A RETROSPECTIVE STUDY OF THE PRODUCTIVITY AND MAIN CAUSES OF INFERTILITY AT KANYARIRI VETERINARY FARM

A THESIS SUBMITTED TO UNIVERSITY OF NAIROBI FOR PARTIAL FULFILLMENT OF THE BACHELOR OF VETERINARY MEDICINE DEGREE.

DECLARATION

I confirm that this report is my original work and has not been presented for any award in any other university.

Signature……..
Date……..

CHEISON JEROTICH J30/2655/2006

This project has been submitted for examination with my approval as a University supervisor.

Dr. Ken Mbai (BVM, MSc,)

Lecturer

Department of Clinical studies,Theriogenology section.

Signature…….
Date……..

ACKNOWLEDGEMENT

First l wish to thank God Almighty for His grace and for giving me the opportunity and strength to go through my studies.

Am greatly indebted to Prof Mutembei and DrMbai of Clinical studies,University of Nairobi for their devoted guidance,support and encouragement during the course of my study.

I wish to convey my special regards to my beloved family;mommrsJulia,Victor,Sharon,Blessings and brother Dan.Am indeed greatful for being there for me and for your prayers.

\Finally l cannot forgettheimmence support from the Faculty Dean Prof Mulei,ProfBadamana,ProfAgumba for their help during my course work and project and DrMuchemi who has been my motivation.l wishto say thank you all.

DEDICATION

To my parent mrs Julia Cheison and my Brother Dan,may God bless you abundantly for your tireless efforts towards my education dear mum and bro Dan.

1.0ABSTRACT

Infertility is the diminished capacity to produce viable offspring. The goal of the breeding programme should be to have 90-95% of cows bred in 60 days breeding season Iif calving or pregnancy are below this, there must be a reason. It affects both male and female animals.

This project is a retrospective study of the main causes of cow infertility in Kanyariri veterinary farm, using data to establish causes of and its economic significance. The study involved selecting 20 cows randomly, analyzing the reproduction records and production records using analysis of variance (ANOVA) to determine age at first service, number of services per conception and average milk production per lactation, as well as questionnaire sheet to determine methods of heat detection applied in the farm. The semen sources and its handling was also analyzed. The time of insemination in respect to oestrous sign manifestation was also established.

This survey therefore was aimed to document the infertility causes at Kanyariri veterinary farm to improve reproductive performance by establishing the possible causes of infertility.

Documentation of infertility causes at Kanyariri veterinary farm gave precise reproductive performance and may be used as a tool to determine the economic significance of infertility.

LIST OF TABLES

LIST OF FIGURES

Table of Contents

CHAPTER 1

1.1. INTRODUCTION

Infertility issues within dairy herds can becomplex and costly. Losses per cow per day depend on the management system.However the scope for improvement is great with farmers and veterinary partnership having the potential to improve herd fertility rates.

Infertility is classified intoanatomical infertility,functional infertility managementaland infectious infertility.JohnG.Wright,page 392. (1947)

a) Functional infertility

Causes of functional infertility include cystic and inactive ovaries with anoestrus, early embryonic mortality with repeat breeding and prolonged gestation.

This type of infertility is causedby hormonal imbalance,it includes failture of follicles to develop,failure of follicles to rupture and persistence of corpus luteumin absenceof normal pregnancies among others.(Veterinary obstetrics, by Franz benesch , John G.wright(1948)

b) Infectious infertility

Infectious agents that have a detectable effect on the animal may interfere if only slightly with its reproduction. These include several bacterial, protozoan, viral and mycoplasmal, infections, several being important zoonoses.(veterinary obstetrics by franzbenesch, john g wright (1947)

CHAPTER 2

2.0 PROJECT JUSTIFICATION

Cow infertility is extremely prevalent and is a major cause of reduced reproduction performance

2.1 **HYPOTHESIS**

There is reduced productive and reproductive performance of dairy cattle at Kanyariri veterinary farm due to delayed age at first service and poor production during the first lactation.

2.2 **OBJECTIVES**

2.2.1 **General objective**

Documentation of fertility levels at first service and milk production on first lactation.

2.2.2 **Specific objectives**

To determine the age at first service of heifers.

