Production of milk (pasteurized)
- Manufacture of milk powder
- Manufacture of UHT milk (sterilized)
- Manufacture of various types of fermented milk (mala, yogurt)
- Manufacture of ice-cream
- Manufacture of ghee
- Manufacture of butter
- Manufacture of cheese

Women entrepreneurs should be encouraged to invest in some of the above areas.

3.8 EMPLOYMENT

In addition to employment in the dairy industry itself there is potential in many of the enterprise linked with the industry.

3.9 ENVIRONMENT ISSUES:

These arise due to:

- Poor siting of dips which pollute rivers.
- Improper use of veterinary drugs, leading to residual levels in milk and milk products.
- Improper use and management of manure from dairy animals
- Improper management of forage, thus failing to ensure proper ground coverage for environmental protection.
- Inadequate practice of agro-forestry through the planting of leguminous shrubs for animal fodder, which would be environmental friendly in fixing bacterial as well as giving coverage to the soil.
- Inadequate use of manure as a source of fuel biogas.

3.10 ROLE OF CO-OPERATIVES:

There are three co-operatives engaged in milk processing (Meru, Limuru and Kitinda). Any well run co-operative can start milk processing. This is one way to bring our indigenous entrepreneurs into processing of milk products. However, proper management needs to be seriously considered.

3.11 GENDER ISSUES:

- Policy makers should take into consideration the role of women as dairy farmers. Women dairy farmers could be encouraged to set up processing units.
- Technical packages should be developed with consultation with women dairy operators so that these do not over-burden women without meeting their needs.
- Research and extension personnel should also target women dairy operators instead of concentrating too much on men dairy operators.

3.12 LINKAGES

4.0 **FISHERIES SUBSECTOR**

4.1 **MAIN FEATURES OF SUB-SECTOR:**

The Fisheries Subsector contributes to foreign exchange earnings, increased rural incomes and improved nutrition. Developing this subsector involves promoting capture of fish in lakes, rivers, dams and the ocean, whereas aquaculture is promoted on farmland. The subsector has a potential of 552,000 tonnes of fish annually but at present only 184,000 tonnes are landed at the beaches. Marine fishing alone has a capacity of producing 260.000 tonnes but is producing 6,000 tonnes at present. These low landings are mainly attributed to the low level of technology applied at the shoreline. Fish farming has a potential of producing 50,000 tonnes annually, but only 1,108 tonnes were produced in 1996.

Although it has all along been the Government policy to guide and assist the development of the fish resources, as evidenced in the various National Development Plans since independence, indications on the ground are that very little progress has been made in this direction. It is still evident that about 90% per cent of harvesting of fish in Kenya is largely being done by private small scale fishermen, who operate on lakeside, along rivers and streams, and in the shallow waters of the Indian Ocean. Some of the areas that the Government has been planning to provide some form of assistance are market development, shore preservation and storage facilities to serve fish production areas, mechanization of small boats, harbour and landing place improvements, improved road network and training.

The fisheries subsector can be divided into three distinct productive areas: inland fisheries, marine fisheries and aquaculture.

Some of the major inland sources of freshwater fish are: lake Victoria, Turkana, Baringo, Naivasha, Jipe and Challa. The main types of fish found in Lake Victoria are the Nile Perch, Tilapia and "Omena". The other lakes produce various types of fish such as Black Bass, Tilapia and Crayfish.

The Kenyan coastline measures about 880km. Much of the coastline is fringed by Mangrove forests and swamps, especially from the Ungwana Bay to the Somali borders and the extreme south. The continental shelf (designed as the area shelving down to 200 metres) is narrow and extending to no more than 18km from the shore. This makes it less productive. There is however, an offshore bank, the North Kenya Bank which extends from approximately 35km South East of Lamu to the Kenya - Somali border which is rich in Crustaceans. Almost the entire catch of small scale fishermen is taken from shallow waters inside the fringing reef due to limitations of boats and gear and the frequently rough sea conditions beyond the reef. Some of the types of marine fish landed include: Prawns, Lobsters, Shrimps, Tuna, etc.

Aquaculture (fish farming) is practiced in many parts of the country. The types of fish kept include Tilapia, trout,prawns, shrimps and Oysters.

4.2 FISHING TRADE

Quantity and value of fish landed between 1991 to 1996 is shown at table 2.

Quantity of freshwater fish landed in 1996 amounted to 177,408 tonnes while saltwater fish amounted to 6,263 tonnes, thus making a grand total of 183,671 tonnes for the year. The biggest source of freshwater fish is Lake Victoria which accounted for 171,419 tons in 1996. Other sources of freshwater fish include lakes Turkana, Naivasha, Baringo, Jipe and numerous fish farms. The value of fish landed in 1996 was Kshs. 290 million with freshwater fish contributing Ksh. 271 million.

TABLE 2: QUANTITY AND VALUE OF FISH LANDED IN 1991 - 1996

	1991	1992	1993	1994	1995	1996
Quantities (Tonnes)						
Freshwater fish						
L. Victoria	186366	151216	174829	193652	181888	171419
L. Turkana	1078	1543	871	1125	2332	2380
L. Naivasha	299	238	109	75	84	96
L. Baringo	130	255	37	7	126	131
L. Jipe	107	112	101	117	150	162
Fish Farming	1009	1017	1014	1119	1083	1108
Other areas	2109	1676	1895	1866	2231	2112
Total	**191098**	**156057**	**178856**	**197961**	**187894**	**177408**
Marine fish	6434	6276	3823	4138	4665	4915
Crustaceans	766	573	373	554	455	461
Other marine products	264	345	141	312	874	887
Grand Total	**198562**	**163251**	**183193**	**202965**	**193888**	**183671**
Value (Ksh. '000)						
Freshwater fish	83306	162277	180446	185927	242772	271496
Marine fish	3765	5914	4807	9088	10570	11717
Crustaceans	3019	3108	2829	3370	3120	3264
Other marine products	536	850	202	211	3748	3806
Total	90626	172149	188284	198596	260210	290283

4.3 FISH PROCESSING

In 1994 there were only 11 factories processing fish. About 14 factories processing fish in 1993 could not acquire licences to process fish as they failed to fulfil the necessary conditions mainly health conditions). The fishing sector employed about 300,000 fishermen in 1994 and another 6,000 were engaged in the processing firms. Major fish processors include Kenya Cold Storage, Samaki Industries, Wananchi Marine Products and Victoria Nile Perch. Their combined processing capacity was 12,000 tonnes (1993), and their main products were frozen fillet, dried, salted and smoked fish. Production of prepared and preserved fish has shown a downward trend form 310,142, kgs in 1990 to 180, 178 kgs in 1994.

Local fish market is conducted on the beaches and in open-air- markets by small scale traders and in urban centres by firms with refrigeration facilities. Most of the fish sold in these markets is unprocessed and not frozen. The export trade earned the country over Kshs. 3 billion and provided jobs in various stages of fishing, transport, processing and exporting. Most of the export trade is Nile Perch from L. Victoria. Kenya's major markets for fish are the European Union (EU), Japan, America and the Middle East. However, the largest single market is the EU which consumes most of the fresh fish and significant quantities of frozen fish products.

4.4 CONSTRAINTS

The problems that face the fish processing industries are numerous and range from those related to raw materials acquisition, to infrastructure, marketing and policy issues. The major constraints are:

- Most processing plants are located far away from the landing beaches and connecting roads are often not tarmacked and impossible to travel during the rains. Inevitably this implies high transportation cost which the firms can seldom absorb.
- Most beaches have no fish handling and storage facilities and this results in high post harvest losses.
- Most small-scale fishermen use boats with no refrigeration facilities and the chances of their catch going bad and wastage is high.
- Inadequate data on fishery resources. Fishery data are essential for Government policy formulation, planning and resource management.
- Presence of water hyacinth in Lake Victoria.
- Inadequacy of reliable information on foreign markets, and poor management of fishery co-operatives.
- Siltation of some of the inland fresh water lakes e.g. lakes Naivasha and Baringo.
- Poor handling practices from harvesting to packaging.
- Inadequate information on stocks in both inland waters and marine.

