DETERMINANTS OF SUCCESS OF DOG BREEDING FIRMS IN KENYA

A CASE OF DOG BREEDING FIRMS IN KAJIADO NORTH CONSTITUENCY, KENYA

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A RESEARCH REPORT SUBMITTED IN PARTIAL FULFILLMENT FOR THE AWARD OF MASTERS DEGREE OF ARTS IN PROJECT PLANNING AND MANAGEMENT OF NAIROBI UNIVERSITY, KENYA

YEAR 2017

DECLARATION

This research report is my original work and has not been presented to any other examination body.

Sign……. Date……....

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Declaration by Jared

This research report has been submitted for approval with my approval as the university supervisor.

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DEDICATION

This thesis is dedicated to my family members, my father Justus Ombasa, mother Joyce Ombasa, wife Linnet Kintu and my sibling junior Ombasa who supported me throughout my studies. Their love, care, concern, support, encouragement and enthusiasm inspired me to achieve this goal.

ACKNOWLEDGEMENT

I take this opportunity to first, thank God for good health and for bringing me this far. I extend my gratitude to my supervisors; Dr. Christopher Gakuu for his encouragement and patience in reading, correcting, re-reading and refining this work. I must extend special thanks to all the Nairobi University lecturers for their immense support during the course of this study. Collectively, your efforts and expertise have given me a rudimentary look into your world. I sincerely thank and appreciate my respondents for providing me with the required information without which this work would not have been completed. Finally my heartfelt regards go to my family for giving me support during the entire period of my study and research. Most sincere thanks to my wife Linnet Kintu for missing my presence when I was preoccupied with this work. I am indeed greatly indebted to my father Justus Ombasa and my mother Joyce Ombasa for having sent me to school. I recognize the support, care and encouragement from my family members, classmates and friends. God bless you abundantly.

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LIST OF ACRONYMS AND ABBREVIATIONS

DNA: Deoxyribonucleic Acid

SPSS: Statistical Packages for Social Sciences

ABSTRACT

Productivity in livestock farming rose dramatically throughout the developed world during the second half of the twentieth century as a result of efficient breeding programmes, improved understanding of animal nutrition and disease control, and better designed housing systems. In Kenya dog breeding firms is an upcoming industry due to the growing middle class. The reality of today's dog breeding firms is horrific. Despite the economic importance of dog breeding firms in Kenya, there is dearth empirical evidence of the determinants of the success of dog breeding firms in Kenya. Thus this study envisioned filling this research gap. Thus the general objective of the study was to analyze the determinants of the success of dog breeding firms in Kenya; a case study of dog breeding firms in Kajiado North Constituency**.** The findings of this study would be of great benefit to dog breeding farm managers because it will provide an insight into the determinants of the success of dog breeding firms in Kenya. The findings from this research will also be valuable to the government of Kenya, as information resulting from this research will form a basis of formation of government policies that govern dog breeding firms. The main limitation of the study was respondents' honesty, time and resources. The researcher overcame the challenge of respondents honest by explaining to the respondents the importance of the research, thus the need of giving honest opinion. The researcher took work leave so as to overcome time constrains and also mobilized resources from friends and family to overcome challenges of limited resources. The study adopted a descriptive research design. The researcher conducted a survey of dog breeding firms in Kajiado north Constituency. According to the ministry of livestock 2010 there are about 120 pet raring firms in Kajiado north Constituency in Kenya. Thus the target population was 120 pet raring firms in Kajiado Constituency in Kenya. The sampling design was stratified random sampling and the sample size was 30% of the target population which will be 40 pet firms in kajiado Constituency Kenya and spread equitably and equally a across the constituency. Both qualitative and quantitative primary and secondary data was used for the study. The primary data was collected by use of a structured questionnaire. The study collected both quantitative and qualitative data. The descriptive data was analyzed using Statistical packages for social sciences (SPSS version 22) while the qualitative data was analyzed by content analysis. The study concluded that breeding resources, breeding knowledge, technology and breeding management affects the success of dog breeding firms in Kenya. The study recommends that dog breeders should mobilize enough breeding resources through credit or equity and government should also subsidize veterinary services and dogs feed. The study also recommends that government should invest on current breeding technology and pass the knowledge of breeding technology to dog breeders for adoption. The study finally recommends that dog breeders should seek for knowledge through further training, workshops and fairs in order to improve their knowledge and skills on dog breeding and breeding management skills and competence.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Productivity in livestock farming rose dramatically throughout the developed world during the second half of the twentieth century as a result of efficient breeding programmes, improved understanding of animal nutrition and disease control, and better designed housing systems Nibert (2002). The growth rate and feed conversion efficiency of broiler chickens illustrate the changes vividly: between the early 1960s and the late 1990s the time needed to produce a slaughter-weight broiler fell from 80 to 40 days, and the required feed consumption halved (King, Marston, & Bennett, 2012). This growth in productivity has added to human wealth. It has also allowed farmers to make effective use of the natural resources at their disposal.

Thousands of dog breeding firms exist throughout United States. In Kenya dog breeding firms is an upcoming industry due to the growing middle class. According to Farstad (2014), for centuries dogs have been inbred, even the champions, a practice that is slowly causing breeds to move towards endangerment due to the increasing severity and frequency of congenital defects. Some of the problem lies with backyard breeders, people who breed dogs even though they don't have the experience and knowledge necessary to produce healthy, well-tempered puppies.

The face of animal breeding has changed significantly over the past decades. Animal breeding used to be in the hands of a few distinguished 'breeders', individuals who seems to have specific arts and skills to 'breed good livestock'. Nowadays, animal breeding is

much dominated by science and technology Cross, Williams & Edwards-Jones (2009). In some livestock species, animal breeding is in the hands of large companies, and the role of individual breeders seems to have decreased. There are several reasons for this change. Firstly, the breeding industry has taken up scientific principles. Looking was replaced by measuring, and an intuition was partly replaced by calculations and scientific prediction.

Other major developments were caused by the introduction of biotechnology. These are roughly the reproductive technologies, and the molecular genetic technology. Not all of this is new. Artificial insemination was introduced in the fifties in cattle. No doubt that the technology had a major impact on rates on genetic improvement in dairy cattle, and just as important, on the structure of animal breeding programs. Nowadays, technologies like ovum pick up, in vitro fertilization, embryo transfer, cloning of individuals, cloning of genes, and selection with the use of DNA markers are all on the ground. Some of the technologies are already applied, others are further developed, or waiting for application. Finally, the rapid development of computer and information technology has greatly influenced data collection and genetic evaluation procedures in livestock populations, now allowing comparison of breeding values across herds, breeds or countries (Nussbaum, 2006).

The introduction of breeding methods typically needs to find the right balance between what is possible from a technological point of view and what is accepted by the decision makers and users within the socio-economic context of a production system Gamborg (2004). Ultimately it is the consumer who decides which technology is desirable or not. In most western societies, consumers are increasingly aware of health, environmental and animal welfare issues. Food safety and methods food production are part of their buying

behavior. However, price and production efficiency remain to be major contributors to sustainability of a livestock industry. Successful animal breeding programs need to find the right dose of technology that helps them to be competitive.

1.2 Statement of the Problem

Dogs are useful and important domestic animals and pets in several ways which include guarding of property and livestock; assisting the blind and other disabled people to maintain functionality; performing search and rescue missions and acting as sled animals; and in detecting explosives and drugs (Horn *et al.*, 2013). Dog breeding business is a potential tool for addressing unemployment among the youths, especially the teeming population of young graduates of veterinary medicine in Kenya. Consequently, an evaluation of the dog breeding business and understanding of the factors necessary for successful venture is desirable to guide prospective graduates and people interested in veering into dog breeding. But little is known on how breeding resources, breeding knowledge, technology and breeding management influence the success of dog breeding firms.

Despite the importance of dog breeding Bir & Croney (2016) contends that the reality of today's dog breeding firms is horrific. A puppy dog usually lives in a cage slightly larger than its own body, moves around and sleeps on wire flooring. A female dog will likely be bred twice a year for eight years, with little time between litters. Puppy mill dogs can, and usually do, suffer from problems including, but not limited to, untreated bite wounds, pneumonia, heat stroke, ear infections, blindness, malnutrition, splayed and swollen feet, rotted teeth and mange, all due to the conditions of their confinement and treatment, and lack of veterinarian care.

A study by Gamborg (2004) showed that the cost of breeding activities, competition, unavailability of suitable breeding material, lack of breeding knowledge and management skills results to failure rate of up to 60% of dog breeding firms. Despite the economic importance of dog breeding firms in Kenya, there is dearth empirical evidence of the determinants of the success of dog breeding firms in Kenya. Thus this study envisioned filling this research gap.

