METABOLITES AND HORMONES AS INDICATORS OF POSTPARTUM REPRODUCTIVE EFFEICIENCY OF PASTURE BASED FRIESIAN DAIRY COWS IN KARI-LANET, KENYA

ANNAH HOKA INDETIE (MSc)

Registration No. 184/21977/2012

Signature.....Date..10/09/2014

DEPARTMENT OF ZOOLOGICAL SCIENCES

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SUPERVISORS

DR. MICHAEL GICHERU
DEPARTMENT OF ZOOLOGICAL SCIENCES
KENYATTA UNIVERSITY

Signature.....**Date**.....

DR. SYPRINE OTIENO
DEPARTMENT OF ZOOLOGICAL SCIENCES
KENYATTA UNIVERSITY

Signature .....**Date**.....

DR. FRANCIS NJONGE
DEPARTMENT OF ANIMAL SCIENCE
JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

Signature .....**Date**.....

ABSTRACT

Agricultural production remains the main source of livelihood for rural communities in sub-Saharan Africa, providing employment to more than 60% of the population and contributes about 30% of domestic products. There is a deficit of up to 15 mg /day of metabolisable energy and effective rumen degradable protein of 235g/ day to support desired levels of milk output. This deficit has led to low milk production and inefficient reproductive performance of smallholder dairy cows. In other parts of the world, influences of Hormones and metabolites on reproductive performance of dairy cattle have been established. In Kenya, information on whether metabolites and hormonal levels are indicators of nutritional levels and reproductive performance of postpartum dairy cows is not sufficient. Therefore this study seeks to determine indicators of postpartum ovarian cyclicity in Friesian dairy cows. The study will be conducted at KARI- Lanet within the Rift Valley. Purposive sampling technique will be used to select 30 Friesian cows of parities 1-4 and of body condition score 2-4. The cows will be grazed on Elba Rhodes. Test group cows (20 cows) will be supplemented with 2kg of total mixed ration (TMR) of Bracharia and Dolichos lab lab pre and 4kg of TMR postpartum whereas control group cows (10 cows) will not be supplemented. Water and minerals will be given *adlibitum* to all cows. Daily milk will be recorded. Cows' weights and body condition score will be recorded weekly. Calving body condition will be recorded. Reproductive data will include days from calving to first observed estrus, days to first service, and conception at first service, and number of services to conception. Blood samples will be aseptically collected into heparinised tubes twice a week from each cow via jugular vein into well labeled tubes and will be centrifuged for 15 minutes at 1500xg to give plasma for blood metabolites and hormone analysis. Non-esterified fatty acids, Insulin-like-growth factor-1, will be measured using commercial kits. Twenty milliliters (mls) of evening milk will aseptically be collected into 25mls sample bottles containing sodium azide as a preservative. The milk will be centrifuged at 300 revolutions per minute for 30 minutes and the resulting skimmed milk used for progesterone analysis using IAEA/FAO bench protocal. Plasma Leptin concentration will be determined every 4 days using established methods. Pasture and total mixed ration feeds analysis will be done using wet chemistry to give chemical composition of the feeds. Milk production, BCS, metabolites and hormonal concentrations will be analysed by mixed procedure (SAS institute Inc. Cary, NC. USA). Turkey Kramer tests will be conducted to analyse differences within and across treatments. Factors affecting the initiation of ovarian cyclicity will be evaluated by regression analysis using backward elimination procedure. The independent variable will be the re-initiation of ovarian cyclicity and the dependent variables will include parity, BCS at parturition, body weight, milk production, total protein, urea, NEFA, IGF-1 and leptin. The recommendations of this study could put interventions in place for reproductive efficiency leading to increased milk and meat.

ABBREVIATIONS AND ACRONYMS

AI	Artificial Insemination
ANOVA	Analysis of Variance
BCS	Body Condition Score
CL	Corpus Luteum
DM	Dry matter
DMI	Dry matter intake
ECF	East coast fever
EDTA	Ethylenediaminetetra-acetate.
FAO	Food and Agricultural Organization
FSH	Follicular stimulating hormone
GH	Growth hormone
IAEA	International Atomic Energy Agency
IGF-1	Insulin-like growth hormone-1
LH	Luteinizing Hormone
NEB	Negative energy balance
NEFA	Non-esterified fatty acids
NEL	Net energy of lactation
P_4	Progesterone
RDP	Rumen degradable protein
RIA	Radioimmunoassay
RPM	Revolutions per Minute
SAS	Statistical Analyzing System