- Most aquaculture small-scale farmers do not run on commercial basis.
- Inadequate availability of land for aquaculture
- Inadequate supply of fish feed
- Over fishing due to limited mobility of fishermen fishing from breeding grounds.

4.5 **PROPOSED SOLUTIONS:**

The following are proposed solutions to improve productivity and efficiency in the fishing sub-sector:

- In the current National Development Plan the Government has undertaken to make deliberate efforts to encourage sustainable exploitation of fisheries; by paying more attention to more value added industries.
- Within the same Plan Period the Department of Fisheries is expected to undertake the following activities:
  - Fish farming surveys
  - Environmental protection programmes in and around fishery water bodies. This will include liaising with other agencies to address de-siltation of lakes, especially Baringo, Naivasha, Turkana and Jipe.
  - Control of water weeds on lake Victoria and lake Naivasha.
  - Fisheries applied research especially on capture and culture fisheries and production of fish food and re-stocking programmes.
  - Stock assessment surveys in both inland and marine waters to raise Kenyan's fisheries database to the international level.
  - Indian Ocean Coastal Zone Management Programme
  - Infrastructure development in an around landing points (this will involve construction and maintenance of access roads, sheds, cold storage and ice-making plants in addition to rural electrification and provision of social services amenities).
- Government should review existing fish harvesting registration and standards and respective compliance and monitoring procedure.
- The Government should involve services of third parties in the monitoring and meeting the quality specifications.
- Fish processors should join public institutions to enhance research in and development in fishing industry.
- The Government to immediately establish a competent Authority for certifying fish exports, and monitoring compliance of international standards, relating to

general fish handling and processing facilities.

4.6 POTENTIAL AREAS FOR SMEs INVESTMENTS

In addition to harvesting of fish utilizing locally fabricated fishing dhows, there are opportunities for SMEs in:

- filleting
- canning
- smoking of fish
- skin tannery
- utilization of by-products like fish bones to make fish meal
- aquaculture
- transportation of fish

4.7 ENVIRONMENTAL ASPECTS

The fish filleting plants needs a lot of water for processing and cleaning purpose. Therefore such plants should be put where there is an adequate supply of water. The processing plants also produce a number of useful by-products and waste products. These waste products should be disposed of immediately in proper manner or sold to fishmeal manufacturing plants if there are any near-by. Otherwise, the waste from the fish filleting plants if not properly disposed of can be a source of an offensive and awful smell.

4.8 ROLE OF CO-OPERATIVES

Most co-operatives are involved in fish harvesting and they should now embark on penetrating the processing of fish as well as the exportation of fish.

4.9 GENDER ISSUES

Men dominate the fishing industry and there should be a deliberate effort to involve women in this trade. Women should take the first initiative as this need not to be a male dominated industry. Women are found mainly frying fish for sale and also selling dried omena.

4.10 LINKAGES

The fish-processing sub-sector has linkages to:

- fish filleting
- ice manufacturers
- manufacturing of ice making equipment
- fish net manufacturers

- fishermen and fishermen co-operative societies
- fish traders
- packaging industry
- tanneries (manufacture of leather from the Nile perch)
- boat/dhow manufacturers
- soap and pharmaceutical industries
- freezing equipment manufacturers

5.0 SLAUGHTER, PREPARING AND PRESERVATION OF MEAT AND MEAT PRODUCTS.

5.1 INTRODUCTION

Livestock products account for about 10 per cent of GDP and over 30 per cent of the farm gate value of agricultural commodities. The subsector employs over 50 per cent of the agricultural labour force, and provides raw materials for the local dairy, meat and meat processing industries, as well as hides and skins for tanneries, wool, and hair.

Livestock production is fully privatised and the Government's role is the provision of extension services, especially in appropriate technology and improved management. The overall livestock policy is to sustain a proper balance in investments in the subsector and provision of services between the public sector, the private sector and beneficiaries. The policy strategies already put in place include the transfer of most holding grounds to County Councils and retaining strategic ones in order to save on costs, decontrol of meat and animal feed prices, transfer of dip management as to Community Dip Committees, the provision of livestock drugs at cost, decontrol of milk prices and liberalization of the Veterinary and Artificial Insemination (AI) Services.

It is expected that proper implementation of these policy strategies will result in the improvement of the quality of livestock and increase in the processing of livestock products. In particular, it is expected that there will be improvement in the marketing facilities in meat producing areas and the setting up of modern slaughter houses and cooling facilities in meat producing areas and in strategic locations for export purposes.

The meat processing subsector was liberalised in 1987 but despite this, activities in the subsector is dominated mainly by butcheries. Major key players in the subsector include, the Kenya Meat

Commission at Athi River (Canned beef manufacturer) and the Farmers Choice factory at Kasarani, Nairobi. Quick action is required to be taken by the government on the re-opening of Kenya Meat Commission (KMC). The country is losing a lot due to lack of export of canned beef products.

5.2 MEAT PRODUCTION

The meat subsector in Kenya can be divided into red and white meat. The former consists of beef, mutton and goat meat and accounts for 70 per cent of meat consumed domestically, while the latter consists of poultry and pig meat and account for the other 30 per cent. A large proportion of the beef is produced in ASAL areas relying on extensive grazing. About 90 per cent of white meat is produced by smallholder farmers and is dominated by farms in high potential areas.

For the purpose of the present study, the Kenya Meat industry will be split up as follows:-

- Beef
- Mutton and goat meat
- Poultry meat
- Pork
- Miscellaneous

5.3 BEEF PRODUCTION

Beef production is based on the Zebu cattle production, which is mainly found in the Arid and Semi Arid Lands (ASALS), and on culls from the dairy herd. The so called commercial breed herd is only found in some few ranches in the Rift Valley Province. An improved herd of Boran Cattle of less than 200,000 is found in the former white settlers' ranches. The Boran Cattle is of importance to Kenya because it has been selected and improved locally and its qualities can compete with any other beef cattle in the world.

The beef industry has been liberalized for a longer period than dairy (since 1987 as compared to dairy in 1992). It also enjoyed some degree of competition, even before its liberalization. The market however lacks the type of stratification as found in the Western world beef market.

Beef remains relatively cheap in Kenya due to the fact that most of it comes from the ASAL areas and the rest from culls in the dairy industry. Liberalization of the economy, especially the beef marketing, has also assisted in containing the price.

Information on beef production is still very limited and the estimation of how much was produced is extrapolation of data on hides and skins and from the slaughter statistics. It is assumed that there are some hides entering into the country from the neighbouring countries whose effect however can also be assumed to be offset by the unaccounted for hides from within.

Estimation from the hides and skins indicates that about 210,000 tonnes of beef was produced in 1995. This is a decline from the previous 2 years where about 250,000 and 265,000 tonnes of beef were produced in 1993 and 1994 respectively. This decline in beef production is however an indication of weather improvement from the previous years where more beef stocks may have been retained for herd replenishment unlike when they are disposed off to avoid losses due to inadequate grazing.

5.3.1 **CONSTRAINTS FACING BEEF PRODUCTION**

Specific constraints to beef production include:

- Poor infrastructure in beef production areas.
- Poor beef marketing structure.
- Sub-division of land in ranches.
- Under-investment in beef production in terms of technical and policy research.
- Inadequate disease control services.
- Credit availability and suitability for both production and marketing.

