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Study on veterinary antibiotic drugs handling and utilization in and around Holeta

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A cross-sectional study was conducted to assess the antibiotics drug handling and utilization practices of the animal owners from November 2016 to April 2017. A total of 384 randomly selected animal owners in and around Holeta were interviewed using semi-structured questionnaires. Most of the respondents (animal owners) were educated (59.4%), whereas less than half of them (40.6%) were uneducated. The prevalence on the challenges faced by their animals was 25, 42.2, and 32.8% due to disease, feed shortage and both disease and feed shortage, respectively. A total of 6.5% of the respondents purchased antibiotics from private pharmacy and brought to their house by carrying them in pockets, while 3.9 and 2.9% of the respondents store drugs on the shelf and floor up to three months, respectively. Drug administration activity was performed by non-professional personnel simply by guessing. 66.1% of the respondents knew about withdrawal period of antibiotics whereas 33.9% of them did not know about withdrawal period of antibiotic drugs. At the time of drug administration, 12.8% sold the milk, 86.7% gave the milk for calf and 0.5% of them used the milk for home consumption without maintaining its withdrawal period. A few number of animal owners (2.6%) injected their animals below normal dosage resulting to resistance of the disease to the antibiotics. Majority of the animal owners (93.5%) used veterinary professional service to their diseased animals for treatment whereas a few number of the respondents (6.5%) purchased antibiotics from private pharmacy without prescription of the veterinarian for self-treatment of their animals. In conclusion, this study result revealed that there is improper handling and utilization practice of veterinary antibiotic drugs in the study area. It is recommended that training should be given for the animal owners on the appropriate handling and utilization practice of veterinary drugs and continuous follow up by the stake holders should be undertaken.

Key words: Antibiotics drug, animal owners, Holeta, veterinary.

INTRODUCTION

Ethiopia is a leading country in the number of animal population in the African continent. However, the output in terms of contributions to the improvement of the livelihood of animal owners and for the growth of the national economy is at a lower stage compared to the vast resource on hand. Poor Animal health service and

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lack of properly utilizing veterinary antibiotics are among the main contributing factors for the poor utilization of the resources (Flynn, 2012).

A drug is any substance that when inhaled, injected, smoked, consumed, absorbed via a patch on the skin, or dissolved under the tongue causes a physiological change in the body. In pharmacology, a pharmaceutical drug is a chemical substance used to treat, cure, prevent, or diagnose a disease or to promote well-being (Flynn, 2012). Veterinary drugs are such substances as are made to treat, prevent or diagnosis diseases in animals that belong to different chemical classes and therapeutic areas, for example antibiotics, anti helminthics, non-steroidal anti-inflammatory drugs (NSAIDs), etc (Hirsh and Zee, 1999). An antibiotic class can be defined as a group of agents with a similar mechanism of action, regardless of chemical structure (Addah et al. 2009). Antibiotic drugs have been widely used globally in animals for more than 50 years, with tremendous benefits in animal production and economic development (Flynn, 2012).

There are many risks derived from irrational use of antibiotics resulting in environmental contamination with original substances or derivatives, indirect impact on health via resistant micro-organisms, direct organic damage and the influences on the biotic environment are a matter of concern (Thawani, 2010).

Major economic loses and animal welfare problems could arise in veterinary medicine, because antimicrobial resistance has been found to cause therapy failure and higher mortality and morbidity rate (Acar, 1997). The provision of quality animal health-care necessitates the availability of safe, effective and affordable antibiotics of the required quality, in adequate quantity at all times, and presented, dispensed and used rationally (Acar, 1997).

In and around Holeta, West Shoa Zone of Oromia Regional State, there is little information regarding, veterinary antibiotic drugs handling and utilization practice and there is no published material concerning this title.

Therefore, the objective of the study was to assess the antibiotic handling and utilization practices of the farmers and to assess the challenges that enforced the animal owners to buy antibiotics.

MATERIALS AND METHODS

Study area

The study was conducted from November 2016 to April 2017 in and around Holeta. The site is located at 9º 3' N latitude and 38º 30' E longitudes, about 33 km West of Addis Ababa along the main road to Ambo in Oromia Regional State. The study area has an altitude of 2400 m above sea level and receives an average annual rainfall of about 1000 mm.

The mean minimum and maximum temperatures are 6 and 22ºC respectively. Regarding season, there are three seasons: short rainy season (March to May), long rainy season (June to September) and dry season (October to February).

Study design

Cross-sectional questionnaire - based study was carried out from November 2016 to April 2017 in and around Holeta. Data collection questionnaire format was developed and animal owners were interviewed to assess handling and utilization of veterinary antibiotic drugs used by them for treatment of animal diseases using a simple random sampling method.

