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Assessment of ethno veterinary practice and medicinal plants used to treat chicken diseases in selected districts of Arsi Zone

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Abstract

Poultry disease is a major cause of reduced productivity in traditional production systems, mainly due to high mortality caused by diseases and predator attack. In order to control various poultry diseases, ethno veterinary medicine is widely practiced by poor village farmers in Ethiopia. This study was conducted to identify the ethno veterinary medicinal plants used for the treatment of chicken disease and practices in selected districts of the Arsi Zone. Ethno veterinary data were collected from 150 respondents using a structured questionnaire. Fifteen different plant species with ethno veterinary importance used for chicken disease prevention and control were identified in the study areas. Leaves were most commonly used plant part for ethno veterinary medicine preparations. Topical, oral, nasal, ocular and anal routes were used to administer medicinal plants. In addition to traditional medicinal plants; conventional veterinary drugs were used. It is good to substantiate their assertions through research on the medicinal plant efficacy and toxicity.

Keywords: Ethno-veterinary practice, medicinal plants, chicken disease, Arsi Zone

1. Introduction

Poultry diseases, predator attack feed shortage were the major cause of mortality, low production and productivity in developing countries including Ethiopia. The problem is more sever particularly in traditional production systems. In order to control various poultry diseases, ethno veterinary medicine is widely practiced by poor village farmers ^[1].

Ethno-veterinary medicine (EVM) is a scientific term for traditional animal health care that encompasses the knowledge, skills, methods, practices, and beliefs about animal health care found among community members that the ethno veterinary knowledge (EVK) base differs from region to region and has traditionally been passed down orally from generation to generation. This also includes social practices and the ways in which livestock are incorporated into farming systems. EVM knowledge has been developed through trial and error and deliberate experimentation which then could not be substantiated by proven scientific theories ^[2-6].

Ethno veterinary medicine provides valuable alternatives to and complements modern veterinary medicine. It is of specific value in developing countries where modern veterinary medicines are often not accessible to livestock producers. It can play a significant role in grassroots development, which seeks to empower people by enhancing the use of their own knowledge and resources. EVM is the only option for most of village poultry farmers in Africa in general and in Ethiopia in particular, because there are almost no veterinarians in African rural areas. it is sustainable and ecologically sound, and accessible to the villagers as plant products. This implies that EVM is widely used in the developing world than in developed countries ^[7]. Farmers use traditional remedies because they are readily available at low cost or no cost at all ^[8]. Even though it is available in low cost, the effectiveness of the practice and medicinal plants needs further investigation ^[9].

In Ethiopia there has been limited documentation of EVM in chicken health compared with the multiethnic cultural diversity and the diverse flora of the country ^[10, 11]. Similarly there is no well documented information on traditional knowledge and practices on ethno veterinary medicine in Arsi Zone, Oromia Region, thus the study was undertaken to assess and document the experience of the chicken producer farmer on ethno veterinary medicine in chicken health management in selected districts of Arsi Zone.

2. Materials and methods

2.1 Study areas and sampling methods

The study was conducted in selected districts of Arsi Zone from December 2014- April 2015. The Zone is located 175 km far from Addis Ababa and situated between 6°45'N to 8°58'N latitude and 38°32'E to 40°50'E longitude. The mean annual temperature of the Zone ranges between 20 °C – 25 °C in the low land and 10 °C -15 °C in the central high land. Mixed crop and livestock farming system is the mode of agriculture in the study areas (Arsi zone rural and agricultural development office, 2014). Study districts, PAS and chicken producer farmers were selected by multistage random sampling methods. Three districts, five peasant associations in each district and 10 chicken producer farmers in each PAS, with a total of 150 farmers were selected for interview.

2.2 Data collection and analysis

Primary data on ethno veterinary practices and breeds of chicken owned by farmers were collected from 150 randomly selected respondents in the three districts using structured questionnaire. The structured questionnaire was used to collect information on local name of the medicinal plants, plant parts used, methods of preparation for use, without additives, chicken diseases for which medicinal plants are used, route of administration, dose, modern drugs used by respondents to treat chicken disease if available and major constraints encountered in poultry production in the study areas. Data were entered in excel spreadsheet 2010 and analyzed by SPSS version 16. Descriptive statistics were used to generate frequency distribution and percentage table. Ranking of the major constraints of chicken production in the study areas was conducted.