1.3 Purpose of the study

To analyze the determinants of the success of dog breeding firms in Kenya; a case study of dog breeding firms in Kajiado North Constituency, Kenya

1.4 Specific objectives

The specific objectives in the study were therefore the following;

i. To examine the influence of availability of breeding resources and services on the success for dogs breeding firms in Kajiado North Constituency, Kenya
ii. To establish the influence of breeding knowledge on the success for dogs breeding firms in Kajiado North Constituency, Kenya
iii. To establish the influence of technology of breeding firms on the success for dogs breeding firms in Kajiado North Constituency, Kenya
iv. To establish the influence of breeding management on the success for dogs breeding firms in Kajiado North Constituency, Kenya

1.5 Research Questions

i. How does availability of breeding resources and services influence the successfulness of dogs breeding firms in Kajiado North Constituency, Kenya

ii. To what extent does breeding knowledge influence the successfulness of dogs breeding firms in Kajiado North Constituency, Kenya

iii. To what extent does technology of breeding firms influence the successfulness of dogs breeding firms in Kajiado North Constituency, Kenya

iv. To what extent does breeding management influence the successfulness of dogs breeding firms in Kajiado North Constituency, Kenya

1.6 Justification of the study

The findings of this study would be of great benefit to dog breeding farm managers because it will provide an insight into the determinants of the success of dog breeding firms in Kenya. The findings from this research will be valuable to the government of Kenya, specifically ministry of agriculture who will use the finding to evaluate the successfulness of dog breeding firms. Information resulting from this research will form a basis of formation of government policies that govern dog breeding firms. The research information will also contribute to the existing body of knowledge on determinants of the success of dog breeding firms. This will serve as reference for future researchers and scholars in the field of management.

1.7 Limitations of the Study

The study used survey questionnaire that relied on self-report responses. However the problem with using questionnaire is that it is based on the assumption that participants

responded to the questions in an honest and accurate manner. Nevertheless it is not always the case that participants answer the questions in an honest manner. This is because participants often gave answers that they believed to be desirable. The study was also limited by time and resources.

1.8 Delimitations of the Study

The researcher overcame the challenge of respondents honest by explaining to the respondents the importance of the research, thus the need of giving honest opinion. The researcher took work leave so as to overcome time constrains and also mobilized resources from friends and family to overcome challenges of limited resources.

1.9 Basic assumptions of the Study

The following, assumptions were made on the study; that the respondents would honestly and truthfully answer survey questions exhaustively; that prospective respondents would cooperate with the research team; that the relevant documents would be available and accessible to researchers for primary and secondary data collection.

1.10 Definitions of Significant Terms used in the study

Breeding firm Success: refers to accomplishment of dog breeding firms

Breeding Knowledge: is the practice of mating selected animals with the intent to maintain or produce specific qualities and characteristics

Breeding Management: Breeding management is maximizing pregnancies so as to realize the optimum profit potential in animal production

Breeding resources: refers to a stock or supply of money, materials, staff, food and other assets that are needed for dog breeding.

Breeding Technology: the practice of producing offspring or set aside especially for producing offspring

Breeding: is the reproduction that is, producing of offspring, usually animals or plants.

1.11 Organization of the study

Chapter one focused on the background of the study, problem statement and the objectives, limitation, delimitation, assumptions and definition of key terms. Chapter two focused on literature review and conceptual framework. Chapter three focused on research methodology. Chapter four on data analysis and interpretation while chapter five focused on summary of major findings, conclusion and recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter contains the information on the relevant literature reviewed and a conceptual framework illustrating diagrammatically the variable relationships. The literature review cited similar areas of study or studies.

2.2 Determinants of the Success of Dog Breeding

The study reviewed the various determinants of the success of dog breeding by various scholars from different part of the world. The researcher limited himself to the latest journals and books on dog breeding.

2.2.1 Availability of breeding Resources and Services

Resource use and the environmental impact of animal production are primarily determined by farm animals' capacity for efficient feed conversion. The more efficiently animals can convert locally available feeds (particularly those which cannot be used for human consumption); the more sustainable is the corresponding production system. Hence, by selecting for traits that improve feed conversion, breeders can promote environmental sustainability (Bir & Croney 2016).

Health problems associated with breeding have been noted in several species. In dairy cows, high milk yield is connected both with significantly raised levels of mastitis and reproduction problems. In broiler chickens, high growth rate causes leg problems. Whether animal welfare is defined in terms of the animals' subjective experience or in terms of health and biological function these problems will involve reduced animal

welfare. Welfare problems also in presently used production systems. Examples are feather-pecking in laying hens and tail-biting in pigs, both of which may be influenced by breeding. Breeding companies can play an important role in addressing welfare problems of both these types by defining broader breeding goals – goals that include not only production traits but also functional traits ((Laflamme & Willoughby (2014),).

There may be an economic benefit in including some non-production traits, such as those relating to animal health, into breeding goals. But obviously, bringing traits that confer no obvious economic advantage into the breeding goal carries monetary costs (among other things, it may slow down the breeding progress for traits that directly affect producer-income). The question is how to cover these costs. One option is through product-pricing. However, as Appleby et al. (2003) point out, this places a heavy responsibility on the individual consumer at point of sale; and the fact that breeding is only a small part of the food chain may make it difficult to convince the consumer of the desirability of the relevant price rises. Another possibility would be for major processors and retailers of food to focus on ethical issues because of the positive effect this may have on these companies' brands. However, in real life the focus will inevitably be on a few salient parameters that are cheap and/or matter to a broad cross-section of consumers. It is unlikely that the issues we have been discussing can be properly dealt with in this way.

2.2.2 Breeding knowledge

According to Kolar (2003) the purpose of animal breeding is not to genetically improve individual animals- once an individual is conceived, it is too late to change the genotype of that animal- but to improve animal populations, to improve future

generations of animals. To this ask breeders bring two basic tools: selection and mating. Both involve decision-making. In selection, it is decided which individuals become parents, how many offspring they may produce, and how long they remain in the breeding population. In mating, it is decided which of the males we have selected will be bred to which of the females we have selected (Appleby, 2002).

Selection is used to make long-term genetic change in animals. It is the process that determines which individuals become parents, how many offspring they may produce, and how long they remain in the breeding population. Most of us are familiar with the term natural selection. Natural selection is the great evolutionary force that fuels genetic change in all living organisms.

Rice (2016) thinks of natural selection as affecting wild animals and plants, but in fact it affects both the wild and domestic species. All animals with lethal genetic defects, for example, are naturally selected against- they never live to become parents. Natural selection cannot be ignored but the kind of selection of primary interest in animal breeding is artificial selection. The idea behind selection is simply this: to let individuals with the best sets of genes reproduce so that the next generation has, on average, more desirable genes than the current generation of animals. The animals with the best sets of genes are said to have the best breeding values. They are from a genetic point of view- the individuals with the greatest value as parents. In selection, we try to choose those animals with the best breeding values: the animals that will contribute the best genes to the next generation. The result of

successful selection is then to genetically improve future generations of a population by increasing over time the proportion of desirable genes (Rauw, 1998).

According to Serrane (2010) selection is the first of the two basic tools used by animal breeders to make genetic change. The second tool is mating. Mating is the process that determines which (selected) males are bred to which (selected) females. It is distinctly different from selection. In selection, you choose the group of animals you want to be parents; in mating, you match males and females from the selected group.

There are many different methods for mating animals, and each method can be defined by a set of mating rules: a mating system. There are three reasons for using mating systems: (1) to produce offspring with extreme breeding value, (2) to make use of complementarity, and (3) to obtain hybrid vigour (Serrane, 2010).

In the past, before new technologies such as DNA tests and health databases were available, breeders did the best they could with what they had to work with. Today things are different. Knowledge-based breeding has emerged. This means that when quality information is collected and then coupled with the advancements of science, progress is more certain. Even with this kind of knowledge the time and effort required to fix a problem or produce litters of consistent quality is not always short and it cannot be quantified. For these reasons careful thinking is expected Fraser (2004). For example, more is now known about how to analyze pedigrees and use new breeding methods. Take, for instance, the breeder who intends to produce a specific trait such as a dog with a body that is longer than tall, a wedge-shaped head, a strong and level back, or a tail that

curls up or hangs down. In order to accomplish these things breeders must pay close attention to the traits of the ancestors and what they have produced. For breeders interested in improving the front assembly they must work to produce offspring that do not have forequarters with scapulars (shoulder blades) that are short and steep which give the appearance of a short neck. To avoid these pitfalls, information must be collected about the fourteen ancestors in the first three generations and, if possible, their littermates. In the simplest of terms, each breeding is a mix of genes from the sire and dam (50–50). The breeder who is serious about producing quality must study and evaluate these ancestors and then develop a strategy based on the information collected.

Smith (2016) contends that in order to shift the odds in favor of the breeder, knowledge-based breeding helps move the needle. It requires the collection of the right kinds of information and then the willingness to use it properly. It begins with the fourteen direct ancestors of the sire and dam (three generations). They are central to managing risk and making improvements.

