FACTORS INFLUENCING THE QUALITY OF HIDES AND SKINS, A CASE OF KAJIADO COUNTY OF KENYA.

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DECLARATION

This research project report is my original work and has not been presented for the award of a degree in any other university.

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To my dear wife Eunice Nairesiae, my daughter Victoria Nashipai and son, Emmanuel Letipat

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LIST OF ABBREVIATIONS

ASAL : Arid and Semi-Arid Areas

CFC: Common Funds for Commodities

CTC : Centre Technique Chaussure

DFID : Department for International Development

ESALIA: East and Southern Africa Leather Industries Association

FAO : Food and Agriculture Organization of the United Nations

ILRI: International Livestock Research Institute

ITDG: Intermediate Technology Development Group

KLDC: Kenya Leather Development Council

LAIFEZ : Leather and Allied Industries Federation of Zimbabwe

OAU/IBAR : Organization of African Unity/ Inter-African Bureau of Animal Resources.

PIC : Product Improvement Center

UNDP: United Nations Development Program.

UNIDO: United Nations Industry Development Organization

Abstract

Hides, skins and leather industry is one of the key agricultural sub-sectors in Kenya and has a high potential towards commodity development that has a positive economic-socio trickle effect on rural development, wealth creation and employment. Full potential of the sector is yet to be realized in Kenya and other Africa countries due to poor quality of raw hides and skins leading to low demand for semi-processed leather in both domestic and export markets. Most pastoralists still view hides and skins as by-product, therefore yet to maximize income from the sale it. This study investigated factors contributing to poor quality of hides and skins in Kajiado County and suggest possible actions for improving quality to meet the needs of domestic and export markets, hence improve income for pastoralist in the County. A survey was used to collect and collate data . Data processing, analysis included data preparation, editing, coding, classification and analysis were carried out. The returned questionnaires were checked for consistency, cleaned, and the useful ones coded and analyzed using MS excel computer software. The researcher analyzed the quantitative data using descriptive statistics and presented through percentages, means, standard deviations and frequencies. The study found that all the independent variables were significantly affecting the quality of hides and skin in Kajiado County. As part of improving the quality of hides and skins in the County, the research has made recommendations to be effected which includes; policy review, capacity building for local farmers and further studies on value addition

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The lives of millions of families in different parts of the world are dependent on livestock production in general and hide and skins in particular as a source of income and indeed for food security. In many of the developing countries, the livestock sector has enormous potential for improvement. Hides and skins are primarily the raw material for the tanning industry; where they provide leather for the manufacture of leather products. Although any hide or skin can be processed into leather (and leather products) various breeds of domestic cattle, sheep and goats provide the overwhelming majority of raw materials ((FAO, 2001).

The hides, skins and leather industry is one of the key agricultural sub-sectors in Kenya and has a high potential towards commodity development that has socio economic importance and positively impacts on rural development, wealth creation and employment (Mwinyihijah, 2009). The leather industry generates KShs.1.8 billion annually while the export earnings are approximately KShs.4 billion and estimated to have a potential of over KShs.10 billion. The leather industry depends entirely on the livestock resource base from the Arid and Semi-Arid Lands (ASAL) which covers about 70 percent of the country (Mwinyijah and Magero, 2009).

The industry has seen tremendous growth in recent years, especially after the Kenya Government moved to impose a 40% export duty on raw hides and skins. This ensured those raw materials were not exported out of the country leaving the local tanneries with no raw material. The export duty has resulted into an increase in the number of tanneries within the country (Kenya Economic Survey 2011). Hides and skins often of intrinsically and up discarded or wasted because of ignorance or misinformation (FAO, 2009). In majority of developing countries, despite the fact that they have enormous livestock population, their contribution to the growing supplies of hides and skins on the world market is very unreasonable due to the major reasons being lack of modern slaughtering facilities, lack of knowledge and understanding of the correct methods of flaying and curing of the perishable hides and skins (Lukin, 1967).

About 40 % of hides and skins still go to waste or their quality is substantially reduced due to factors that could be avoided. Some of these casual factors are embedded in the production structure and animal husbandry practices used in the respective countries while others arise from the dispersion of the slaughtering facilities, unfavourable marketing structures, poor handling *(Ministry of Livestock report, 2011)*. The selling price of hides & skin, and associated products depends on quality of hides and skin and the grades of the leather processed. To endeavour to improve the quality of hides and skins in Kajiado County, the study will highlight issues that contribute to poor quality hides and skins which policy makers will use to develop programmes to address the same both at national and grass root level.

1.2 Problem Statement

Although Africa produces 8% of the total world's hides and skins, its only 4% is converted to leather. The uncounted 4% is the loss as a result of poor quality among others.
Hides and skins trade is a major foreign income earner for Kenya. The bulk of hides and skins exported and utilised for leather tanning in the country are produced in the arid and semi arid areas of Kenya (Wayua and Kagunyu, 2008). However, it has been observed that the full potential of hides and skins have not been realised in Kenya and other countries due to low quality leading to low demand for both domestic and export market. The quality of hides and skins produced in the pastoral areas is of low quality due to poor curing methods among other problems in the value chain (Foxwell1999).

Most rural communities currently are using sun-drying hides and skins preservation method, this has led to a decline in demand and there is a preference for salted one. Sun dried hides and skins take more time to tan and also use more chemicals at the tanneries as compared to wet salted hides and skins. Although hides and skins account for a significant portion of the value of livestock output in Kenya and especially Kajiado County, its full potential as a product has not been realised because of several reasons, the most important being low quality of the product produced with consequent poor demand in both domestic manufacturing industries and in the export market.

The final quality of the hides and skins depends to a large extent on the entire production chain, including animal nutrition, control of ecto-parasite diseases, and adaptation of standardized flaying procedures to storage techniques of hides and skins. It is estimated that

hides and skins sub-sector in Kenya losses an estimated KShs.4.52 billion as a result of poor hides and skins quality. The study aims at examining factors influencing the quality of hides and skins with a view of informing policy and decision makers developing hides and skins quality improvement programmes.

1.3 General objective of the Study

This study will investigate factors contributing to poor quality of hides and skins in Kajiado County and suggest possible actions for improving quality to meet the needs of domestic and export markets, hence improve income for pastoralist in Kajiado County.

1.3.1 Specific Study objectives

i. To examine the effect of poor animal husbandry on the quality of hides and skins.
ii. To assess the effect of livestock branding on the quality of hides and skins.
iii. To establish the effects of poor flaying techniques on the quality of hides and skins
iv. To asses to what extent does grading of hides and skins affect quality.
v. To examine post-slaughter practices that affects quality of hides and skins.

1.4 Research questions

i) To what extent does animal husbandry affect the quality of hides and skins?
ii) What is the effect of branding on the quality of hides and skins?
iii) To what extend does poor flaying techniques contribute to poor quality of hides and skins?
iv) How does grading of hides and skins affect quality
v) To what extent does post –slaughter practices affects quality of hides and skins?

1.5 Significance of the Study

The abundance of raw material in the form of hides and skins from cattle and small stock (sheep and goats) which form part of the livelihoods of pastoralists and play a crucial role in creating employment opportunities for both rural and urban communities. Over 80% of farmers living in Kajiado County rely on livestock as a source of income and general livelihoods. Improved quality of hides and skins will lead to increased prices which will cumulatively lead to improved quality of life as farmers are able to meet their basic needs and surpluses invested. The current practice in the county is that hides and skins are regarded as a meat by-product of meat and not a commodity for sale (ILRI, 2000).

At the national level, the government of Kenya currently earns Kshs 4 billion annually from the exports of hides and skins against a potential of Kshs 10 billion. The deficit is attributed to poor quality of hides and skins. Development and enforcement of policies to improve hides and skins will lead to increased foreign export earnings which will catapult the country to achievement of Kenya Vision 2030 (*Mwinyihija,2011).*

Leather and footwear manufacturers industry will by and large benefit from improved quality of hides and skins. Finished leather for upholstery and premium footwear is currently import from Europe and Asia. This has been necessitated by lack of quality finished leather in Kenya. The importation of quality leather has led to increased in the costs of leather goods making it beyond reach to majority of Kenyans (KIPPRA Study Report on Cluster Analysis for enhancing productivity and Competitiveness of the Kenyan Economy 2010).

By identifying major factors that influence quality of hides and skins in the study area, the research report will inform policy makers in the hides, skins and leather sub-sector to develop specific and efficient extension programs to improve the quality. Improvements in hides and skins can enhance the role of the leather industry in food security, poverty alleviation and rural employment.

1.6 The Scope of the Study

The study was carried out in Kajiado County which is located at the southern tip of the former Rift Valley Province. The County has a population of 687,312 (2009 *Population and Housing Census*). It is bordered by Tanzania to the south-west and the County of TaitaTaveta to the south-east, Machakos County to the east, Nairobi County to the north-east, Kiambu County to the north and Narok County to the west. It covers a total area of 21,901 Km^2. The region is very dry with few seasonal rivers. Its officially designated as semi-arid. Though it has pockets of arable land in Loitokitok and Ngong areas. The annual rainfall varies between 500 and 1,250 mm. There are two wet seasons, the 'short rains' between October and December and the 'long rains' between March and May. In recent years, there have been long periods of drought when there has been little or no rain. The county is inhibited by Maasai community who are pre-dormantly pastoralists. The population of livestock is 1,829,629 (411,840 Cattle, 718,131 Sheep and 699,658goats). (2009 *Population and Housing Census Volume II*)

1.7 Limitations of the Study

The study was hampered by fewer or absence of hides and skins records among the traders especially in areas like quality and standards. Research on hides and skins is also very limited. The geographical scope of the project is vast with poor infrastructure which made collection of data to be difficult.

1.8 Delimitation of the Study

Kajiado County, where the study was carried out has the highest number of hides and skins traders in the country. There is the willingness of respondents to participate in the study in order to improve their own livelihoods.

1.9 Assumptions of the Study

It's assumed that the sample represents the population. The data collection instrument has validity and is measuring the desired constructs and the respondents will answer questions correctly and truthfully.

1.10 Definition of Terms

Abattoir: A slaughterhouse having proper facilities for all aspects of slaughter with the necessary equipment for proper handling of meat, skins and other animal by-products in an appropriate manner.

Branding: A permanent man-made mark on the hide for animal identification usually made with a hot metal bar.

Bovine: Term specifically applied to leather made from hides of cows, although it is generally loosely used to designate any leather tanned from hides of animals of the bovine species.

Crusts: Light leather which has not been further processed after tanning but has been merely dried out: usually vegetable but sometimes chrome or combination tanned.

Curing: The treatment of raw hides and skins after flaying to retard bacterial action and putrefaction.

Flaying: refers to removal of hide or skin from an animal and in this context the animals referred are cattle, goats and sheep.

Flay cuts: Damage caused by careless use of a knife during flaying, sometimes cutting through the skin.

Grain: The pattern of the outer surface after the hair or wool and epidermal tissue have been removed.

Grain Break: Any hide having a defect on the hair side causing the grain to be broken one inch or more in length or diameter, or having two or more such defective spots, which aggregate in measurement one inch or more in length or diameter. This includes sores, rubs, scuffs and deep scratches.

Hide: outer covering of a mature or fully grown bovine, equine, camel or other domestic or wild animal of a larger kind.

Leather: Means a hide or skin with or without hair which still retains its original fibrous structure more or less intact and which has been semi-tanned so as to be imputrescible even after exposure to water.

Quality: A measure of excellence or a state of being free from defects, deficiencies, and significant variations, brought about by the strict and consistent adherence to measurable and verifiable standards to achieve uniformity of output that satisfies specific customer or user requirements.

Skin: the outer covering of a goat, sheep, game animal, reptile, bird or any otherdomestic or wild vertebrate of smaller kind.

Slaughter defects: refer to cuts or holes and gorges to the hides and skins making them unfit for the subsequent use up the value chain mainly due to poor slaughtering facilities, inadequate flaying skills and motivation and poor illumination during slaughter

Tanning: The process of converting putrecible hides and skins into leather is known as tanning e.g. Chroming tanning, Vegetable tanning, Alum tanning etc.

Tannins: The materials which can tan leather are known as tannins. These can be produced naturally or synthetically. Example: Basic Chrome power, Basic Aluminium salts, Zirconium salt, Titanium salts, Vegetable tannins- Mimosa, Quebracho, Divi-divi, Ock, Hemlock, Mangrove etc., various syntans etc.

Value addition: Refers to fully or partially transformation of raw materials/ resources to a more valuable forms and as a result possesses higher prices and long shelf life span

Wet-blue: Term for all chrome tanned and still moist leathers are known as wet-blue.

Wet Salting: Curing method, in which the cooled flayed hide or skin, which has been fleshed to remove meat and fat, trimmed to shape, washed with water, drained and weighed, is spread out flesh side up, on a concrete self draining floor and well sprinkled with salt (common salt)

Wet-white: Chrome free pre-tanned leather which is tanned with alum, titanium or zirconium salts or glutaraldehyde is known as wet-white leather

1.11 Summary

The chapter has given background information on the study. It has highlighted the objective of the study, the research objectives, significance, the scope, definition of terms as used in the study and the conceptual framework.

The objective of the study was to identify factors contributing to poor quality of hides and skins produced and suggest possible actions for improving quality to meet the needs of domestic and export markets hence improve pastoralist's income in Kajiado County.

The next chapter gives a literature review on the factors influencing the quality of hides.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The purpose of this study was to examine factors contributing to poor quality of hides and skins in Kajiado County by reviewing, analyzing, and incorporating into this study what others have observed in their studies. The chapter is structured according to the research questions. It addresses how poor livestock husbandry, branding, flaying, grading and post slaughter practices affects the quality of hides and skins.

