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USAGE OF ANTIBIOTICS IN DAIRY FARMS OF KATHMANDU, NEPAL

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ABSTRACT
Although antibiotics used in dairy farms have economic benefits for producers, it might enter the aquatic and terrestrial ecosystems and contribute to the increasing emergence of antimicrobial resistant bacteria. Therefore, to assess the usage of antibiotics in dairy farms, a survey was conducted from May to Nov, 2014 in ten dairy farms at Kathmandu and Bhaktapur districts by using survey questionnaire. The data obtained was entered into Microsoft Office Excel sheet for analysis. None of the farms had written plans for treating sick animals with antibiotics. However, all the farm owners always sought the veterinarian's advice before administering antibiotics. Other than the veterinarian, antibiotics were administered to animals by the owners in all cases. All the farm owners had practiced the complete course of treatment following administration of an antibiotic except in one farm which had practice of using overdose of antibiotics. None of the farm owners visibly marked treated cows as "treated". Only two farm owners were trained on rearing animals and those were only applying the separate milking practice of treated cows. Lack of written plans for treating sick animals with antibiotics, practice of overuse of antibiotics beyond the prescribed duration and untrained farm owners who were unaware of milking of treated cows on separate unit are factors that can lead to inappropriate use of antibiotics. However, administration of antibiotics only after veterinarian's advice before administering antibiotics was found to be a good practice.

KEYWORDS: Antibiotics, Farm, Dairy.

INTRODUCTION
Antibiotics are used in livestock production as therapeutics, growth promoters and prophylactics. At sub therapeutic levels, antibiotics are helpful in improving growth, reducing risk of disease[1], improving digestion, improving weight gain and decreasing time and amount of feed needed to reach slaughter weight.[2-5] However, the extensive use of antibiotics has led the bacteria to adapt defenses against antibiotics.[6] Moreover, the usage of antibiotics is known to leave the residues in products of farm.[6-9] Antibiotics can enter the aquatic and terrestrial ecosystems through the effluent discharge from farms.[10] When applied to the land, these farm wastes with residues of bioactive veterinary drug and antimicrobial-resistant bacteria are susceptible to run into water-bodies and can generate reservoirs for antibiotic resistant bacteria in the environment.[11, 12] To understand the risks of public health associated with antibiotic usage within the dairy industry, it is first important to define the type and specific use of antimicrobial agents that are associated with on-farm management practices. Hence, this study will provide the baseline information on the types and usage of antibiotics in selected dairy farms in Kathmandu valley.

MATERIALS AND METHODS
Study sites
This cross sectional descriptive study was conducted from May to Nov, 2014. Five cow farms on Tyanglaphat area located between Kirtipur and Kalanki at Kathmandu district were randomly selected. Similarly, five cow farms on Gothatar area located between Mulapani and Tribhuvan International airport at Bhaktapur district were randomly selected for the study.

Survey questionnaire
A survey was conducted on selected dairy farms of Kathmandu valley for the use of antibiotics. A survey questionnaire was developed for collecting information on antibiotic usage. The questionnaire[1] survey was administered to the farm owner. It took 45-60 minutes to complete the survey.

Data analysis
The obtained data was entered into Microsoft Excel and grouped by the type of response (e.g. “yes” or “no”) obtained.

Table 1: Questionnaire

Sr. No.	Questions	Expected responses
1.	Do you provide commercially available feeds to cows?	Yes/No
2.	Does the farm have written planned document for the treatment of sick animals with antibiotics?	Yes/No
3.	Is the veterinarian's advice sought before administering antibiotics?	Always / Most of the Times /Sometimes
4.	Other than the veterinarian, who is allowed to administer antibiotics to animals?	Owner/ Family Milker Farm worker
5.	Following administration of an antibiotic, is the course of treatment completed?	Always/ Sometimes/ Never
6.	Are treated cows always visibly marked as "treated"?	Yes /No
7.	Are treated cows separated physically from other milking cows?	Yes/No
8.	Are treated cows milked last?	Yes/No
9.	Are treated cows milked with a separate milking unit?	Yes/No
10.	Are cows routinely screened after freshening for antibiotics with an antibiotic residue detection test?	Yes/No
11.	Have you taken any training on rearing of farm animals?	Yes/No

RESULTS

The farms had 15 to 42 cows. Four of the 10 farms had practice of providing commercially available feeds.