3. Result and discussion

3.1 Breeds and chicken ownership

The two breeds local and exotic cross with local chicken were found in the study areas during data collection. From those breeds of chicken 53.3% of the respondents owned exotic, 20.0% local and 26.7% both exotic and local breeds of chicken see table 1, below. Exotic breeds were predominated in the study districts followed by local and exotic breeds. The minimum and maximum numbers of chicken owned by respondents ranged from 4 to 120 with an average of 27.77 and standard deviation of 32.40. Most of the respondents 83.3% choose local breeds for their disease resistant nature.

3.2 Common poultry disease in the study areas

Common diseases of chicken reported by respondents were Newcastle disease (NCD), fowl cholera, fowl typhoid, fowl pox, coccidiosis, external parasite scaly leg syndrome, disease of the eye (infectious coriza) and paralysis of chicken which is suspected to be marex. Newcastle disease was found to occur frequently and cause high mortality in the country in general and in the study areas in particular. Specific

symptoms of fowl pox like scabs on wattle and comb, scaly leg and pediculosis locally called kinkin syndrome were mentioned by the majority of the respondents in the study areas which is similar with ^[12, 13] research result in Ethiopia and Zambia respectively.

None specific signs of chicken disease like anorexia, ruffled feathers, diarrhea, sudden death were mentioned by all chicken owners. Forty percent of the respondents' loss all of their chicken due to outbreak of NCD (local name of called fungal) in short rainy season (February-march). The result is similar with ^[14] reported outbreak of NCD was occurred between January- April.

Fifteen medicinal plants were identified by the respondents for the treatment and control of different chicken disease and parasites in the study districts. The medicinal plants used in the study districts are summarized in the table 2 below. Sixty six percent of the respondents use traditional medicine for the treatment and control of chicken disease in combination with modern medicine. The remaining 33.3% did not use traditional medicine. In addition to traditional medicine the respondents have got veterinary service like vaccination 10% drug 30% and both vaccine and drug sale 40% with injectable and oral administration. The remaining 90% did not get vaccination. 53.3% was purchased from a human and veterinary pharmacy and 13.7% from open market to treat different chicken health problems table 3. The respondents compare the effectiveness of the modern drug and traditional medicine as good, moderate and poor (table 4). Outbreaks of chicken disease were reported by 40% of the respondents and lost all chicken flocks because of poor coverage of vaccination. The outbreaks were caused by Newcastle virus based on the report of mortality during the outbreak which was 100%. These findings indicated that the use of traditional remedies predominated in all the villages, especially in the remote areas where drugs and vaccines were not easily accessible. This study result was similar with the report of ^[14] 66% of the family poultry in Botswana use traditional medicine and higher from ^[15] 53.25% of the rural farmer in Nigeria use Ethno veterinary Medicine.

In the present study Tetracycline tablet, tetracycline ointment, CAF, OXYTTC LA and Amprolium were the most common veterinary drugs from human and veterinary pharmacy for the treatment and control of chicken health problems in the study areas. The most common preparation of traditional medicine practiced by the producers was ointment, water extraction and alcohol extraction. According to the farmers response cold water extraction was the most common practice done in the study areas (table 2). The use tetracycline ointment common drug of human medications to treat chicken disease in our study is consistent with previous study ^[16, 14] reported that occasionally antibiotics originally intended for human use given to chicken disease treatment and control in Africa and Botswana respectively.

Table 1: Breeds of chicken owned by respondents in the study areas

Breed	No	%	Min	max	mean	std
Local	73	20.00				
Exotic	652	53.30				
Both local and exotic	108	26.7				
Total	833	100%	4	120	27.77	32.39

Table 2: Preparation of medicinal plants and plant parts used for treatment of chicken disease

Local name	Scientific	Plant parts used	Preparation and extraction	Rout	Poultry disease and symptoms treated
red pepper	<i>Capsicum annum</i>	Seed	Crash the red pepper and mixed with feed and oil	Orally with feed	(Newcastle Disease)
Tobacko	<i>Nicotiana tabacum L.</i>	Leaf	Water extract	drenching	Coughing
Mekmeko		Root	Water extract	Drenching	Newcastle Disease
Garlic	<i>Allium sativum</i>	seed	Chopping, alcohol extract	drenching	Depression and any chicken disease
Neem	<i>Azadirachta indica</i>	Leaf	Water extract	drenching	Depression and parasites
Chat		Leaf	Water extract	Orally with feed	Any disease
Feto (mustard)	<i>Brassica campestris</i>	seed	Water extract	Orally With feed	Newcastle and other chicken disease
Damakese	<i>Damakese</i>	Leaf	Hot water extract	Orally With feed	Any chicken disease
Atsefaris/astenagr	<i>Cannabis sativa</i>	Leaf	Chopping and mixed with feed	Orally With feed	Any chicken disease
Tenadam	<i>chale pensis L</i>	Leaf/seed	Chopping and water extraction	Drunching	Any chicken disease
Red onion	<i>Allium cepa</i>	Bulb	Chopping and mixed with feed	Orally With feed	Any chicken disease
Dgta	<i>Calpurnia aurea</i>	Leaf	Chopping the leaves and rub topically	Topical	scaly leg syndrome
Senafch (mustard)	<i>Brassica campestris</i>	seed	extracting with water after crashing the seed	Drenching	Newcastle disease fowelpox, coccidiosis
Green pepper	<i>Capsicum annum</i>	Seed/fruit	Chopping and mixed with feed	Orally With feed	Any chicken disease
Berberere	<i>Capsicum annum</i>	Flower	Water extract	Orally with feed	Any chicken disease
Jinjible (Ginger)	<i>Zingibera officinale</i>	Root	Chopping and extracting by water	Drenching	Coughing