Sample size determination

The sample size for collecting the questionnaire data was determined by using formula as indicated on (Thrusfield, 2005):

$$n = \frac{z^2\, p\,(1-p)}{w^2}$$

Where, Z is the confidence level, P is the estimate of the population, and W is the margin of error. (When: Z = 1.96, P = 0.5, and W = 0.05).

$$N = \frac{(1.96)^2\,(0.5)(1-0.5)}{(0.05)^2}$$

Based on the above formula the total numbers of animal owners selected for questionnaire survey was 384.

Study population

Animal owners (384) from randomly selected kebeles of in and around Holeta, were considered for this study.

Data collection and analysis

Questionnaire administration was done by local language to gather Information through semi-structured questionnaire (annex) from animal owners and the collected data from questionnaires were entered into Microsoft Excel spread sheet version 2010 and analyzed using SPSS Version 20 for descriptive statistics in percentage.

RESULTS

The present study revealed that greater than half of the respondents (59.4 %) in and around Holeta were educated whereas less than half of them (40.6%) were uneducated. The prevalence on the challenges faced by their animals was 25, 42.2, and 32.8% due to disease, feed shortage and both disease and feed shortage, respectively. A small number of farmers (6.5 %) in the study area purchased antibiotics from private pharmacy to treat their animals. 6.5% of the respondents purchased antibiotics from private pharmacy and brought to their house by carrying them in the pocket. 3.9 and 2.9% of the respondents store drugs on the shelf and floor up to three months, respectively. Drugs administration activity was performed by non-professional person simply by

Table 1. Antibiotics handling practice of animal owners.

Parameter	Category	Number	Percentage
Education level	Illiterate	156	40.6
	Below grade 8	174	45.3
	Above grade 8	54	14.1
Challenges on animal health	Disease	96	25.0
	Feed shortage	162	42.2
	Disease and feed shortage	126	32.8
Purchase of drugs	No	359	93.5
	Yes	25	6.5
Drug administered by	Not applicable	359	93.5
	Non professional	25	6.5
problem during drug administration	Not applicable	374	97.4
	Swelling of injected site	10	2.6
means of drug transportation	Not applicable	359	93.5
	Carrying in pocket	25	6.5
Store before administration	Not applicable	359	93.5
	Yes	25	6.5
Place of store	Not applicable	359	93.2
	On shelf	15	3.9
	On floor	10	2.9
Duration of drug store	Not applicable	359	93.2
	One month	10	2.6
	Two month	11	2.9
	Three month	4	1.3
Proper dose administration	Not applicable	359	93.2
	From leaflet	3	0.8
	Advice from professional	20	5.2
	By guess	2	0.5

guessing and information obtained from other professional (Table 1).

Most of the respondents (66.1%) have awareness about the withdrawal period of antibiotics whereas 33.9% of the respondents did not know about withdrawal period of drugs. Out of 384 respondents, 12.8% sold the milk, 86.7% gave milk for calf and 0.5% of them used milk for home consumption at the time of drugs administration. A few numbers of respondents (2.6%) injects their animals below the normal dosage resulting drug resistant disease to their animals (Table 2).

DISCUSSION

The handling and utilizing practice of antibiotics used in animal owners have been implicated in the development and spread of resistant bacteria phenotypes that is affecting the therapeutic efficacy of current antibiotics (Silbergeld et al., 2008; Sanford et al., 2009). This study aimed at assessing the practices of handling and utilization of veterinary antibiotics as a case study.

This study revealed that animal owners are faced with many challenges regarding their animals including feed shortage and disease. These challenges were enumerated from many sources such as lack of sufficient and standard nutrition, poor husbandry practices, inadequate animal health services such as treatment practices and disease control activity. Many of the animal owners in the study area were advised and supported by the professionally skilled person to treat their diseased animals, while some others bought antibiotics from private pharmacy and treated their animals by themselves.

Table 2. Antibiotics utilization practice of farmers.

Parameter	Category	Number	Percentage
Awareness of withdrawal period	No	130	33.9
	Yes	254	66.1
Information of withdrawal period	Not applicable	130	33.9
	From professionals	254	66.1
Use of milk after drug administration	For sell	49	12.8
	For calf	333	86.7
	For home consumption	2	0.5
Dosage below the normal	Not applicable	358	93.2
	No	22	5.7
	Yes	4	1.0
Response of below dosage	Not applicable	380	99.0
	Not cured	4	1.0
	Not available	25	6.5

The primary purpose of veterinary antibiotic drugs is to safeguard the health and welfare of animals with well diagnosed disease and well prescribed drugs under the supervision of veterinarian and professional person. Lack of practice to go to veterinary professionals, when their animals were sick and ineffective selection of veterinary drugs was the major problem of veterinary antibiotics handling and utilization. As a result, antibiotics were tried without proper diagnosis (Laxminarayan et al., 2013).

