

INVESTIGATION OF ETIOLOGY AND PREDISPOSING FACTORS TO DOMESTIC RABBIT DISEASES IN SELECTED AREAS IN KENYA

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1.0. INTRODUCTION

- ▶ Rabbit production is now one of the fastest growing livestock enterprises in the world.
- ▶ highly prolific, early maturity, fast growth rate, high genetic selection potential, efficiency in feed conversion and economic utilization of space (Lukefahr & Cheek, 1990)
- ▶ The estimated rabbit population in Kenya is at 600,000 (APD, 2010)

INTRODUCTION.....continued

- ▶ Rabbit Development Stakeholders Forum (RDSF) was established to spearhead a national campaign to promote rabbit production and consumption.
- ▶ challenges to production Are: Diseases, feed cost, market, sources of breeds (APD, 2010)
- ▶ Knowledge on rabbit diseases is an important gap among existing veterinary practitioners in Kenya (Borter *et al.*, 2010).

2.0. LITERATURE REVIEW

Rabbit Diseases

- **Gastrointestinal, Respiratory, Skin, Reproductive, metabolic and nutritional diseases and disorders and miscellaneous conditions.**
(Martino and Luzi, 2008, Cooper 1973).

ETIOLOGY OF GASTROINTESTINAL DISEASES

Bacterial diseases

Colibacillosis, Salmonellosis (Cooper, 1973).

Escherichia coli and Salmonella spp

Protozoal diseases

intestinal coccidiosis (Aleri *et al.*, 2012), and hepatic coccidiosis
Toxoplasmosis and Cryptosporidiosis

Eimeria spp

*Toxoplasma gondii and
Cryptosporidium parvum*

Viral diseases

*Adenovirus, Rota virus, corona viruses
and Rabbit calicivirus (RCV)*

ETIOLOGY OF GASTROINTESTINAL DISEASES

Complex enteritis

Mucoid enteritis/ Mucoid enteropathy

Combination of bacteria, toxins, dietary irregularities and or obstructions of git

Helminthes

pin worms (*Trichuris* and *Passalurus spp*), *Trichostrongylus spp*, flukes and tapeworms.

Non infectious conditions

bloat (Aleri *et al.*, 2012)
Stressors (weaning, transportation,, feed changes, antibiotics and Moldy feed.

ETIOLOGY OF RESPIRATORY DISEASES

Bacterial agents

Pasteurella spp, *Bordetella spp*, *klebsiella spp*, *staphylococci spp*, *streptococci spp* and rarely *Escherichia coli*, *salmonella* and *listeria*.

Viral diseases

myxomatosis, herpes virus and paramyxoviruses

others

Helminthes, *Aspergillosis*

ETIOLOGY OF SKIN DISEASES

Fungal diseases Dermatomycosis/ trichophytosis caused	<i>Trichophyton, Microsporum, Achorion</i>
Ecto-parasites Mange Ear canker	lice and fleas , Mange mites like <i>Sarcoptes spp</i> s and <i>Notoedres cati, Cheyletiella parasitovorax</i> <i>Psoroptes canaliculi</i>
Bacterial diseases Dermatitis and abscesses	<i>Pasteurella spp</i> s, <i>staphylococcus</i> , and <i>streptococcus species</i>
Foot pad abscesses and Sore hocks	Non specific bacteria, predisposed by breeds, wet , dirty hutch floors, and irritating action of urine salts
Viral diseases	<i>Papilloma viruses, rabbit pox virus</i> and <i>Leporipoxvirus</i>