2.2.3 Breeding Management

Breeding management is an important component of successful planned reproduction in dogs. Mismanagement accounts for many of the breeding problems you see in practice. Because of the wide variation seen in normal canine reproductive cycles, it is not surprising that management issues confuse breeders and veterinarians alike. Many factors affect pregnancy rate, including animal health, nutrition and previous reproductive history (Gamborg, 2004).

Lawrence (2004) indicates the aim of animal breeding is to genetically improve populations of livestock so that they produce more efficiently under the expected future production circumstances. Genetic improvement is achieved by selecting the best individuals of the current generation and by using them as parents of the next generation. A breeding program is the organized structure that is put into place to genetically improve livestock populations.

Successful genetic improvement requires breeding programs to have (at least) the following components: A system to record data on selection candidates. Without data on selection candidates it is impossible to identify the best individuals. Methods and tools to estimate the genetic merit (breeding value) of selection candidates. This step is referred to as "breeding value estimation" or " genetic evaluation system" . A system to select the animals that become parents of the next generation, and mate them to produce the next generation. A structure to disseminate the genetic improvement of the breeding program into the production population. In most cases, the breeding population and the production population are (partly) separated. Since the aim is to improve livestock production, genetic improvement created in the breeding population should be disseminated into the production population (Whitehead (2015).

2.2.3.1 Data recording and collection

Estimation of breeding values requires phenotypic data on selection candidates. Thus a system has to be set up to routinely record data on selection candidates. The way data is collected depends on the species and the traits in the breeding goal. For

example, the product of a dairy cattle breeding company is a straw of semen from a bull (Bir & Croney 2016).

However, milk yield cannot be recorded on bulls. Thus to identify bulls of high genetic merit for milk yield, one has to collect data on daughters of bulls. Dairy cattle breeding schemes therefore have a system to record data on daughters of test bulls. Milk yield of those daughters is recorded on common dairy herds, meaning that farmers are involved in the data recording. In beef cattle breeding, growth performance of bulls can be recorded on the selection candidates themselves, meaning that progeny testing is not necessary. In beef cattle breeding, data collection therefore takes place at testing stations where the performance of selection candidates is recorded. The quality of the data is fundamental to the success of breeding programs. Without high quality data, it is impossible to accurately estimate genetic parameters and breeding values.

2.2.3.2 Breeding value estimation

According to Whitehead (2015) after data are recorded, breeding values have to be estimated. The common procedure to estimate breeding values in applied livestock breeding is called "BLUP". BLUP and selection index theory have the same theoretical basis; both are based on regression of breeding values on phenotypes. Compared to selection index theory however BLUP has the following advantages; i) It accounts for systematic environmental effects. ii) BLUP is more flexible than selection index theory and therefore more suitable as an operational tool. iii) BLUP takes account of selection.

2.2.3.3 Selection and mating

Selection and mating takes place after breeding are estimated. Selection refers to the process of choosing parents to produce the next generation, whereas mating refers to the pairing of selected individuals Bell, (2009). Thus selection precedes mating. The selection process determines the genetic improvement of the population over time, whereas the mating process determines how maternal and paternally derived alleles are combined within individuals.

The decision about which animals should be selected as parents for the next generation is mainly based on assessment of breeding value of individual animals. Genetic evaluation is central to animal improvement schemes. Selecting animals based on estimated breeding value maximizes the response to selection that can be achieved. However, there is one other criterion that is relevant when deciding which animals should have offspring. This criteria is common ancestry of all selected parents. The coancestry of selected parents should stay below certain limits, since it is directly related to the buildup of inbreeding. Coancestry among selected parents is determined by the average relationship among the selected parents as well as the number of parents selected. In this course we will more explicitly discuss selection strategies that maintain low levels of inbreeding.

Decisions about which animals need to be mated are often seen in relation to dominance effects. Utilizing dominance variation is often not of primary importance for improvement of purebreds, but it can have more impact if breeding animals are selected from different breeds or lines, as heterotic effects between breeds can be utilized. When

multiple traits are involved in the breeding objective, assortative mating could be useful, matching qualities in different parents for different

There is a good possibility that in the near future, planned mating will gain in importance, when effects of specific genotypes will be better understood. One could envisage certain genotypes with high growing potential to be combined with specific genes that have major effect on meat quality. Another argument for planned matings is to avoid inbreeding in direct offspring as well as the rate of inbreeding in the population. However, the rate of inbreeding depends mainly on population size and number of parents selected

2.2.3.4 Dissemination of genetic progress

In most species, the breeding and production populations are distinct. Genetic progress is created in the breeding population, but the final aim is to improve livestock production in the entire population. Thus genetic improvement created in the breeding population has to be disseminated into the production population.

In dairy cattle, the breeding and production populations are not strictly separated. Superior cows from the production population can enter the breeding population, meaning that they are selected as bull dams. Genetic progress created in the breeding program is transferred to the dairy farms by the sale of semen of progeny tested bulls to the farmers. The sale of semen is the primary source of income for dairy cattle breeding companies. In addition, a limited number of embryos from the breeding population are sold to the dairy farmers (Sansi, 2012).

According to The National Committee for Pig Production (2004) the situation is different in pig and poultry breeding. Pig and poultry production are based on crossbreeding systems. The breeding populations consist of purebred lines, which are mated together to produce crossbred offspring. Crossbred offspring are sold to fattening farms or egg producers. The breeding and production populations are therefore completely separated; crossbred production animals cannot enter the purebred breeding populations. Dissemination of genetic superiority of the purebred breeding populations takes place by the sale of crossbred offspring (Farm Animal Welfare Council, 2004).

2.2.4 Animal Breeding Technology

The face of animal breeding has changed significantly over the past decades. Animal breeding used to be in the hands of a few distinguished " breeders" , individuals who seem to have specific arts and skills to " breed good animals" . Nowadays, breeding in particular in livestock species is dominated by science and technology. In some livestock species, animal breeding is in the hands of a few large companies, and the role of the individual breeders seems to have decreased. There are several reasons for this change. Firstly, the breeding industry has adopted scientific principles (Gamborg, 2004).

Looking was replaced by measuring, and an intuition was partly replaced by calculations and scientific prediction. Other major developments grew from the introduction of biotechnology Marder, (2013). Biotechnology can be broadly defined as the application of biological knowledge to practical needs. These technologies fall

generally into two categories, reproductive and molecular. Not all of this is new. Artificial insemination was introduced in cattle in the fifties. There is no doubt that technology had a major impact on rates of genetic improvement in dairy cattle and is just as important to the structure of animal breeding programs. Nowadays, technologies like ovum pick up, in vitro fertilisation, embryo transfer, cloning of individuals, and selection with the use of DNA-information is all on the ground. Some of the technologies are already applied, others are further developed, or waiting application. Finally, rapid development of computer and information technology has greatly influenced data collection and genetic evaluation procedures in animal populations, now allowing comparison of predicted breeding values across farms, breeds or countries (Giffin, & Carlson, 2014).

It is important to recognise that the introduction and exploitation of new technologies have large social impacts. The introduction of breeding methods typically needs to find the right balance between what is possible from a technological point of view and what is accepted by the decision makers and users within the socio-economic context of the production system Lawrence, (2004). Ultimately it is the consumer who decides which technology is desirable and which is not. In most western societies, consumers are increasingly aware of health, environmental and animal welfare issues. Food safety and methods of food production are part of their buying behaviour. However, price and production efficiency are still major factors determining the sustainability of a livestock sector. Successful animal breeding programs need to find and apply the accepted technologies that help them remain competitive. This course is mostly concerned

with the technical issues involved in the application of new technologies in animal breeding (Nussbaum, 2006).

Techniques used by breeders have also been subjected to ethical scrutiny. Breeding technologies used in addition to, or instead of, traditional mating range from established methods (e.g. artificial insemination) to newer, more controversial activities (e.g. cloning and transgenesis (FAWC, 2004). Many of the latter are still used only on an experimental basis, and examples of their successful application in farm animals are rare.

Concerns over reproductive and genetic technologies are numerous: they include anxieties about welfare consequences for animals, risks to the environment and human health, interference with aspects of life which are not for humans to tinker with (that is, the allegation that we are 'playing God'), and the violation of genetic integrity (Savolainen and Leitner, 2012).

Most of the main factors that determine genetic gain are directly influenced by the reproductive rate of the breeding animals Savolainen and Leitner (2012). A higher reproductive rate leads to the need for a decreased number of breeding animals, therefore increasing the intensity of selection of these animals. If reproductive technology is possible, for example AI, the benefit could be expressed in terms of increased genetic rate of improvement, which in turn has a dollar component attached to it. More offspring per breeding animal allow also more accurate estimation of breeding value.

Reproductive technology allows the intensive use of superior breeding stock. An obvious consequence is possibly that the most popular breeding animals are overused, and the population could encounter inbreeding problems. Typically, as new technologies in animal breeding allow faster genetic change, long term issues such as inbreeding and

maintenance of genetic variation become important. For that reason, selection tools in animals breeding have become somewhat more sophisticated in recent years (Marder, 2013).