2.1.1 Production and trade in hides and skins in Africa

The use of hides and skins dates a very long time ago. Therefore, leather making is one of the oldest trades of mankind. Due to the skin's versatility and its nature, being susceptible to putrefaction, drying and hardening off, man devised means of preserving it in different ways suited to the various intended uses. The skins were smoked over an open fire to prevent them from rotting. Therefore, more preservative methods were developed and improved leading to the birth of tanning. The process of tanning improved from the use of animal fat, brain, and other substances/methods purposely done for softening and arresting putrefaction to the use of today's chemicals to produce fashionable and variable leathers to cover various products to meet the modern world needs (John 1997).

Hides, skins, leather and leather products are among the most widely traded commodities in the world with their total export value estimated at US$ 54 billion and the informal business amount to almost the same value. Despite such big world trade volume, the largest disparity is observed on the African continent, where 21 percent of the world livestock population has only one percent traded value (GRM International, 2007).

CFC project, (2001) indicated that although Africa occupies a relatively low position in production and trade in hides and skins within the global leather industry in spite of its significant livestock population and low labour cost. This is a reflection of the leather sector weakness in the various stages of leather production cycle starting with, animal husbandry,

slaughter facilities and preservation and processing. Kiriithu, (2006) noted that the most significant factor influencing production of hides and skins is the "cultural factor" in livestock rearing which discourage commercial farming/slaughtering and lay emphasis on numbers of animals maintained by a farmer as a sign of wealth.

While many agricultural commodities are the primary products of a particular enterprise, hides and skins are not, animals are not kept to provide hides and skins. Indifferent countries, the primary reason for keeping animals varies. In general though, livestock such as cattle, buffalo, sheep and goats are maintained to provide meat, milk, wool, transportation or to provide a source of wealth (Leach, 1995).

Livestock rearing in Africa is done under very diverse conditions varying from open Savannah grasslands, organised commercial farms, zero and semi-zero grazing.
The quality of products obtained from livestock reared in these varying environments is directly influenced by these conditions In the case of hides & skins the quality and yield of leather obtained from such animals is dependent on these factors *(FAO, 2001).*

According to Rienstra, (2004), the gap between resources (livestock) and production (hides and skins) in Africa is wide, but also exposes the potential of the industry. Reducing the gap is critical in this important sector, which is strategic for economic and industrial development. By boosting exports, the entire continent stands to benefit.
At household level, livestock plays a critical economic and social role in the lives of pastoralists, agro-pastoralists and smallholder farmers. It fulfils an important function in coping with shocks, accumulating wealth and serving as a store of value in the absence of formal financial institutions. Livestock also provide nutritious food, additional emergency and cash income (Delgado,et al. 2004).

Table 1: Global livestock population, hides and skins production and ratio of outputs

Table showing livestock population and hides and skins production globally

Category	World	Africa
Bovine hides		
Livestock no. (Millions)	1495.5	21
% share of global herd	100	15
Of take rate (%)	21.5	12
Numerical Outputs (million pieces)	321.9	26.5
Goats skins		
Goats no. (Millions)	752	218
% share of global herd	100	29
Of take rate (%)	48.8	31.3
Numerical Outputs (million pieces)	366.9	63.2
Sheep skins		
Sheep no. (Millions)	1035.9	220
% share of global herd	100	21.2
off take rate (%)	48.9	34.2
Numerical Outputs (million pieces)	506.1	75.2

Source: Extracted from FAO 2005 world statistics .com

From the above Table, Africa's livestock population represents over 15%, 21% and 29 % of the global cattle, sheep and goats population respectively and with estimates of 221 million cattle heads, 220 million sheep and 218 million goats, Despite the huge livestock population, however, the continent is considered to account for less than 5 % of the world market (FAO 2005).

According to Leach, (1995), meat is usually the most important product and receives considerable attention. Hides and skins are often dismissed as being of secondary importance and tend to receive inadequate attention. Since hides and skins are by-products, their supply is not primarily affected by the demands of the tanning industry. Deliberate slaughter of animals for meat production accounts for most of the hides and skins available to the tanning industry.

According to (Leach, 1995 and Delgado 2004), In Africa, livestock production and the off-take rate is very low. Although animals are kept for milk, meat, transport, crop production and as form of wealth and savings, and for many social functions, sales are not regular nor do

they occur at optimal age to make efficient use of feed resources. Instead, animals are generally sold at times of need for cash and in times of crop failure or other forms of emergency or natural disasters. Global trade figures shown in the table below indicate revenue within the leathers industry. There is a great potential for Kenya to increase foreign earnings from the sale of leather and leather products.

Table 2: International Trade within the Leather Industry

	Value (USD) Billions	Percentage
Raw hides and skins	5	8
Wet blue	3	6
Crust and finished leather	11	21
Leather shoes	25	46
Leather products	10	19
Total trade	54	100

Source: Comtrade (UN Commodity Trade Statistics 2007)

2.1.2 Hides and skins production in Kenya

The leather industry, a sub-sector of agriculture sector, has evolved over the years to be currently contributing 1.5 percent to GDP (4 percent of agriculture sector). It is estimated that earnings in the local market to be KShs.1.8 billion annually while the export earnings are approximately KShs.4 billion from the export of hides and skins, leather, leather goods and footwear (Mwinyihija, 2010).

It is estimated that the industry has a potential of over KShs.10 billion every year, making it one of the industries to anchor the country into industrialization through value addition. The leather sub-sector role in the economy is best scrutinized in terms of income generation (both local and export earnings), production and employment (Kenya Leather Development Council Report, 2009).

According Ministry of Livestock report, (2011), there is huge potential in the sector with a livestock population of 10 million beef cattle, 3 million dairy animals, 9 million goats, 7

million sheep and 800,000 camels and an emerging ostrich, crocodile, guinea fowl, donkeys and snakes yet to be developed.

Wayua and Kagunyu, (2008),noted that the number of animals slaughtered daily in Kenya clearly indicates the significant income potentiality of hides and skin. In many rural areas, hide and skins are not collected at all or used inefficiently. Hide and skins is considered as of little or no value due to low prices offered by the traders or collectors.

The leather industry depends entirely on the livestock resource base from the Arid and Semi-Arid Lands (ASAL) which covers about 70 percent of the country. The table below represents annual production of hides and skins from 2000 – 2009.

Table3: Annual Production of Hides and Skins 2000 – 2009 (in millions)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cattle	2.4	2.5	2.3	2.4	2.2	2.5	2.6	2.0	1.4	1.5
Goat skins	1.6	2.7	2.9	2.8	3.5	3.8	4.0	2.3	2.1	3.9
Sheep skin	2.3	2.0	2.6	2.4	2.6	2.9	2.5	1.9	1.6	2.3
Camel	0.008	0.012	0.030	0.028	0.018	0.022	0.065	0.070	0.080	0.080

Source: Leather Development Council (2008-13) Strategic Plan

2.1.3 History and Changes in the Industry

Trading in hides and skins trading in Kenya began many years before independence. The raw hides and hides and skins were exported to Europe where processing were undertaken Recently, the Kenya Government moved to impose a 40% export duty on raw hides and skins, a move that has resulted in the development of the leather industry. The export duty has resulted into an increase in the number of tanneries within the country.

The export policy is intended to reduce the raw materials leaving the country and encourage value addition activities within the country. As a result the sector has realized the creation of

7 thousand new jobs, increased income for 40,000 people as well as boosted the earnings of the sector by almost KShs.1billion with an underlying potential for much more.

According Ministry of Livestock Report (2011), the market liberalization incorporated initiative like a reduction of the trade tariffs on imported leather and footwear which provoked a surge in cheap imports. As a result, half of the tanneries were competing with goods from the international market. By the years 2004/05, there was an increase in the number of hides and skins being produced from the international market nevertheless a reduction in the number of jobs available locally with the government loosing revenue of up to KShs.1.14 billion.

The value addition initiative comes in handy to make sure that production locally gets to the utility level before export. The number of tanneries in the country has been rising gradually from 9 in 2005 to 13 in 2011 with 3 more under construction. Value addition locally comes with greater potential for more jobs to the locals as well as earns the Government more revenue. Export markets for Kenyan hides and skins are Pakistan, Italy, India and China. Aklilu, Y., Irungu, P and Reda, A. (2002).

At the moment, the Leather Developing Council report 2011 indicate that there are 13 tanneries operating in the country while 3 more are yet to be commissioned.

Table 4: Operational and planned tanneries in Kenya

The below table shows names and location of operational tanneries and those where construction is on-going.

No.	Name	Location
1	Aziz Tanneries limited	Njiru
2	Nakuru	Nakuru
3	Sagana	Sagana
4	Faaso	Nairobi
5	Zingo	Nairobi
6	Athi River Tanners	Athi River
7	Bata	Limuru
8	East African Leather Factory	Njiru
9	Dog Bonnes	Dandora
10	New market Leather	Nairobi
11	Nairobi Tanners	Nairobi
12	Alfa Rammar	Athi River
13	Leather Industries of Kenya	Thika
Mini-processing plants (planned)		
Bungoma		
Garissa		
Wajir/Buna		

The above tanneries provide the demand for the hides and skins locally and supply of leather in the country however, their production capacity still falls below the existing demand for leather goods in the country. This has resulted to increase in imports of the substitute goods others being the counterfeit products from international market that have flooded our markets trying to meet the demand in the local market (*Kenya Leather Development Council Report, 2011)*

2.1.4 Hides and skins in Kajiado County

The county is inhibited by Maasai community who are pre-dormant pastoralists. It has three constituencies namely; Kajiado North, Kajiado central and Kajiado South. Hides and skins are bought mainly by local traders and village collectors. Strengthening the need and the capacity of Maasai pastoralists to access and utilize this livestock resource sustainably is essential, AGSEC consultants, (2000).

According to *Chabari, (1994) ;McDermott et al.,(1999)*, livestock is the main resource in the county and forms the economic base of the Maasai community, as it is more reliable than crop production. During drought, for instance, animals die and crops fail, but some animals may survive to build up the herd again, this being a kind of insurance against unpredictable misfortunes in the harsh environment. It is also the centrepiece of the daily and ceremonial life and is the principle currency for social and commercial transactions.
For any transactions, the Maasai consider small stock as a "current account" and cattle as a "savings account", while the camel is likened to a "fixed account". This means that, pastoralists will first dispose the small stock for their needs before they think of disposing cattle. Hides and skins is not considered as a source of income and is mainly left to women to either sell or dispose it (Mbogoh *et al.*, 1989).

Pastoralists sell or slaughter distinct class of animals (Dyson-Hudson, 1982; McCabe, (1984); Gufwoli; Behnke, (1990). Often sold or slaughtered are mature castrated males (Mbogoh *et al.*, 1989), barren females and culled breeding animals that are past reproductive age (Schwartz, 1981). When this class of animals is unavailable, they resist to sell or slaughter.
Mbogoh *et al.*, (1989) ; Aklilu *et al.*, (2002), noted that sources of trade's hides and skins in pastoral areas include pastoralists households, butchers/slaughterhouses and influx from neighbouring districts or countries . In pastoral areas, socio-cultural obligations such as ritual meat feast and traditional crafts affect the volume of hides and skins for trade.
The main source of hides and skins include slaughter houses, butchers and households. The population of livestock in the county is as follows:-.

Table 5: Livestock Population by constituency and type

Table showing livestock population in each constituency and type

Constituency	Cattle	Goats	Sheep
Kajiado North	151,295	314,080	236,790
Kajiado Central	95,534	218,961	270,148
Kajiado South	165,011	185,090	192,720
TOTAL	411,840	718,131	699,658

Source: 2009 Population and Housing Census Volume II

2.1.5 Hides and skins quality

The hides and skins produced in Africa generally carry a poor image in the global markets because of various constraints found throughout the production chain starting with animal husbandry conditions, lack of slaughter facilities, inappropriate flaying, and poor handling and preservation of these raw materials (*Mohammad A. 2002).*

According to *FAO (2002),*Hides and skins are one of the most valuable exports for many developing countries and play an integral role in the livelihoods of communities as a source of income and employment. Only a small portion of hides and skins from local community reach the markets as they are of low quality. As a result, hides and skins produced are few compared to the number of livestock slaughtered as some are disposed or eaten by dogs.

Assessing the quantity of hides and skins available for collection is certainly much easier than determining the quality. The problem is that quality means different things to different people because they have different expectations or requirements *(Leach, 1995).*

Among the pastoralists, not enough attention is paid to maintaining the quality of the hides and skins. Hides and skins are not sold when prices are considered to be too low resulting in a lower quality when they are sold at a later date. The low prices for the hides and skins is no incentive for proper handling and drying. Tanning of damaged hides and skins require more chemicals and effort to repair them (www.africaleather.com)

According to Chabari, (1994)), the production of good quality leather depends on the quality of the raw material. Defects in leather implicate higher cost in production and greatly reduce the selling value for the leather. In Kenya, the economic loss due to hides and skins defect is very high. These defects are encountered from the time the animal is born until the leather processing is completed. It is practically impossible to find out perfect animal hide or skin. Defects come from carelessness in breeding, feeding, living condition, diseases, parasites, handling, slaughtering, preservation, storing and transportation

The quality of hides and skins for production of different types of leather is determined by certain characteristics of the raw material such as thickness, and evenness of the thickness over the surface, weight, density and presence or absence of defects. Hides and skins differ in their structure depending upon the habit of life, season of year, age, sex, and breeding of the stock (www.africaleather.com)

Aklilu et al., (2002); *Gathuma et al.*, (1989), *Gufwoli and Behnke*, (1990) , observed that a high proportion of hides and skins in pastoral areas is in the low quality grades III and IV and a low proportion is of high quality grades I and II. The Ministry of Agriculture and Livestock Development is doing little to improve hides and skins quality and prices although it is entrusted with the responsibility of offering licenses, extension, inspection, grading and advisory services.

This is attributed to non-recognition of hides and skins trade as one of the major components of trade in pastoral areas and as an important source of income to livestock producers and thus, deserving an increased attention. It was observed that there exist a strong correlation between quality of hides and skins and price.

