



**BUSITEMA  
UNIVERSITY**  
*Pursuing Excellence*

**PRACTICES LEADING TO MIS-USE OF VETERINARY ANTIBIOTICS BY  
LIVESTOCK KEEPERS IN ARAPAI SUB COUNTY, SOROTI DISTRICT**

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**A DISSERTATION SUBMITTED TO THE FACULTY OF AGRICULTURE AND  
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THE AWARD OF THE DEGREE OF BACHELOR OF ANIMAL PRODUCTION AND  
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## DECLARATION

I, Akia Goretty, do hereby declare that, this dissertation is my own original work done within the period of study that it has neither been submitted nor being concurrently submitted in any other institution of higher learning

Signature..... adk ..... Date 31/9/2015 .....



## APPROVAL

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

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3/9/2015

## DEDICATION

This report is dedicated to my parents . . .

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Above all, I highly thank the Almighty God whose mercies have been upon me throughout my studies at Busitema University and I have thus reached this far

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## LIST OF ABBREVIATIONS

NDA	National Drug Authority
UBOS	Uganda Bureau of Statistics
WHO	World health Organization
SPSS	Statistical Package for Social Scientists
Animal Industry and	of Agriculture

## ABSTRACT

. A cross sectional study was conducted in Arapai Sub County to assess antibiotics mis-use among cattle keepers, practitioners and drug sellers. Quantitative and qualitative data was collected using structured questionnaires and interview guide, collected data was screened and stored in excel software spread sheet. Simple random sampling technique was used to select farmers, practitioners & drug sellers. 97.3% of the respondents never observed drug withdrawal periods. (98.2%) of the farmers visually estimated the weights of their animals. Expiry dates of antibiotics were only taken note of by 66.4% of the respondents. 37.3% actually continued with therapy until they see that the animal had recovered fully. 50.9% kept their drugs in polythene bags (hanged on walls). In a nut shell, the study concluded that the major cusses of antibiotic misuse was the absolute lack of strict regulations and a well functioning regularity body governing the sale and use of veterinary antibiotics. It was there for recommended that MAAIF in conjunction and National drug authority and the ministry of health and local government come up with the hard to break policies regulations and by laws by-laws respectively and back by strong reinforcement machinery

## CHAPTER ONE: INTRODUCTION

### 1.1 Background

Antibiotics are used in livestock production for prevention and treatment of infectious diseases besides their sub therapeutic use as growth promoters (Chee-Sanford *et al.*, 2009). Larger amounts of antimicrobials are employed in livestock production than in human medicine (Silbergeld *et al.*, 2008). Antibiotics are mainly used in the production of pig, cattle, poultry and recently in aquaculture (Silbergeld *et al.*, 2008). The antibiotics used in livestock fall into all the major classes of antibiotics used in clinical practice; there has been cases in which antimicrobials were licensed for livestock use before their subsequent use in humans (Silbergeld *et al.*, 2008). These drugs are essentially important inputs in livestock healthcare and production. However, their use in food producing animals has inevitably resulted in the presence of their residues in animal products consumed by humans.

The inappropriate use of antibiotics in agriculture has been found to contribute to increased antibiotic resistance in human pathogens through the consumption of antibiotic residues in animal products (Richter *et al.*, 1996). Human exposure to these antibiotics and their resistant microorganisms during animal care and the contamination of ground and surface waters, soils and crops by farm wastes (Borgen *et al.*, 2000) are also implicated. Antibiotic resistant strains of bacteria known to be food-borne pathogens like *Salmonella* spp, *E. coli*, and *Campylobacter* spp have been isolated from farm animals (Englen *et al.*, 2005). Non-therapeutic use of antibiotics in agriculture leads to the development of antibiotic resistance, particularly in gut bacteria, such as Enterococci (Angulo *et al.*, 2004). Antibiotic resistance can increase with continued and widespread use of antibiotics to improve growth of livestock (Castanon, 2007). These microbes, especially the multi-resistant food-borne pathogens may infect people or their resistance genes may spread to other bacteria that can infect humans (Nawaz *et al.*, 2001).