To determine age at first calving

To determine milk production level at first lactation.

To determine the relationship between Production and Reproduction.

CHAPTER 3

LITERATURE REVIEW

Infertility may be classified into:

3.1 **AnatomicalCauses of Infertility**

Congential causes of infertility are inherited. They include development abnormalities of the ovaries,oviduct,uterus,cervix,vagina and the vulva. Some are lethal,afew have a morphological and functional significance. Common morphological conditions include ovarian(gonadal) hypoplacia and aplastic abnormalities of the tubular genitalia.(Arthurs Veterinary Reproduction and Obstetrics by David E Noakes,Timothy J Parkinson,Gary C W England(2003).

Hermaphroditism and freemantismcause arrested developmenyof the mullerian ducts(white heifer disease) and double cervix. They are of little significance if an appropriate programme is practised.

Bovine gonadal hypoplasia is not easy to diagnose and in cases of bilateral ovarian hypolasia, heifers do not develop secondary sexual characteristics and have anoestrus. Where the condition is unilateral, normal sexual organs and oestrous activity maybe observed in, such animals although less so than normal. The condition is potentiated by an autosomal recessive gene with incomplete penetrance and therefore the incidence of gonadol hypoplasia can be reduced by using only animals (male and female)with normally developed sexual organs as breeding stock.(morrow 2 current therapy in theriogenology , Diagnosis,treatment and prevention of reproductive diseases in small and large animals by DAVID A MORROW DVM,PhD(1986)

3.2 Functional Causes OfInfertility

Causes of functional infertility include cystic and inactive ovaries with anoestrus early embryonic mortality with repeat breeding and prolonged gestation. (Arthur,1964)

Cystic ovaries and retained (persistent) corpora lutea. Cystic ovaries contain one or more persistent liquid-filled cavities larger than a ripe follicle (Arthur,1964).This is sometimes referred to as cystic ovarian disease . Ovarian cysts can be classified as follicular or luteal cysts. Their effects vary according to the number and degree of luteinisation. Many unluteinised

follicles tend to lead to nymphomania with frequency irregular heats while cows with few extensively luteinized cyst may become anoestrous .Cows with long term cyst may show virilism. In addition to the pathologic follicular and luteal cysts, there are the non-pathologic cystic corpora lutea. They do not alter oestrous cycle duration and when conception occurs, it can be maintained to term (Roberts, 1971).

Cysts are conventionally diagnosed by rectal palpation but it may be difficult to differentiate between follicular and luteal cysts. They are smooth and convex(MORROW 2 CURRENT THERAPY IN THERIOGENOLOGY Diagnosis,treatment and prevention of reproductive diseases in small and large animals by David A Morrow DVM,PhD(1986)

Incidence of cystic ovaries also appears to be related to milk yield in dairy cattle. Animals of all ages are susceptible but incidence is greater in cows during their fifth or sixth lactation when milk yield is often greatest. It is suspected that ,lactational stress is the predisposing factor. Other factors influencing incidence are prolonged interval from calving to first detectedoestrus, first mating and conception and the interval from first detected heat to conception (David A Morrow DVM,PhD(1986)

Follicular cysts during the early postpartum period may regress by themselves but several therapeutic approaches have also been tried. Products with high luteinising hormone (LH) activity have by been used to treat follicular cysts to good effect. LH rich products administered in conjunction with progesterone compounds have given better result than either product alone.(David A Morrow DVM,PhD(1986)

Anoestrus cows have small flaccid uterine and small inactive ovaries no palpable corpus luteum or follicle. Nevertheless, cows may show anoestrus despite having normal ovarian structure.

Anoestrus is a major problem in the tropics and subtropics where inadequate nutrition, high ambient temperature, high parasite burden and disease exacerbate the problem. Low body weight and poor body condition, compounded with lactation stress can further extended post partum anoestrus period.indicated that the long anoestrus period in nursing cows might be due to an elevated levels of prolactin which appears to depress the secretion and release of GnRH or the pituitary may be less responsive to GnRH during nursing. He also suggested that immaturity could be a contributing factor since anoestrus periods tend to be longer and more common

among first-calf-heifers. Oovaries of such cows may result in underdevelopment of other genital organs.