5.4 **MUTTON AND GOAT MEAT**

Most of the provinces did not report the slaughter data in 1995, and for the skin data, only four provinces reported. Even for those who reported, the recorded figures of slaughtered sheep and goats were not a true reflection of all the sheep and goats slaughtered in the country.

This is because most districts did not report on the number of slaughtered, others gave a combined figure of all the animals slaughtered in the district and others reported a very small figure in comparison to the number of animals in the district. This means that there is a high number of slaughtered animals which are not recorded in some rural and urban areas.

The sheep and goat skins statistics were assumed to match those of the number slaughtered though there may be skins from such animals which may not be counted among the slaughtered sheep and goats. A total of 906,912 skins were recorded in four provinces out of seven provinces in 1995

Table 3 below shows the total number of sheep and goat skins in the country in 1995, and also the total number of sheep skins and goat skins from all the eight provinces. It should be noted that Kirinyaga in Central Province, Kisumu and Kisii in Nyanza and Nairobi did not submit any statistics at all. In North Eastern, only Garissa District submitted.

TABLE 3: SHEEP AND GOATSKINS IN THE COUNTRY (1995)

Province	Sheep	Goats	Total Skins
Rift Valley	514,974	621,285	1,093,364
Coast	49,457	258,546	337,819
N/Eastern	209,214	284,968	216,852
Eastern	303,444	576,763	457,376
Western	38,989	36,256	75,225
Nyanza	142,055	185,782	379,653
Central	94,207	83,231	175,002
Nairobi	34,786	38,156	73,156
Total	1,387,126	2,086,987	3,472,113

5.4.1 CONSTRAINTS FACING PRODUCTION OF MUTTON AND GOAT

These have been identified as:

- diminishing size of high potential land
- inadequate good breeding stocks
- inadequate disease control services
- poor marketing structure

5.5 PIG MEAT PRODUCTION

5.5.1 EXISTING PIG SLAUGHTER HOUSES

The slaughter houses offered by municipal authorities and parastatals in Kenya are almost exclusively for the slaughter and dressing of cattle, sheep, goats and poultry. Pigs are slaughtered commercially in privately owned slaughter houses and slaughter slabs, or in the case of own consumption, slaughtered by individuals. This situation arises because of the presence of Muslim communities in most areas of Kenya and the religious sensitivities involved.

Many of the pig slaughterhouses have poor facilities and do not comply with basic requirements of the Meat Control (Local Slaughterhouse) Regulations of Kenya. Most slaughterhouses have very low throughput with production levels of about 200-500 pigs per year. Few if any, have chillers for holding carcasses overnight or for longer periods, even though chilled meat and even frozen meat appears to be more widely accepted in Kenya than in many African countries. As a consequence slaughter must take place daily and if surplus carcass meat remains at the end of the day it must be sold at reduced prices or wasted.

In some areas, such as the Coast Province, there are very few slaughter facilities and this acts as a constraint on the development of pig production in the area. Many pigs produced in this province are transported to Nairobi for slaughter.

5.5.2 EXISTING PIG PROCESSING FACILITIES

The following firms process pig:

(i) **Farmers Choice (FC)**

Farmers Choice is by far the largest processor of pig meats in Kenya, handing more than 3/4 of the total production.

The Company has a slaughterhouse for pigs and a meat processing plant on the outskirts of Nairobi. The slaughterhouse was constructed in 1986 and the meat processing plant in 1988. The facility is modern, of a relatively high standard, and complies in general with international meat hygiene requirements. The company has a meat export license.

The slaughterhouse has a capacity to slaughter 500 pigs per day and is currently operating at 50 per cent capacity due to lack of enough pigs to slaughter.

The range of products produced by Farmers Choice includes fresh pork and beef cuts, fresh and cooked sausages of various types, continental small goods and cured meats, ham and bacon. The most expensive cuts of products are sold to the higher income groups and the tourist trade. However the main sales thrust for Farmers Choice products are the mass market and the upper-middle income group. The firm also exports its products in the East African Region. Farmers Choice are also involved in pig production and have set up a number of pig units in Kenya.

(ii) **Nairobi Airport Services (NAS)**

Nairobi Airport Services is a catering company whose main business is servicing the airlines operating out of Nairobi and Mombasa. The Company has a modern processing facility in Nairobi and buys port either as carcass or as primal or sub-primal cuts. About 15-20% is purchased as carcass. Suppliers of pork include Farmers Choice and Kenya Cold Storage Ltd.

About 10 per cent of NAS requirements are produced by their own suppliers of pigs with animals being slaughtered and dressed in small private slaughterhouse.

The processing facility is well equipped and able to produce fresh and cooked sausages, continental small goods and dried meats bacon and ham as well as prime and retail cuts and portions.

(iii) **Gourmet Meat Product Ltd.**

This is a small Company processing many types of sausages and continental meat products, as well as supplying cuts of fresh pork, beef and lamb. Marketing by the company is based upon the stargegy of operating in a market sector where it is not competing directly with Farmers Choice in the mass market.

The processing facility is located on the outskirts of nairobi at Karen. Apart from fresh, cooked and dried sausages, bacon and ham. The company also makes various types of pate, brawl, cured and dried meats such as biltong.

The Company also operates a sow pig unit. It can produce fresh and cooked sausage ham, bacon, dried sausages and cuts of fresh meat.

The firm supplies cuts of fresh pork and meat as well as processed produce to retail butcher shops in Nairobi and to the catering of wholesale trade.

(iv) **Kenya Bacon Co.(KBC)**

The firm took over processing facilities formerly owned by NAS. It produces cuts of fresh pork, and also processes fresh and cooked sausages, bacon, ham and firm sells a range of continental small goods. Beef products are also manufactured. Fresh meat and processed product are supplies mainly to a chain of retail butcher shops in Nairobi, and also to their wholesale depot in Mombasa for tourist hotels.

(v) **Kenya Cold Storage Ltd. (KCS)**

The company has cold storage and processing facilities in Nairobi and a depot in Mombasa.

5.5.3 CONSTRAINTS FACING PRODUCTION AND PROCESSING OF PIGS:

Constraints include:

- shortage of breeding stock
- shortage of good quality feed
- shortcoming in extension services
- inadequate credit facilities
- poor marketing structure
- cultural and religious practices
- improper slaughtering facilities

5.6 POULTRY MEAT PRODUCTION

Off all the poultry species, chickens are the most popular with the Kenyan farmers. The majority of these (79%) are local birds which are normally left to fend for themselves around the farms. Hybrid layers and broilers (20% of Kenyan Poultry) are kept commercially near the main towns for ease of market. The flock size in Kenya is small compared to other countries and varies between 100-1000 birds per batch. These birds are kept by small scale farmers.

Other poultry species are of minor importance in the country and they make up only 1% of the total poultry population.

5.6.1 POULTRY PRODUCTION

Table 4 below gives poultry production in the provinces for 1995 while table 5 shows annual production of poultry from 1990 - 1995.

Table 4: **POULTRY PRODUCTION (1995)**

Province	Broilers	Layers	Indigenous	Others
Western	25,838	84,037	2,926,900	70,212
Central	1,210,790	1,434,870	1,718,152	45,563
R/Valley	10,900	105,720	4,158,672	16,954
Nyanza	51,655	411,759	6,174,661	21,366
Eastern	21,410	188,118	3,151,060	12,085
Coast	129,870	330,456	2,833,076	46,062
Nairobi	2,149,540	141,900	37,080	
Total	3,600,003	2,696,860	20,999,601	463,999

Table 5: Annual Poultry Production ('000)

Year	Broilers	Layers	Indigenous	Total
1990	5,776	1,865	17,674	25,228
1991	5,500	1,800	17,546	24,846
1992	5,400	1,684	18,786	25,870
1993	744	1,864	18,415	21,023
1994	2,526	2,609	17,488	22,632
1995	3,600	2,697	20,999	26,504

The following observations can be made from the production statistics in the above two tables:-

Nyanza, Western and Eastern Provinces, traditionally poultry keeping area has a high concentration of local/cross birds. Rift Valley also had a high concentration of local/cross birds mainly due to the large size of the province.