Technology used at various stages in the processing chain from raw hides to finished leather products may be inappropriate or poor leading to poor quality products. Investment in technology, infrastructure(physical, financial, information) and skill of manpower engaged in the sector may be very low in comparison to the need and potential leading to poor quality output(Leach et al, 1993).

Mohammad ., A., (2002), Kagunyu., A., Ngari., E., (2009), Girma, (2002) have identified causes of poor quality in hides and skins which include poor animal husbandry, arbitrary branding with hot iron, in appropriate flaying and slaughtering and post slaughter management of hides and skins.

Table 6: Defects analysis and resultant Cost in Losses in the Sub-Sector

The below table shows defects analysis and resultant costs in losses in the sub-sector

	Defeats	Percentage damage	Value Loss (KShs.) in Billions
1	Pre-slaughter		
	Branding	21	0.95
	Tick bites	23	1.04
	Sores and wounds	4	0.18
2	Peri- & Post slaughter		
	Flay damage	35	1.58
	Dragged grain	12	0.54
	Others (e.g. putrefaction)	5	0.23
	Total loss		4.25

Source: Perspective of the Leather Subsector in Kenya, LDC

As indicated in the above table, the sub-sector losses as a result of poor quality of hides and skins an estimated Kshs 4.25 Billion

2.1.6 Hides and skins trade

In Africa, about 60% of the hides and 90% of the skins come from the homesteads slaughter, (Tedesse., 2005). Thus, the marketing chain for hides and skins trade is principally from the primary producers/households to small dealers/agents- collectors to the big traders in major towns who supply to the tanneries. Hides and skins from slaughter houses are sold to major traders as per their request and on the agreed price.

As per Hides and Skins Act (1989), to be a dealer a registration certificate is require from Ministry of livestock and a business operation license from local councils. However, there are also many illegal operators in the business.

According to *Mwinyihijah*, (2010), ninety percent of Hides and Skins produced in Kenya is exported to external markets in both raw and semi processed form. Eighty percent of the exports are currently in wet blue state. There are 2,760 registered Hides and skins traders, 13 operating tanneries, 1500 registered slaughter houses/slabs and 16 registered exporters. The

trade in hides and skins earn the country approximately Kshs 4.5 billion with an estimated Kshs 1.7billion earned directly by the traders in the primary and secondary markets and employs 10,000 people in the informal and formal sector.

2.2 Poor animal husbandry

Traditionally farmers treat their animals when they get sick or injured. Of the different traditional methods of treating animal practiced by the farmers branding is the common and this has a significant negative effect on the quality of the hides or skins produced from branded animal. Hides and skins are meat by-products and there is still little consideration given to the care required for the collection and processing of the hides and skins into high quality leather. Tick and insect bites also degrade or lower the quality of hides mainly in the swamps/delta areas where there is ample supply of water and animal husbandry is inadequate (Adugna, 2004).

According to Russell ,et al, (1980), any selection and breeding program that may be operated on the farm or ranch will inevitably affect many features of the offspring of a particular mating including certain characteristics of the hide or skin. Environmental ones often obscure genetic factors, in particular by the consequences of nutrition.

Kagunyu., A., and Ngari., E. (2009), noted that poor animal husbandry and disease management practices lead to production of poor quality animals, hence poor quality hides and skins which further leads to low prices and that pre-slaughter operations that affect the quality of the hides and skins available to the tanning industry are principally the result of the quality of the husbandry applied by those who looked after the animals-herders, farmers, ranchers, feedlot staff, veterinarians, hides and skins merchants and transport operators.

2.2.1 Mechanical defects

Majority of livestock roam freely in the wilderness and are subjected to thorny and shrubby vegetation resulting in scratched hides. Though the scratches cannot be easily detected on live animals, during the tanning of hides into leather they become clearly visible resulting in low quality leather. Mechanical damage (brand marks, scratches, horn rakes, yoke marks etc), or defects due to Diseases that can be viral like LSD, Small-Pox, Rinder-Pest, Fungal like ring worm or parasitic like tick-damage, sheep ked, louse infestation and mange (Lukin,1967).

The defects that lower the quality which is originated by mechanical damage could properly be called defects of carelessness because every one of such defect can be eliminated. They include branding in belief of curing the animals from diseases, grain scratches and tears by sharp objects like barbed wire, collar and yoke lashes, whip lashes they can be seen in the form of scars on the grain surface of the hides and skins (Lukin;1967).

Damage caused to the hides and skins under pastoral and smallholder husbandry conditions when the animal is alive is mostly attributed to various types of mechanical actions and is classified as mechanical damage. Loss of value attributed to these types of damages is estimated to be 40% of the total value of hides and skins for Africa in general (Kagunyu A; Ngari, E, (2009).

Scratches and horn rakes are amongst the most common mechanical damages found on both hides and skins in all four countries as elsewhere in Africa. This is because most of the livestock is concentrated in areas of open savannah grasslands or areas with fairly dry environment where thorny bushes are found. Multiple scratches are therefore quite common. Scratches give leather an anaesthetic appearance and if deep, cause considerable loss of tear strength especially on skins.

The quality is also degraded as tanners try to obscure the faults on the grains by embossing or printing, which also increase processing costs. Consequently, the raw materials fetch lower prices (Adugna, 2004).

On cattle hides horn rakes are a general problem as animal husbandry practices in these countries discourage dehorning. Therefore cattle injure the hides mostly in crushes, in fights or during transportation. In some cases the damage is quite serious as the wound is generally deep. Another type of serious damage is caused by pointed instruments.

2.2.2 Poor nutrition

Emaciation is the thinness and friability of hides and skins derived from animals suffering from prolonged and bitter starvation, leathers which are produced from such hides and skins are noted for their dryness and flabbiness. Cockles which are coarse wrinkles on shoulder portions of hides increase considerably when animals are under fed (Lucian, 1967).

NPC, (1981) noted that diet plays an important role in the health of the animals and also in the quality of the raw material. Poor nutrition causes an animal to be smaller, the skin thinner and of poorer substance and lacks elasticity. The effect of diet is more pronounced in goat skins due to the fact that many goats are pastured on poor land. Thinness and lack of plump substance resulting from poor nourishment make it necessary to set many goat skins for manufacturing of lining leather.

Although nutritional deficiencies are usually non-specific and are often the result of low plane nutrition, insufficient intake of feed energy is the main cause of retarded growth. Hides and skins from areas where feeds available for the animals is inadequate usually bear tell-tale quality characteristics. The hides are normally of small size, mainly lights and mediums with thin substance. The grain structure is normally tight but is usually degraded by the environment, which is normally thorny and bushy. These types of hides and skins originate mainly from marginal areas where animals are not reared in ranches. The post-mortem preparation of hides and skins is generally poor so that these materials result in high lime-loss rejects percentages when processed in the tannery, Kiruthu S, (1991).

2.2.3 Age of livestock

The male cattle or bulls, especially the older ones have thicker heads and shoulders which might cause trouble in handling. In sheep skins the main difference is that the female skins have finer grains and always lighter but with greater tensile strength than the male one. Age differences also contribute to the inferior qualities in leather. The skins of the young animals have fine and compact structures and tight grain patterns, while the skins of older animals have tougher and coarser grain surface."Old grain" is the term used by tanners to describe the rough and calloused skin of very old animals; in these hides wrinkles are very developed. age does not only have natural influence on the skin but also as the animal gets older, the skin also accumulates scars from brands, disease parasites, scratches. NPC, (1981)

2.2.4 Breed

Different breeds as well as husbandry practices have implications for quality of hides and skins produced. Hides obtained from cattle in commercial farms and feedlots are of superior

quality as compared to those obtained from pastoralists. Local zebu also has a lower quality hides as compared to other breeds such as the sahiwal (Kiruthu*et al* ., 2000).

Kiruthuet al,, (2000) observed that pastoral and smallholder systems, farmers keep livestock for other purposes such as signs of wealth as well as for ploughing. Therefore they are less inclined to sell animals when they attain maturity and only sell when they must in order to raise money to pay for urgent and important needs. Therefore animal husbandry practices do not promote measures or methods which lead to high off-take rates Therefore livestock slaughtered usually constitute of mature or old animals whose skins have suffered damage through exposure to the environment.

Desirable or undesirable characteristics of hides and skins can be attributed to certain breeds. Cattle hides and sheep skins show more breed characteristics than goat skins (NPC, 1981).e.g. bovine hides from North America and Europe normally yields flat hides of over 40sq.ft in area. But the typical bovine hide from South America may yield a flat hide of only about 25sqft.area and a Zebu cross-breed from Africa often provides a hide below 25sqft. Ovine skins such as that of wool bearing merino sheep Australia can yield a larger skin often above 7sqft area but will not be readily acceptable to the tanners due to the ribbings apparent on them (FAO, 1986).

2.2.5 Climate and its effect on quality of hides and skins

The climatical conditions on which livestock is raised has an effect on the substance of its skin and on the grain of the leather. Animals raised in warm climate have a short hair and the leather produced has superior substance, smoother and finer grain patterns, where as animals raised in cooler climate or higher altitudes grow longer wool or hair, and the leather made are of poorer substance and coarser grain patterns. These effects of climate, especially on substance is more pronounced on sheep and goat skins than on cattle hides (NPC, 1981).
Cattle from the communal sector fattened for supplying to the abattoirs also produce better quality hides than those produced by pastoral cattle, indicating that nutrition plays a role in improving both meat and hide quality.

Defects due to diseases

Many diseases can affect the quality of hide and skins. The commonly noticed ones can be viral, fungal and parasitic.

Lumpy skin disease

This is a highly infectious skin disease of cattle caused by a herpes virus and is characterized by the sudden appearance of nodules on all parts of the skin. During the course of the disease, the affected portion of the skin becomes hard and dry, and separates from the surrounding normal tissue (FAO; 1986).

Smallpox

At first small red spots appears on the more tender parts of the skin such as the inner thigh, the abdomen and the sides. The red spots develop in to blisters from pin point to pea sized and turn in to sores. The animal is urged to scratches or rubs the sores on rough objects and secondary infection may develop. Mostly sheep and goats suffer from the smallpox. Grain surface of skins damaged by the smallpox hollow resembling tiny dots (NPC: 1981).

Ring Worm

This is fungus infection that attacks the hair and its roots. It appears on the hair side in the form of circular patches varying from 0.5 to 4cm in diameter. The patches are usually covered with scabby matters and are partly or completely bald. The scars are clearly visible to the tanner being shiny and circular in appearance (NPC: 1981).

Parasitic

In Kenya external parasites damage livestock skins, sheep skins by cock lean irritation caused by sheep ked (melophagusovis) and sheep louse (bovi cola ovis), goatskins by sarcoptic mange caused by mites (sarcopitic scabies) some are damaged during slaughter while relatively few are spoiled during preservation (FAO, 2009).

Tick-Damage

The damage is caused by blood sucking parasite-ticks. They usually adhere to the inner part of the hide such as the dewlap and inner parts of the legs. The defect has the shape of tiny holes or unhealed scars. These holes can be seen on the grain surface of the finished leather resembling tiny spots and hollows (Lukin, 1967). While developing and growing in to the

adult organism, the males move about rapidly causing the host animal to rub and scratch. Secondary infection leads to fare more extensive damage. Badly tick infested animals have poor health and provide hide with lack of substance.

The damage to leather caused by tick is so deeply seated that even with grain correction, the scars will persist. The small hole and the more or less healed scars mark the smoothness of the grain and detract from the appearance of the finished leather (NPC; 1981).

Sheep ked

This is a flat brown insect and is blood sucker which measure about 6mm in length and occurs on sheep in most part of the world. Its life cycleis spent entirely on the host and spread by contact between hosts. Its existence on the host caused irritation with resulting scratching, biting and damage to the fleece which is further downgraded by staining by the fleece of the ked. Heavy infestation causes skin blemishes which reduce the marketable value of the skin and of any leather made from it. It causes "cockle" or rib cockle in sheep skin (FAO; 1986).

Haematopinus

FAO, (1986), it's noted that irritation caused by lice leads to scratching, rubbing and licking by the infested host. The lesions caused by the louse infestations are often almost circular and small size and the extent of damage to the eventual leather depends on the presence or absence of secondary infection. The damage done by biting and sucking lice can usually be eliminated by the grain correction according to the degree of secondary infection

Manges

These are parasitic caused diseases of the animal skin which produce serious damage to the hides and skins. These damages are caused by several varieties of scabies; these mites multiply inside the dermis or the grain layer. The affected hides and skins present defects like coarse grain lesions and scratch scars and become totally unsuitable for the production of good quality leather (NPC;1981).

Grub Damages: This damage is caused by the larvae of warble flies. These are widely spread defects on the central butt portion of cattle hides and goat skins. The degree of decrease in

quality of hides and skins depends on the extent of damage by these larvae. They drill round holes up to 3 mm in diameters on the surface of hides and skins, thus reducing their usefulness (Lukin, 1967).

2.3 Livestock Branding

Karuthu, (2000), has defined branding as a permanent man-made mark on the hide for animal identification usually made with a hot metal bar

According to Lukin, (1967) ; Mwinyihija, (2010); Karuthu, (2000) ; FAO, (2001), among the pastoralist and small scale farmers there exist widespread and indiscriminate practice of branding cattle with hot irons which causes high losses in the hide and leather industry estimated between 10-40 percent of the value of the hide and skins. The practice of branding is common due to prevalence of cattle rustling and farmers use prominent branding in order to identify their animals. There are also pastoral tribes who use branding as treatment method for certain diseases especially by applying hot irons on glands. Unfortunately most branding is done on areas of hides, e.g. on the back and rumps, which have high value.

Branding defects include those induced during change of ownership, zones branding and identifications in feedlots.

Gebre-Egziabher *et al.* (1998) noted that branding of livestock with hot wood and metal is one of the traditional methods practiced to treat sick animal. Pastoralists in rural areas brand their cattle for curative purpose when veterinary services are inaccessible. The same author noted that considerable loss of skins and hides is due to branding and thus farmers need to be thought and provided efficient veterinary services. Pastoralists brand their livestock with hot irons for identification (as livestock rustling is a common practice among pastoral communities) and as cure for various diseases. Unfortunately, this is done indiscriminately and branding marks are made on the larger part of the body destroying the hide. Peri-slaughter defects are caused by bleeding and dressing (ripping and flaying damage).

