

Ethnoveterinary Medicine Usage in Family Chickens in the Selected Four Villages of Botswana

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Abstract

A study was carried out in Central, Kweneng and South East districts of Botswana to document ethnoveterinary practices used in health management of family chickens. Data were collected using a structured questionnaire and through direct observation. The questionnaires were administered to 100 respondents (25 respondents per village) in Khudumelapye (Kweneng), Mogobane (South East), Mokubilo and Serowe (Central). The results of the study showed that females were the main owners and carers of family chickens constituting 86%. Forty-eight percent of the respondents were mature followed by youth (31%) and adults (21%). Family chicken losses were attributed to predation (35.29%), diseases (29.75%), parasites (20.09%) and theft (14.87%). The common diseases experienced by respondents were Newcastle Disease (NCD), fowl pox, and infectious bronchitis disease. Sixty-five percent of the respondents used modern medicines, 10% traditional remedies while 25% used both modern medicines and traditional remedies to control diseases and parasites. Six medicinal plants (*Aloe spp.*, *Moringa oleifera*, *Nicotiana tabacum*, *Boscia albitrunca*, *Senna italica*, and *Capsicum annum*) that were used in the control and treatment of chicken diseases were identified. The commonly used plants were *Aloe spp.* and *Nicotiana tabacum* because they effectively controlled and treated diseases such as NCD, coccidiosis and respiratory diseases. The plant parts used were leaves, fruits and roots which were either used fresh or dry. Leaves were the common plant parts used. All medicinal plants were administered orally before or after disease outbreaks. Traditional remedies were the common methods of parasite control with wood ash predominating. The results indicate that respondents depended on ethnoveterinary medicine for treating family chickens' diseases.

Key words: Ethnoveterinary medicine, family chickens, medicinal plants, diseases, parasites

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Introduction

Family chicken production plays an important role in the livelihoods of Batswana (citizens of Botswana). In Botswana, family chickens comprise mainly unimproved indigenous chickens, known locally as *Tswana* chickens. Setlalekgomo (2012) stated that *Tswana* chickens can provide cheaper animal proteins and employment for women in villages and rural areas. The money obtained from selling chicken can help in buying food, toiletry and school uniforms for children, thus alleviating poverty and improving the standard of living of women.

The major constraints faced by family chicken rearers are disease outbreaks and parasites. These constraints can be alleviated by the use of conventional drugs which are expensive and out-of-reach resources for the health management of chickens (Mwale et al., 2005). Family chickens are owned mostly by rural farmers who cannot afford to purchase conventional drugs. As a result, farmers use ethnoveterinary medicine (EVM) to manage family chicken diseases and parasites. The wide use of traditional remedies by family poultry rearers in Botswana is attributable to lack of knowledge in the use of vaccines, lack of cooling facilities, unavailability of vaccines, and possible effectiveness of the remedies in curing some diseases (Moreki, 2013). Increased attention on EVM is justified because it is accessible, easy to prepare and administer at little or no cost at all (Jabbar et al., 2005).

Herbal medicines are known to be broadspectrum and therefore may be a future answer to pathogen resistance to conventional drugs (Mwale et al., 2005). Moreki (2013) in Botswana stated that the indigenous traditional knowledge of medicinal plants of various ethnic communities, which has been transmitted orally for centuries, is fast disappearing from the face of the earth due to the advent of modern technology and transformation of traditional culture.

There is little information documented in Botswana about the use of EVM in family chicken production. Therefore, a study was conducted to document ethnoveterinary practices employed by family chicken rearers in four selected villages of

Botswana to treat ailments and control parasites in family chickens.

Materials and Methods

The study was conducted at Khudumelapye (Kweneng District), Mogobane (South East District), Mokubilo and Serowe (Central District) from June to July 2012. A random sampling procedure was applied to this study and the cluster random sampling technique was used to choose 25 respondents [Botswana Network of People Living with HIV and AIDS (BONEPWA+) beneficiaries] from each village. Data were collected by administering a structured questionnaire and through direct observation. Secondary sources of data were also reviewed. Questionnaires were administered by approaching respondents personally by calling at their homes. Only one member of the household was interviewed by reading and interpreting the questions in Setswana (a local language) and responses recorded in English. Errors in data collection were minimized by using only one interviewer throughout the course of data collection. Qualitative and quantitative data were analysed using Microsoft Excel. Tables and figures were used to present summary statistics.