Most of the birds kept in the country are local/cross which are normally left by farmers to roam outside the homesteads. The poultry distribution in the country during 1995 was as follows:

Table 6: **ESTIMATED POULTRY MEAT PRODUCTION AND VALUE**

Type of bird	No. slaughtered (000's)	Total meat (tonnes)	Value (Kshs)
Indigenous	8,400	10,920	1,260,000
Broilers	3,600	5,400	702,000
Culled Layers	809	15,619	157,640

Total	11,617	31,939	2,119,640

Source: Department of Livestock Production, MOALDM, Annual Report, 1996

The following consumptions apply to the table above:

Indigenous birds

40 per cent of indigenous birds will be slaughtered by the end of the year. Average dressed weight is 1.3kg and cost per bird is Kshs. 150.

Broilers

Broilers will be slaughtered at 7 - 8 weeks with an average dressed weight of 1.5 kgs while cost for Broiler meat is Ksh 130/kg

Layers

Replacement rate for layers is 30 per cent, while culled layers with an average weight of 1.3 kg sell at Ksh. 150 per bird. Culled layers sell at Ksh. 150 each.

From the table it can be noted that over 11 million birds were slaughtered in 1995 and quantity of meat produced from these birds was approximately 31,939 tonnes with a value of approximately Kshs. 2,119,640. It should be noted that commercial poultry processing is undertaken primarily by Kenchic Ltd, which has a modern slaughterhouse unit at Tigoni in Kiambu district.

5.6.2 CONSTRAINTS FACING POULTRY MEAT PRODUCTION

These have been identified as follows:

- diseases
- availability of day old chicks
- poor marketing structure

5.7 MARKETING OF LIVESTOCK PRODUCTS

5.7.1 **RED MEAT**

The marketing of livestock was completely liberalized in 1987 which resulted in several livestock traders and meat processors entering the market. Red meat are marketed using several channels (i) sale to local butchers- mainly in high potential areas where only few animals are involved at a time; (ii) producer - trader channel most common in pastoral areas. Some traders buy from local livestock owners and sell at livestock markets near the areas of production. Then there is another category of livestock traders (bigger ones) who buy from the local livestock markets and transport the animals to slaughter houses in urban areas and/or export live animals overseas; (iii) producer abattoir channel - some livestock owners trek their animals from the pastoral areas to lose weight and get emaciated and end up fetching poor prices. The majority of the holding grounds which used to be utilized for holding the trekked animals briefly in order to regain good condition before slaughter at the abattoirs are not functional and (iv) external marketing either regional, international and involved both live animals and meat, most live animals exports are sheep/goats. Meat exported used to be chiefly canned beef which used to be exported by the Kenya Meat Commission (KMC) before its closure in 1990.

5.7.2 **WHITE MEAT**

Pig and pig products marketing is handled mainly by Farmers Choice Ltd; Kenya Cold Storage and other small outlets. The demand for pig production is projected to increase significantly for domestic use and for export. Poultry meat producers sell directly to tourist hotels.

The gross marked products of various livestock is shown in table 7 while table 4.1 shows livestock purchased for slaughter by licensed abattoir. From table 7 it is noted that gross marketed value of cattle and calves for slaughter increased from Kshs. 5.4 billion in 1990 to over Kshs 6 billion in 1995 while that of pigs increased from 75 million in 1990 to Kshs. 290 million in 1995. From table 8 we note that the number of cattle and calves purchased for slaughter increased from 828,000 heads in 1990 to over 1 million heads in 1995. Number of sheep and goats purchased for slaughter increased from 1,206,000 heads in 1990 to about 1,327,000 heads in 1995.

TABLE 7 GROSS MARKETED VALUE OF PRODUCTION, 1990-1995

Kshs. million

	1990	1991	1992	1993	1994	1995
Cattle and calves for slaughter	5,382	3,876	4,142	4,704	5,054	6,051
Sheep, goat and lamb for slaughter	543	605	613	679	670	921
Pigs for slaughter	75	85	107	186	273	290
Poultry and eggs	42	45	48	54	54	64

TABLE 8: LIVESTOCK PURCHASE FOR SLAUGHTER BY ALL LICENCED ABATTOIRS 1990 -1995 ('000 HEADS)

	1990	1991	1992	1993	1994	1995
Cattle and calves	828	969	921	980	991	1,067
Sheep and goats	1206	1345	1275	1280	1310	1327
Pigs	84	83	81	88	91	91

5.8 GENERAL CONSTRAINTS FACING THE SUBSECTOR

The major constraints facing the slaughter, preparation and preservation of meat subsector was the collapse and closure of the Kenya Meat Commission (KMC) in 1991. The factory, has the capacity to meet international health standards, and could produce high quality exportable beef products. When it was operatinoal KMC used to penalise livestock farmers by paying them less than what the private slaughter houses and processors paid. Despite recent injection of funds by the government, rehabilitation of the parastatals has not succeeded as the firm is viable to compete both internationally and locally due to inefficiency coupled with high overheads, while it cannot also meet international health standards anymore.

Shrinking amount of land is the current most important constraint facing the subsector as a result of sub-division of large high potential farms and ranches in arid and semi arid areas as a result of the government efforts to distribute land to landless Kenyans. High cost of disease control is also a constraint especially following the collapse of Government extension services to livestock owners and the introduction of cost-sharing of services. This had tended to raise the price of chemicals, drugs and vaccines to a level which most livestock farmers could not afford.

Privitisation of KMC is unlikely to benefit the livestock farmers in the short run based on past experience. One viable option is the encouragement through incentives of setting up small and medium size slaughter houses, meat processing facilities in the rural areas where the majority of our livestock population is located.

5.9 **PROPOSED SOLUTIONS TO PROBLEMS FACING THE SUB-SECTOR**

These have been identified as follows:

- Discourage sub-division of ranches
- Quality enforcement of feeds be intensified by the Kenya Bureau of Standards
- Government to consider reducing taxes on inputs for veterinary drugs, duty on imported drugs
- Sensitization of the farmer on the importance of practices in disease control measures
- Government to speed up the setting up of the proposed Agricultural Development Bank which would be best suited for lending to livestock farmers.
- Ways to be explored on how the insurance industry can be facilitated to provide cover to diary farmers as financial institutions are reluctant to lend to livestock farmers without insurance cover.
- Privatizing and reopening the Kenya Meat Commission (KMC).

5.10 POTENTIAL AREAS FOR INVESTMENTS

There is potential for small scale operations in the following areas:

- Setting of smallscale modern slaughterhouses
- Production of day old chicks
- Setting up of small scale tanneries
- Processing of various types of products from livestock
- Processing of by-products from slaughterhouses
- Commercial rearing of livestock
- Setting up of small rural animal feeds plants
- Rearing and slaughtering of turkeys, rabbit etc.
- Using various waste products from cattle like hoofs to make ornaments or grind bones as an ingredient for animal feeds, etc.

5.11 ENVIRONMENTAL ASPECTS

There should be proper disposal of by-products and waste from slaughterhouses.

5.12 ROLE OF CO-OPERATIVES

The co-operatives have a role in the supply of inputs to the farmers and investing in processing units.