Besides a direct effect on rate of genetic improvement, another important consequence from increasing reproductive rates is to disseminate superior genetic stock quickly. The influence of a superior breeding animal would be much higher if thousands of offspring could be born, rather than if the superiority is passed on through the production of sons via natural mating. Another example is that of cloning. Cloning is not extremely important for increasing rate of genetic progress, but it could have a large impact by allowing many copies of the best individual to perform in commercial herds. As reproductive rates are basically multiplying factors in a breeding structure, any improvement in reproduction will justify higher investment in improvement of the best breeding stock (Savolainen and Leitner 2012).

2.2.5 Government support of Dog Breeding Firms

In public discussion, words such as support, subsidy, assistance, and aid to producers are often used inter-changeably to describe the transfers provided to farmers or the agricultural sector as a whole, which result from government policies that raise farmers' revenues or reduce their costs Rice, (2016). The government uses the neutral term "support" to estimate the monetary value of transfers resulting from agricultural policies, whatever the intended objectives of those policies.

Countries pursue a variety of goals with their policies. Although they use different mixes of policy measures to do so, it is the way in which the measures are implemented in the context of the conditions in each country that determines the impacts on production, consumption, income, trade and the environment Gamborg (2004). In order to provide a basis for more in-depth policy analysis, the government not only calculates overall support levels, but also reports their composition using different categories of policy measures that reflect how the policies are implemented. The implementation criteria tell us something about how different policies may affect farmers' decisions to produce farm goods.

Some policy measures deliver support directly related to the amount of a specific commodity produced (market price support and payments based on commodity production) or inputs used. These policy measures are the ones that have the strongest influence on production incentives, although this incentive can be weakened in those countries that place constraints on output produced or inputs used. Policy measures that deliver support based on the current area planted animal numbers, but are not dependent on the amount of a specific commodity produced have somewhat less influence on production incentives. Other policy measures provide support based on criteria such as past production history, the overall farm area, the income situation of the farmer, or for the provision of environmental services. Such measures have the least Influence on production incentives (The National Committee for Pig Production, 2004).

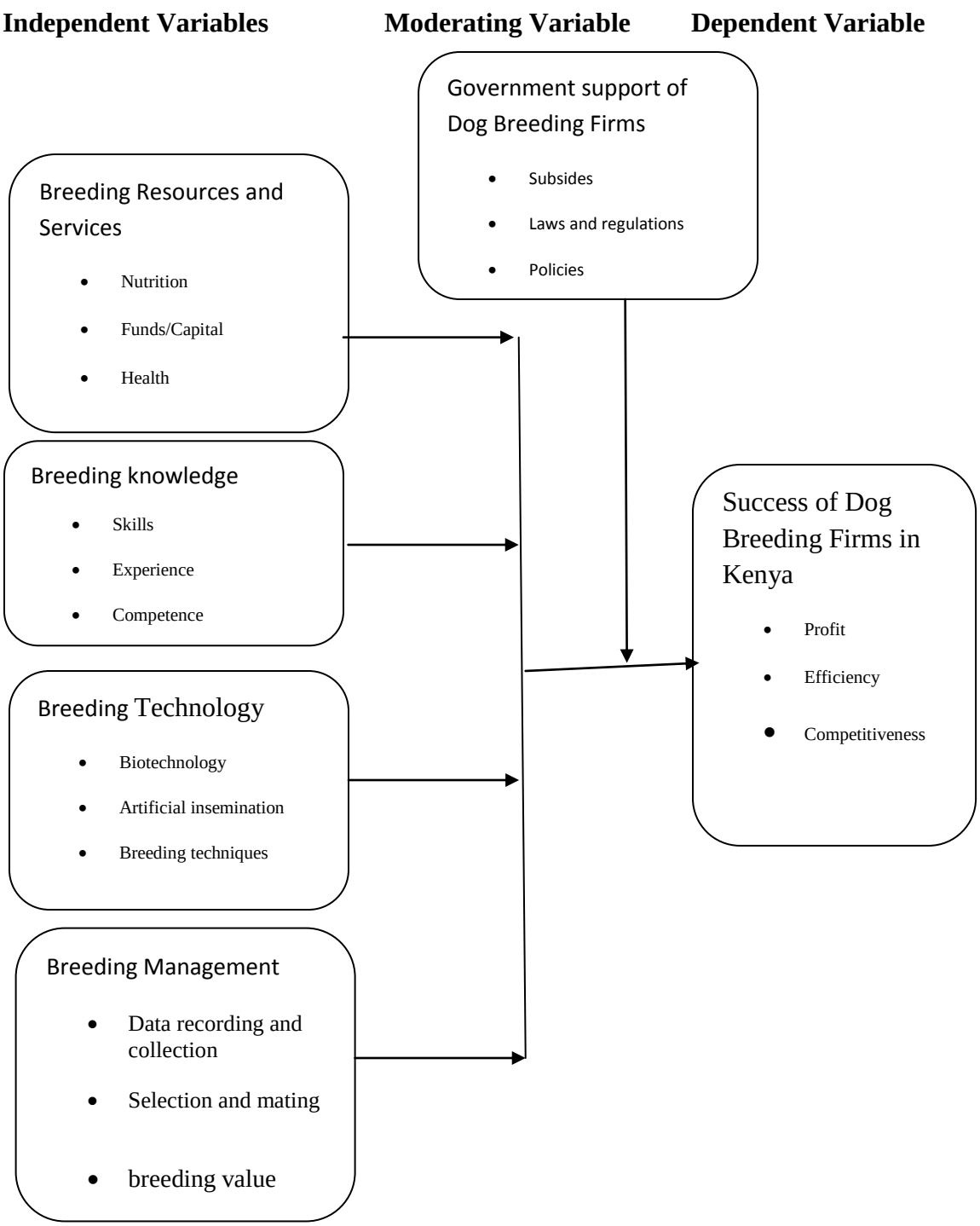
2.2.6 Performance of Dog Breeding Firms

Dog breeding enterprises are continuously developing, particularly towards increased scale and greater specialization. These developments will demand different breeds and crosses. Particularly in developed countries, consumer priorities and choices may have an important influence on future breeding goals. Genetic improvement efforts must constantly bear these possibilities in mind and not concentrate solely on breeding objectives focused on today's problems (Bir & Croney 2016).

The cost of breeding activities, competition, and the international availability of suitable breeding material, are important criteria to be considered when taking decisions regarding support and public funding for national breeding programmes. These decisions are not easy, as a logical and comprehensive approach to the economic evaluation of breeding programmes is still unavailable. Many governments have decided to rely on international genetic material for breed development. Countries face problems in the organization and implementation of effective and efficient breeding programmes (Gamborg, 2004).

This is particularly true for low and medium external input production systems, which are in most cases associated with locally adapted breeds with limited production output Gamborg, (2004). It is unlikely that the private sector will contribute significantly to the cost of new national ruminant breeding programmes in developing countries, in particular for systems with limited potential for increased production. Such costs would have to be borne by national institutions. Cooperation in breeding activities between countries with similar production conditions, such as already happens in Europe, is an opportunity to share costs and make breeding programmes more sustainable(Nussbaum, 2006).

Figure 1: Conceptual Framework



2.3.1 Breeding Resources and Services

Breeding Resources and Services affect the performance of Dog Breeding firms in Kenya in terms of availability of funds or capital where in some cases funds may lack to finance the breeding process, also the nutrition levels and the mode of diet that the breed is fed with. In addition to this, health is another factor that affects breeding in that the health services administered to the breeds should be good.

2.3.2 Breeding knowledge

Breeding knowledge also affects the performance of Dog Breeding firms in Kenya in terms of the level of skill of the breeder, the level of experience that the breeder has in this particular field and also level of competence.

2.3.3 Breeding Technology

Breeding Technology affects the performance of Dog breeding firms in Kenya in terms of biotechnology where there are many different methods of breeding that has been invented. Also there is the use of artificial insemination where by breeding employ assisted reproductive technology, donated sperm, and/or animal husbandry techniques. Lastly technology has come up with new breeding techniques such as gene transfer, in-vitro production, cloning and sexing of embryos that have been developed and are being refined with efficiencies suitable for use in animal agriculture.

2.3.4 Breeding Management

Breeding Management affects the performance of Dog breeding firms in Kenya where by the breeder is required to collect and record data that may be used for future reference. This will also involve selection process and mating the breeds.

2.3.5 Success of Dog Breeding Firms

The success of dog breeding firms was the dependent variable in this study. It was measured by profitability, efficiency and competitiveness of dog breeding firms.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Chapter three describes research methodology and covers the research design for the study, target population, sampling frame and sample size, methods of data collection and instruments, data processing and analysis, reporting procedures and information dissemination.

