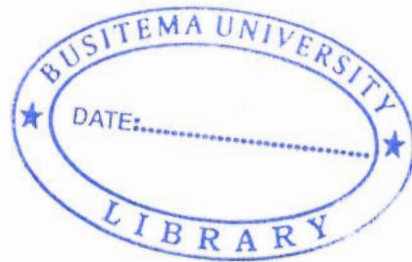


**CONSTRAINTS TO THE ADOPTION OF THE ARTIFICIAL INSEMINATION
TECHNOLOGY BY DAIRY FARMERS OF BUHWEJU DISTRICT IN UGANDA**

BY



TURINAWE BARNABAS

BU/UG/2011/159

turibarnabas@gmail.com

SUPERVISOR: Dr. G.M. KAMUGISA

**A DISSERTATION SUBMITTED TO THE FACULTY OF AGRICULTURE AND
ANIMAL SCIENCES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE AWARD OF THE BACHELOR OF ANIMAL PRODUCTION AND
MANAGEMENT DEGREE OF BUSITEMA UNIVERSITY**

2014

DECLARATION

I, **TURINAWE BARNABAS**, declare that this study is the original work of my effort and has never been submitted to this or any other university or institution of higher learning for any academic award.

Signature..... Date.....

APPROVAL

This dissertation has been submitted for examination with the approval of my supervisor,

Dr. GM KAMUGISA,

Department of Animal Production and Management,

Faculty of Agriculture and Animal Sciences,

Busitema University

Signature..... 

Date.....



DEDICATION

I dedicate this piece of work to my Mum, brothers; TUMUSIME, MWUJUKA and MPAMIZO, sisters; ATUKWASE and ATUJUNE and my friends; POLLY CARP and EVALYNE for the tremendous support which enabled me to go through the course.

ACKNOWLEDGEMENT

I am heartily thankful to my supervisor, Dr. G.M. Kamugisa, whose encouragement, guidance and support from concept level to the final stage of this dissertation enabled me to develop an understanding of the subject.

I also offer my sincere regards and blessings to Dr. Matovu Henry, Mr. Mbogua Joseph and the entire staff of the Faculty of Agriculture and Animal Sciences for their support and extensive critique that enabled me to model this dissertation to acceptable standards.

I owe my sincere gratitude to farmers and staff of Buhweju district, students and civil leaders who contributed relevant information for the good of this study. Thank you for your voluntary participation in this study.

Lastly, I would like to acknowledge all my classmates and friends who made my stay at Busitema University a memorable experience and for all the people who helped me a lot. Thank you very much and may God bless you all.

TABLE OF CONTENTS

DECLARATION	i
APPROVAL	i
DEDICATION	ii
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vii
LIST OF TABLES	viii
LIST OF ABBREVIATIONS	ix
ABSTRACT	x
CHAPTER ONE	1
1.1 Background	1
1.2 Statement of the problem	1
1.3 Justification of the study	2
1.4 Main Objective	2
1.5 Specific Objectives	2
1.6 Research questions	2
CHAPTER TWO: LITRATURE REVIEW	3
2.1 A.I. around the World	3
2.2 A.I. in East Africa	3
2.3 A.I. in Uganda	3
2.3.1 Breeds of cattle in Uganda	4
2.3.2 Key players in the field of A.I.	4
2.3.3 Adoption of A.I. in Uganda	4
2.3.4 Factors influencing the utilization of A.I. in Uganda	5
2.3.5 The sources of semen for A.I. in Uganda	5
2.4 Advantages of A.I.	6
2.5 Disadvantages of A.I.	7
CHAPTER THREE: MATERIALS AND METHODS	8
3.1 The area of study	8

3.2	Sampling design.....	8
3.3	Operational approach.....	9
3.4	Statistical analysis.....	9
CHAPTER FOUR: RESULTS.....		10
4.1	Age & Level of Education of the Farmers.....	10
4.2	Farming System and Size of the Herd Kept by the Farmers.....	10
4.3	Method of Breeding.....	11
4.3.1	Natural Mating.....	12
4.3.2	Artificial Insemination.....	13
4.4	Livestock Extension.....	13
4.4.1	Level of Education of the Extension Workers.....	13
4.4.2	Livestock Extension Workers with Skills in A.I.....	14
4.4.3	Extension Workers Practicing the A.I. technology.....	14
4.4.4	possible limitations to the use of the A.I. technology.....	14
4.4.5	Possible Solutions to the Limitations.....	15
CHAPTER FIVE: DISCUSSION OF RESULTS.....		16
5.1	Age & Level of Education of the Farmers.....	16
5.2	Farming System and Size of the Herd Kept by the Farmers.....	16
5.3	Method of Breeding.....	17
5.3.1	Natural Mating.....	17
5.3.2	Artificial Insemination.....	17
5.4	Livestock Extension.....	17
5.4.1	Level of Education of the Extension Workers.....	17
5.4.2	Livestock Extension Workers with Skills in A.I.....	18
5.4.3	Extension Workers Practicing A.I.....	18
5.4.4	Possible limitations to the use of A.I.....	18
5.4.5	Possible Solutions to the Limitations.....	19
CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS.....		20