5.13 GENDER ISSUES

Since women are involved in rearing of poultry and pigs, they should also be encouraged to venture in processing of various products from livestocks

5.14 LINKAGES WITH OTHER SUB-SECTORS

The meat processing subsector has linkages to:-

- meat processing equipment manufacturers
- animal feed manufacturers
- packaging industries
- tanneries
- restaurants and hotels
- soap industry - through provision of tallow

6.0 ANIMAL FATS AND OILS

6.1 POLICY ENVIRONMENT

Over 95 per cent of domestic edible Oil requirements of 200,000 tonnes are currently imported costing the country between K.Pound 200 million and K.Pound 300 million a year. The consumption of edible oils has been growing at about 13 per cent per annum during the 1978 to 1992 period. Kenya's heavy reliance on imported edible oils has occurred despite the nation's considerable potential to produce the product locally. There are government efforts to promote local oilseed growing through appropriate policies/strategies and the setting up of some institutional framework (Oilseed Development Council). However, it is noted that although animal oils and fats are in some cases equally substitutable with vegetable oils and fats, no deliberate efforts are being made to address the contribution of animal oils and fats, particularly meat fats, in reducing imports. For instance, favourable policies and incentives towards the pig industry and the re-opening of the Kenya Meat Commission will greatly contribute to an increase in production of animal oils and fats locally.

There is no specific government policy targeting the animal oils and fats sub-sector. It is therefore important that when developing a policy framework for the vegetable oils sub-sector, the animal oils and fats should be considered.

6.2 ANIMAL FATS AND OILS

Oils and fats are essential constituents of all forms of plant and animal life. Plants that produce oil include soyabean, castor, cotton seed, peanut, sunflower, coconut and palm. There are also oil-bearing varieties of flax. Corn oil is a by-product of the corn milling industry and cottonseed is a by-product of the cotton ginning industry. Both coconut and oil palms produce larger yields of oil per unit land area than any of the annual oil crops. These plant sources of oil are commonly referred to as vegetable oils and fats.

The commercial land animal fats come mainly from three kinds of domestic animals - pigs, cattle and sheep. Other animals, such as fowl, are raised in large numbers, but their carcasses are so small that they are usually consumed without the fatty portions being separated and processed to yield a pure fat. These animal fats are sometimes called meat fats due to the fact that they are by-products of the meat-packing industry. Internationally, the production of milk fats approaches that of animal body fats. The greater part of the World's milk fat production consists of butterfat derived from cow's milk. The same case applies to Kenya.

6.3 **ANIMAL FATS**

The major edible animal fats are lard and tallow. Lard (and rendered pork fat) are obtained from pigs, and edible tallow is obtained largely from cattle and also from sheep. The main inedible animal fats are tallows and greases.

LARD

Lard is the most important of the edible animal fats. It is defined as the fat rendered from certain fresh, clean, sound fatty tissues of pigs in good health at the time of slaughter, with or without lard stearin or hardened lard. Rendered port fat, on the other hand, is the fat other than lard rendered from clean, sound carcasses or edible organs from pigs in good health at the time of slaughter with certain parts of the animal specifically excluded. Pork fat, although obtained from less desirable packing house products, is not necessarily inferior to lard except in its darker colour, more pronounced flavours, and somewhat higher free fatty acid content. It is often more resistant to rancidity than ordinary grades of lard.

The composition, characteristics, and consistency of lard vary greatly according to the feed of the pigs as well as the part of the animal from which it is taken.

TALLOW

Tallow is mostly used for production of soap on commercial scale. The soap prepared from tallow is more homogenous and if a good quality of tallow is used, the more whiter soap is obtained.

Although tallow is an important edible fat, its derivation from in some cases animals or parts of carcasses which are unfit for consumption as food, a considerable part of the total production appears on the market as an inedible fat. Tallow, and even lard, is generally priced somewhat below most of the vegetable oils.

6.4 **MARINE OILS**

A considerable volume of oils in the World market is contributed by the sea; these oils are called marine oils. They include whale oil, sperm whale oil and fish (including liver) oil. Fish oils are mainly derived from the more numerous small, oily fish, such as sardines, herring, etc. Most of the fish processed for oil are taken in the North Atlantic and North Pacific Oceans. Fish oils, unlike animal fats, are not usually by-products of the preparation of carcasses for meat. The whole fish are processed to yield oil as the primary product, and the residue remaining after extraction of the oil is used for animal feed or as a fertilizer. The production of fish oil is surpassed by that of whale oil, which under normal conditions, ranks in volume with major vegetable oils. Whales are taken primarily for their oil.

The oil content in different species of fish varies greatly, as the table below of the fish mainly used in the fish meal industry shows:-

Species	Oils Content %
Herring	10-25
Anchoveta	3--8
Whitefish	0-2
Redfish	6-10
Flounder	2-3
Mackerel	7-20
Shark	0-2

The wide variation in the figures for each species is due to the variation in oil content with the changing seasons and the age of the fish.

Fish oils contain also non-fat constituents; such as vitamins A and D, cholesterol, lecithin, pigments of fish oils, etc. Consequently the fish oils are used extensively for industrial and nutritional purposes. In industry, fish oils are used in the manufacture of soaps, detergents, paints and varnishes, printing inks, lubricants, leather, insecticides and cosmetics.

The nutritional uses of fish oils include:- human foods, medicine, animal feeding, vitamins A and D stabilized on dry carriers, and water dispersion of vitamins A and D.

6.5 **POSSIBLE CHOICES OF TECHNOLOGY**

PRODUCTION OF LARD

The Uplands Bacon Factory located at Uplands used to produce lard before its closure and eventual liquidation. However, at present it is only Farmers Choice which has the capacity to produce lard locally.

PRODUCTION OF TALLOW

The Kenya Meat Commission factory at Athi River used to produce tallow before its closure in 1990. At present, there is no local firm producing tallow of prime grade.

6.6 **MANUFACTURE OF TALLOW AND LARD-TECHNOLOGICAL OPTIONS**

6.6.1 **ALTERNATIVES AND CONSTRAINTS:**

Modern melting procedures (continuous, refining) are used only in companies which treat more than 4,000 tonnes of raw materials.

Production costs vary considerably depending on the price paid for procurement.

6.7 PRODUCTION OF MARINE OILS

There is no local production of marine oils and chances of doing it are slim due to inadequate availability of raw materials.

6.8 PRODUCTION OF BUTTER AND GHEE

Table 9 shows production of butter and ghee from 1992 to 1996.

Table 9: Production of butter and ghee.

YEAR	PRODUCTION (TONNES)
1992	3,143
1993	2,394
1994	2,409
1995	3,131
1996	2,327

From the table we note no clear trend in the production of butter and ghee but there is a definite decline from 1992 to 1994 when the amount of butter and ghee produced declined from 3,143 tonnes in 1992 to 2,409 tonnes in 1994.

6.9 IMPORTATION OF ANIMAL OILS AND FATS VS.VEGETABLE OILS AND FATS

Table 10 gives the value of imports of oils and fats from 1990 to 1995.

Table 10: Importation of animal oils and fats (1990-1995)

	1990	1991	1992	1993	1994	1995
Animal oils & fats	95.08	51.2	110.72	166.74	148.18	319.9
Vegetable oils & fats	1295.5	1894.2	2978.2	3601.9	4947.1	7029.8
Total	1390.58	1945.4	3088.92	3768.54	5095.28	7349.7
% of animal oils and fats of total imports	6.8	2.6	3.4	4.4	2.9	4.3

From the table it can be noted that the country imported Kshs.95.08 million worth of animal oils and fats in 1990 which was only 6.8 per cent of total oils imported. Although the amount of animal oils and fats continued to increase and rising to Kshs.319.9 million in 1995, its percentage of total oil imports has continued to decline reaching 2.9 per cent and 4.3 per cent in 1994 and 1995 respectively.