Veterinary practice in Uganda is characterized by various illegal practices such as treatment of animals by unqualified people, dispensing of drugs by people other than veterinary surgeons and pharmacists, and not adhering to withdrawal periods of drugs among others (Mukasa *et al.*, 2012 ). It is evident that antibiotics used by livestock farmers are not used as per prescription by Veterinary staff or qualified personnel (Mubito *et al.*, 2014). Most farmers in rural areas of East Africa, Uganda inclusive have admitted to rely on directives from drug store vendors most of whom are not necessarily qualified to do so (Mubito *et al.*, 2014), while other farmers depended

## REFERENCES

- Aarestrup, F. M., Seyfarth, A. M., Emborg, H. D., Pedersen, K., Hendriksen, R. S., Bager, F. 2001. Effect of abolishment of the use of antimicrobial agents for growth promotion on occurrence of antimicrobial resistance in fecal enterococci from food animals in Denmark. *Antimicrobial Agents and Chemotherapy*, 45:2054-2059.
- Addah W, Baah J, Tia S and Okine E (2009). Knowledge and practices of smallholder farmers and herdsmen in the use of acaricides and gastrointestinal anthelmintics in Ghana. *Livestock Research for Rural Development* 21(198). Available:
- Angulo, J. F, Baker, N. L, Olsen, S. J, Anderson, A., Barrett, T. J. 2004a. Antimicrobial use in agriculture: Controlling the transfer of antimicrobial resistance to humans. *Seminars in Pediatric Infectious Diseases*, 15: 78-85.
- Awa, A. A., Goromela, E.H., Okurut, H. Akol, H., Sembring, J., Spilsbury and Toura, A.L. (1999). Towards a better integration of livestock and crops in the Teso Farming System: A joint publication of the International Centre for Development and Serere Agriculture and Animal Research Institute (SAARI).
- Bett B, Machila N, Gathura PB, McDermott JJ and Eisler MC (2004). Characterisation of shopsselling veterinary medicines in a tsetse infested area of Kenya. *Preventive Veterinary Medicine* 63(1- 2)29-38
- Borgen K., Simonsen G. S., Sundsfjord A., Wasteson Y., Olsvik O., and Kruse H. (2000). Continuing high prevalence of Van-A type vancomycin resistant enterococci on Norwegian poultry farms three years after avoparcin was banned. *J. Appl. Microbiol.* 89:478-485.
- Boxall A. B. A., Fogg L. A., Blackwell P. A, Kay P., Pemberton E. J. and Croxford A. (2004). Veterinary medicines in the environment. *Rev. Environ. Contam. Toxicol.* 180:1-91.
- Callie H T, Amy P, Robert E J, Partha P R and Katharine F K 2012 Excretion of Antibiotic Resistance Genes by Dairy Calves Fed Milk Replacers with Varying Doses of Antibiotics, *Journal of Front Microbiology* 3:139.

- Castanon, J. I. R. 2007. Review: History of the Use of Antibiotic as Growth Promoters in European Poultry Feeds. *Poultry Science*, 86:2466–2471 doi:10.3382/ps.2007-00249.
- Chee-Sanford J.C., Koike S., Mackie R. I., Krapac I. G., Lin Y., Maxwell S., Yannarell C. A. and Aminov R. I. (2009). Fate and Transport of Antibiotic Residues and Antibiotic Resistance Genes following Land Application of Manure Waste; *Journal of Environmental Quality*; 38:1086-1108.
- Dehaumont, P. 2004. OIE International standards on antimicrobial resistance. *Journal of Veterinary Medicine B*, 51: 411–414.
- Donkor E. S., Newman M. J., Yeboah-Manu D. (2012). Epidemiological aspects of nonhuman antibiotic usage and resistance: implications for the control of antibiotic resistance in Ghana. 17 (4): 462-468.
- Ejobi, F., Enyaru, J., & Olila, D. (2005). Investigation on the occurrence of residues of antibiotics and acaricides in animal products in the districts of Mbarara and Masaka; A Technical Report Submitted to the Danish International Development Agency. Unpublished Report.
- Grave K, Greko C, Nilsson L, Odensvik K, Mork T, Ronning M. The usage of veterinary antibacterial drugs for mastitis in cattle in Norway and Sweden during 1990-1997. *Prev Vet Med*. 1999; 42: 45-55.
- Iruka N O and Ojo K K 2010 Antimicrobial resistance and use in Africa. In: Am'bal de J, Sosa I Denis K, Byarugaba I Carlos F, Ama' bile-Cuevas I Po-Ren Hsueh I Samuel Kariuki I Iruka N. Okeke (Editors). *Antimicrobial resistance in developing countries*, US Springer Science and Business Media, pp 301-314.
- Irungu P., Kariuki S., Winters C. J. (2011). A pilot survey of farmers' motivations of antibiotics use in livestock production in Kenya. *Afr J Health Sci*. 19 (Supplementary, 3-4): 44
- Karimuribo E D, Mdegela R H, Kusiluka L J M and Kambarage D M 2005 Assessment of drug usage and antimicrobial residues in milk on small holder farms in Morogoro, Tanzania, *Bulletin Animal Health and Production* 53: 234 – 241
- Komolafe O O 2003 Antibiotic resistance in bacteria- an emerging public health problem, *Malawi Medical Journal* 15(2) 63 – 67.