6.1	Conclusion.....	20
6.2	Recommendations.....	20
	REFERENCES.....	21
	Appendix A: Questionnaire for dairy farmers.....	23
	Appendix B: Questionnaire for extension workers	28

LIST OF FIGURES

Figure 4.3: Showing the breeding method preferred by the farmers

LIST OF TABLES

Table 4.1.1: Showing the age of the farmers

Table 4.1.2: Showing the level of Education of the farmers

Table 4.2.1: Showing the farming systems

Table 4.2.2: Showing the size of the herd kept by the farmers

Table 4.3.1: Showing the source of the bull used for natural mating

Table 4.3.2: Showing the farmers' reasons for not using the A.I. technology

Table 4.4.1: Showing the level of education of the livestock extension workers

Table 4.4.2: Showing the number of extension workers with skills in AI and the institutions of training

Table 4.4.3: Showing the respondents who are practicing AI in their sub counties

Table 4.4.4: Showing the possible limitations to the use of A.I. in Buhweju district

Table 4.4.5: Showing the possible solutions to the limitations of using A.I. in Buhweju district

LIST OF ABBREVIATIONS

AI	Artificial Insemination
DDA	Dairy Development Authority
Dr.	Doctor
FAO	Food and Agricultural Organization of the United Nations
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
NAADs	National Agricultural Advisory Services
NGOs	Non-Government Organizations

ABSTRACT

Artificial insemination (A.I.) is one of the most effective tools available to cattle producers to improve productivity and profitability of their cattle operations. It confers several advantages over natural mating. Its use has been of enormous economic benefit through genetic improvement of the animals for milk production and the control of venereal diseases.

Low genetic potential, among other causes, is responsible for the poor milk productivity of the indigenous cattle of Uganda. However, breeding with semen from proven sires will facilitate faster genetic improvement and enhance milk productivity. A.I. is a key tool in the realization of such an objective. Despite its presence in Uganda for over 60 years, less than 10% of the country's herd has been bred using this technology. The reasons for this low adoption are not very clear. Consequently, a cross-sectional study was designed to determine constraints to the adoption of the A.I. technology by dairy farmers of Buhweju district. Specifically, the study sought to establish the farmers' attitudes and knowledge about A.I. and to determine the factors limiting the utilization of this technology. The data collected was analyzed using the Statistical Package for Social Scientists (SPSS) version 16.0 and the results presented in form of pie charts and frequency tables.

The study revealed that there was a group of farmers who were totally ignorant about the A.I. technology, those who claimed it could harm their animals, and those who saw it as being too expensive. The study also found out that there was easy access to free natural breeding services; lack of precise breeding objectives by the farmers; high costs of A.I. equipment; absence of budget allocations to A.I.; and lack of facilitation to the A.I. technicians. Further, A.I. facilities were far from the farms; the trained technicians were very few; even then, they lacked transport to the farms; and the farmers failed to seek timely A.I. services.

To better appreciate the advantages of A.I., it was recommended that the farmers undergo sensitization programmes and training in heat detection and breeding. It was also recommended that the practice of sharing or using stray bulls is discouraged as this could lead to the spread of venereal diseases and indiscriminate mating resulting in poor productivity. Further, the study urges that more efforts be made by the relevant authorities to train additional A.I. technicians and to properly facilitate and motivate them.

CHAPTER ONE

1.1 Background

Artificial insemination (A.I.) is the technique of transferring semen containing viable spermatozoa collected from a male animal into the reproductive tract of the female animal to facilitate conception. It is one of a group of technologies commonly known as “assisted reproduction technologies” (Jane *et al.*, 2011). A.I. is widely used for livestock breeding around the world (Gamborg *et al.*, 2005) with more than 70% of the animals in the developing world being bred using this technology (Kaaya *et al.*, 2005).

Artificial insemination is a necessary tool in sustainable farm animal breeding (Gamborg *et al.*, 2005). It is an important technique that offers several advantages over natural mating (Eklundh *et al.*, 2013). Its use as a method of production, particularly in the dairy sector, has been of enormous economic benefit through genetic improvement of milk production, the control of venereal and other diseases, and lethal genes (Howle, *et al.*, 2012). The method promises a prevention of reproductive diseases that might be spread by natural mating and allows the use of several superior breeds within a herd which is not possible through natural service. The major benefit of the technique is that it offers excellent possibilities to genetically improve the livestock, especially for the small-scale farmers so that their production and productivity are enhanced (Martinez, 2012). Additionally, AI prevents in-breeding and replacing the bull after every two years (Bayer *et al.*, 2005).