Table 11 below gives the quantity of imports of oils and fats from 1990 to 1995.

Table 11: Quantity of Imports of Oils and Fats (tonnes)

	1990	1991	1992	1993	1994	1995
Animal oils & fats	8721	3519	738572	621074	532718	91289
Vegetable oils & fats	160875	174676	189974	138505	296235	204004
Total	1695968	178195	1873592	1447154	3015628	213132
% of animal oils and fats of total imports	5.1	2.0	3.9	4.3	1.8	4.5

Again it is noted that while the quantity of animal oils and fats imported continue to increase its percentage of total oils and fats imported continue to show a declining trend.

6.10 CONSTRAINTS FACING THE ANIMAL FATS AND OILS SUB-SECTOR

These were identified as:

- Availability of raw material (fish oil and other marine oils).
- No processing capacity (fish oil and marine oils).
- The existing urban slaughterhouses do not have the technical capacity to separate fat from meat and refine it further.
- Demand for lard is low due to cultural and religious beliefs.

6.11 PROPOSED SOLUTIONS

Proposed solutions to overcome identified constraints are:

- Privatization andre-opening of Kenya Meat commission (KMC) which has a capacity to produce tallow.
- Setting up of modern slaughterhouses capable of separating fat from meat and further refining it.

6.12 POTENTIAL AREAS FOR SMEs INVESTMENTS

One area which has potential and where SME operators can invest is the setting up slaughterhouses with modern machinery and equipment capable of separating fat from meat and further refining it.

6.13 ENVIRONMENTAL ASPECTS

There is no evidence of any pollution of the environment.

6.14 LINKAGES

The animal oils and fats sub-sector has linkages to:

- Fishmeal manufacture - some fish oils are a by-product of fishmeal manufacture
- Soap manufacture - fish oil is one of the ingredients of some soaps
- Pharmaceutical industry - some fish oils such as the cod liver oil is used in the pharmaceutical industry
- Food industry - some fish oils are carriers of vitamins A and D.

7.0 RECOMMENDATIONS ON FUTURE PLAN OF ACTION

7.1 PREAMBLE

The study has highlighted many constraints facing the four sub-sector of the animal based food industry. It is to be assumed, and quite rightly that constraints have arisen due to:

- lack of appropriate policies to address the particular constraints
- defective policies
- failure to implement policies due to lack of clear guidelines.

What the study has attempted to do is to identify various policies on the sector, looked at areas where there are policy gaps and weaknesses and recommended the "way forward"

Although the government has an obligation to improve the business environment, it is handicapped by shortage of funds. Therefore prioritisation is important as the Government is never in a position to do everything. It is prudent governance to utilise limited resources efficiently in order to get maximum impact. At the same time there are some actions which the private sector, as a partner with Government, are mandated to take. Inevitably taking action will increase costs for the private sector and therefore prioratisation is again important and dependent on costs.

The study has recommended intervention focusing on each of the four sub-sectors comprising the animal based food industry, and suggestions have been put forward on how policies can be changed or formulated to facilitate industrial development in each of the four sub-sectors. Some of the policy recommendations are short-term while others are of a long-term nature.

7.2 SPECIFIC RECOMMENDATIONS

7.2.1 RECOMMENDATIONS FOR MANUFACTURE OF DAIRY PRODUCTS: ANIMAL BREEDING

- The Government should continue to support privatisation of A.I services. However, production of semen should be left to the Government.
- Private sector should distribute and provide A.I. services and ensure provision of proper equipment and education. Co-operative societies should also be involved.
- Government to review policy of AGRICULTURAL DEVELOPMENT COOPERATION (ADC) farms for agricultural development. Sub-division of dairy farms should be discouraged while more farmers should be encouraged to become breeders to reduce importation of resources. Government to take steps to halt anymore sub-division of ranches, whether Government owned or individually.

DAIRY CATTLE FEEDS

- Government to encourage small scale animal feed processors subject to Kenya Bureau of Standards (KEBS) scrutiny. Affordable and good quality animal feeds could be manufactured using waste products from sisal or high protein plants for early maturity of calves. Farmers to be encouraged to add high protein concentrates to feeds for improved milk yield.

DISEASE CONTROL

- Government to consider reducing taxes on inputs for veterinary drugs and duty on imported veterinary drugs.
- Sensitisation of farmers on the importance of disease control measures through barazas or extension workers.
- Strict re-enforcement of rules/regulations governing cattle movement.

- Government to promote research for cheap sustainable and environmentally safe drugs.
- Government to encourage innovative research.
- Funding for research to be adequately addressed by the Government - current provision is too low.

- Explore possibility of private extension services by qualified people i.e. vets at a fee.
- Co-ordination system of A.I. and extension services to be set up by Government or body to license those providing these services i.e. vets services Board to be re-enforced.

YOUNG STOCK MANAGEMENT

- Farmers to be sensitised on benefits accruing from proper management of young stock.

POOR RELATIVE PRICES

- Government and private sector to facilitate efficient marketing system.

UNAVAILABILITY OF SUITABLE CREDIT

- Since commercial banks not sensitive to farmers needs, the Government should facilitate formation of a Farmers Bank. In this respect setting up of the proposed Agricultural Development Bank should be speeded up. The proposed bank would be best suited to lending to farmers.
- Ways to be explored on how the insurance industry can be facilitated to proved cover to dairy farmers as financial institution are reluctant to lend to dairy farmers without an insurance cover for cattle.
- Minimum guarantee returns system to be renewed.

POOR STATE OF INFRASTRUCTURE

- Cess or presumptive tax to be put in a special fund to be used by farmers to improve infrastructure, especially roads.
- A deliberate effort to be made to provide electricity and water in milk producing areas by the Government. In this connection the rural electrification programme should give priority to milk producing areas.
- Local authorities to make all-weather roads in milk producing areas. Cess money to be ploughed back to local authorities to facilitate maintenance of rural roads.
- Allow private investors to make all-weather roads in milk producing areas on cost-recovery basis.

LACK OF TIMELY PAYMENT

- Co-operative Bank to ensure money gets to farmers or co-operative societies with minimal delay.

INCOMPLETE INFORMATION ON INVESTMENTS AND MARKETS

- The Kenya Dairy Board to be facilitated to have a Management Information System in place. The Board in conjunction with the Dairy Training Institute in Naivasha has taken the first initiative by launching a publication called "Maziwa News".
- The Ministry of Agriculture and the Kenya Dairy Board to be facilitated to provide relevant information/data to the mass media for dissemination to dairy farmers and processors.
- Information dissemination to be re-enforced especially by KIPO on appropriate packaging technology. KIRDI should make more efforts to disseminate information on appropriate milk processing technologies.

LACK OF APPROPRIATE TECHNOLOGIES

- If not locally available, the Government should assist dairy farmers and other willing investors to acquire appropriate dairy processing technologies from outside Kenya. Such imports should attract zero duty and VAT rating.
- An evaluation be undertaken to compare the economics of adopting specific alternatives for milk packaging. The Kenya Dairy Processors

Association in collaboration with the Kenya Dairy Board and the Ministry in charge of Livestock Development to take the lead in this effort. Policy should also be geared towards encouraging the processors to adopt cheaper, domestically available packaging materials, The goal should be to encourage competition and efficiency in packaging across the country.