- Lathers C M 2002 Antibiotic use Selects for Resistance in Pathogenic Bacteria and in the Endogenous Flora of Exposed Animals and Humans, *Journal of Clinical Pharmacology* 42(6) 587-600
- Martin, S. W., Meek, H. A., Willeberg, P. 1987. *Veterinary epidemiology: Principles and Methods*. Iowa State University Press, Ames, Iowa. 45 pp.
- Mitema E. S., Kikuyi G. M., Wegener H. C. and Stohr K. (2001). An Assessment of Antimicrobial Consumption in Food Producing Animals in Kenya. *J Vet Pharmacol Ther.* 24 (6): 385-90.
- Mmbando T L 2004 Investigation of OTC used and abuse, Determination of its residues in meat consumed in Dodoma and Morogoro Municipalities. MSc Thesis, Sokoine University of Agriculture, Morogoro, Tanzania. pp 19 -27
- Morley, P. S., Apley, M. D., Besser, T. E., Burney, D. P., Fedorka-Cray, P. J., Papich, M. G., Traub-Dargatz, J. L., Weese, J. S. 2005. Antimicrobial drug use in veterinary medicine. *Journal of Veterinary Internal Medicine*, 19:617-629.
- Nawaz, M. S., Erickson, B. D., Khan, A. A., Khan S. A., Pothuluri, J. V., Rafii, F., Sutherland, J. B., Wagner, R. D., Cerniglia, C. E. 2001. Human health impact and regulatory issues involving antimicrobial resistance in food animal production environment. *Regulatory Research Perspective*, Vol 1 Issue 1.
- Nyazema N, Viberg N, Khoza S, Vyas S, Kumaranayake L, Tomson G, Lundborg CS. Low sale of antibiotics without prescription: a cross-sectional study in Zimbabwean private pharmacies. *J Antimicrob Chemother* 2007; 59: 718-26.
- Okeke I. and Lamikanra A. (1995). Quality and bioavailability of tetracycline capsules in a Nigerian semi-urban community. *International Journal of Antimicrobial Agents.* 5:245-50.
- Okeke N. I., Lamikanra A and Edelman R. (1999). Socioeconomic and Behavioural Factors Leading to Acquired Bacterial Resistance to Antibiotics in Developing Countries. *Emerging Infectious Diseases.* 5:18-24.
- Richter A., Loscher W. & Witte W. (1996). Feed additives with antibacterial effects—pharmacologic/toxicologic and microbiologic aspects. *Prak. Tierarzt.* 77:603.

- Roderick, S., Stevenson, P., Mwendia, C., Okech, G. 2000. The use of trypanocides and antibiotics by Maasai pastoralists. *Tropical Animal Health and Production*, 32:361-374.
- Silbergeld E.K., Graham J. and Price B.L. (2008). Industrial Food Animal Production, Antimicrobial Resistance, and Human Health; *Annual Review of Public Health*. 29:151-69.
- Taylor-Powell. E. (1998), Sampling program development and evaluation, Texas agricultural extension service, the Texas A and G University System College, Texas
- Teuber M. (2001). Veterinary use and antibiotic resistance. *Curr Opin Microbiol*. 4: 493-499.
- UBOS, 2014: National Population and Housing Census 2014 Provisional Results, November 2014.
- Ungemach F R, Müller-Bahrtdt D and Abraham G 2006 Guidelines for prudent use of antimicrobials and their implications on antibiotic usage in veterinary medicine, *International Journal of Medical Microbiology* 296 Suppl 41:33-38.
- USDA. (2007). Pig 2006, Part II: Reference of pig health and health management practices in the United States, 2006 USDA: APHIS: VS, CEAH. No. N479. 1207. USDA, Fort Collins, CO.
- Wageh S. D., Elsaid A. E., Mohammed T. E-A., Yoshinori I., Shouta N., Mayumi I. (2013). Antibiotic residues in food: the African scenario. *Japanese Journal of Veterinary Research*, 61(Supplement): S13-S22.
- Wegener HC. Risk management for the limitation of antibiotic resistance-experience of Denmark. *Int J Med Microbiol*. 2006; 296: 11-13.
- WHO (2011). Tackling antibiotic resistance from a food safety perspective in Europe. WHO regional office for Europe, Copenhagen, Denmark 1-88.
- World Health Organization (WHO) (2012a). Antimicrobial Resistance. Available: [<http://www.who.int/mediacentre/factsheets/fs194/en/>]
- World Health Organization 2007 WHO The world health report 2007 - A safer future: global public health security in the 21st century : <http://www.who.int/whr/2007/en/index.html>



Y. Pang, B. A. Brown, V. A. Steingrube, R. J. Wallace Jr., and M. C. Roberts, "Tetracycline resistance determinants in *Mycobacterium* and *Streptomyces* species," *Antimicrobial Agents and Chemotherapy*, vol. 38, no. 6, pp. 1408-1412, 1994.