The trend of antibiotic administration by the respondents (6.5%) indicates improper practice of antibiotic utilization. The underperformance of some of the antibiotics as reported by the animal owners could be due to lack of awareness about the handling and utilization of antibiotics. The storage conditions of antibiotics in the animal owners were suboptimal because the storage environments of the antibiotics were prone to temperature fluctuations which hastens antibiotic decomposition, reducing its concentrations and efficacy (keke et al., 1999) thus promoting resistance in exposed bacteria (Laxminarayan et al., 2013; Teuber, 2001).

The major considerations for proper usage of antibiotics drugs, which are a main concern of modern medicine, are to select the optimal drugs at the proper dosage and duration, to minimize the emergence of resistance and to provide health services at a reasonable cost (Pang et al., 1994) whereas the end users of antibiotics were unable to select proper dosage and duration of treatment in the study area indicating improper utilization of antibiotic drugs. The knowledge of many animal owners concerning antibiotics withdrawal periods and dosages was found to be low. Moreover, the animal owners depended more on fellow animal owners than veterinarians for antibiotic knowledge, which resulted in the use of the same antibiotics and similar handling practices among animals in close proximity or within the same district. Poor dosing practices, for example, were common when an antibiotic failed to treat an infection. The animal owners lacked adequate measuring instruments to mete out correct dosages. In this study area there were lack of knowledge and practice concerning antibiotics dosing and withdrawal period as the same as reported earlier (Addah et al., 2009).

Ideally, good antibiotic prescribing practice should reflect the use of the most effective, least toxic, and least costly antibiotic for the precise duration of time needed to cure the infection (Gyssens, 2001) whereas the animal owners bought antibiotics without prescription in the study area that. Generally, majority of the animal owners in and around Holeta were provided veterinary professional service on animal disease treatment whereas a few number of the farmers purchased antibiotics from private pharmacy without prescription for self-treatment of their animals indicating improper handling and utilization practice of antibiotic drugs.

Abbreviations: NSAID, Non-steroidal anti-inflammatory drugs; **MICs,** minimum inhibitory concentrations; **MBCs,** minimum bactericidal concentrations; **CAFOs,** concentrated animal food operations; **HARC,** Holeta Agriculture Research Center.

CONFLICTS OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Acar JF (1997). Consequence of bacterial resistance to antibiotics in medical practice. Clin. Infect. Dis. 24(Supplement_1):S17-S18.

Addah W, Baah J, Tia S, Okine E (2009). Knowledge and practices of smallholder farmers and herdsmen in the use of acaricides and gastrointestinal anthelminthes in Ghana. Livest. Res. Rural Dev. 21:11.

Flynn WT (2012). The Judicious Use of Medically Important Antimicrobial Drugs in Food-Producing animal's center for Veterinary Medicine (HFV-1). Food and Drug Administration. Department Of Health and Human Services. http://www.fda.gov/downloads/animal veterinary /guidancecomplianceenforcement/.guidance for industry/ucm.21:6-9.

Gyssens IC (2009). Quality measures of antimicrobial drug use. Int. J. Antimicrobial Agents 17(1):9-19.

Hirsh DC, Zee YC (1999). Veterinary microbiology.1st ed. Blackwell Publishing Company. California. pp. 48-57.

Laxminarayan R, Duse A, Wattal C (2013). Antibiotic resistance-the need for global solutions. Lancet Infect. Dis. 13(12):1057-1098.

Okeke N, Lamikanra A, Edelman R (1999). Socioeconomic and behavioral factors leading to acquired bacterial resistance to antibiotics in developing countries. Emerging Infect. Dis. 5(1):18-27.

Pang Y, Brown BA, Steingrube VA, Wallacer RJ, Roberts MC (1994). Tetracycline resistance determinants in Mycobacterium and Streptomyces species. Antimicrobial Agents Chemother. 38(6):1408-1412.

Sanford JC, Mackie RI, Koikeetal S (2009). Fate and transport of antibiotic residues and antibiotic resistance genes following land application of manure waste. J. Environ. Qual. 38(3):1086-1108.

Silbergeld EK, Graham J, Price BL (2008). Industrial food animal production. antimicrobial resistance and human health. Ann. Rev. Public Health. 29:151-69.

Teuber M (2001). Veterinary use and antibiotic resistance. Curr. Opinion Microbiol. 4(5):493-499.

Thawani V (2010). Rational use of medicine achievements and challenges. Indian J. Pharmacol. 42:63-64.

Thrusfield M (2005). Veterinary Epidemiology, 3rd ed. Blackwell Science Ltd. Edinburgh, UK. pp. 228-247.