UNFAIR COMPETITION FROM MILK VENDORS

- This should not arise if the necessary laws are enforced as "milk hawking" is illegal.
- Government to speed up finalisation of Kenya Dairy Development Policy Paper as well revision of the Dairy Industry Act, CAP. 336 in view of the liberalisation of the industry since May 1992. The broad objective of the dairy policy is to ensure an orderly development of the dairy industry in Kenya in relation to the vision, mission and core functions of the Ministry of Agriculture, Livestock Development and Marketing.
- Government to speed up restructuring of the Kenyan Dairy Board so that it is able to effectively regulate the sector. A lot has taken place since liberalisation of the industry and the Board has to be more empowered and capacity built to be able to perform its role more effectively.

7.2.2 RECOMMENDATION FOR FISHERIES SUB-SECTOR

There are two sources of fish:-

- Catches from inland lakes and Indian Ocean.
- Fish Farming.

Major source is Lake Victoria - over 90 per cent.

Stocks of each type of fish found in the lake is unknown. The Government should take immediate steps to carry out this stock assessment in conjunction with Tanzania & Uganda. This assessment will give an indication of the composition of each species of commercial importance. Further recommendations are:

- Ascertain maximum sustainable yields of Kenya's 10,000 km^2 of inland waters and 6500km^2 of fishable offshore waters.

- Formulate a stock management system/plan that will ensure that overfishing is curtailed, particularly for Nile perch.
- Water hyacinth - control spread of this weed.
- Re-examine the licensing system such that instead of using it as a Government revenue source, it should be designed in such a way that it is used to collect data in order to upgrade fisheries database to all international level.
- Infrastructure: The handling of fish at harvesting/landing points needs to be improved and therefore encouragement of the setting up of small scale cold storage facilities along the landing beaches is necessary. The encouragement could be in the form of reducing
- waiving tax on imported processing machinery/equipment.
- Rural electrification be deliberately intensified in fish production areas.
- All weather roads be deliberately constructed in fish production areas through the partnership of local authorities and the local fishing community.
- Deliberate efforts be made to identify investors to carry out deep sea fishing and processing and give appropriate incentives.
- Draw up and implement environmental protection programmes in and around fishery water bodies.
- Government should review existing fish harvesting registration and standards and respective compliance and monitoring procedures.
- Government involve services of third parties in the monitoring and meeting the quality specifications.
- Government should review its policy on staff transfer and mobilization in order to promote specialization for effective use of its human resource.
- Government should design and implement appropriate credit schemes targeted at the fishing industry.
- Fish processors and public institutions should join together in order to enhance research and development.

FISH FARMING

Catches in natural waters in the world are reducing. Therefore, deliberate efforts should be mad to promote local fish farming as an economic and commercial venture. Originally, fish farming was initiated, designed and planned without concern for profitability. It was essentially regarded as a family subsistence activity. It is therefore recommended that:-

- Fish farming be prioritized

- Research and Development on fish farming be intensified.

7.2.3 RECOMMENDATIONS FOR MEAT AND MEAT PRODUCTS SUB-SECTOR

- The few remaining ranches should not be sub-divided.
- Quality enforcement of feeds be intensified by the Kenya Bureau of Standards and there is urgent need to educate the feed manufacturers on the importance of keeping the set minimum standards and their maintenance.
- There is need for the sensitization of the farmer on the importance of practicing disease control measures.

- Vaccination is an infrastructural problem and therefore it should remain a Government undertaking.
- Privatise and re-open the Kenya Meat Commission (KMC).

7.2.4 RECOMMENDATIONS FOR ANIMAL FATS AND OILS

- **Sensitisation:** The public be sensitised on the nutritional importance of fats and oils consumption.
- **Research:** Further research and studies be undertaken in order to identify all possible uses/demand locally of animal fats and oils.
- **Local Resource:** Fish with a lot of oil e.g. shark, should be utilized as a raw material for fat extraction.
- **More information:** Kenya Industrial Property Office (KIPO) avail information on small-scale technologies relating to animal fats and oils.
- Privatize and re-open the Kenya Meat Commission (KMC) which has a capacity to produce tallow.
- Encourage the setting up of modern small scale slaughterhouses capable of separating fat from meat and further refining it.

APPENDICES

APPENDIX I

LIST OF LICENSED MILK PROCESSORS (1997)

PROCESSOR	COMMENCEMENT DATE	PRODUCTS	LOCATION
1. Aberdare Cheese Factory P.O. NAIVASHA TEL. 0311-20512	December 1982	CHEESE	NAIVASHA
2. Aberdare Creamery P.O. Box 875 NAIVASHA Tel:02-246875/561341	December 1995	Pasteurised Milk	North Kinangop
3. Bio-Foods Ltd P.O. Box 12143 NAIROBI Tel: 02-891530	November 1990	1. Yoghurt 2. Mala	Nairobi
4. Brookside Dairy P.O. Box 236 RUIRU Tel: 0151-54010/12/13 0151-54337 Fax: 0151-54101	September 1993	1. Pasteurised 2. Yoghurt 3. Mala 4. Butter	Thika
5. Chesumot Ltd. P.O. Box 180 KERICHO Tel: 0361-20170	August 1991	1. Mala 2. Cheese	Kericho
6. Delamere Dairy P.O. Private Bag NAIVASHA Tel: 0311-20675	December 1994	1. Pasteurised 2. Yogurt & Mala 3. Butter 4. Cream	Naivasha
7. Doinyo Lessos Creameries P.O. Box 169 ELDORET Tel: 0311-20675 5. Cream	January 1958	1. Pasteurised 2. Mala 3. Yoghurt 4. Butter Cheese	Eldoret

8. Echuka Farm P.O. Box 8 TIGONI Tel: 0154-41977	February 1976	1. Pasteurised 2. Yoghurt 3. Mala 4. Butter 5. Cream 6. Cheese	Kiambu
9. Eldairy Products Ltd P.O. Box 1074 KAPSABET Tel: 0321-63652	April 1994	Mala	Kapsabet
10. Eldoville Farm P.O. Box 24390 NAIROBI Tel: 02-882642/884540	February 1986	1. Yoghurt 2. Mala 3. Cream	Nairobi
11. Farm Best Dairy Kamami Farm P.O. Box 60873 NAIROBI	April 1993	1. Pasteurised 2. Cream	Kiambu
12. Happy Cow Ltd P.O. Box 558 NAKURU Tel: 037-215479/446	June 1996	1. Cheese 2. Pasteurised	Nakuru
13. Hill Farm Enterprises P.O. Box 1588 THIKA Tel:0151-31758	August 1994	Pasteurised Milk	Kandara
14. llara Dairies P.O. Box 6 RONGAI Tel: 0362-32416/7	December 1994	1. Mala 2. Yoghurt	Nakuru
15. Kenya Milk Products P.O. Box 816 NAKURU Tel: 037-2861	January 1984	1. Cheese 2. Yoghurt 3. Mala	Nakuru
16. Kilifi Plantations Private Bag KILIFI Tel: 0125-22119	December 1965	1. Pasteurised 2. Mala	Kilifi

17. Limuru Milk Processors P.O. Box 8 LIMURU Tel:0154-71369	July 1995	1. Pasteurised 2. Butter 3. Ghee	Kiambu
18. Palm House Dairy P.O. Box 1001 NAIROBI Tel:0154-65344	June 1996	1. Pasteurised 2. Mala 3. Yoghurt	Kiambu
19. Spin Knit P.O. Box 1478 NAKURU Tel: 037-213719/492	January 1996	1. Pasteurised 2. Cream 3. Yoghurt	Nakuru
20. Sunpower Products P.O. Box 41112 NAIROBI Tel: 0154-40776	January 1980	Cheese	Kiambu
21. Teita Estate P.O. Private Bag MWATATE	January 1994	1. Pasteurised 2. Mala	Mwatate
22. Toiyoi Roast P.O. Box 896 KAPSABET Tel: 0326-33002	June 1994	Cheese	Kapsabet
23. Premier Dairy P.O. Box 1522 KERICHO Tel: 0361-72235/7/8/9	November 1996	1. Pasteurised 2. Yoghurt 3. Mala	Kericho
24. Machakos Milk Processors P.O. Box 207 MACHAKOS Tel: 0145-20087	April 1997	1. Pasteurised 2. Yoghurt	Machakos
25. Meru Co-operative Dairy P.O. Box 6 MERU Tel: 0164-30081/2	February 1980	1. Pasteurised 2. Butter 3. Ghee	Nairobi