3.2 Research Design

The researcher used descriptive survey that investigates determinants of the success of dog breeding firms in Kajiado Constituency in Kenya. According to Cooper & Schindler, (2011) descriptive research involves gathering data that describe events and then organizing, tabulating, depicting, and describing the data, it also uses description as a tool to organize data into patterns that emerge during analysis and often uses visual aids such as graphs and charts to aid the researcher. A descriptive survey was ideal as the researcher sought to obtain information that describes existing phenomena of determinates of success of dog breeding firms in Kajiado North Constituency, Kenya.

3.3 Target Population

According to the ministry of livestock 2015 there were about 120 pet raring firms in Kajiado north Constituency in Kenya (Kenya National Bureau of Statistics, 2010). Thus the target population was 120 pet raring firms in Kajiado Constituency in Kenya. The researcher defined the target population based on available data and statistics at the time

of undertaking the study but relied as well on logic. The population is defined in keeping with the objectives of the study.

3.4 Sampling procedure and Sample size

The sampling design was stratified random sampling and the sample size was 30% of the target population which was 40 pet firms in kajiado Constituency Kenya and spread equitably and equally a across the constituency. According to Mugenda and Mugenda, (2003) 30% of the target population is representative of the population and economical.

The population was divided according to the administrative unit (strata) as shown in Map 1,(Ngong ward, Olkeri Ward, Ongata Rongai Ward, Nkaimirunya Ward, and Oloolua Ward) then pet firm in each administrative unit was determined and an equal number (size of each stratum) was selected from each administrative unit. Then random sample was selected from each sub-group.

Table 1: Sampling Frame

Location	Number of respondents	Percentage
Ngong ward	8	20.0
Olkeri Ward	8	20.0
Ongata Rongai Ward	8	20.0
Nkaimirunya Ward	8	20.0
Oloolua Ward	8	20.0
Total	**40**	**100**

3.5 Research Instruments

The researcher used a questionnaire to collect primary data. A self-administered questionnaire is the one of the way to elicit self-report on people's opinion, attitudes, beliefs and values. Primary data was obtained through self-administered questionnaires with closed and open-ended questions (see appendix I)

3.6 Pilot Testing

Data collection tools mainly the questionnaire was pretested by administering the questionnaires to the farmers and firm mangers of pet firms residing in the same constituency, but who are not members of the firms from where the actual data was randomly collected. The researcher used 10 percent of the target population which was 12 pet firms for the pilot study. After collecting the piloting data from the respondents the researcher tested for validity and reliability of the instruments.

3.6.1: Validity of Instruments

According to Mugenda (2008), Validity is the accuracy and meaningfulness of inferences, which are based on the research results. In other words, validity is the degree to which results obtained from the analysis of data actually represent the phenomenon under study. Content validity of an instrument is improved through expert judgment. To ensure content validity, the questionnaires were subjected to a panel of peers to assess whether each measurement question in the questionnaire is essential, useful or necessary (Cooper & Schindler, 2011). Essential responses on each item from each panelist are

evaluated by a content validity ratio, and those meeting statistical significance value are retained (Cooper & Schindler, 2011).

3.6.2: Reliability of Instruments

According to Mugenda (2008), Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials. The researcher used split-half method. A split-half test was obtained by administering the same instrument to the same different group of respondents at two different points in time. The degree to which both administrations were in agreement was used as a measure of the reliability of the instrument. This yielded a half test coefficient. The Spearman – Brown Prophecy formula for the full test was employed to obtain a total test coefficient of the instruments. They was considered reliable if the reliability was between 0.7 – 1.0 (Fraenkel and Warren, 2000; Huck, 2000). The researcher used SPSS version 22 for calculating the reliability of the instruments. The study pilot results had a Cronbach's Alpha of 0.8094, thus the instruments were considered to be reliable.

3.6: Data Collection Procedures

The researcher used primary data. Primary data collection involved administration of questionnaire, while Secondary data collection will involve perusal of documents (document analysis). The researcher distributed the research tools to the respondents through drop and pick later method. This method saved on time and costs. Moreover, it is more convenient for this study.

3.7: Data Analysis Techniques

The processing of descriptive statistics for numeric data involved examining/editing and categorizing. Completed data collection instruments were edited and data fed into computer. The data was entered and analyzed by simple descriptive statistical analysis using statistical package for social scientists (SPSS Version 22) computer software. The software was chosen because it is the most used package for analyzing survey data. The software has the following advantages: it is user friendly, can easily be used to analyze multi-response questions, cross section and time series analysis and cross tabulation; (i.e. relate two sets of variables) and it can also be used alongside Microsoft Excel and Word packages. The descriptive statistics analysis was carried out by computing the means, standard deviations and %ages for responses to questionnaire items, followed by testing for relationships and predictions among variables which was determined by using regression techniques. The survey report was compiled in Microsoft Word and Tables formatted in Excel and results has been presented in tables and %ages.

A multivariate regression model was applied to determine the relative importance of each of the variables with respect to performance of dog breeding firms in Kenya

The regression model will be as follows:

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + ę$$

Where:

y = Performance of Dog Breeding Firms in Kenya

β_0 = Constant Term

β_1= Beta coefficients

X_1= Availability of breeding Resources and Services

X_2= Breeding knowledge

X_3= Breeding Technology

X_4=Breeding Management

ę = Constant error

3.8: Ethical Considerations

Ethical consideration in research should be an integral part of the research planning and implementation process, not viewed as an afterthought or a burden. There should be increased consciousness of the need for strict ethical guidelines for researchers. Some of the ethical issues touch on deception and invasion of privacy (Frankel, R. Jack & Norman E. Wallen, 2000).

There are three main ethical principles that were considered:

i. Beneficence***:*** Maximizing good outcomes for science, humanity, and the individual research participants and minimizing or avoiding unnecessary risk, harm, or wrong.
ii. Respect***:*** Treating people with respect and courtesy, including those who are not autonomous (e.g., small children, people who have mental retardation or senility)

iii. Justice***:*** Ensuring that those who bear the risk in the research are those who benefit from it; ensuring that the procedures are reasonable, non-exploitative, carefully considered and fairly administered.

While undertaking the research, there were six norms of scientific research that guided the researcher. These include:

i. Use of valid research design: Faulty research is not useful to anyone and it is not only a waste of time and money but cannot be conceived of as being ethical in that it does not contribute to the well-being of the participant.
ii. The researcher must be competent to conduct the research
iii. Consequences of the research must be identified: procedures must respect privacy, ensure confidentiality, maximize benefits, and minimize risks
iv. The sample selection: must be appropriate for the purpose of the study, representative of the population to benefit from the study, and sufficient in number.
v. The participants must agree to participate: in the study through voluntary informed consent- that is, without threat or undue inducement (voluntary), knowing what a reasonable person in the same situation would want to know before giving con sent (informed), and explicitly agreeing to participate (consent).

3.9: Operational Definitions of Variables and Measuring Indicators

Operational definitions of variables explain the variables and measuring indicators as was used in the study as illustrated in the Table 1.

Table 2: Operational Definitions of Variables and Measuring Indicators

Variables	Indicators	Measurements	Measurements Scales	Study Designs	Tools of Analysis
Research Objective 1	To examine the influence of availability of breeding resources and services on the success of dogs breeding firms in Kenya				
Independent Variable Performance of Dog Breeding Firms in Kenya	Availability Of Breeding Resources	1) Availability of vet services 2) Availability of dog food 3) Affordability of vet services and dog food 4) Level of capital of dog breeders	Ordinal Interval	Qualitative and Quantitative	Descriptive statistical analysis by computing the means, standard deviation and %ages of gender responses to questionnaire items.
Research Objective 2	To find out the influence of breeding knowledge on the success of dogs breeding firms in Kenya				
Independent Variables Performance of Dog Breeding Firms in Kenya	Breeding Knowledge	1) Level of dog breeders skills 2) Numbers of years of dog breeders 3) Level of dog breeders competence	Ordinal Interval	Qualitative and Quantitative	Descriptive statistical analysis by computing the mean, standard deviation to questionnaire items, cross-tabulation and testing significance by the Chi-Square Test of Independence @ 0.05 significance level.
Research Objective 3	To look into the influence of technology of breeding firms on the success of dogs breeding firms in Kenya				

Independent Variables Performance of Dog Breeding Firms in Kenya	Technology used for breeding	1) Levels of use of biotechnology in dog breeding 2) Levels of use of AI services	Ordinal Interval	Qualitative and Quantitative	Descriptive statistical analysis by computing the mean, standard deviation and % for responses to questionnaire items, cross-tabulation and testing significant differences by the Chi-Square Test of Independence @ 0.05 significance level.
Research Objective 4	To analyze the influence of breeding management on the success of dogs breeding firms in Kenya				
Independent Variable Performance of Dog Breeding Firms in Kenya	Breeding Management	1) Extent of data recording and collection 2) Availability of selection and mating records 3)	Ordinal Interval	Qualitative and Quantitative	Descriptive statistical analysis by computing the means, standard deviation to questionnaire items.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.0 Introduction.

This chapter discusses the interpretation and presentation of the determinants of the success of dog breeding firms in Kajiado North constituency. It contains both descriptive and inferential results of determinants of the success of dog breeding firms in Kajiado North constituency.