Results and Discussion

Demographic characteristics

Across the villages females were the main owners and carers of family chickens constituting 86% of the total respondents (Table 1). Forty-eight percent of the respondents were mature (middle aged) followed by youth (31%) and adults (21%). In agreement with the present results, Moreki et al. (2011) reported that the majority of BONEPWA+ food security beneficiaries were females who were caregivers and unemployed. Sloan (2011) stated that poultry are often owned and managed by women and children for whom they represent an important source of cash income in times of need through the sale of adult birds, chicks or eggs. The respondents who completed non-formal education and those that never attended school were adults.

Causes of losses in family chickens

Thirty-five percent of the respondents said they experienced bird mortality and losses were attributed mainly to predation, diseases, parasites and theft (Figure 1). Predation accounted for 35.29% of losses followed by diseases (29.75%), parasites (20.09%) and theft (14.87%). Previous study by Moreki et al. (2010a) showed that the major causes of losses in family chickens are diseases (36.7%), parasites (11.1%), predation (8.89%) and a combination of diseases, parasites and predation (8.89%). Similarly, Ranwedzi (2002) in South Africa reported the major constraints in family chicken production to be diseases (57.4%)

and predators (35.2%). Furthermore, Mcainsh et al. (2004) stated that the most visible constraints to local chicken production in Sanyati (Zimbabwe) were high mortality caused by diseases (28%), predators (27%), and external parasites (21%). Mapiye and Sibanda (2005) found that 40.5 % of deaths recorded were due to predation, 30.2% to disease, 8.8% to accidents, 8.6% to parasites and 12.9% to unknown causes. A recent study by Worku et al. (2012) reported that 96.9% of the respondents identified predation to be the primary production constraint in West Amhara Region of Ethiopia.

Table 1: Demographic parameters of respondents that benefited from BONEPWA+ food security project in the four selected villages of Botswana

Variable n=100	Category	Number of respondents				Overall
		Mokubilo	Mogobane	Serowe	Khudumelapye	
Gender	Male	6	4	2	2	14
	Female	19	21	23	23	86
Age (years)	Youth	6	2	11	12	31
	Mature	14	13	12	10	48
	Adults	5	10	3	3	21
Marital status	Married	6	9	6	7	28
	Single	15	14	17	15	61
	Widowed	4	2	2	3	11

In the current study, predation was highest in Khudumelapye followed by Mogobane (Figure 1) as birds scavenged most of time due to lack of feeds and rearing was at the ploughing sites (*masimo*) where predators are commonly found. Lack of housing also contributed to chicken losses. Fifty-

five percent of the respondents said that they did not provide housing to their chickens resulting in increased predation. Other causes of mortalities were poisoning (7%), inclement weather (5%) and vehicular accidents (2%).

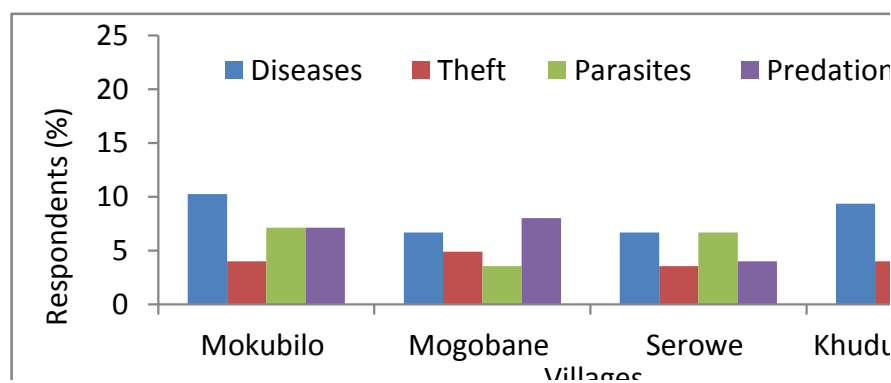


Fig.1: Major causes of family chicken mortalities experienced by respondents that benefited from BONEPWA+ food security project in the four selected villages of Botswana

Health management

Diseases, control and treatment

Eighty percent of the respondents said that they knew NCD based on signs and symptoms, and had experienced its occurrence (Figure 2). Sloan (2011) observed that NCD is one of the most significant constraints to village and back-yard poultry production, impacting on household nutritional security and income generation. In the present study, the respondents said they recognized NCD by its rapid course and clinical signs including greenish to whitish diarrhoea, coughing and twisted neck (torticollis). Other clinical signs and diseases frequently recognised by respondents were fowl pox, sudden death, infectious bronchitis (noisy breathing, cough and depressed chicken) and infectious bursal disease (locally known as *saakhubama*) (Figure 2).