NUTRITIONAL DISEASES	Vitamin A deficiency, Vitamin E deficiency and hypervitaminosis A, hypervitaminosis D and Pregnancy toxemia “ketosis
NEOPLASTIC DISEASES:	Pituitary Adenoma, Thymoma, fibroma, Squamous cell carcinoma,
REPRODUCTIVE DISEASES AND DISORDERS Mastitis, Bacterial Metritis Vulvovaginitis Rabbit syphilis or vent disease,	<i>Staphylococcus aureus</i> and <i>Pasteurella spp</i> , <i>Chlamydia spp</i> <i>Proteus spp</i> <i>Treponema cuniculi</i> Sterility, twisted uterus, Delayed birth, Parturition outside the nest box, prolapses of the vagina and even abandonment of the litter
CONGENITAL OR HEREDITARY DISORDERS	Glaucoma (Buphthalmia), Malocclusion and tooth over - growth or “wolf teeth,” Splay leg and ataxia)
MISCELLANEOUS CONDITIONS	Trichophagy, trichobenzoars, cannibalism, heat prostration, broken back and intussusceptions

LITERATURE REVIEW.... cont

In Kenya, Cooper (1973) concluded that all diseases of rabbits recognized elsewhere in the world exist in Kenya.

- Respiratory and gastrointestinal conditions as the most common (Ngatia *et al.*, (1988))

LITERATURE REVIEW.... cont

- ▶ Diseases of rabbits in Nairobi have increased tremendously by the year 2010 Aleri *et al.*, (2012).
- ▶ Little has been done to find out the causes of mortalities and Morbidities of domestic rabbit (Wesonga and Munda, 1992; Cooper, 1973)
- ▶ Reasons: Knowledge gap, inadequate connection between field diagnoses and confirmatory laboratory diagnoses (Borter *et al.*, 2010)

3.0. OBJECTIVES

- ▶ **Overall objective**

To determine the characteristics diseases that constrain rabbit production in Kenya

Specific objectives

- ▶ To characterize the rabbit production systems in relation to disease burden in Nairobi, Central, Eastern and Rift valley regions of Kenya.
- ▶ To determine the etiology of rabbit diseases in domestic rabbits in the selected areas of Kenya
- ▶ To determine the predisposing factors associated with rabbit diseases in the selected areas of Kenya

4.0. JUSTIFICATION

- ▶ The National livestock policy , Government Vision 2030 and Millennium development goals (MOLD, 2008) aim to eradicate extreme poverty and hunger and achieve food security.
- ▶ Mailu *et al.* (2012) recommendation on promotion and development of rabbit supply chain in Kenya. Stresses on the need to asses important aspects such as diseases, marketing, consumption and breeds of rabbits kept.

JUSTIFICATION..... continued

The aim of this study is to carry out an assessment of rabbit diseases, their etiology and predisposing factors. This will avail the basic information needed to constitute their control measures and improve rabbit production

5.0. HYPOTHESES

- ▶ Diseases that limit rabbit production in Kenya are predisposed by poor hygiene within the farms

6.0. MATERIALS AND METHODS

6.2. study Area

The cross sectional survey will be done in: Kiambu, Thika, Nyeri, Othaya, Mukurweini, karatina, Gilgil, Nakuru, Meru, Taita and Wundanyi which are selected to represent Central, Eastern, Rift valley and Coast provinces rabbit producing areas

MATERIALS AND METHODS

6.3. Choice of farm, animals

The study will involve a purposive sampling of sick, moribund, dead and or rabbits with disease history.

- ▶ 384 rabbits will be examined as determined by the method described by Martin *et al.* (1987):
- ▶ $N = Z^2\alpha \times PQ/L^2$

Where N = Number of rabbits to be examined

P = Prevalence of diseases estimated at 50%,

Q = 1- P, L = desired Precision at 5% at confidence interval of 95%.

The farms to be visited are those with more than 5 adult rabbits. hence number of farms to be sampled are 77 (384/5) farms.

MATERIALS AND METHODS....con

The locations of the farm will be purposefully determined through the assistance of livestock production officers of each area.

On farmers consent, , at least one sick rabbit from each farm will be selected and transported alive to the lab for blood sampling, necropsy, parasitological and microbiological examination.