4.1 The Response Rate

Table 3: Response Rate

	Frequency	% response rate
Non response	12	30.0
Actual respondents	28	70.0
Targeted respondents	40	100

The table 3 above shows the correct number of the questionnaires that were returned out the total number of what was sent out. The researcher targeted 40 dog breeding firms, 28 respondents out of the 40 sample respondents filled-in the questionnaires making a response rate of 70%. This reasonable response rate was achieved after the researcher made physical visits to remind the respondent to fill-in the questionnaires. According to Babbie & Earl (2009), 50% response rate is deemed adequate and one can proceed with data analysis.

4.2 Background Information

4.2.1 Age Bracket

Table 4 Age Bracket

Age Bracket	Frequency	Percentage
20-30 years	5	17.9
30-40 years	13	46.4
40-50 years	7	25.0
above 50 years	3	10.7
Total	28	**100**

The percentage of respondents between the of age 30-40 years was 46.4% followed by the age of 40-50 years with 25% then 17.9% for ages 20-30 years and lastly a 10.7% for those above the age of 50 years. This implied that majority dog breeders of respondents were between the ages of 30-40 years. This can be attributed to the fact that majority of Kenya work force below 40 years.

4.2.2 Academic level

Table 5 Academic level

Academic level	Frequency	Percentage
Secondary Certificate	7	25.0
College Diploma	16	57.1
University Graduate	3	10.7
Post Graduate	2	7.14
Total	28	**100**

Respondents who had diploma certificate led with 57.1% followed by college secondary with 25% then university graduates who had 10.7% and finally the post graduate with 7.14%. This implied that a high percentage of respondents who reared dogs in Kajiado North Constituency were those who had college diploma education. Thus, the respondent well understood the questionnaires and their response was reliable.

4.2.3 Length of operation

Table 6 length of operation

Length Of Operation	**Frequency**	**Percentage**
Less than 1 year	3	10.7
1-5 years	18	64.3
5-10 years	5	17.9
above 10 years	2	7.1
Total	28	**100**

The respondents who were in the dog breeding business for a period of 1-5 years comprised of 64.3% followed by those who had operated for 5-10 years with 17.9%. This was followed by 10.7% for the respondents who were in the business for less than 1 year and lastly a 7.1% for those who had been in business for more than 10 years. This was taken to mean that the business was an upcoming business since majority had been in operation for less than five years.

4.3: Determinants of the Success of Dog Breeding Firms in Kenya

A five point likertscale in statistical analysis was used where the mean and standard deviation of respondents selecting a particular response was computed indicating the general perception of the sampled respondents. A mean score of above 4.5 indicated that the respondents strongly agreed; a mean of 3.5 to 4.5 indicated respondents strongly agreed; a mean of 2.5 to 3.5 indicates that the respondents were undecided; a mean of 1.5 to 2.5 indicates that the respondents were disagreed; while a mean below 1.5 indicated respondents strongly disagreed. On the same note standard deviation(s) were used because they were found useful to assess how a variable as a sample was.

4.3.1 Effects of breeding resources on the success of dog breeding firms

Table7 Effects of breeding resources on the success of dog breeding firms

Breeding Resources	Mean	Std. Deviation
Availability of vet services	4.45	.900
Availability of dog food	3.90	.895
Affordability of vet services	3.75	1.345
Affordability of dog food	4.08	.786
Level of capital of dog breeders	3.66	1.352

The researcher sought to determine their respondents' responses on the issues pertaining effects of breeding resources and services on the success of dogs breeding. The respondents agreed that availability of vet services, affordability of dog food, and availability of dog food, affordability of vet services and level of capital of dog breeders

affects the success of dog breeding firms. Each of the factors had a mean score of 4.45, 4.08, 3.90, 3.75 and 3.66 respectively.

The study results demonstrate that breeding resources and services affects the success of dog breeding firms. The study results concurs with Bell, (2009) who pointed out that efficient breeding services help boost the success of dogs breeding by enabling that quality puppies are given birth. Some of the breeding resources suggested included: good and comfortable kernels, quality food and regular vaccination.

4.3.2 Effect of breeding knowledge on the success of dog breeding firms

Table 8 Effect of breeding knowledge on the success of dog breeding firms

Breeding Knowledge	Mean	Std. Deviation
Level of dog breeders skills	3.91	.894
Numbers of years of experience of dog breeders	3.35	.447
Level of dog breeders competence	4.07	1.000
Quality of breed produced through selection and mating	4.40	1.817
Lifespan of the breed	3.28	1.304

The researcher sought to determine the level of respondents' agreement in relation to effect of breeding knowledge on the success of dog breeding firms. The respondents agreed that quality of breed produced through selection and mating, level of dog breeders' competence and skills affects the success of dog breeding firms. Each of the factors had a mean score of 4.40, 4.07 and 3.91respectively. The respondents were

undecided on effect of numbers of years of experience of dog breeders and lifespan of the breed on the success of dog breeding firms each had a mean score of 3.35 and 3.28 respectively.

The study results concur with Bell (1999) contends that in order to shift the odds in favor of the breeder, knowledge-based breeding is critical. Two important factors in breeding knowledge are selection and mating. Both involve decision-making. In selection, it is decided which individuals become parents, how many offspring they may produce, and how long they remain in the breeding population. In mating, it is decided which of the males we have selected will be bred to which of the females we have selected. According to Appleby, (2002) the idea is to let individuals with the best sets of genes reproduce so that the next generation has, on average, more desirable genes than the current generation of animals. The animals with the best sets of genes are said to have the best breeding values.

4.3.3 Effects of technology used on the success of dog breeding firms

Table 9: Effects of technology used on the success of dog breeding firms

Technology	**Mean**	**Std. Deviation**
Level of use of biotechnology in dog breeding	3.60	.894
Levels of use of scientific measurement and prediction	4.12	.447
Use of artificial insemination (AI) services	4.35	1.000
Levels of use of breeding techniques	3.90	1.304

The study findings show that the respondents agreed that there is great effect of use of Artificial Insemination (AI) on success of dog breeding firms; levels of use of scientific measurement and prediction on success of dog breeding firms; levels of use of breeding techniques on success of dog breeding firms and level of use of biotechnology in dog breeding on success of dog breeding firms. Each of them is shown by the mean scores of 4.35, 4.12, 3.90, and 3.60 respectively.

The study results concurs with Nussbaum, (2006) who indicated that successful dog breeding programs need to find and apply the accepted technologies that help them remain competitive such as Artificial Insemination, biotechnology and other breeding techniques. Besides a direct effect on rate of genetic improvement, another important consequence from increasing reproductive rates through use of breeding technology is to disseminate superior genetic stock quickly. The study results deduced that technology affects success of dog breeding firms in Kenya.

4.3.4 Effects of breeding management on the success of dog breeding firms

Table 10 Effects of breeding management on the success of dog breeding firms

Breeding Management	Mean	Std. Deviation
Extent of data recording and collection	3.82	1.581
Availability of selection and mating records	4.67	1.000
Dissemination of genetic progress	3.45	.400
Estimates of breeding value	3.16	1.342

The researcher sought to determine respondents' responses on the issues pertaining effects of breeding management on the success of dog breeding firms. The respondents strongly agreed that availability of selection and mating records affects the success of dog breeding firms, which had a mean score of 4.67. The respondent agreed that extent of data recording and collection affects the success of dog breeding firms; which had a mean score of 3.82. The respondents were undecided on effect of dissemination of genetic progress and estimates of breeding value on success of dog breeding, each had a mean score of 3.45 and 3.16 respectively.

The result suggests that there was a great effect of breeding management on the success of dog breeding firms. The study results concurs with Willis, (2005) who indicated that breeding management is an important component of successful planned reproduction in dogs, which should have following components: A system to record data on selection candidates. Without data on selection candidates it is impossible to identify the best individuals for mating. The decision about which animals should be selected as parents for the next generation is mainly based on assessment of breeding value of individual animals.

4.4: Success of Dog Breeding Firms

Table 11: Success of Dog Breeding Firms

Success of Dog Breeding Firms	Mean	Std. Deviation
the dog breeding firm are profitable	4.08	0.918
the dog breeding firm are efficient	3.91	0.804
the dog breeding firm are competitive	3.53	0.918

The researcher sought to determine respondents' responses on the issues pertaining success of dog breeding firms. The respondents agreed that their dog breeding firms were profitable, efficient and competitive; each had a mean score of 4.08, 3.91 and 3.53 respectively. The study reflects the views of Gamborg (2004) who contended that the cost of breeding activities, competition, and the international availability of suitable breeding material, are important criteria which determine the success of breeding firms.

4.5 Regression Analysis Results

4.5.1 Correlation Analysis

Correlation analysis was carried out to find out if the study variables were related to each other. Two predictor variables are said to be correlated if their coefficient of correlations is greater than 0.5. In such a situation one of the variables must be dropped or removed from the model. As shown in table below, none of the predictor variables had coefficient of correlation between themselves more than 0.5 hence all of them were included in the model.