. The vaginas, uteri and ovaries of such animals feel inactive on rectal palpation. Condition that may stimulate pregnancy such pyometra; severe metritis, foetal maceration or mummification may cause anoestrus. These conditions damage the endometrium lining the uterus and reduce secretion of luteolytic prostaglandins.

They are those cows that require three or more service to conceive. Repeat breeding can be caused by a number of factors including sub fertile bulls, endocrine problems, malnutrition, reproductive tract infections and poor management. Critical previous work in which adhesions of the ovarian bursa, salpingitis, cystic ovaries and endometrities were found in repeat breeding cows.

Repeat breeding can be treated by enucleating the corpus luteum or causing its lysis by prostaglandins or infusion of the uterus with 50-200ml of 1 to 2% luqols iodine which has a stimulating effect on the uterus.

3.3 Infectious Causes of Infertility**.**

Infectious agents that have a detectable effect on the animal may interfere if only slightly with its reproduction. These include several bacterial, protozoan, viral and mycoplasmalinfections.Several are important zoonoses.

(i)Bacterial and protozoan infections

- Brucellosis

  Affects human, domestic and wild animals worldwide. Caused by *Brucellaabortus* in cattle, *B. mellitensis* in shoats, *B suis* in swine and *B. canis* in canines.

  It causes widespread economic losses due to abortion, extended calving interval and affects humans causing undulating fever (David A Morrow DVM,PhD(1986)

The disease is spread in cattle after ingestion of the bacteria, and through the mucosa of the eye, nose and that or Al with infected semen.

The bacteria show preference for pregnant uterus due to erythritol. Also affect foetus and lymph glands of udder.(David A Morrow DVM,PhD(1986)

- **Trichomoniasis**

  Its causes endometrities, pyometra, abortion,early embryonic decays and sterility. It's a veneral disease spread at service or by artificial insemination with improperly treated or handled semen. Its caused by *Trichomonas fetus,* a protozoan. (David A MorrowDVM,PhD(1986)

  Iin bulls, trichomonadscolonisethe crypts of external mucosa of penis and prepuce(David A Morrow DVM,PhD(1986)

  In cows and heifers are infected during natural services by carrier bull or contaminated semen following natural service. The protozoa first multiply in the vagina and cervix then migrate to the uterus.(David A Morrow DVM, PhD(1986)

- **Campylobacteriosis**

  It's a venereal disease caused by *Campylobacter fetus* subspecies*veneralis*. Events subsequently to infection are similar to those for Trichomoniasis, except that the migration of the organism from vagina and cervix appears faster. In cows, infection is initially acute but eventually becomes chronic. Campylobacteriosis is a major cause of infertility causing poor conception,increased return to service, reduced calving rate and permanent infertility.(David A Morrow.DVM,PhD(1986)

- **Leptospirosis**

  Bovine leptospirosis is a systematic disease characterized by fever and sometimes, mastitis and abortion. It should suspect in cows showing other symptoms such as Icterus and haemoglobinuria. It's one of the most widespread zoonoses.(David A Morrow,DVM,PhD(1986)

CHAPTER 4

MATERIALS AND **METHODS**

4.1 StudyArea

This study was carried out at Kanyariri veterinary farm.The farm is a three hundred and seventy five acre piece of land in Kiambu county,Kanyariri village.

The farm is Four Kilometres west of upper Kabete of Nairobi and Nineteen Kilometres from Nairobi city. The farm has a herd of 200 dairy cattle, flock of dopper sheep, a piggery unit and layer poultry unit.

4.2 Study Design

The reproduction records of 20(Twenty) randomly selected dairy cattle was retrospectively analysed, to get the number of services per conception,age at first service,age at first calving and average milk production at first lactation.

A questionnaire was administered to the person in charge of the farm animals Mr Ngesa to capture the information on methods of heat detection,artificial insemination technique, sources of semen and general condition of semen, storage and handling.

4.3 DataManagement and Analysis

Data was recorded and served in acomputer in Microsoft Excel and analysed using analysis of various methods .production records was used to provide average of milk production in the first lactation for the 20 sample animals. Reproduction records were analysed to get age at first service,number of services per conception and age at first calving.