Traditionally farmers treat their animals when they get sick or injured, of the different traditional methods of treating animal practiced by the farmers branding is the common and this has a significant negative effect on the quality of the hides or skins produced from branded animal. Hides and skins are meat by-products and there is still little consideration

given to the care required for the collection and processing of the hides and skins in to high quality leather (Adugna, 2004).

2.4 Flaying techniques

Muthee, (2008) defined flaying as the removal of skin from the body, generally, an attempt is made to keep the removed portion of skin intact and without few holes as possible. An animal may be flayed in preparation for human consumption, or for its hide or fur; this is more commonly called skinning. Kiruthu, et al.., (2000), noted that improper slaughtering and flaying practices cause damage to hides and skins and the type of flaying equipment also plays a major role in the production of good quality hides and skins. All slaughter facilities slaughter houses use hand flaying. As a result, flay cuts and gouges are a common feature on hides and skins. It's observed that hides and skins from homestead are of much lower quality because of the number of gorges and holes in the hides and skins. In more organized slaughter houses, hides and skins quality is taken into consideration by minimizing holes and gorges. Flay cuts, scores or gouges in hides and skins are caused by the careless use of the knife or by the use of unsuitable knives. Flay cuts constitute the most serious mechanical defects on hides and skins. Lack of proper tools like the rounded flaying knives, lack of flaying skills and carelessness lead to loss of quality or outright rejection of raw hides and skins (Leach et al, 1993).

Hand flaying using knives is the most common technique in pastoral areas. Poor flaying causes holes and cuts on the hides and skins, which consequently fetch lower prices because of the poor quality, and also results in higher rejection by tanneries. Post-slaughter defects are caused by abrasion, damage by pests and moulds, and inappropriate curing methods (Kagunyu et al 2011; Mbogo and Malala 2007). For camel hides, poor flaying is due to the inability of all Government abattoirs in Kenya to hang camel carcasses for skinning. Pre-, peri- and post-slaughter defects account for 40%, 20% and 40%, respectively, of the defects in hides and skins. Lack of adequate slaughter facilities in designated slaughterhouses where the height of the abattoir may be a limitation; lack of hoists; lack of proper flaying knives and hide pullers in most cases are unavailable (Muthee 2008).

Poor enforcement of existing legislation on the meat industry governing minimum requirements for slaughterhouses and slaughter slabs has been noted as a major impendent to improvement of hides and skins. Lack of adequate slaughter facilities and equipments in

designated slaughterhouses in most countries. The height and hoists of most slaughter houses are low and lack of proper flaying knives and hide pullers in most cases are absent or limited. The local councils charge high fees to butchers when they slaughter in abattoirs, therefore discouraging the use of the same (Adugna, 2004).

2.5 Hides and skins grading

The quality of skins and hides is defined by its grade though a process called grading. Grading of hides and skins refers to the number of defeats it has. A hide or skin with no defeat would be designated Grade I (perfect), while another with many serious defeats would be graded IV (imperfect) and is simple discarded. Anything of intermediate quality is grade II or III (Delgado *et al.*., 1999).

According to conventional grading procedures, hides or skins with no defects are designated Grade I (perfect) while others with many serious defects are designated Grade V (imperfect) or simply discarded. Anything of intermediate quality is classified as Grades II, III or IV. The defects that are considered during the course of grading include any of those factors that could affect the subsequent manufacture of leather.

The position of a defect is also significant, at least in hides. For example, defects in the butt are considered more serious than those in the shoulders, because the butt is normally expected to provide the best physical characteristics. Conversely, a defect in the belly or shanks would not be considered very serious because these parts provide softer, weaker leathers, and defective areas here are easily removed by trimming. A third and final aspect of grading is the intensity of the defect. For example, a shallow butcher's cut on the flesh surface may be dismissed as unimportant, but if the cut penetrates and perforates the dermis, it would be considered more serious.

Though no reliable statistics on grading classification exist, a survey of slaughter points in Dar es Salaam in 2000 indicated that of the total number of hides produced, only 10% were of grade 1, 20% grade 2, 35% grade 3, 30% grade 4 and 5% reject (CFC project, 2001).

Another document produced by a Task Force of Stakeholders reported that over 50% of all hides and skins are of reject category and less than 15% are of grade 1 and 2 (Task Force report, 2002).

Irrespective of the discrepancy in statistics, the problem is a serious one as with such poor and unclassified supply, tanneries need to spend more time on grading before processing, cost of processing poor quality product is high and the cost become even higher at advanced stages of processing because only a small proportion of supply eventually gets processed into quality finished leather.

Although there is demand for higher quality products at domestic and export markets at higher prices, current practices are reducing the current and potential value. Consequently, everyone in the chain – farmers, hides collectors, traders, slaughterhouses and tanners – see hides and skins as low value items not deserving enough attention or proper treatment.

CFC project, (2001), noted that no public grading of hides and skins is practiced at slaughter houses, so supply is not differentiated by quality and value. Better quality product therefore obtains no price benefit, thus providing no incentive for skilled slaughtering and flaying. As a result of all these, tanneries get poor quality hides and skins, and often they get product of unpredictable quality, and spend extra cost for grading and sorting.

Lack of grading has made processing poor quality product high and the cost become even higher at advanced stages of processing because only a small proportion of supply eventually gets processed into quality finished leather. Although there is demand for higher quality products at domestic and export markets at higher prices, current practices are reducing the current and potential value. Most farmers, collectors and traders see hides and skins as of low value and a by-product, therefore not deserving enough attention or proper treatment (FAO, 2001).

It's also observed that production of good quality leather fully depends on the quality of the raw materials. Good quality raw materials, in turn, imply good quality leather, low cost of production, high selling price and total growth of the national economy. In Africa as a whole, the economic loss due to damages and defects on hides and skins are very high.

Traditionally, the determination of defects on hides and skins was the basis of grading operations carried out routinely before, during or after preservation.

These assessments received considerable attention though they often failed to reveal the majority of defects. Some defects simply cannot be seen in preserved hides and skins while the consequences of others may not be fully appreciated by those people doing the grading (FAO, 2005).

2.5. 1 Pricing of hides and skins

According to UNIDO, (2005), price differentiation based quality currently don't exist at the input supply level, and therefore primary producers, usually farmers, no incentives to maintain quality of hides and skins when the animals are still alive or at the time of slaughter. Primary suppliers are also not aware of the market prices that determine selling price and therefore are at mercies of major traders who determine prices. The current low prices for hides and skins are no incentive for proper handling and curing. The primary producer in the village, the small farmer, receives such a poor return as compared with the final price that it gives them no incentive to improve the quality of livestock or their hides/skins. Primary producer at the household level could realize a price increase of 20–100% as a result of wet salting their hides and skins before selling to merchants, (Kagunyu et al 2011). Poor infrastructure increases transport and other transaction costs and is a major limitation to the marketing of hides and skins. These characteristics magnify the effects of inadequate information-sharing, from which markets in pastoral areas are suffering. Wholesalers cannot receive reliable market information from the tanneries on future price trends. This is critical since wholesalers lack any sources of information on the international price and the tannery does not guarantee a fixed purchasing price. It buys skins based on the international price at the time of the wholesalers' delivery, not at the time of the wholesalers purchase from collectors. There is usually a time lag of around 2 to 3 months for delivery from merchants to the tannery since wholesale merchants have to keep the skins stored in salt until a large enough number has accumulated for truck transportation (Kagunyu et al 2011; Omiti 2004; Wayua and Kagunyu 2008). As a result, the risks of international price changes are shared between the tannery and merchants. The poor transfer of knowledge, skills and information is further manifested by limited interaction of the farmers with extension officers due to poor road networks and resources. Considerable progress has, however, been made in the

provision of communication systems such as mobile telephone facilities (Mas and Morawczynski 2009).

2.6 Pre and Post-slaughter practices

Mwinyijah and Magero (2009), in an investigation carried out by UNIDO Africa Leather Programme found that at least 60% of hides and skins defects found in Kenya are attributed to defects which are caused during slaughter, due to handling and preservation procedures. Loss of quality of hides and skins due to post-slaughter activities is therefore very significant for the leather industry and has contributed to a large extent to the poor image of raw materials of African origin.

Mohammad. A & Kiruthu,(2002), noted that most animals in African countries are slaughtered in facilities which do not have adequate infrastructure or tools required to ensure production of good quality hides and skins. The level of skills and technique used during slaughter also vary widely. Pastoralists mainly use ground drying and suspension drying to cure hides and skins, which result in inferior quality skins (Kagunyu et al 2011). The wet skin is pegged on the ground to dry or tied to a frame and dried upright. Only very few producers are aware of wet salting method of curing hides and skins. This lack of knowledge on preservation means that suppliers, therefore, cannot stockpile skins until the price increases

The final part of the pre-slaughter operations involves the supply and transportation of the animal to the market and ultimately the butchery. Special attention is required at this stage since any damage to the animal will not have time to heal before the animal is slaughtered, so any defect will remain on the hide or skins as an open wound. The range of different problems that can occur at this stage is extensive, and many others associated with improper transportation (Russell et al, 1980).

Preservation is the name given to a variety of procedures, which can be applied to hides and skins in order to reduce, or stop spoilage. Preservation can only maintain quality. It follows that a bad preservation will allow deterioration of all a skin, irrespective of its original quality (Leach, 1995).

Most hides and skins are preserved in one way or another before being shipped to a tannery, but it is not always necessary in the manufacture of leather freshly flayed hides and skins may be dispatched immediately to the tannery and made into leather. Unfortunately, few tanneries

are sited close enough to their source of raw material to be able to receive fresh skins. Generally though, tanneries are still geographically isolated from their raw material. This has significant implications in the utilization of hides and skins (Haines, 1975).

Leach et al, (1993), noted that despite the significance of activities undertaken in slaughterhouses, it is generally accepted that the facilities available in most developing countries are less than ideal. In some instances, the problem is a general lack of money for the provision or improvement of facilities. Although hides and skins from conventional slaughtering operations constitute the bulk of raw materials for the tanning industry.

Most hides and skins are affected by the pre-slaughter defects accumulated during the life of the animal the commonly observed pre-slaughter defects can be natural (poor nutrition, age and sex, breed and climatic effects(FAO, 2009).

2.6.1 Traditional production system

According to Tedesse., (2005), the great majority of sheep and goats (90%) and most of the cattle (60%) are slaughtered informally in homesteads for consumption by the owner or in a small community (shopping centers) where no formal slaughtering facilities exist.
The traditional production system results in a considerable amount of inferior grades and rejects of output. One of the major reasons is that preservations often starts after celebrating a feast, when the hides and skins have started to putrefy.

2.6.2 Damage caused during storage, packaging and transportation scratches and tearing

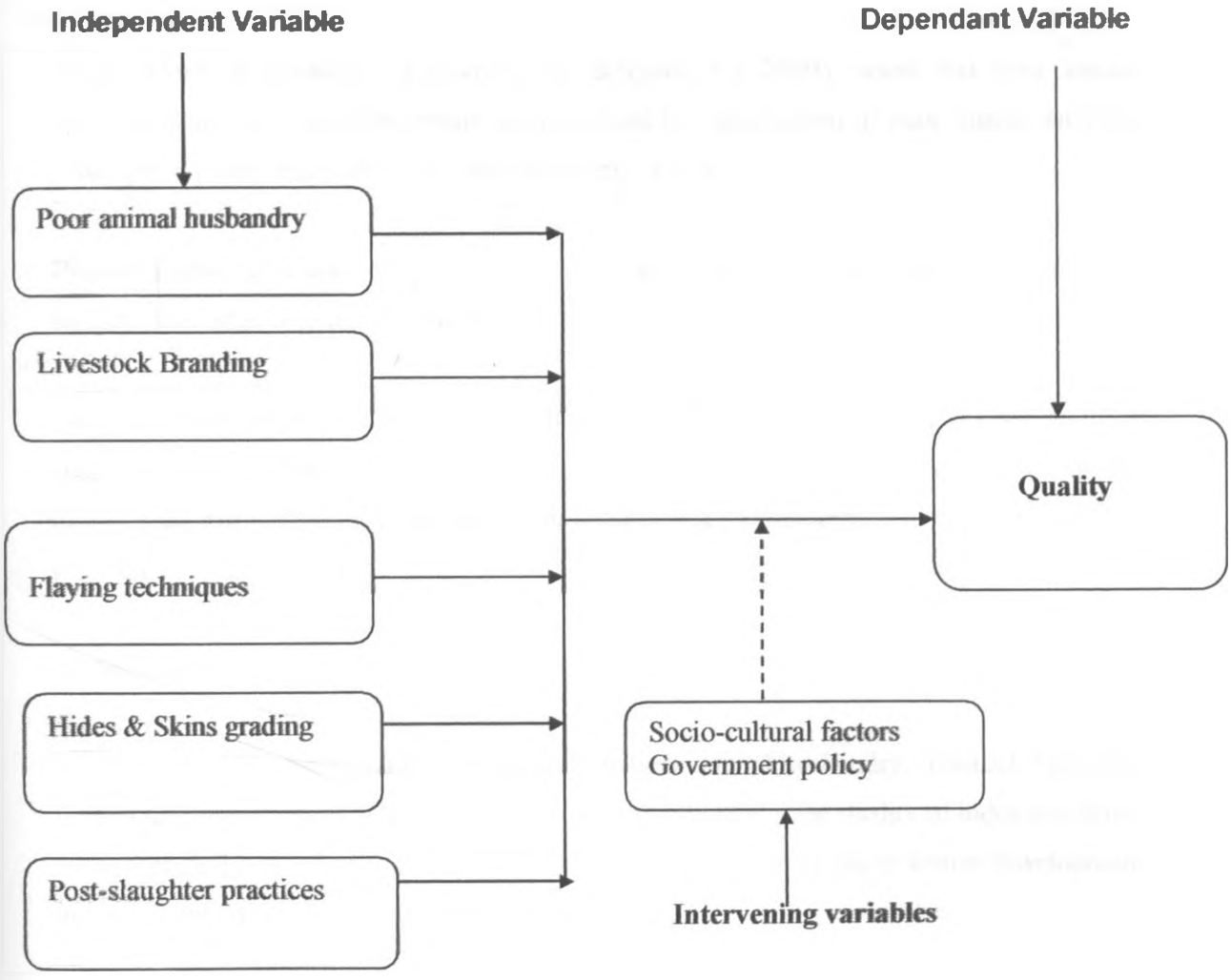
Even after the hides are properly dried or cured they may still suffer damage by careless handling. Inadequate strapping when the hides are baled can do serious damage by the loose shanks and edges getting torn. Outside hides of loosely packed bales have been almost torn in half when being moved and thrown about during transportation. Excessive pressure by baling presses will cause tearing of the edges and cracking at the folds and attempts should be made to place protective materials underneath the straps. Wet salted stocks can suffer damage by abrasion if baled singly hair side out.