Table 3: Common drugs used for chicken disease treatment by respondents in the study areas

Types of drugs	Disease type	Source	Dose	Rout	Duration
Tetracycline tablet	Newcastle disease, diarrhea, cholera	Human pharmacy	1tablet/hen	Oral, drunching,	For 1 day
CAF tablet	Newcastle, fowl thypoid, chicken cholera, and diarrhea	human	1tab/hen	Oral, drunching feeding	For 1 day
Amprolium powder	Newcastle, coriza, and any other disease	Vet pharmacy	1teaspoon/hen	Oraly with water &feed	For 3 days
OXTTC LA inject able 20%	Infectious coriza, fowl cholera, Newcastle, Diarrhea	Vet pharmacy	1cc/hen	Oral drenching	Once/day
Tetracycline ointment	Any eye disease	Human pharmacy	1drop/eye/hen	Topical application	For three days

Table 4: Comparison of the effectiveness of modern drug and traditional medicine by respondents

Types of medicine	Effectiveness%					
	Excellent	Good	moderate	Poor	No response	Total
Traditional medicine	(0%)	35(23.3%)	55(36.7%)	9(6%)	51(34%)	100%
Modern medicine	5(3.3%)	20(13.3%)	50(33.3%)	15(10%)	60(40%)	100%

3.3 Major constraints of chicken production in the study areas

Respondents were given a chance to list and rank their major constraints for chicken production in different seasons. According to the respondent's response, chicken disease prevalence, feed shortage, predator attack, mortality, hatchability, and egg spoilage were the common problems of the production. They rank chicken disease as first priority and

predator attack and feed shortage second and third constraints respectively in the study areas regardless of the season. This is similar with [17] who reported poultry disease, predator attack and feed shortage as the first and second challenges for poultry production in Africa. The major constraints of poultry production in different seasons and the severity of the constraint are listed under (table5).

Table 5: Major constraints of poultry production in different seasons in the study areas

No	Major constraints	Short rainy season (mar-may)	Long rainy season Jun-aug	Short dry season (sep-nov)	Long dry season (dec- feb)	Rank
1	Feed shortage		xx-xxxx	Xx		3
2	Chicken disease	xx-xxxx	xx-xxxx	Xxx	Xxxx	1
3	Predetors	xx-xxx	xxx-xxxx	Xxx	xxx-xxxx	2
4	High mortality	X	xxx-xxxx			4
5	Poor hachability		xx-xxx			8
6	Spoileg of egg		xx-xxxx			7
7	Low price chicken		x-xxxx	xx-xxx		6
8	Low price of egg		Xxx	xx-xxx	Xxxx	5

x= less serious xx=moderately serious xxx= serious xxxx=more serious

The common predators of chicken in the study areas were hamagota, eagle, wild cat and fox, see the table below.

Table 6: Major predators and risk factors of chicken in the study areas

No	Predators	Age of chicken	Sex of chicken	Breed preference	Color preference	Prevention methods
1	Hamagota	All age group	Both sex	No breed preference	No color preference	Fencing and using dog
2.	Eagle	Young	Both sex	No breed preference	White	No prevention
3	Wild cat	All age group	Both sex	No breed preference	No color preference	dog, fencing, proper housing
4	Fox	All age group	Both sex	No breed preference	No color preference	Using dog

4. Conclusion

Chicken producer farmers widely use medicinal plants for the control of chicken diseases. It is good to enhance veterinary health particularly rural poor communities, which do not have access to modern medical service. Ethno veterinary practices and identified medicinal plants used by chicken producers in the study districts can be used as base line for further research on the active ingredient and toxicity of plant remedies for the development of alternative medicament with low cost and environmentally friendly. Predator attack and feed shortage were also considered as the major problems for chicken production.

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