Table 12: Pearson Correlation Correlations

	breeding resources	breeding knowledge	technology	breeding management
breeding resources	1.000			
breeding knowledge	.252	1.000		
Technology	.467	.247	1.000	
breeding management	.307	.254	.380	1.000

Mainly the study was on dependence and independent relationship, a moderate multiple regression analysis was used. The multiple regression analysis is mathematically expressed as shown below: A multivariate regression model was applied to determine the relative importance of each of the four variables with respect to the changes on motivation the regression model was as follows:

$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + ẹ$

Where:

y = determinants of the success of dog breeding firms in Kenya

$\beta_{1,2,3,4}$= Beta coefficients

β_1= Beta coefficients

X_1= breeding resources

X_2= breeding knowledge

X_3= technology

X_4= breeding management

Regression equation and the predictor relationship

The established multiple linear regression equation becomes:

$Y = 0.497 + 0.839X_1 + 0.506X_2 + 0.476X_3 - 0.606X_4$

Where

Constant = 0.497, shows that breeding resources, breeding knowledge, technology and breeding management were all rated as zero, determinants of the success of dog breeding in firms in Kenya rating would be 0.497

X_1= 0. 839, shows that one unit change in breeding resources results in 0.839 units increase in successful dog breeding firms in Kenya

X_2= 0.506, shows that one unit change in breeding knowledge results in 0.506 units increase in successful dog breeding in firms in Kenya.

X_3= 0.476, shows that one unit change in technology, results in 0.476 units increase in successful dog breeding in firms in Kenya.

X_4= 0.606, shows that one unit change in breeding management, results in 0.606 units increase in successful dog breeding in firms in Kenya.

4.5.2 Regression coefficients

Table 13 Regression coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.497	.167		2.980	.004
breeding resources	.839	.212	.933	4.431	.030
breeding knowledge	.506	.142	.826	5.526	.031
technology	.476	.126	.793	5.895	.046
breeding management	.606	.073	.321	4.174	.050

Strength of the model

Analysis in table 4.9 shows that the coefficient of determination (the percentage variation in the dependent variable being explained by the changes in the independent variables) R2 equals 0.822, that is breeding resources, breeding knowledge, technology and breeding management which explains 82.2% percent of determinants of the success of dog breeding firms in Kenya leaving only 17.8% percent unexplained.

4.5.2 Strength of the model

Table 14 Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.907 (a)	.822	.814	.5747	.822	102.78	4	89	.000

Model Summary

Predictors: (Constant), breeding resources, breeding knowledge, technology and breeding management.

Adjusted R^2 is called the coefficient of determination and tells us how successful dog breeding in firms in Kenya varied with breeding resources, breeding knowledge, technology and breeding management. From above, the value of adjusted R^2 is 0.822. This implies that, there was a variation of 82.2% on successful dog breeding in firms in Kenya that varied with breeding resources, breeding knowledge, technology and breeding management at a confidence level of 95%.

CHAPTER FIVE: SUMMARY OF FINDINGS, DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents discussions of the key findings presented in chapter four, conclusions drawn based on such findings and recommendations there-to. This chapter is, thus, structured into discussions, conclusions, recommendations and areas for further research.

5.2 Summary of findings

The researcher evaluated the determinants of the success of dog breeding firms in Kenya which were breeding resources, breeding knowledge, technology and breeding management.

5.2.1 Effects of breeding resources on the success of dog breeding firms

The researcher sought to determine their respondents' responses on the issues pertaining effects of breeding resources and services on the success of dogs. The researcher established that availability of vet services, affordability of dog food, and availability of dog food, affordability of vet services and level of capital of dog breeders affects the success of dog breeding firms.

5.2.2 Effect of breeding knowledge on the success of dog breeding firms

Also the researcher sought to determine the level of respondents' agreement in relation to effect of breeding knowledge on the success of dogs breeding firms. The respondents agreed that quality of breed produced through selection and mating, level of dog

breeders' competence and skills affects the success of dog breeding firms. The respondents were undecided on effect of numbers of years of experience of dog breeders and lifespan of the breed on the success of dog breeding firms

5.2.3 Effects of technology used on the success of dog breeding firms

The researcher further sought to establish the effects of technology used on the success of dog breeding firms**.** The respondents agreed that there is great effect of use of Artificial Insemination (AI) on success of dog breeding firms; levels of use of scientific measurement and prediction on success of dog breeding firms; levels of use of breeding techniques on success of dog breeding firms and level of use of biotechnology in dog breeding on success of dog breeding firms.

5.2.4 Effects of breeding management on the success of dog breeding firms

The researcher also sought to determine their respondents' responses on the issues pertaining effects of breeding management on the success of dogs firms. The respondents strongly agreed that availability of selection and mating records affects the success of dog breeding firms. The respondent agreed that extent of data recording and collection affects the success of dog breeding firms, while the respondents were undecided on effect of dissemination of genetic progress and estimates of breeding value on success of dog breeding.

5.3 Discussion

Dog breeding has become extremely popular in the Kenya; furthermore, it is becoming a big-money business for people that own purebred dogs. However, many people don't really understand what is required to be successful at breeding dogs. A study by Gamborg

(2004) showed that the cost of breeding activities, competition, unavailability of suitable breeding material, lack of breeding knowledge and management skills results to failure rate of up to 60% of dog breeding firms.

The study established that there is need to have the right breeding resources such dog food, vet services and capital. These resources will enhance the dog health which is extremely important to the success of a good dog breeder. Dog breeders should ensure that the breeding dogs are always well fed and provided with excellent nutrition, vitamins and supplements. According to Farstad (2014) dog breeders should always keep their dogs as healthy as possible, it is extremely important during pregnancy.

The researcher sought to establish the effects of breeding knowledge on the success of dog breeding firms**.** One of the most important factors in successfully breeding dog is choosing the right mate, thus the need to have good knowledge, skills and experience in dog breeding. The mate should possess the types of traits and qualities that the breeders want to see displayed in any offspring that are delivered. This study results concurs with findings of Serrane (2010) who pointed out that that both the male and female dog should be healthy and have no signs of genetic faults that could jeopardize the health of a litter of puppies.

The researcher also sought to determine the effects of breeding management on the success of dogs firms. The study established that good record-keeping practices on both the male and female dogs helps in increase success in dog breeding. However, it is even more important to keep good records for the female dog. Dog breeders need to always keep records with a detailed history of female dog that will contain important date

information such as the day the dog breeder notice the dog going into heat, any changes in behavior or temperament, as well as any medical or health issues. This will be important in genetic progress and estimates of the dogs. The study results concur with Willis, (2005) who indicated that breeding management is an important component of successful planned reproduction in dogs.

The researcher sought to establish the effects of technology on the success of dog breeding firms**.** Breeding industry has taken up scientific principles. Looking was replaced by measuring, and an intuition was partly replaced by calculations and scientific prediction.

Other major developments were caused by the introduction of biotechnology. Nowadays, technologies like ovum pick up, in vitro fertilization, embryo transfer, cloning of individuals, cloning of genes, and selection with the use of DNA markers assist in improving success of animal breeding. The study results concurs with Nussbaum, (2006) who indicated that successful dog breeding programs need to find and apply the accepted technologies that help them remain competitive such as Artificial Insemination, biotechnology and other breeding techniques.

The study results indicated that breeding resources, breeding knowledge, technology and breeding management influence the success of dog breeding firms in Kenya. Success of dog breeding firms can be improved by efficient breeding programmes, improved understanding of animal nutrition and disease control, and better designed housing systems.

5.4 Conclusions

The researcher concluded that breeding resources, breeding knowledge, technology and breeding management affects the success of dog breeding firms in Kenya. Inadequate resources have been identified as the most contributing factor to successful dog breeding in firms. It was discovered that most firms lack breeding resources therefore hindering successful dog breeding. Breeding knowledge also was identified as another factor that most firms do not have adequate knowledge on how the process of dog breeding works. Technology was termed as very important in order to know the new and better ways of successful dog breeding. Breeding management was found to be also a determining factor in successful dog breeding. Therefore these factors were found to be very crucial in successful dog breeding.

5.5 Recommendations

The researcher recommends that dog breeders should mobilize enough breeding resources through credit or equity and government should also subsidize veterinary services and dogs feed. The researcher also recommends that government should invest on current breeding technology and pass the knowledge of breeding technology to dog breeders for adoption. The researcher finally recommends that dog breeders should seek for knowledge through further training, workshops and fairs in order to improve their knowledge and skills on dog breeding and breeding management skills and competence.

5.6 Recommendations for further study

The study was carried out in Kajiado North Constituency only. The researcher recommends that a similar study should be undertaken by future researchers in a different geographical area to verify the study results. The researcher further recommends more research on individual variables, to enhance deep and through understanding of determinants of the success of dog breeding firms in Kenya.