2.6.3 Wetting and contamination

When hides are allowed to get wet in shipment or in transit, bacterial action (putrefaction) will occur. Contamination in transit can cause varying degrees of damage, the worst being direct contact with sea water and iron decks. The resulting iron salt stain being permanent and a serious loss to the tanner.

2.7 Conceptual Frame work

There is a direct relationship between the dependent variables (livestock husbandry, livestock branding, hides and skins grading, flaying techniques, post-slaughter practices and independent variable (quality). The dependent variables influence the quality of hides and skins.



Source: (Adugna, 2004)

Fig.1: Conceptual Frame work

Flaying techniques: Most slaughtering at household level and slaughter houses, use hand flaying and as a result, flay cuts and gouges are a common feature on hides and skins compromising on the quality.

Hides & skins grading: The absence of scientific method to determine defects on hides and skins has affected grading hence limiting hides and skins improvement.

Livestock branding: There exist of widespread and indiscriminate practice of branding cattle with hot irons causes high losses in the hide and skins and reduces the value of hides and skins by 10-40 percent, Lukin, (1967); Mwinyihija, (2010); Karuthu, (2000)

Poor animal husbandry: Kagunyu., A., &Ngari., E,(2009), noted that poor animal husbandry and disease management practices lead to production of poor quality animals, hence poor quality hides and skins and the reverse is true.

Post-slaughter practices: Method of storage, preservation and transportation of hides and skins by and large determine the final quality of leather.

Socio-cultural factors and government policy: Livestock rearing among pastoralists has a socio-cultural attachment rather than economic alone. The absence or weak policies towards hides, skins and leather development in the country is a hindrance to achievement of its full potential.

2.8 Summary

The chapter highlights literature written on how poor animal husbandry, livestock branding, flaying techniques, grading and post slaughter practices affects the quality of hides and skins. Also discussed is the quality of hides and skins and the current trends in leather development in Kenya and Africa.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives an overview of research design, the methods used for data collection and analysis. It will also describe target population, sample size and sampling procedures used and a map of the study area. A summary of the chapter is provided at the end.

3.1.1 Research Design

A survey was used as a research design for this study utilising available data and information relating hides and skins in Kajiado County. A case study is a research design that intends to provide sufficient details and disclosing complexity of a given process and relationship by looking at an individual case at a given situation (Denscombe, 1998). The case study design helped yield the broadest base of information possible on which to make necessary recommendations for further study (Leslie, 1987). The case study assembles more detailed quantitative information from sampled households, slaughter houses, skin traders and tanneries.

3.1.2 Population in the County

The District covers an area of approximately 21,902.9 Km^2 and is divided into 7 districts namely: Ngong, Magadi, Isinya, Central, Namanga, Mashuru and Loitokitok. It has 47 locations and 120 sub-locations and three constituencies namely: Kajiado North, Kajiado Central and Kajiado South. Kajiado has two local authorities namely: Olkejuado County Council with forth three (43) civic wards and Kajiado Town Council with six (6) civic wards.

Table3.1 : Population per district.

Table showing population per district in Kajiado County

District	Area (sq. km)	Population
Ngong	3698.1	223,699
Magadi	2640.3	35,970
Mashuru	1066.3	29,928
Kajiado Central.	2909.7	83,555
Isinya	2238.0	77,140
Namanga.	2994.2	53,895
Loitokitok	6356.3	183,125
Total	**21,902.9**	**687,312**

Source: Kenya National 2009Census Vol II

3.1.3 Target Population

A population is the total collection of elements about which we wish to make some inferences. A portion of the population is called a sample (Ken Blak, 1999).In order to determine the target population of the research, the researcher obtain information on the households, hides and skins traders, slaughter houses and tanneries in Kajiado County. Selection of respondents was based on cattle ownership, involvement in hides and skins value chain and the respondents willingness to participate in the research.

During the data collection process, the participants were informed about the objective of the study as well as its confidentiality. Interviews was carried out at farmers' homesteads, business premises for hides and skins traders and slaughter houses offices. For key informants, interviews were conducted place of work. The selected population has a direct impact on the quality of hides and skins in the County

3.1.3.1: Households

Kajiado County has 173,464 households (Kenya National 2009 Census Vol II) in the three constituencies namely Kajiado North, Kajiado Central and Kajiado South. The County has a density population of 31Km^2 person, out of a population of 687,312, more than 70% live in rural areas. Most families in the rural areas are pastoralists, while others are practicing mixed farming. In the urban areas their mainstay is businesses.

3.1.3.2 Slaughter houses/abattoirs

Slaughter houses are the major source of hides and skins in the County. Butchers enhance the marketability of livestock by acting as buyers in their own right hence help availability of hides and skins.

Table 3.2 : Slaughter houses/abattoirs in Kajiado County.

Table showing slaughter houses and abattoirs in Kajiado County

District	No. Slaughter houses
Ngong	8
Magadi	3
Mashuru	4
Kajiado central	5
Isinya	3
Namanga.	3
Loitokitok	4
Total	**30**

Source: Ministry of Livestock Report 2011

3.1.3.3 Hides and skins traders

In the county, there are 60 hides and skins traders, distributed in the local trading centres as shown above. People undertaking hides and skins businesses are traders mostly immigrants from other counties and are located in major trading centres in the County. They use their stores to preserve and for storage purposes as they await getting economical numbers to be transported to tanneries. Hides and skins traders rely mostly on village collectors and slaughter houses for their supplies.

Table3.3 Hides and skins traders in Kajiado County

Table showing number of Hides and skins traders in each district.

District	No. of traders
Ngong	12
Magadi	5
Mashuru	10
Kajiado Central	11
Isinya	8
Namanga.	5
Loitokitok	9
Total	**60**

Source: Ministry of Livestock Report, 2011

3.1.3.4 Operational tanneries in Kenya

Tanneries are processors who buy hides and skins from hides and skins traders/wholesalers and produce pickle, wet blue, crust and finished leather and supply to domestic and external markets. They are well equipped and has the necessary capital, facilities and competent staff. The companies are concentrated mainly around Nairobi and hold specialized hides and skins (semi processed and processed) export licenses.

Currently there are 13 tanneries that are operational in Kenya. However, most of them are producing below 60% capacity. Their level of production is up to wet blue and exported for further processing. Part of the wet blue is sold locally to Jua Kali artisans for purposes of making belts, wallets and shoes.

Table 3.4: Tanneries and their location

Table showing operational tanneries and their location in Kenya

No.	Name	Location
1	Aziz Tanneries limited	Nairobi
2	Nakuru	Nakuru
3	Sagana	Sagana
4	Faaso	Nairobi
5	Zingo	Nairobi
6	Athi River Tanners	Athi River
7	Bata	Limuru
8	East African Leather Factory	Nairobi
9	Dog Bonnes	Dandora
10	New market Leather	Nairobi
11	Nairobi Tanners	Nairobi
12	Alfa Rammar	Athi River
13	Leather Industries of Kenya	Thika

Source: Kenya Leather Development Council Strategic Plan 2009-2013

3.1.4 Sampling Procedure

Stratified sampling was used to select 70 households to be interviewed in the study, 10 hides and skins traders, 7 slaughter houses and 3 tanneries selected randomly. This number was considered a reasonable size that portrayed the picture of the respective target group.

Table 3.5: Households to be sampled per district

STRATA	N	Sample (n)
Ngong	223,699	23
Magadi	35,970	4
Mashuru	29,928	3
Kajiado Central.	83,555	9
Isinya	77,140	8
Namanga.	53,895	6
Loitokitok	183,125	17
Total	687,312	70

Ni= Sample (n)

$N = 687,312$

$$ni - n.\frac{Ni}{N}$$

$n = 70$

Table3.6: Slaughterhouses/Abattoirs to be sampled per district

Strata	**N**	**Sample (n)**
Ngong	8	1
Magadi	3	1
Mashuru	4	1
Kajiado Central	5	1
Isinya	3	1
Namanga.	3	1
Loitokitok	4	1
Total	**30**	**7**

One slaughter house per district was randomly selected for purposes of the study.

Table 3.7: Hides and skins traders sampled per district

Strata	(N)	Sample (n)
Ngong	12	2
Magadi	5	1
Mashuru	10	2
Kajiado Central.	11	2
Isinya	8	1
Namanga.	5	1
Loitokitok	9	1
Total	**60**	**10**

Sampling of the tanneries

Three tanneries in each different geographical location was selected randomly for study purposes.

Nairobi County 1

Kiambu County 1

Machakos County 1

3.1.5 Data collection methods

Various data collecting techniques were applied; it included interviews with the help of semi-structured questionnaires, direct observation, key informants and stakeholders. Enumerators were recruited and trained to manage the formal survey, using the structured questionnaire to collect the information.

3.1.5.1: Semi-structured questionnaires

This method helped in gathering quantitative information and any sensitive information which could not have been captured using any other method. The questionnaire clearly states that the information was confidential and was used for purposes of research.

3.1.5.2: Direct Observation

The method was used to acquire data on different methods used for flaying methods, curing hides and branding marks on the livestock. The researcher visited sampled slaughter houses and hides and skins stores.

3.1.5.3: Key informants and stakeholders.

The researcher interviewed selected key informants; they included local veterinary and livestock officers, local leaders and Non-Governmental Organizations dealing with livestock and livelihoods in the county. The aim was to solicit additional information not captured during the administration of the other two methods.

3.1.6 Validity and reliability

Validity refers to the degree to which evidence supports any inferences a researcher makes based on the data collected by a using a particular instrument. An instrument is reliable if it gives consistent results with repeated measurement. To ensure that the data and information obtained were consistent, the researcher used structured interviews, observation and focussed group's discussions concurrently as the situation dictated.

3.1.7 Data analysis

Data processing and analysis included data preparation, editing, coding, classification and analysis. This involved a sequence of operations to check and code forms, transfer the tabulation on computer files, check for errors and make an exploratory analysis. Data preparation involved editing of and validation of the data collected. This was aimed at identifying incorrect entries; entries entered in the wrong places and missing entries. Data coding facilitated proper data categorization.

The returned questionnaires were checked for consistency, cleaned, and the useful ones coded and analyzed using Microsoft excel and Statistical Package for Social Scientists (SPSS V. 17.0) computer software. The researcher analyzed the quantitative data using descriptive statistics and presented through percentages, means, standard deviations and frequencies. The use of structured questionnaires enabled the researcher to quantify quantitative data using the size, frequency distribution, and association of variables in the study population and answers to questions that could be counted and expressed numerically. The qualitative data was coded thematically and then analyzed statistically. Conceptual content analysis was used for data that is qualitative nature or aspect of the data collected from the open ended questions and the focus group discussions. The information was displayed by use of tables.

3.1.7.1 Quantitative data

The effect of livestock branding, poor flaying techniques and hides and skins grading was analyzed quantitatively by use of measures of central tendency (mean and median) and presented in percentages and frequencies. SPSS software was used to analyze the data. The quantitative analysis is clear, precise in specifying both the independent and the dependent variables under investigation. It achieved high levels of reliability due to minimized subjectivity of judgment, Balsley, (1970).

3.1.7. 2 Qualitative data

For purposes of this study, interviews were conducted to deduce the effect of various farming systems, animal feeding regimes, types, age of breeds on the quality of hides and skins. Qualitative data analysis will attempt to accurately describe, decode, and interpret the meanings of phenomena occurring in their normal social contexts, Fryer, (1991).
The method did assist obtain a more realistic feel of the world that cannot be experienced in the numerical data and statistical analysis used in quantitative research and has the ability to interact with the research subjects in their own language and on their own terms (Kirk & Miller, 1986). It provided an holistic view of the phenomena under investigation, Bogdan, (1975), Patton, (1980).

3.1.8 Summary

The study applied various research techniques to collect data, which included; Semi - structured questionnaires, documentary information, key informants and direct observation. To ensure reliability and validity of the data, triangulation was undertaken. Data analysis was done using Ms excel and SPSS and presented in various forms such as frequencies and percentages.