Table 2: Sampling sites for data collection

Sr. No.	Sampling site	Total number of cows	Use of commercial feed
1.	Tyanglaphat-1	15	Yes
2.	Tyanglaphat-2	20	Yes
3.	Tyanglaphat-3	23	No
4.	Tyanglaphat-4	42	Yes
5.	Tyanglaphat-5	17	No
6.	Gothatar-1	20	No
7.	Gothatar-2	27	No
8.	Gothatar-3	33	No
9.	Gothatar-4	19	No
10.	Gothatar-5	39	Yes

None of the farms had written plans for treating sick animals with antibiotics. However, all the farm owners always sought the veterinarian's advice before administering antibiotics. Other than the veterinarian, antibiotics were administered to animals by the owners in all cases. All the farms' owners had practiced the complete course of treatment following administration of an antibiotic except in one farm which had practice of using overdose of antibiotics.

None of the farm owners visibly marked treated cows as "treated". Similarly, there was no practice of physically separating treated cows from other milking cows. Only two farm owners milked the treated cows last.

Table 3: Practice of milking treated cows last among dairy farms (n=10)

Sr.No.	Farm owners milking treated cows last	Frequency	Percentage
1.	Yes	2	20%
2.	No	8	80%

Only two farm owners were trained on rearing animals and those were only applying the separate milking practice of treated cows.

Table 4: Status of training and milking practice on farms

Sr. No.	Training status	Separate milking practice		Total
		Applied	Not applied	
1.	Trained	2	0	2
2.	Not trained	0	8	8
	Total	2	8	10

None of the farms routinely screened cows after complete course of antibiotics with an antibiotic residue detection test.

DISCUSSION

The survey in this study included the questions that were helpful in gaining insight into farm management practices associated with antibiotic usage. Forty percent of cow farms had practice of providing commercially

available feeds and all the farm owners didn't have knowledge whether it was medicated or not.

None of the farms in this study had written plans for treating sick animals with antibiotics. Similar surveys conducted with dairy producers from Michigan, Minnesota, New York and Wisconsin showed that 71.7%, 58.6% and 36.4% of conventional dairy producers kept antibiotic treatment records for lactating, non-lactating cows, and calves/heifers, respectively.[13] This indicates that farm practices are in primitive stage in developing countries as compared to developed countries. One of the important aspects of proper use of antibiotics is to take advice from the veterinarian before the use of antibiotics. All the farm owners in this study always sought the veterinarian's advice before administering antibiotics. One good practice found in this survey was that all the farm owners had practiced the complete course of treatment following administration of an antibiotic except in one farm which had practice of using overdose of antibiotics. That farm owner had the concept that veterinarians practice the low dose of antibiotics which is not sufficient for treatment and hence, used antibiotics beyond the prescribed duration. None of the farm owners in this study visibly marked treated cows as "treated". A majority of the farms in a similar survey in USA (87%) marked their animals treated with antibiotics. This practice has been shown to be effective in preventing drug residues in milk.[14]

This study clearly indicates that training is very much important for proper management of cow farms. Due to lack of training and awareness, there was no practice of milking the treated cows in separate milking units. Only 20% of farm owners milked the treated cows last.

Routine testing of treated cows with a residue detection kit is helpful in reducing the risk of residue occurrence in milk.[15] The regular testing of milk and proper management of treated animals could be an important factor that allowed 97% of dairy producers in a similar study to produce milk free of antibiotic residues.[1] Department of livestock services, Nepal, detected 63 milk samples to contain antibiotic residue by using Smarkit -Food safety rapid kit.[5] We recommend regular screening of antibiotic residues in cow urine and milk in dairy farms. Workers of dairy farms should also be trained on cow rearing practices.

CONCLUSIONS

Lack of written plans for treating sick animals with antibiotics, practice of overuse of antibiotics beyond the prescribed duration and untrained farm owners who were unaware of milking of treated cows on separate unit are factors that can lead to inappropriate use of antibiotics. However, administration of antibiotics only after veterinarian's advice before administering antibiotics was found to be a good practice.

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