CHAPTER 5

RESULTS

Table 1.1

Cow Ear tag Identification number	Services per Conception	Age at first service	Average milk production
700	**5**	**36**	**6**
708	**2**	**17**	**5**
709	**1**	**32**	**5**
712	**4**	**26**	**7**
714	**2**	**18**	**8**
716	**1**	**16**	**6**
726	**3**	**27**	**10**
727	**2**	**17**	**7**
730	**2**	**25**	**6**
732	**1**	**23**	**6**
734	**3**	**33**	**0/aborted**
737	**1**	**28**	**7**
740	**1**	**28**	**8**
742	**4**	**27**	**0/aborted**
750	**1**	**22**	**7**
764	**3**	**33**	**9(stillbirth)**
770	**2**	**35**	**5**
771	**2**	**24**	**5**
779	**2**	**33**	**8**
790	**1**	**26**	**6**

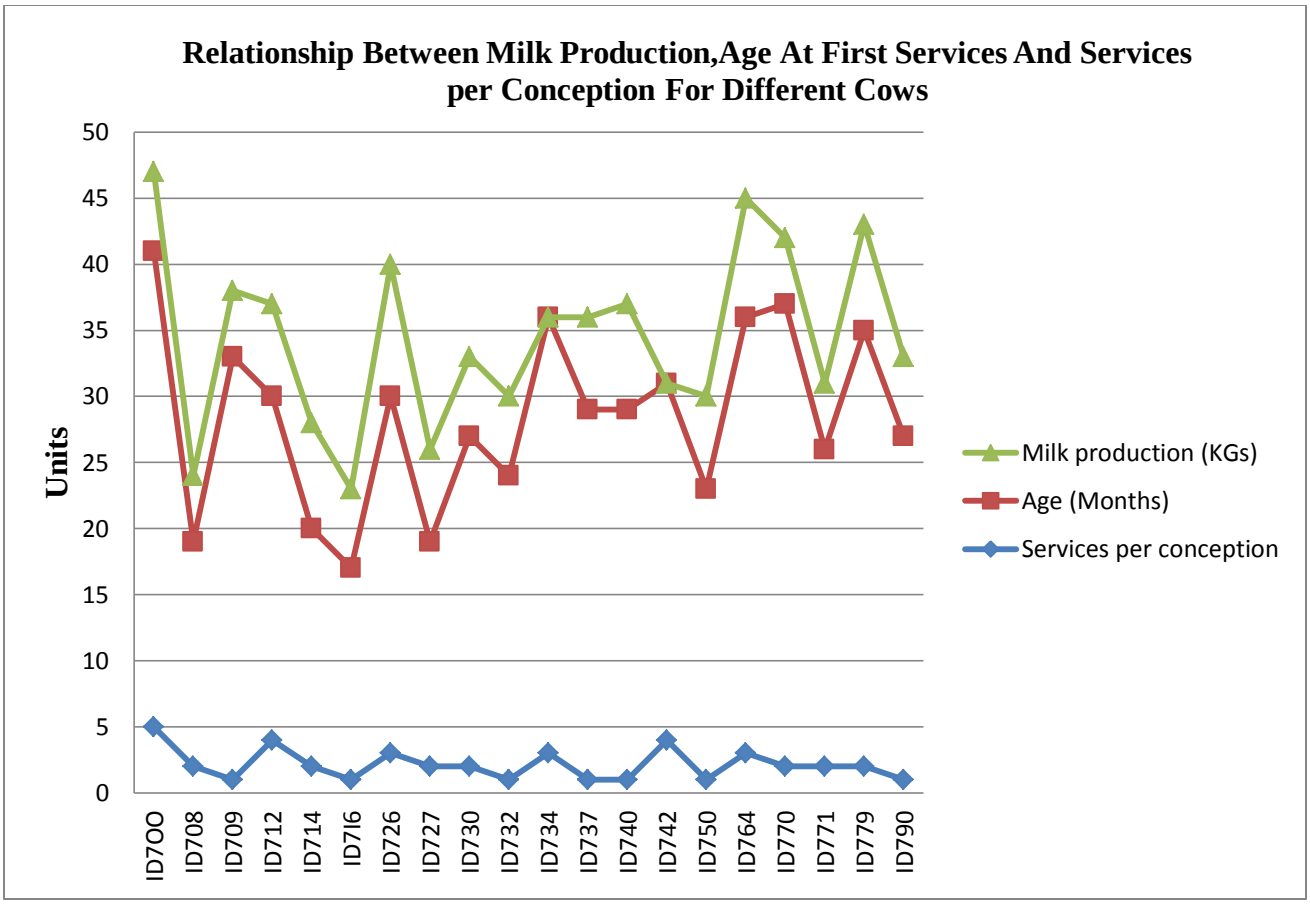

Figure 1.2

KEY;