On farm sampling of blood for parasitology- faecal samples and skin scrappings, Bacteriology- nasal and conjunctiva swabs, haematology- blood smears and EDTA blood will be done

MATERIALS AND METHODS....cont

- ▶ **Sampling frame**
- ▶ **Objective 1: To investigate the impact of housing and husbandry systems on the health and welfare of farmed domestic rabbits**
 - In each Random clinical examination. (bucks and does and weaned kits). First 50 rabbits and 10% of the remaining.
 - Information to be obtained include:
 - body condition, skin and hair quality; sanitary, feeding and evaluation of hygiene and routine management procedures
 - Criteria recorded in a Clinical score card and observation sheet.
 - Questionnaire on rabbit husbandry practices will be administered to each farmer

MATERIALS AND METHODS....cont

Objective 2: To investigate the etiology and pathology of diseases causing morbidities and mortalities in domestic rabbits

- **At farm**
- **Bacterial agents**

Deep nasal swab, conjunctival swab, wound swabs placed in transport media put in cool box for microbiological isolation and identification as described by **Carter (1979)**

macroscopic characteristics of colonies , Gram staining, catalase activity, oxidase and coagulase test with rabbit plasma, TSI.

MATERIALS AND METHODS....cont

Parasitological techniques

a. Fecal and gastro-intestinal parasites

samples of fresh feces will taken from the litter and under the cages, for rabbits housed in groups 3 samples will be taken in different areas of the building(s) for "MacMaster counting technique (Sinkovics et al.,' 1984). To reveal nematode eggs and identify coccidia oocysts

For positive cases fecal culture and sporulation of the oocyst to identify the coccidia species.

MATERIALS AND METHODS....cont

- ▶ Helminthes will be preserved in 70% ethanol and identified according to Soulsby (2005)

b. Skin samples

- ▶ Both deep and superficial lesions will be collected from animals with skin lesions
- ▶ skin scrapings will be digested in 10% potassium hydroxide, analyzed and mites identified as per the key given by Soulsby (2005), Isolation of fungi in SDA (carter 1979)
- ▶ External parasites will be preserved in 70% ethanol and identified Soulsby (2005)

MATERIALS AND METHODS....cont

c. Hemoparasites

At farm level blood smears will be made, fixed for Giemsa staining and examination.

At the lab 2ml blood will be collected from marginal ear vein and placed in EDTA for CBC, determination using the automated method (Haematology, Analyzer) and relative differential count for leukocytes

MATERIALS AND METHODS....cont

- ▶ Necropsy

The rabbits will be will be humanely euthanized (Appendix 1) and necropsy done as per the macroscopy protocol in the Department VPM University of Nairobi

Routine sampling of the following organs liver, lungs, kidney, spleen and any other organ if findings give reason to. For microbiological and histopathological examination.

MATERIALS AND METHODS....cont

These samples will be fixed in 10% formalin, for at least 48hours and processed for routine histopathological observations as described by Luna (1968),

Data management

The data will be entered into Excel spread sheet and analyzed using SAS (Statistical Analytical System) 2002 – 2003 (SAS Institute Inc., Cary, NC, USA) for descriptive statistics, correlation between the husbandry practices and health status.

8.0. BUDGET

Expendable items	Cost (ksh)
Laboratory reagents and lab supplies	300,000
Field reagents and equipments	100,300
Literature document/information	5,000
Software and statistical packages	15,000
Stationary	
Printing	2,000
Printing cartridge	3,000
Travels	
Subsistence-field work per diems	100,000
Transport-rental car/fuel	110,500
Sub- total	635,800
Contingencies (5% of total)	31,790
Grand Total	667,590

Appendix 1: Handling and care of experimental animals

All the animals used in the study will be handled humanely, identified using picric acid, and transported in ventilated boxes

The rabbits will be housed individually and cared for according to the guidelines by the ARRP (2003) for not more than 3 days. Euthanasia by stunning and neck dislocation after sedation with xylazine at 5mg/kg i.m. The carcasses will be disposed in the disposal pits. cages disinfected using 10% formalin.

- ▶ Thanks for listening
- ▶ Comments
- ▶ Questions?