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APPENDICES

Appendix I: Introduction Letter

Jared Ombasa

P.O Box, Nairobi – Kenya.

17th September 2017

Dear Sir/Madam,

RE: TO WHOM IT MAY CONCERN

I am Jared Ombasa, a Master of Arts student from the University of Nairobi carrying out a survey to identify the 'the determinants of the success of dog breeding firms in Kenya; a case study of dog breeding firms in Kajiado North Constituency .

In my schedule, I would be visiting your organization for a face- to -face interview and a questionnaire with the staff members who will be sampled for this purpose to represent your organisation. The date, time of arrival departure will be communicated to your firm over cell phone. Kindly circulate this information to all staff for their awareness and maximum participation.

Yours faithfully,

Jared Ombasa

Appendix II: Questionnaire

Section A: Background information *(please put an X in relevant box)*

1. What is your age bracket?

20-30 years [ ]

30-40 years [ ]

40-50 years [ ]

Above 50 years [ ]

2. Which is your highest academic level?

Primary certificate [ ]

Secondary certificate [ ]

College diploma [ ]

University Graduate [ ]

Post graduate [ ]

3. How long have you being operating your business?

Less than 1 year [ ]

1-5 years [ ]

5-10 years [ ]

Above 10 years [ ]

Section B: Breeding resources and services

How can breeding resources help to boost the success of dogs breeding firms in Kenya?

7: To what extent do you agree with the following statements on the effects of breeding resources and services on the success of dogs breeding firms in Kenya?

Key: 5 strongly agrees, 4 agree, 3 undecided, 2 disagree, 1 strongly disagree (please put an X as appropriate)

	1	**2**	**3**	**4**	**5**
Availability of vet services					
Availability of dog food					
Affordability of vet services					
Affordability of dog food					
Level of capital of dog breeders					

Section C: Breeding Knowledge

8: To what extent do you agree with the following statement on the effect of breeding knowledge on the success of dogs breeding firms in Kenya?

Key: 5 strongly agrees, 4 agree, 3 undecided, 2 disagree, 1 strongly disagree (please put an X as appropriate)

	1	2	3	4	5
Level of dog breeders skills					
Numbers of years of experience of dog breeders					
Level of dog breeders competence					
Quality of breed produced					
Lifespan of the breed					

Section D: Technology

9: To what extent do you agree with the following statement on the effects of Technology used on the success of dogs breeding firms in Kenya?

Key: 5 strongly agrees, 4 agree, 3 undecided, 2 disagree, 1 strongly disagree (please put an X as appropriate)

	1	2	3	4	5
Levels of use of biotechnology in dog breeding					
Use of artificial insemination (AI) services					
Level of use of breeding techniques					
Levels of use of scientific measurement and prediction					

Section D: Breeding Management

9: To what extent do you agree with the following statement on the effect of Breeding Management on the success of dogs breeding firms in Kenya?

Key: 5 strongly agrees, 4 agree, 3 undecided, 2 disagree, 1 strongly disagree (please put an X as appropriate)

	1	**2**	**3**	**4**	**5**
Extent of data recording and collection					
Availability of selection and mating records					
Dissemination of genetic progress					
Estimates of breeding value					

Section E: Success of Dog Breeding Firms

10: To what extent do you agree with the following statement on the on the success of dogs breeding firms in Kenya?

Key: 5 strongly agrees, 4 agree, 3 undecided, 2 disagree, 1 strongly disagree (please put an X as appropriate)

	1	2	3	4	5
the dog breeding firm are profitable					
the dog breeding firm are efficient					
the dog breeding firm are competitive					

11 Kindly list other determinants of the success of dog breeding firms in Kenya?

……

……

……

……

12 According to your own opinion what measure that can be taken to enhance successful dog breeding in Kenya?

……

……

……

……

Appendix III: List of Dog Breeding Firms

1) Acacia Pedigree
2) Eve Kennels
3) Farmers And Friend Atlas
4) Total Breeders And Keepers Limited
5) Lynden Vet Breeders
6) Small Five Breeders
7) Aaron's Firm
8) Kinyua Dogs
9) Kathenju Agencies
10) Olperes Firm
11) Pet Care Centre
12) Nalepo Dogs
13) Rimpa Breeders
14) Apex Security Dogs Breeders
15) Niteforce Breeders
16) John Dog Firm
17) Young Pets
18) Mambao Firm
19) Max Breeders Centre
20) Imani Kennels
21) Kathenju Agencies
22) Sane Kennels
23) Pendo Breeders

24) Tuli Breeders

25) Ngatia Kennels

26) Pet Paradise Breeders

27) Pawwise Breeding Firm

28) Kijuu Kennels

29) Olperesi Kajiado Farm

30) Wanyika Breeders

31) Kwetu Kennels

32) Farmers And Friends Atlas

33) Nyakio Kennels

34) Mushiri Kennels

35) Olkeri Dog Breeders

36) Amos Odidi Breeders

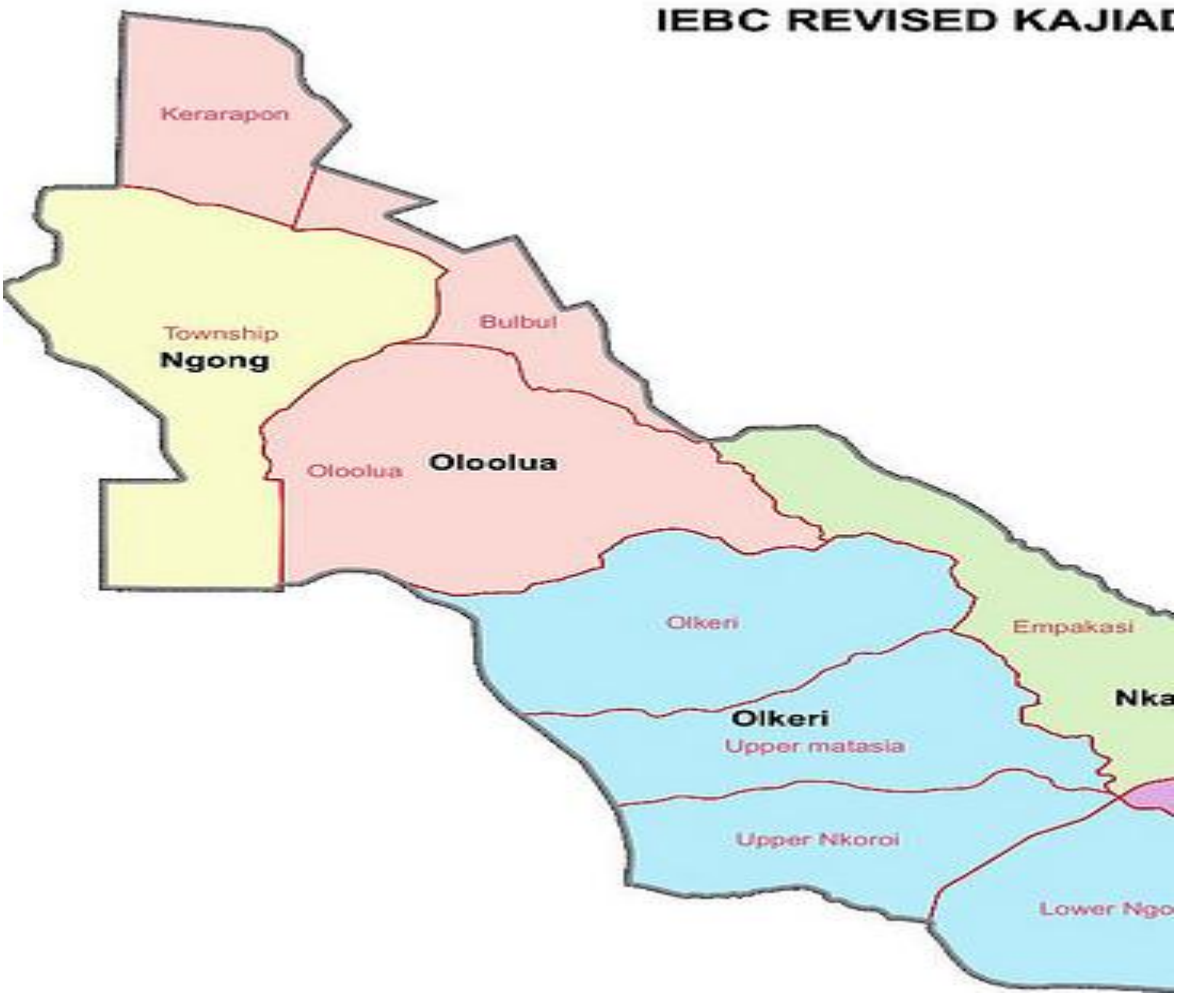
37) Steve Mwendwa Breeders

38) Kererapon Farm

39) Michoma Farm

40) Odanga And Friens Breeders Company

Appendix IV: Map of Kajiao North Constituency



Appendix V: Research Permit