3.1.8 Operational definition of variables

Research Objectives	Type of Variable	Indicator	Measuring of Indicators	Data Collection Methods	Level of Scale	Types of Analysis	Types of Analysis
To assess the effect of poor animal husbandry on the quality of hides and skins.	Independent	Poor animal husbandry	Level of pasture availability	Questionnaire, observation , Key informants	Ordinal Nominal	Parametric	Descriptive
To assess the effect of livestock branding on the quality of hides and skins.	Independent	Livestock branding	Prevalence of livestock branding	Questionnaire, observation , Key informants	Ordinal Nominal	Parametric	Descriptive
To assess the effects of poor flaying techniques on the quality of hides and skins	Independent	Flaying techniques	Frequency of poor flaying techniques	Questionnaire, Observation , Key informants	Ordinal Nominal	Parametric	Descriptive
To examine to what extend does grading of hides and skins affect quality.	Independent	Hides and skins grading	Level grading of hides & skins	Questionnaire, observation , Key informants	Ordinal Nominal	Parametric	Descriptive
To examine post-slaughter practices that affects quality of hides and skins.	Independent	Post - slaughter practices	Prevalence of post-slaughter practices that affects quality of hides and skins.	Questionnaire, observation , Document analysis Key informants	Ordinal Nominal	Parametric	Descriptive
Socio-cultural factors	Intervening		Economic activities Traditional beliefs	Questionnaire	Ordinal Nominal	Parametric	Descriptive
Government policy	Intervening		Regulations	Questionnaire	Ordinal Nominal	Parametric	Descriptive
Hides and skins quality	Dependent	Quality standards	Degree of Quality	Secondary data sources	Ordinal Nominal	Non-Parametric	Descriptive

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter focused on data analysis, interpretation and presentation. The purpose of the study was to investigate factors affecting the quality of hides and skins in Kajiado County. The researcher assed how poor animal husbandry, livestock branding, poor flaying techniques, lack hides and skins grading and post-slaughter practices affect the quality of hides and skins. The researcher made use of frequency tables, graphs and percentages to present data.

4.1.1 Response Rate

This research study had a sample size of 70 households members, 10 hides and skins traders, 7 slaughter houses, 3 tanneries and 3 key informants. Out of the 70 households questionnaires, 66 were dully filled and returned to the researcher which represents 94.28% response rate. For hides and skins traders 8 questionnaires were dully filled and returned this represents 80%, 7 slaughter houses supervisors were interviewed which represents 100%. 3 key informants (County hides and skins officer, veterinary officer and a Non-Governmental Organization representative) were interviewed this represents 100%. 3 tanneries returned dully filled questionnaires, this make their response rate was 100%.

The response rate was adequate for this analysis and conforms to Babbie (2002) stipulation that any response of 50% and above is adequate for analysis.

4.2 Analysis of general information

In an effort to determine the general information of the respondents, the researcher requested them to indicate their gender and age bracket.

4.2.1: Demographic Characteristics of the respondent's

The researcher sort to know the respondent gender, education level, age and occupation.

Table 4.1 Gender composition of the respondents studied in Kajido County, Kenya

	Frequency	Percentage
Male	40	45.97
Female	47	54.03
Total	87	100

Table 4.1 shows the gender composition of the respondents, 45.97% of the interviewed respondents were male whereas 54.03% were female. It can therefore be concluded that the majority of the respondents were women. Among the Maasai at household level management and sale of hides and skins is mostly left to women hence the number of women interviewed. However, almost equal effort was made to sample the representatives of the gender as the responses were well distributed among the gender.

4.2.2: Respondents level of education

The researcher objective was to find out the education level of the respondents.

Table 4.2 Level of education of respondents

	Frequency	Percentage
Illiterate	16	18.39
Primary	41	47.12
Secondary and above	30	34.49
Total	**87**	**100.0**

The table 4.2 shows the level of education of the respondents. From the analysis, 18.39 % of the respondents are illiterate, 47.12% have at least primary school education and 34.49% have secondary and post secondary education. The percentages shows that high number of respondents drop out of school in primary school. Culture and economical factors has been sighted as the major causes of illiteracy and school dropout.

4.2.3: Respondent's ages

Table 4.3: Age bracket of the respondents

	Frequency	Percentage
Under 15 years	5	5.74
16-30 yrs	23	26.44
31-46 yrs	30	34.49
47-62 yr	23	26.44
63 yrs and above	6	6.89
Total	**87**	**100.0**

From table 4.3 ,5.74%of the respondents were below 5 years, 26.44% were between 16 and 30 years, 34.49% were aged between 31 and 46 years, 26.7% were aged between 47 and 62 years while 6.89% were aged above 63 years. The majority of the respondents were aged between 31 and 46 years.

4.2.4 Occupation

Table 4.4: Occupation of the respondents

	Frequency	Percentage
Farming	66	75.87
Business	12	13.79
Others	9	10.34
Total	**87**	**100.0**

The table 4.4 shows that farming is the most predominant economical livelihood activity at 75.87%, 13.79% are undertaking various businesses and 10.34% are involved in other occupations such as formal employment, casual labour. The County being an Arid and semi-Arid region, livestock keeping is the most viable option.

4.2.5 Average livestock ownership per household

The researcher intended to ascertain livestock own by the respondents in a bid to corroborate the same with secondary data from Ministry of livestock.

Table 4.5: Average Livestock ownership by the respondents in Kajiado county.

Table showing average livestock ownership per respondent in Kajiado County

Livestock	No.
Cows	67
Goats	145
Sheep	200
Others	1

From Table 4.5, the average number of cows per respondent is 67, 145 goats , 200 sheep and others 1 (donkeys and camels), from the graph the highest number of livestock is sheep, the same is attributed to the open dry Savanna grass lands where sheep do very well and have a shorter gestation period compared to cows and goats.

Table 4.6: Total number of animals slaughtered by the respondents per year

Type	Households	Slaughter houses
Cows	3	38,325
Goats	10	51,100
Sheep	8	40,880
Mean	7	43,435
Std. deviation	3.60	5519.43

From Table 4.6, animals slaughtered at household level had a mean of 7 and standard deviation of 3.60. Animals slaughtered by the slaughter houses had a mean of 43,435 annually and a standard deviation of 5519.43. Cows are rarely slaughtered at homestead

unless there is a major celebration. They are kept as security to be sold in times of emergencies.

4.2.6 No. of hides and skins produced per district (pieces)

The researcher intention was to ascertain number (pieces) of hides and skins sold in the five districts in the year 2011.

Table 4.7: Hides and skins production per district (pieces)

	KAJIADO NORTH	ISINYA	KAJIADO CENTRAL	MASHUURU	LOITOKITOK	TOTAL
Cows	29573	21218	26500	19685	23741	120717
Goats	27791	30167	27299	22355	18451	126063
Sheep	31097	32185	28769	22257	19244	133552
Total	88,461	83,570	82,568	64,297	61,436	380,332

From Table 4.7; The highest number of hides and skins was from Kajiado North (88,461), Isinya (83,570), Kajiado Central (82,568), Mashuuru (64,297) and Loitokitok (61,436). For Kajiado North, Kajiado Central and Isinya, the high number of hides and skins is attributed to proximity and high demand for meat in Nairobi and its suburbs

4.3: Extent to which animal husbandry affect the quality of hides and skins

The researcher objective was to assess the effect of poor animal husbandry on the quality of hides and skins

Table 4.8: Extent to which animal husbandry affects the quality of hides and skins

The below table show the extent to which animal husbandry affect the quality of hides and skins

	Frequency	Percentage
No extent	6	6.89
Little extent	27	31.04
Moderate extent	40	45.98
Great extent	14	16.09
Total	**87**	**100**

From Table 4.8, 45.98% of the respondent strongly agreed that animal husbandry moderately affect the quality of hides and skins, 31.04% by little extend, 16.09% believed it affects by great extend and 6.89% don't believe at all that animal husbandry play a role in determining the quality of hides and skins.

4.3.1 Livestock breed

Livestock breeds determine the quality and weight of the hides and skins. The communities in Kajiado County rear traditional Zebu, Borana , Sahiwal and dairy cows

Table 4.9 Cattle breeds and the quality of hides.

The respondent ranked different breeds of livestock as per their quality of hides and skins.

	Percentage
Zebu	18
Borana	25
Sahiwal	55
Dairy cows	2
Total	**100**

From Table 4.9, Sahiwal cattle have the best hides (55%) due to its big body size, hide

texture and weight. Quality of Borana hides was ranked 2nd (25%), that of Zebu breed (18%) and dairy cows (2%). In Kajiado County, most farmers rear zebu cattle due to its adaptability to Arid and semi-arid regions.

4.3.2 Prevalent animal skins diseases

The researcher objective was to identify animal diseases that affect hides and skins quality among livestock.

Table 4.10 Prevalence of animal skin diseases in the county

The respondents indicated that the prevalence of animal bovine diseases is as follows;

	Percentage
Lumpy skin disease	39
Small pox	8
Ring worms	32
Tick damage	21
Total	**100**

As indicated in Table 4.10, lumpy skin disease is the most prevalent (39%), ring worms (32%), tick bite (21%) and small pox (8%). The spread of the disease is catalysed by free ranch grazing of the animals.

Table 4.11: Hides and skins mechanical defects

The respondents gave the following as some of the common mechanical defects that affect livestock bovine

Defects	Frequency	Percentage
Horn rakes	23	26.43
scratches	51	58.63
Yoke marks	3	3.45
Others	10	11.49
Total	87	100

As indicated in Table 4.11, most hides and skins have scratches (58.63%), horn rakes

(26.43%), and yoke marks (3.45%) while others account for (11.49%). Majority of livestock in the county roam freely in the wilderness and are subjected to thorny and shrubby vegetation resulting in scratched hides.

4.3.3 Accessibility to veterinary extension services

The researcher planned to gauge household's accessibility to veterinary services in the county.

Table 4.12 Farmers accessibility to veterinary services

The respondents gave the duration in which they access veterinary services as follows

	Percentage
On request	4
Weekly	11
Monthly	14
After two months	30
Annually	29
No extension services	12
Total	**100**

As indicated in Table 4.12, 30% of famer's access extension services after two months, 29% annually, 14% monthly, 11% weekly and 4% access services on request. 12% of the farmers don't access veterinary services at all. Most remote villages have poor infrastructure and therefore not easily accessible there are few or no livestock extension services officers at the County.

4.4 Extend to which flaying techniques affect the quality of hides and skins

The researcher objective was to assess the effect of poor flaying techniques on the quality of hides and skins.

Table 4.13 Extent to which flaying techniques affect the quality of hides & skins

The extent to which flaying techniques affect the quality of hides and skins was indicated as follows:-

	Percentage
No extent	6
Little extent	11
Moderate extent	32
Great extent	51
Total	**100**

From Table 4.13, 51% of the respondents agree that flaying techniques affect the quality of hides and skins by great extent, 32% by moderate extend, 11% by little extend and 6% don't believe that flaying techniques in any way affect the quality of hides and skins.

4.5 Livestock Branding

The researcher objective was to assess the effect of livestock branding on the quality of hides and skins

Table 4.14 Farmers practising livestock branding per district

The percentage of respondents branding livestock per district were indicated as follows:-

District	Percentage
Ngong	17
Magadi	71
Mashuru	30
Kajiado central	27
Isinya	17
Namanga	45
Loitokitok	66

As per Table 4.14, livestock branding is rampant in Magadi district (71%) , Loitokitok (66%), Namanga (45%), Mashuuru (30%), Kajiado Central 27% , Isinya and Ngong division 17%.

Table 4.15 Households reasons for branding

The respondents indicated below their reasons for branding

	Frequency	**Percentage**
Identification	45	68.19
As a means of treatment	14	21.21
Decoration purposes	7	10.60
Total	**66**	**100**

From Table 4.15, among the household respondents 68.19% practice livestock branding to curb cattle rustling or for easy identification when the animal get lost, 21.21% confirmed that

the do so to treat skin diseases, while 10.60% do branding to decorate their livestock especially the priced bulls.

Table 4.16: Cattle branding parts

The respondents point out that they brand the following parts;

Part	Frequency	Percentage
Shoulder	20	30.30
Back	18	27.27
Forehead	10	15.15
Legs (below hock)	3	4.55
Hindsight	15	22.73
Total	66	100

As per Table 4.16, most farmers brand their livestock on the shoulder 30.30%, back 27.27%, hindsight 22.73%, forehead 15.15% and legs (below hock) 4.55%. From the analysis most farmers brand critical part of the hide damaging the most valuable part of the hide.

4.6 Hides and skins grading

The researcher objective was to assess the effect of grading on the quality of hides and skins

Table 4.17: Extent to which grading affect the quality of hides and skins

The respondents point out the extent to hides and skin grading affect the quality of hides and skins

	Frequency	Percentage
No extent	11	12.64
Little extent	17	19.55
Moderate extent	28	32.18
Great extent	31	35.63
Total	**87**	**100**

From Table 4.17, 35.63% of the respondents agreed that hides and skins grading or lack of it affect its quality, 32.18% to moderate extend, 19.55% to little extend and 12.64% to no

extend. Lack of positive feedback and sensitization on required quality for hides and skins has hampered continuous improvement.

Table 4.18 Hides and skins grades in Kajiado County

Part	Cattle	Sheep	Goats
Grade 1	10	40	30
Grade 2	30	28	29
Grade 3	45	17	19
Grade 4	10	13	17
Reject	5	2	5
Total	100	100	100

According to Table 4.18, sheep has the highest grade 1 quality skin (40%), goat (30%) and cattle had the lowest grade 1 (10%). For grade 2, cattle had the highest (30%), goats (29%) and sheep (28%). Among the rejects, sheep had the lowest rejected skins (2%)while for cattle and goats similar quantities of hides and skins were rejected (5%).

The lowest grade 1 (10%) in cattle is attributed to scratches as a result of bushes and horn rakes and difficulty in preservation at household level. A higher grade 1 in sheep skins is attributed to good texture of the African sheep skin.

Hides and skins merchants report that delayed delivery of the raw hides and skins from households and slaughter houses compromise on the quality due to bacterial infection.

4.6.1 Quality of hides and skins

The researcher objective was to ascertain the quality of hides and skins in the county. It was done through observation at various slaughter houses and by records from county hides and skins officer.

Table 4.19: Quality of hides and skins produced by household's (percentage)

Quality	Households	Slaughter houses
Excellent	15	36
Good	30	45
Fair	42	15
Poor	10	4
Very poor	3	0

From Table 4.19; a higher percentage of hides and skins obtained at household level fall under the fair category (42%), good at 30% and 15% fall under the excellent category.
As compared to households, slaughter houses has the produce the best hides and skins, excellent 36%, good 45% and only 4% poor. The quality in the slaughter houses is attributed to provision of flaying knifes by Ministry of livestock and general capacity building of the flayers.