26. Express Dairy P.O. Box 20170 NAIROBI Tel: 782480/781408	November 1997	Pasteurised Milk	Nairobi
27. Bubagi Dairy P.O. Box 539 KITALE Tel: 0325-318819	February 1997	Pasteurised Milk	Trans-Nzoia
28. Nyota Dairy P.O. Box 2151 KITALE Tel: 032531773	March 1997	1. Pasteurised 2. Mala 3. Yoghurt	Kitale
29. Unigate Dairy P.O. Box 54212 NAIROBI Tel: 215147/8	October 1997	Pasteurised Milk	Nairobi
30. Dangelato P.O. Box 54380 NAIROBI 3. Ice Cream	December 1994	1. Pasteurised 2. Mala Yoghurt	Nairobi
1 . Kenya Co-operative Creameries		1. Pasteurised	Nairobi (2) Naivasha
		2. UHT Milk	Nakuru
	3 . Milk Powder	Eldoret	
	4. Mala	Kitale	
	5 . Butter	Sotik	
	6. Cheese	Changamwe Mariakani Kiganjo Nyahururu	

APPENDIX 11

LIST OF EXPORTERS OF FISHERY PRODUCTS

1 Samaki Industries Ltd
P.O. Box 41218
Nairobi
Tel: 556359, 555823
Fax:545702

2. Kendag Ltd
P.O. Box 32705
Tel: 802899, 861322/20
Fax:803236

3. Star Fisheries Ltd
P.O. Box 45455
Nairobi
Tel: 791824
Fax:791824

4. Capital Fish Ltd
P.O. Box 39358
Nairobi
Tel: 48215, 48241-2,48148

5. East Africa Seafoods Ltd
P.O. Box 10271
Nairobi
Tel: 533236
Fax:533236

6. W.E. Tilley
P.O. Box 11880
Nairobi
Tel: 862203/4
Fax:540048

7. Fish Processors Ltd
P.O. Box 4162
Kisumu
Tel: 035/44413, 40102,40188
Fax:44439

APPENDIX III

LIST OF MEAT AND MEAT PRODUCTS PROCESSORS

1 Kenya Meat Commission
P.O. Box 2
Athi River
Fax:20339

2. Farmer's Choice Ltd
P.O. Box 47791
Nairobi
Fax:812123

3. Gourmet Meat Products Ltd
Ngong Road
Tel: 564946, 564947, 565962

4. NAS Food Processing Division
P.O. Box 19170
Nairobi
Fax:554214

5. Kenya Cold Storage (1964) Ltd
Off Enterprise Road
Tel: 545573, 545579

6. Kenya Bacon Co. Ltd
Wakulima Lane
Tel: 540439, 553680

7. Kenchic Ltd
Woodvale Grove Westlands
P.O. Box 20052,
Nairobi
Tel: 444809, 444814, 448313

8. Afro Meat co. Ltd
P.O. Box 86658
Mombasa
Tel: 0 1 1-227749/50, 313130
Fax: 01 1-223259

9. Peche Foods Ltd
P.O. Box 1064
KISUMU

Tel: 035-21524
Fax: 035-21524

10. Lake Victoria Ltd
P.O. Box 57327
Nairobi
Tel: 571142
Fax: 571125

11. Tropical Food Products Ltd.
P.O. Box 62869
Nairobi
Tel: 447392/447461
Fax:447466

12. Sea Harvest Ltd
P.O. Box 2175
Mombasa
Tel: 01 1-433745, 432575

13. Wananchi Marine Products
P.O. Box 81841
Mombasa
Tel: 0 1 1-226484/479/517

14. Transaffica Fisheries Ltd
P.O. Box 80492
Mombasa
Tel: 011-493946,495267
Fax: 01 1-4959523 227406

APPENDIX IV

LIST OF ANIMAL FATS AND OILS PROCESSORS

1 Kenya Meat Commission
P.O. Box 2
Athi River
Fax:20339

2. Farmer's Choice Ltd
P.O. Box 47791
Nairobi
Fax:812123

APPENDIX V

KEY STAKEHOLDERS IN THE ANIMAL BASED FOOD INDUSTRY

PUBLIC SECTOR

1. Ministry of Agriculture and Livestock Development
   Kilimo House, Cathedral Road
   P.O. Box 30028, Nairobi
   Tel: 718870

2. Ministry of Natural Resources
   Fisheries Department
   Museum Hill
   P.O. Box 58187, Nairobi
   Tel: 742320/742349

3. Ministry of Industrial Development
   Uchumi House, Aga Khan Walk
   P.O. Box 30418, Nairobi
   Tel: 333555

4. Ministry of Finance
   Treasury Building, Harambee Avenue
   P.O. Box 30005, Nairobi
   Tel: 3381 11

5. Ministry of Planning & National Development
   Treasury Building, Harambee Avenue
   P.O. Box 30005, Nairobi
   Tel: 338111

6. Kenya Dairy Board
   Coffee Plaza, 2nd Floor
   Haile Selassie Avenue
   P.O. Box 30406, Nairobi
   Tel: 336070/336060/336020

7. Investment Promotion Centre (IPC)
   National Bank Building, 8th Floor
   P.O. Box 55704, Nairobi
   Tel: 221401/4

8. Export Processing Zone Authority (EPZA)
   British American Centre, Mara Road,
   P.O. Box 50563, Nairobi
   Tel: 712800

9. Kenya Meat Commission
P.O. Box 2, Athi River
Tel: 0150/20720

10. Export Promotion Council (EPC)
Universary Towers, 1st Floor
University Way
P.O. Box 40247, Nairobi
Tel: 228534

11. Kenya Bureau of Standards
Off Mombasa Road
P.O. Box 54974, Nairobi
Tel: 502210

12. Ministry of Research,
Technical Training and Technology
Posta Sacco Plaza, 16th Floor
P.O. Box 51648, Nairobi
Tel: 219430

13. Kenya Marine & Fisheries Institute
Museum Hill
P.O. Box 58455, Nairobi
Tel: 745050/742320

PRIVATE SECTOR

14. Federation of Kenya Employers
Waajiri House, Argwings Kodhek Road
P.O. Box 48311, Nairobi
Tel: 721929

15. Kenya National Federation of Jua Kali Association
P.O. Box 59279, Nairobi
Tel: 762221

16. Kenya Assosiciation of Manufacturers (KAM)
Peponi Road, Westlands
P.O. Box 30225, Nairobi
Tel: 740005/746007/746021

17. Kenya National Chamber of Commerce & Industry
Ufanisi House, Haile Selassie Avenue

P.O. Box 47024, Nairobi
Tel: 220866

18. Kenya Co-operative Creameries Ltd
Creameries House, Dakar Road
Tel: 568780/532535/557915

19. Kenchic Ltd
Woodvale Grove, Westlands
P.O. Box 20052, Nairobi
Tel: 444809/444814/448313

20. Farmers Choice Ltd
Kahawa Station/Off Kamiti Road
P.O. Box 47791, Nairobi
Tel: 811722/810419/811181

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