Sixty-five percent of the respondents in the present study used modern medicines, 10%

traditional remedies while 25% used both modern medicines and traditional remedies (Table 2). The high usage of modern medicines could be attributed to the free supply of vaccines to the beneficiaries by BONEPWA+. In disagreement with the current results, Moreki et al. (2010b) stated that EVM was important in treatment and control of diseases and parasites of family chickens in Botswana, as the majority of family poultry rearers could not afford to purchase veterinary requisites (*e.g.*, vaccines, drugs, dips and chemical dusts), lacked cold chain and also lacked knowledge of vaccine handling and administration. In Namibia, Petrus et al. (2011) reported that farmers depended on plant parts as herbal remedies for their indigenous chicken flock health management and considered the use of EVM as sustainable, economical and culturally acceptable.

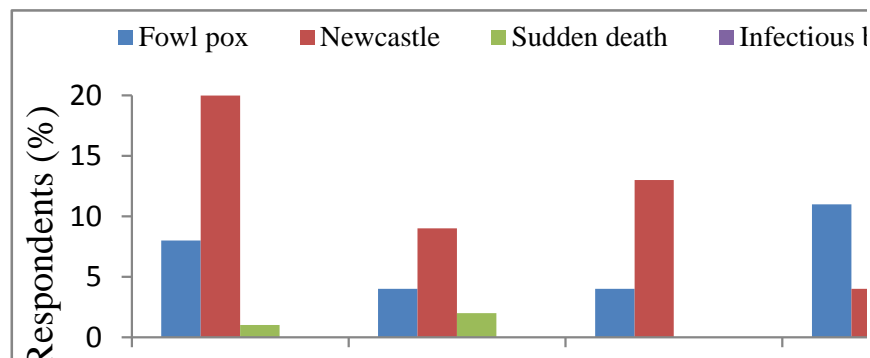


Fig. 2: Family chicken disease prevalence experienced by respondents that benefited from BONEPWA+ food security project in the four selected villages of Botswana.

Table 2: Disease control and treatment methods used by respondents that benefited from BONEPWA+ food security project in the four selected villages of Botswana

Variable n=100	Mokubilo	Mogobane	Serowe	Khudumelapye	Overall
Modern medicine	13	18	21	13	65
Traditional remedies	2	3	2	3	10
Modern and traditional remedies	10	4	2	9	25

Forty-two percent of the respondents used La Sotavaccine, followed by Tetracycline powder (41%), potassium permanganate (10%), sulphazine 16% (2%) and Aloes products (Alwyn and Lump) (5%). La Sota which was administered via drinking water served as a control measure against NCD when it was available from BONEPWA+. The

respondents said La Sota was given to all chickens orally in summer because they believed that NCD outbreak occurred during this period. When the vaccine got finished the respondents did not manage to purchase the vaccine because they said they used chicken proceeds to purchase chickens feeds. Failure by the project beneficiaries (respondents) to

purchase La Sota vaccine rendered the flocks unprotected resulting in heavy mortalities when NCD occurred.

The respondents identified six medicinal plants that were used in the control and treatment of chicken diseases (Table 3). Traditional remedies were mixed because respondents believed that it was effective when mixed. Ninety-seven percent of the respondents said they used *Aloe spp.* and leaf tobacco (*Nicotiana tabacum*) as they effectively controlled and treated diseases such as NCD, coccidiosis and respiratory diseases. This result agrees with Moreki (2012) in Botswana; Okitoi et al. (2007) in Western Kenya and Kugonza et al. (2008) in Uganda. The medicinal plant parts used were leaves, fruits and roots which were either used fresh or dry. All the medicinal plants were administered orally. Petrus et al. (2011) reported that treatment of indigenous chicken diseases in Namibia was based mostly on a concoction of plant materials where farmers mixed different plants or single plant parts depending on the knowledge of the individual farmer. The leaves were harvested, cleaned with water, and crushed before they were mixed with drinking water prior to administration.