Table 4.20: Parameters used to gauge quality

The respondents use the following parameters to determine hides and skins quality

Quality	Households	Traders	Tanners
No. of holes	25	50	65
Shape	17	2	-
Preservation Method	30	30	20
Weight	9	10	15
Others	17	0	0

According to Table 4.20; among the household respondent's hides and skins preservation was the best method to determine quality at 30%, number of holes 25%, others 17% and shape of the skin 10%. For traders, 50% determine the quality of hides and skins by the number of holes, 30% by preservation method, and 10% by weight 2% by shape and other factors. For tanneries, 60% determine quality by no. Holes, 32% by preservation method, 4% by weight of the hides and skins and 8 % by others. As per the tanners, the best way to

measure quality is by the number of holes and texture of the hides and skins.

4.2.8 Marketing of hides and skins

The researcher objective was to establish factors influencing marketing of hides and skins in the county.

Table 4.21: Hides, skins and wet blue leather selling price

The table below shows prices of hides and skins along value chain

Type	Households (Kshs)	Traders (Kshs)	Tanners (Kshs)
Cows	900	3000	10500
Goats	150	600	2570
Sheep	180	700	3540

From Table 4.21; hides and skins tanners benefit more from the trade, whereby value of the same product increase from Kshs 900 to Kshs 10,500. The change is as a result of value addition undertaken. Households benefit very little from raw hides and skins.

4.2.9 Hides and skins selling duration (days)

Due to lack of or inadequate preservation, the earlier the hides and skins reach the market the better.

Table 4.22: Duration when the hides and skins is sold among the households

Below is the number of days it takes for the hides and skins to reach the market.

	Frequency	Percentage
Immediately after slaughtering	3	4.11
After one day	11	15.07
After two days	20	27.39
After three days	29	39.74
After one week	10	13.69
Total	**73**	**100**

From Table 4.22; 39.74% of the household respondents sold their hides and skins after three days, 27.39% of respondents sold theirs hides and skins after two days, 15.07% after one day,

13.69% after one week and 4.11% sold hides and skins immediately after they slaughter their animals. The delay in delivery of hides and skins to the market or traders is attributed to poor road network and the fact market days are held once a week.

4.7 Post-slaughter practices that affect the quality of hides and skins

The research objective was to asses post-slaughter practices that affects quality of hides and skins in Kajiado County.

Table 4.23 Common post-slaughter practices that affect the quality of hides and skins

The respondents indicated that the following post-slaughter practices affect the quality of hides and skins

	Percentage
Preservation method	65
Wetting & contamination	15
Storage	14
Transportation	6
Total	**100**

From Table 4.23, the respondents indicated that the main cause of deterioration of hides and skins quality during post-slaughter activities is preservation method used 65%, wetting and contamination 15%, storage 14% and transportation 6%. Most homesteads lack basic skills and utilities to carryout preservation of the hides and skins.

4.7.1 Hides and skins preservation methods practised in the County.

The research objective was to assess the effectiveness of different hides and skins preservation methods used by the respondents in Kajiado County.

Table 4.24: Hides and skins preservation methods practised in the County

The respondents mentioned that the undertake the following preservation methods;

	Households	Slaughter houses	Traders
Salting	30	27	76
Sun drying	41	-	-
Air drying	11	-	10
Chemical treatment	6	10	14
No treatment	12	63	-
Total	**100**	**100**	**100**

From Table 4.24, 76% of the hides and skins traders salt their products as a means of preservation, 30% of the households salt the product before delivering them to the market and 27% of the slaughter houses salt their products as a means of preservation.

41% of the households preserve their hides and skins through sun-drying. The sun-dried hides and skin are used for other domestic uses eg. as a sleeping mart. 11% of the households and 10% of the traders preserve their hides and skins through air drying. 14% of the traders and 10% of the slaughter houses preserve their hides and skins by use of chemicals. 63% of the slaughter houses forward their hides and skins to traders without carrying out any preservation while 12% of the households hides and skins are not preserved at all. Most household hides and skins are rejected due to poor preserving methods eg, Sun drying which makes the unit cost of processing very costly. Most households cannot afford salt to carryout preservation.

4.8 Summary

The chapter analysed, interpreted and reported finding on the dependent variables that affect the quality of hides and skins namely; poor animal husbandry, livestock branding, flaying techniques, grading and post slaughter practices.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presented the discussion of key data findings, conclusion drawn from the findings and recommendation made. The conclusions and recommendations drawn were focused on addressing the objective of this study which was to investigate factors influencing quality of hides and skins in Kajiado County. The researcher assed how poor animal husbandry, livestock branding, poor flaying techniques, lack hides and skins grading and post-slaughter practices affect the quality of hides and skins.

5.2 Summary of key findings

The study found out that the quality of hides and skins in Kajiado County is mainly affected by poor animal husbandry. Type of animal breeds, availability of adequate and nutritious pastures, disease management practices, age and hides and skins mechanical defects contribute to poor quality in hides and skins.

The study established that that indiscriminate livestock branding is by and large responsible for poor quality of hides and skins in Kajiado County. Pastoral communities brand their livestock with hot irons for identification purposes and to cure certain skin diseases.

The study observed that poor flaying techniques and use of traditional sharp knives which causes holes and gorges on the hides and skins lowers livestock hides and skins quality. The study also establish that skins flayed partly by use of hands has better quality.

The study found out that lack of grading system by traders affected the quality of hides and skins. There is also the absence of price differentiation based quality which inhibits incentives to maintain the quality of the hides and/or skins when the animals are still alive or at the time of slaughter. Continuous improvement of quality of hides and skins is key Lack of grading has made processing poor quality product high and the cost become even higher at

advanced stages of processing because only a small proportion of supply eventually gets processed into quality finished leather.

From the study, it's established that post-slaughter practices and activities (storage, transportation and preservation) contribute to quality of hides and skins.

5.3 Discussions of Key Findings

This section focuses on a detailed discussion of the major findings of the study which also entails comparing the study findings to the literature in order to come up with comprehensive conclusion.

5.3.1 Effect of poor animal husbandry

With regard to the effect of poor animal husbandry on the quality of hides and skins, the study found out that animal husbandry moderately affects the quality of hides and skins. The finding correlate with Kagunyu & Ngari, (2009), in a study carried out in Marsabit county noted that poor animal husbandry and disease management practices lead to production of poor quality animals, hence poor quality hides and skins resulting to low prices.

A higher percentage of all animals reared are the indigenous breeds (zebu) raised by households in pastoral production system. In pastoral system, livestock is kept as a source of livelihood, signs of wealth, beasts of burden and assets to be used in times of emergencies. Therefore, they are less inclined to sell animals even when they attain maturity. They only sell when they want to raise money to pay for urgent and important needs. Pastoralists animal husbandry practices do not promote measures or methods which lead to high off-take rates and livestock slaughtered usually constitute mature or old animals whose skins have suffered damages through exposure to the harsh environment.

The kind of animals kept by the households does to some extend determine the quality and size of hides and skins obtained. Most households in the county keep the traditional Zebu cattle that are small bodied as compared to Sahiwal. The preference of Zebu breed is due to their hardy nature and resistance to both drought and diseases. The same is confirmed by Adugna, A (2004) on a research paper on hides and skins quality and marketing noted that

livestock in the controlled areas and reared for beef purposes has better hides and skins quality.

Tick-borne diseases are prevalent in the County affecting not only the quality of hides and skin but also the survivability of the livestock. Unfortunately less than 50% of the respondents use acaricides to control ticks as they are expensive leaving their animals vulnerable. This confirm findings from a study carried out by Lukin,(1967) on a manual on hides and skins , concluded that badly tick infested animals have poor health and provide hide with lack of substance. The damage to raw hides and skins caused by tick is deep that even with grain correction, the scars will persist. The infected raw materials affected by tick infection are down-graded, rejected or sold at a very low price. The study correlate findings by (FAO; 1986), that animal diseases greatly affect quality of hides and skins.

The study observed that the Ministry of Livestock Development and by extension, livestock county officers who are entrusted with the responsibility of offering licenses, extension, inspection, grading and advisory services are not doing enough to improve hides and skins quality. This has attributed to non-recognition of hides and skins trade as one of the major components of trade in pastoral areas and as an important source of income to livestock producers and thus, deserving an increased attention. The findings are consistent with Gufwoli and Behnke, (1990) and Gathuma *et al.*, (1989) who noted that African governments are not giving hides and skins the attention it deserves. Like the majority of the people, they still see it as a by-product and not a commodity.

5.3.2 Effect of livestock branding on the quality of hides and skins

Majority of the households brand livestock with a hot iron as a way of curbing rustling and cure diseases. The study also reveals that branding is done to most valuable part of hides and skins. Branding makes hides expensive and difficult to cure lowering the quality of hides and skins. The findings correlate with Jabbar & Kiruthu, (2002) on a study on the essential actions to meet quality requirements of hides and skins and semi-processed leather from Africa. In revealed that livestock branding lower the quality of hides and skins.

5.3.3 Effect of flaying techniques on the quality of hides and skins

Techniques used during flaying affect the quality of hides and skins, sharp traditional flaying knives leaves the hides and skins with flay holes, gorges and bruises. The study resonates with findings by Leach et al, (1993) in a study on hides and skins for the tanning industry noted that lack of proper tools like the rounded flaying knives, lack of flaying skills and carelessness lead to loss of quality or outright rejection of raw hides and skins.

The study established that cattle had the highest number of low quality hides due to their size and the fact that it's not possible to do hand skinning. This findings correlates with a study by Jabbar & Kiruthu. (2002) on essential actions to meet quality requirements of hides and in Africa, where large mammals has high number of rejected hides as compared to small ruminants. The study found out that care during slaughtering and flaying of livestock has a profound impact on the quality of skin produced and help in the reduction of associated losses.

Flaying of small stock by pulling of skins reduces incidence of flay cuts as the skins are pulled off the carcass. The different methods of slaughter reflect directly on the quality of raw skins obtained with the pulled skins having less slaughter defects and therefore fetching a better price.

5.3 .4 Effect of grading on the quality of hides and skins

The study found out that hides and skins grading or lack of it affect its quality. Local traders only look at the number of holes and gorges in the skin without referring to other qualities that are required by tanners. Lack of grading has inhibited continuous improvement from the supply side. A study by Jabbar and Kiruthu, (2002) on essential actions to meet quality requirements of hides noted that lack of a common grading or accreditation system in Africa.

The lack of grading and standards undermine the incentive for producers to strive for high quality products. The absence of such incentive reduces the overall value of the hides and skins in the country. However, traders appear to be willing to pay for differentiated products in order to satisfy the quality requirement for export.

Since supply is not differentiated by quality and value, better quality product therefore obtains no price benefit, thus providing no incentive for skilled slaughtering and flaying. As a

result tanneries get poor quality hides and skins, and often they get product of unpredictable quality, and spend extra cost for grading and sorting.

Tanneries confirmed spending more time on grading before processing, this makes cost of processing poor quality product is high and the cost become even higher at advanced stages of processing because only a small proportion of supply eventually gets processed into quality finished leather.

The study found out that sheep skins has the highest quality (grade one) skins. The reasons given is that they have a tough fibre and easily skin by use of hands also unlike goats and cattle that graze in the bushes, sheep graze in the plains minimizing pricking by thorns.
This is consistent with findings by Aklilu *et al.*, (2002), noted that a high proportion of hides and skins in pastoral areas is in the low quality grades III and IV and a low proportion is of high quality grades I and II.

5.3.5 Effect of post-slaughter practices on the quality of hides and skins

Quality of raw hides and skins has not been fully considered as critical by households and policy agencies and no efforts directed at safeguarding it during the animal's lifetime, during slaughter as well as in the handling and preservation of the raw materials.

The study found out that post slaughter handling and management of raw materials to a large extend affects hides and skins quality. The defects on hides are directly caused by slaughter and post slaughter operations include grain cracks, bacterial infection, scratches and tearing, wetting and contamination. The findings are consistent with Kiruthu, S, (2000) in the study on assessment for the development of the hides and skins, leather and leather products sectors in Botswana, who noted that 60% of the defects in hides and skins occur during post-slaughter.
Preservation method is the leading factor that determines the quality of hides and skins. Method used to cure will eventually determine the final quality this is confirmed by Muthee & Kajume , (1997) on a report on Livestock in Kenya noted that most hides and skins in Kenya deteriorate in quality due to poor preservation method.
Africa The quality of raw skins is generally high immediately after slaughter but poor preservation practice leads to lower grades.

The study revealed that there is a decline market demand for sun dried hides and skins as they produce leather products of poor quality. This is as a result of the shift from the use of sun dried skins in the tanneries to wet salted hides and skins. Tanneries said that sun dried hides and skins take more time to tan and also use more chemicals at the tanneries as compared to wet salted hides and skins. This is confirmed by a study by Kagunyu, *etal*, (2010) who observed that low hides and skins prices in Marsabit county is a result of sun drying.

Though wet salting is currently the best curing and preservation method, only a few households and traders were aware of it and no formal training was done. At rural villages, wet salting is so far the most reliable and affordable as confirmed by Mwinyihijah, (2010) in a study on hides, skins and leather value addition initiatives.

The study has revealed that storage and preservation techniques contribute immensely to the quality of hides and skins. A substantial proportion of hides and skins get spoiled at this stage due to improper methods of preservation and storage. This calls for the deployment of proper preservation methods and techniques that guarantees quality. This is confirmed by an investigation carried out by FAO, (2001) on a study on commodity problems; hides and skins in Africa which found out that at least 40% of hides and skins defects found in Tanzania are attributed to defects which are caused during post-slaughter activities.