1.2 Statement of the problem

The average milk production per cow in Uganda is 8.5 liters per week (MAAIF, 2011), which translates into one liter per day. This is as opposed to 15 to 20 liters of milk for exotic dairy cattle or even 30 liters for the high yielders (Staal *et al.*, 2003). Low genetic potential among other causes is responsible for the poor milk productivity of the indigenous cattle of Uganda. Breeding with semen from proven sires will facilitate faster genetic improvement of the dairy cow and enhance milk productivity. A.I. is a key tool in the realization of such an objective (Eklundh *et al.*, 2013). However, despite the presence of A.I. in Uganda for over 60 years, less than 10% of the country's herd population has been bred using this technology (Eklundh *et al.*, 2013).

REFERENCES

Aditya R. Khanal and Jeffrey M. Gillespie (2011): Adaption and profitability of breeding technologies on united states dairy farms. department of agricultural economics, virginia polytechnic institute and state university, blacks burg VA 24061, Louisiana state university agricultural centre baton Rouge, La 70803.

Aditya R. Khanal and Jeffrey Gilksu (2013): Adoption and productivity of breeding technologies. The Journal of Agro-biotechnology Management and Economics, 16 no.1 article 6

Bamwerinde, W. and Alacho, F. (2002): A report on survey to identify suitable agricultural and natural resources based technologies for intensification in south western Uganda. The International Centre for Research in Agro-forestry, Nairobi, Kenya.

Bayer, W. and Wanyama, J. (2006): Biotechnology in animal agriculture and poverty alleviation, an NGO perspective in: Proceedings of the 4th all African Conference on Animal Agriculture and the 31st Annual meeting of Tanzania Society of Animal Production.

Eklundhu, C (2013): The use of artificial insemination in dairy farms in urban/ Peri- urban Kampala, Uganda- A study of knowledge, attitude and practices, the Swedish University of Agricultural Science, Faculty of Veterinary Medicine and Animal Science, Department of Clinical Science.

Galloway, D. &Perera, O. (2003): Guidelines and recommendations for improving artificial breeding of cattle in Africa, A working document of the AFRA Project III-2.RAF/5/046.

Hashakimana, J. (1996): Factors affecting AI acceptability as a breeding innovation: Msc Thesis, Makerere University, Kampala, Uganda.

Hillers, J., Thonney, S. and Gaskins, C. (1982): Economic comparison of breeding dairy cows artificially versus naturally: Journal of Dairy Science, 65 (5): P 861-865.

Howley, P., Donoghue, C. and Heanue, K. (2012): Factors affecting farmers' adoption of agricultural innovations: A panel of data analysis on the use of artificial insemination among dairy farmers in Ireland. Journal of Agriculture Science, 4 (6): ISSN1916-9752

Jane, M. and Morrell, M. (2011): Artificial insemination in farms; Current and Future Trends, ISBN 978-953-307-312-5 in Tech.

Johnson, N. and Ruttan, V. (1997): The diffusion of livestock breeding technology in the US; Observations on the relationship between technical change and industry structure, *Journal of Agribusiness* 15(1):19-35.

Kaaya, H. Bashaaha, B. and Mutetika, D. (2005): Determinant of utilization of artificial insemination services among Uganda dairy farmers, *African Journal of Crop Sciences*, Conference proceeding, Vol.7 pp 567, ISSN 1023-070X/2005.

Khanal, R., Gillespie, J., and MacDonald, J., (2010): Adoption of technology, management practices, and production systems in U.S. milk production, *Journal of Dairy Science* 93(6):12-22.

Marlinez, H (2012): Assisted reproductive techniques in developing countries: a critical appraisal of their value and limitation, *Reproduction in Domestic Animals* 47: 21-26

Mayanja H. (2012): Dairy sector reforms and transformation in Uganda since 1990s, Economic Policy Research Centre, Research report N0.4

Mbowa, Shinyekwa, I and Mayanja L.(2011): Dairy sector reforms and transformation in Uganda since 1990s, Economic Policy Research Centre in collaboration with African Growth Initiative.

Mburu, J., Ojango, K., Kariuk. K, and Bllonweck, (2011): Constraints to the use of artificial insemination services and possible solutions, East African Dairy Development Project Baseline survey brief 2. Nairobi Kenya: ILRI.

Rodriguz, H. and Matine,Z, . (2012): Assisted reproductive techniques for cattle breeding in developing countries; A critical Appraisal of their value and limitations, *Reproduction in Domestic Animals* Vol.47(SI), p.21-26

Tukahirwa, J. and Kabanankye K. (1995): Diagnosis characterization activities in African Highland Initiative (AHI), Benchmark locations in South West Uganda; Synthesis Study. AHI Task Force, ICRAF, Nairobi