ID-identification Tag number

KGs-kilograms

CHAPTER 6

DISCUSSION

Average milk yield was as low as 5kg per day from these are high genetic animals which should be producing at least 30kg per day. The main reason according to my research is poor management of heifers, These are replacement stock which are supposed to be provided with enough balanced feed for their growth and development of reproductive organs, eg mammogenesis and galactogenesis and later on, lactogenesis

.First service was done at late age which range from 17 to 36 months old. This is too late and a lot of loss to the farmer in terms of financial input for feed and other management of these animals during this open period. These condition is observed in herd with improper nutrition because it controlls cyclicity, anoestrus, silent heat, poor heat detection and poor floor which prevent manifestation of heat signs. My sample animals included those which aborted. They are 10% which is high. There was also an animal with stillbirth. Unless there is a mitigating reason for that abortion, the animals should be screened for infectious agents causing infertility.

The number of animals served more than twice are 30%,this is high and increases cost of production in dairy farming, This can be caused by improper oestrus detection, improper semen handling and insemination technique among others.one animal was served 5 times before she conceived. This was too high because the first calving was at age of 4 years.

Questionnaire results revealed that herdsmen are the one responsible for heat observation. There is also no motivation for those particular men when they report oestrus. This can discourage keen observation of heat because its time consuming. It needs 3-4 observation per day, 10-15 minutes per observation. This is done when the animals are resting, before or after feeding and milking.

CHAPTER 7

CONCLUSION& RECOMMEDATIONS

Heifers should conceive when they are14 months old or less and first parturition should be at 2 years old or less. They should be provided with adequate nutrition (energy,protein) to avoid

cessation of cyclical activity, silent oestrus, ovulatory defects, conception failture and fetal and embryonic death.

Oestrus detection should be assigned to specific people in the farm to avoid animals missing insemination. Those who report oestrus should be motivated to encourage hard work.

When abortion occur there may be infectious agents in Reproductive tract of the affected animals, screening should be done to confirm and treatment done appropriately.

Insufficient feed during dry period can beamajor problem whichcan be overcome by ensuring food security, planting and storing enough feed for the year ensures high milk production throughout the year therefore high and continuous profit.

CHAPTER 8

REFERENCES:

1. Arturis veterinary reproduction and obstetrics 8th edition edited by David E.Noakes,TimothyJ.Parkinson and Gary C W Englad**Infertilityincow;structural and functional abnormalities,management and non specificinfectionschapter 5,page 383,(2003)**
2. **Morrow 2 cerrency Therapy in Theriologenology. Diagnosis,Treatment and Preventionof diseases in Small and Large animals,SectionV,page 93,By David A Morrow Drm,PhD(1986)**

7.Veterinary obstetrics

(including certain aspects of the physiology and pathology of reproduction in domestic animals page 393)editors:FRANZ BENESCH and JOHN G WRIGHT.(2001)

CHAPTER 9

APPENDIX

Questionnaire

Administered to check heat detection,handling of liquid nitrogen tank, and semen to aid in investigating the main causes of infertility in Kanyariri vet farm.

Date Questionnaire no.

1.Name of investigator;

2.Name of farm;

3.Name of respondent;

4.A.Placementin farm;

A1.Do you play any other role apart from the above mentioned?YES or NO (tick the appropriate)

A2.If NO,why?

A3.If YES,where were you trained?

A4.What did you learn?

A5.Has the training been helpful?YES or NO.

A6.If YES,in what way?

A7.Are you registered practicioner?

A8.Are there any performance related incentives?

(Any reward for working well?)

A9.What are you rewarded for?

A10.How are you rewarded?

A11.Any purnishment?