5.4 Conclusion

It's evident from the study that animal husbandry to a great extent affects the quality of hides and skins in the county. The study also established that type of livestock breeds kept by the farmers determine the quality and size of hides and skins and prevalence of tick-bone diseases affects the quality of hides and skins. The study also concludes that the absence of adequate veterinary extension services affects the quality of hides and skins in the County.

Widespread and indiscriminate practice of branding cattle with hot irons causes high losses in the hide and leather industry. The traditional act done for identification and curing of various diseases lower quality of hides and skins or sometimes total rejection of the same.

Flaying techniques and tools used during slaughtering contributes to the final quality of hides and skins. Sharp traditional knives used during flaying leaves the hides and skins with flay holes, gorges and bruises

Lack of hides and skins grading system and standards does affect the quality of hides and skins in the county, this undermine the incentive for producers to strive for high quality products and inhibits continuous improvement. It was also established in the study that supply is not differentiated by quality and value denying quality product price benefit.

Post-slaughter practices by and large affects hides and skins quality. The study established that preservation, storage, transportation and curing method are the leading factor that determines the final quality hides and skins.

5.5 Recommendations

Parliament to review the current hides and skins Act, to include clauses on livestock branding that will bar farmers from indiscriminate livestock branding.

The government should rehabilitate and upgrade the current slaughter house and equip them with machines and tools that enhances the quality of hides and skins.

The Ministry of Livestock Development to develop a diseases management policy (diseases free zones) and increase the number of veterinary extension officers in pastoral areas.

Ministry of livestock and Kenya leather Development Council should sensitize livestock farmers on the importance and value of hides and skins as an alternative source of income and to undertake an aggressive awareness campaign and training to improve hides and skins quality.

From the study and related conclusions, the researcher recommends that further studies should be undertaken to assess economic benefit of value addition on hides and skins.

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APPENDICES

Appendix I: Letter of Introduction

August 1, 2012.

Dear respondent,

RE: DATA COLLECTION

I am a student at the University of Nairobi pursuing a Masters of Arts program (Project Planning And Management Option).

Pursuant to the pre-requisite course work, I would like to conduct a research project to determine factors affecting the quality of hides and skins in Kenya, with a focus on Kajiado County.

Kindly therefore, complete the attached questionnaire with accurate information that was used entirely for this research while observing utmost confidentiality.

Your assistance is highly valued. Thank you in advance.

Yours faithfully,

SAMMY NAPOROS

Appendix II: Household Questionnaire

Factors affecting the quality of hides and skins: the case of Kajiado County

Household Questionnaire

Introduction:

The purpose of this study is to investigate factors contributing to poor quality of hides and skins In the County. The data collected was treated as confidential and solely for the purpose of this study)

Details of the Correspondent:

Name of the Respondent .....

District: .... Location: .....

Sub-location: ..... Village: .....

1. Demographic and Household Characteristics of the respondent (please indicate where appropriate)

No.	Age	Sex		Education Level	Occupation
		MALE	FEMALE		
	Under 15 years				
	16-30 yrs				
	31-46 yrs				
	47-62 yr				
	63 yrs and above				

Codes: **Sex:** Male 1, Female 0
Level of education: Illiterate 0, Primary : 1 , Post-secondary 2:
Occupation: Business 0, farming 1, formal employment 2, Other 3.

3. Livestock ownership (Please indicate)

Type of livestock	Number Owned in 2011/12	No. of livestock sold in 2011/12	Cash income from sale (Kshs)
Cattle			
Goats			
Sheep			
Others			

4. General (Tick where appropriate)

1. Did you slaughter any animal in 2011/12 ? Yes ____ No _____

2. In your own view how was the quality of the hides and skins ? a) Good _____

b) fair _____ c) Poor _____

3. What parameter did you use to gage the quality? a) No. of holes _____ b) Shape ____

c) preservation method _____ d) weight _____ e) Other _____

4. Did you sell any hides or skins in 2011/12 ? Yes _____ No _____

5. If no, why? .....

6. How many hides and skins did you sell? a) hides _____ b) skins _____

7. At what price did you sell (on average) in Kshs ? Hides _____ Skins _____

8. What type of Hides and skins did you sell in 2011/12 a) Fresh ___b) Sun dried _____

c) Salted _____

9. When did you sell your hides and skins to the market in a) Immediately after a)

slaughtering _____ b) after a day _____ c) after 2 days _____d) after a week __

10. If yes, what is the reason? a) Inaccessibility to market _____ b) Lack of price

information _____ c) Poor quality _____ d) Low price _____ e) Other specify

11. On what basis did you sell your hides/skins ? a) Weight _____ b) Quality (no. of defects)

_____ c) Breed _____ d) Method of preservation _____ e) Other (specify) _____

12. What kind of diseases affected your livestock in 2011/12

a) disease and parasites _____ b) injury _____c) Others (specify) _____

13. Among the diseases which one (s) do you rank high _____ _____

14. What problems did you face to your hides and skins after slaughter

a) Silts and stains _____ b) preservation_____ c) Other (specify)_____

15. What is your suggestion to solve each problem? _____

16. How did you slaughter your animal? a) In the backyard _____b) Slaughter slab_____

c) Other (specify) _____

17. Did you do preservation after slaughter? Yes _____ No _____

18. Did you receive any extension services from livestock officers? Yes _____ No ___

19. If yes, how frequent? A) Weekly _____ b) Monthly _____Other (specify) _____

20. What do you suggest to solve the major problems in hides and skins quality ?

THANK YOU

Appendix III : Hides and skins traders Questionnaire

Details of the Correspondent:

Name of the Respondent: _____

Division: _____ Location: _____

Sub-location: _____ Village: _____

Trading centre: _____

1. Demographic and Business characteristics of the respondent

No.	Age	Sex		Education Level	Occupation
		MALE	FEMALE		
	Under 15 years				
	16-30 yrs				
	31-46 yrs				
	47-62 yr				
	63 yrs and above				

Codes: Sex: Male 1, Female 0

Level of education: Illiterate 0, Primary : 1 , Secondary and above 2:

Type of business : Sole proprietor 1, Partnership 2, Company 3. Other 4

2. General

1. How long have you been in Hides & Skins business ? a.) < 1 year _____ b) 1-5 years _____ c) 6-10 years _____ d.) above 10 years _____

2. How often do you participate in the trade? A) Daily ___b) Every market day_____ c) Only during festivities _____ d) Other (specify) _____

d) Other (specify) _____

3. On average, how many hides and skins do you buy per day? a) hides ____b) skins ____

4. What was your average purchasing price in Kshs ? Hides _____ Skins _____

5. Which type of Hide/ skins is highly demanded in the market in 2011/12? a) Fresh ____ b) Air dried _____c) Salted _____d) Other (specify) _____

6. What preservation method did you use ? a. Air dried _____b) Wet Salted _____ c) Other (specify) _____

7. What parameters did you use to purchase raw hides? a.) Weight _____ b) Quality_____ c) breed _____ d) Other (specify) _____

8. What major defects did you observe in the raw hides you purchased? b) Branding ___

b) Bruises_____ c) flaying holes _____ d) Putrefaction _____f) Dirtiness _____

9. What major defects did you observe in the raw skin you purchased? b) Branding ___

b) Bruises_____ c) flaying holes _____ d) Putrefaction _____f) Dirtiness _____

10. What do you think the causes of the defects observed? _____

11. How is the quality of hides and skins you purchase? A) Good _____b) Fair _____

c) poor _____

12. Which are the most visible hides and skins defects? a) brands ___b) flaying cuts _____

c) diseases _____ d) Others _____

13. How can the defects be eliminated? _____

14. How did you do if you cannot sell the Hides & Skins you offered to the market?

a.) Preserving & drying _____ b) Sell at lower price _____c). Store_____ e) Other

(specify) _____

15. In your own opinion, what are the other factors influencing the quality of hides and skins?

THANK YOU

Appendix IV: Tannery Questionnaire

Details of the Correspondent:

Name of the Respondent .....

Position of the respondent in the Tannery ... .

County : ..... Town .....

1. General:

1. How many raw Hides & Skins did you buy in 2011/12

Grade : 1st	
2nd	
3rd	
4th	
Reject	

2. What is the reason for purchasing such a quantity .? a) financial constraints _____

b) Low quality__ c) Low supply _____ d) Low demand _____ e) Others _____

3. Where is your source of Hides& Skins? A) Our self _____ b) agents _____ c) buy from traders _____ d) Others _____

4. Did you use additional Preservation method to raw Hides & Skins before processing?

a) Yes _____ b) No _____

5. If yes, what method of preservation do you use?a.) Wet salting ____ b) Air drying _____ c) chemicals _____ d) Others _____

6. Is there price variation of raw Hides & Skins in the market? a)Yes _____ b) No. _____

7. If yes, what could be the reasons you think? a. International price variation _____

b) Market forces _____ c) Quality _____ d) Others _____

8. Do you do additional processing to Hides & Skins before taking to terminal market?

A) Yes _____ b). No _____

9. If yes, what method of processing do you use?a) Pickling _____b) Wet blue _____

c) Crust _____ d) Leather _____

10. On average, what is the unit cost (Kshs) of processing? a) Pickling _____b) Wet blue __

c) Crust _____ d) Leather _____

11. To whom did you sell your processed hides and skins to in 2011/12
a) Local factories _____ b) Exported _____

12. What is the quantity sold? a) Pickled ____ b) Wet blue ____ c) Crust _____

d) Leather _____

13. On average what is the selling price/unit (Kshs)) Pickled ____ b) Wet blue ____

c) Crust _____ d) Leather _____

14. What parameters did you use to purchase raw hides from your suppliers?

a) Weight _____ b) Quality _____ c. Shape and breed _____Others (specify) _____

15. What major defects did you observe in the raw hides you purchased?

a) Branding _____ b. Flay cut _____c. Poor pattern _____ d. Putrefaction _____

e) disease and Parasite _____ f) Other (specify) _____

Put in their order of occurrence _____

17. What do you think the causes of the defects observed?_____

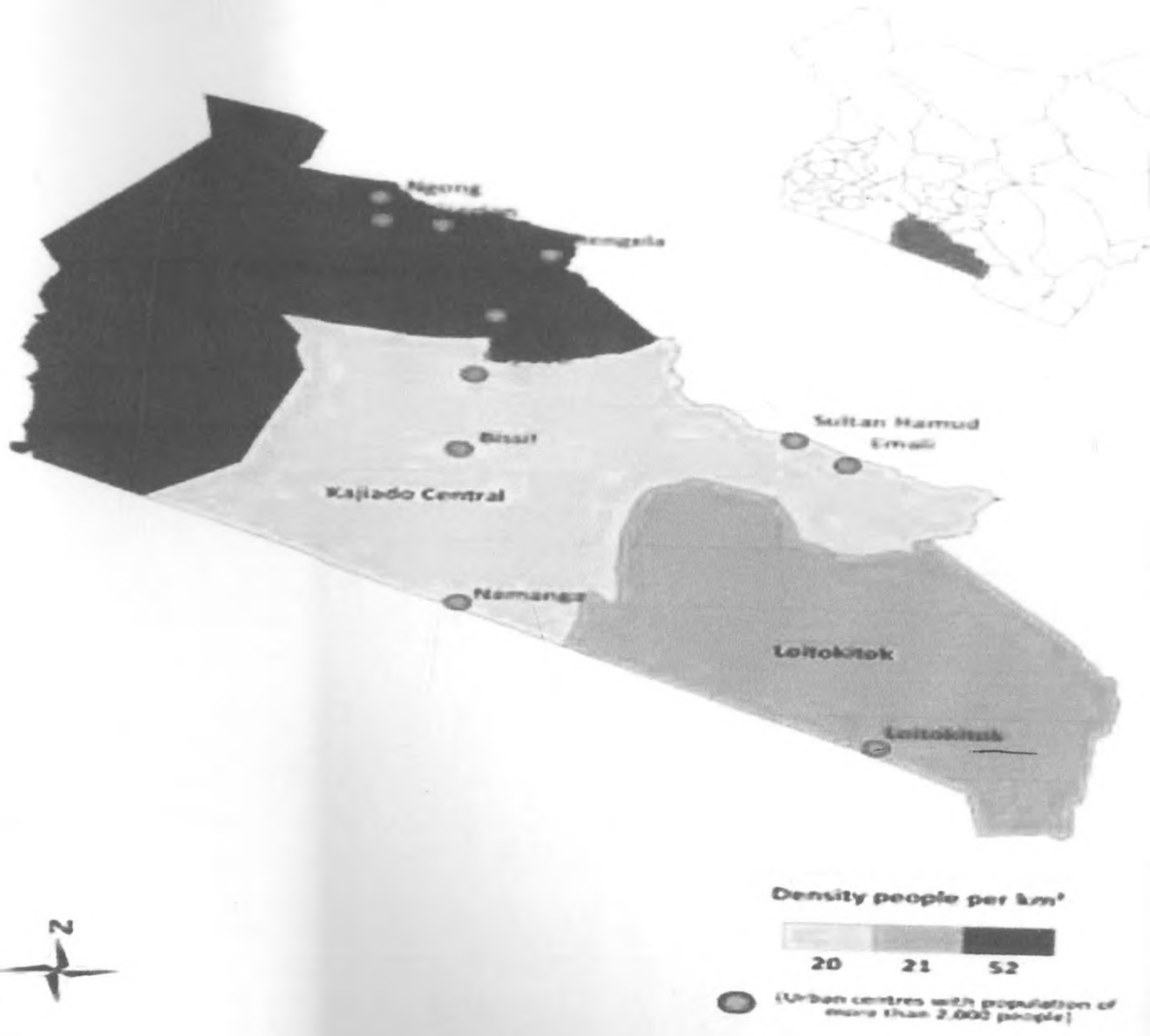
18. Where do you take low quality/ rejected Hides & Skins?

a) Buy with low price _____ b). Did not accept _____ c) Other (specify) _____

19. In your own opinion what are other factors that influencing the quality of hides and skins?

THANK YOU

Appendix V: Map showing study area : Kajiado County



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