The study by Moreki et al. (2010a) showed that 86.7% of the rearers used EVM compared to vaccines and chemical dusts which is in contrast with the findings of this study. Respondents in the current study said that they used salt and vinegar to control internal parasites by adding them to drinking water regularly. Clean water was provided to family chickens and watering equipment cleaned regularly as it was believed that dirty water could harbour diseases and attracts pests. Sixty-eight percent of the respondents said they cleaned feed troughs and removed old feeds, dirt and other contaminants daily to control diseases.

Thirty-two percent of the respondents said they cut bursa of Fabricius to treat infectious bursal disease (IBD), and then dressed it with salt or a mixture of salt and tobacco snuff to stop bleeding. Similarly, Simainga et al. (2010) in Zambia reported that 16.46% of the respondents used conventional drugs, 36% human drugs, 20% a mixture of conventional and ethnoveterinary drugs, 2% removed bursa of Fabricius to control IBD, 4.5% did nothing and 20% did not respond. On the

other hand, Ather (2011) reported that there is no therapeutic or supportive treatment that has been found to change the course of IBD virus. The author stated that immunization is the principal method used to control IBD in chickens and Khorsolin-th vaccine is sprayed at 1 to 3% levels depending on the severity of infection.

Parasites and their control

According to Table 4, the common parasites of family chickens in the four villages were fleas, mites and ticks. Moyo (2009) in South Africa found mites to be the most problematic parasites (79.6%) of chickens followed by fleas (64.5%). Similarly, Ranwedzi (2002) reported mites (77.0%) and fleas (9.3%) to be the most troubling parasites of family chickens. Moreki (2013) in Botswana found that the common parasites of chickens reported by rearers were tampan, mites, fowl lice and ticks. These parasites are blood-suckers and burrow into the skin or live on or in the feathers. The injury caused by these parasites consists of constant irritation and loss of blood. External parasites also contribute to slow growth rates and reduced egg production of family chickens.

The majority (36.62%) of respondents used wood ash to control parasites (Table 5). Ash was spread in chicken houses/shelters, on tree trunks and piles of bricks where chickens roosted at night. In this study, ash from any wood was used. According to Moreki (1997; 2012), wood ashes from *Peltophorum africanum* (mosetilha) and *Combretum imberbe* (motswere) were commonly used. Wood ash was used either hot or cold to repel or suffocate external parasites and practice was said to be effective. Moyo (2009) reported that external parasites were controlled by using wood ash (28%), Jeyes fluid (10%), paraffin (8.4%), used engine oil (2.8%), and chemical dusts such as Karba dust (4.2%). Similarly, Ranwedzi (2002) reported that wood ashes (19.4%), Jeyes fluid (0.9%), Blue Death (0.9%), hot water (6.5%) and paraffin (6.5%) were used to eliminate external parasites. Petrus et al. (2011) in Namibia also reported that ash was used to eradicate external parasites from chickens. Other methods employed to control parasites included regular removal of chicken droppings from shelters,

providing good ventilation and cleaning waterers and feeders regularly.

Table 3: Plants and plant parts used as traditional remedies, method of preparation and administration

Scientific name	Tswana name	English name	Parts used	Method of preparation	Method of administration
<i>Aloe spp</i>	Mokgwapha/ Sekgophana	Burm plant	Fresh leaf	Fresh leaves cut into small pieces	Added to drinking water or mixed with tobacco
<i>Moringa oleifera</i>	*	Moringa	Fresh/dry leaf	Fresh leaves are sun dried and ground into powder or chop fresh leaves.	Added to drinking water, mixed with tobacco / feeds or orally
<i>Nicotiana tabacum</i>	Motsoko	Tobacco	Dry leaf	Leaves are harvested fresh, sun dried and ground into powder	Added to drinking water /mixed with moringa leafmeal
<i>Boscia albitrunca</i>	Motlopi/ Matoppie	Shepherd's tree	Fresh/dry leaf	Fresh leaves are sun dried and ground into powder or chop fresh leaves	Added to drinking water or feeds
<i>Senna italica</i>	Sebete	*	Fresh/dry leaf/roots	Either fresh leaves or roots are chopped	Added to drinking water
<i>Capsicum annum</i>	Pherehere	Pepper/chilli	Fresh leaf /dry fruits	Fresh leaves chopped/ Fruits ground	Added to drinking water

* Name could not be found

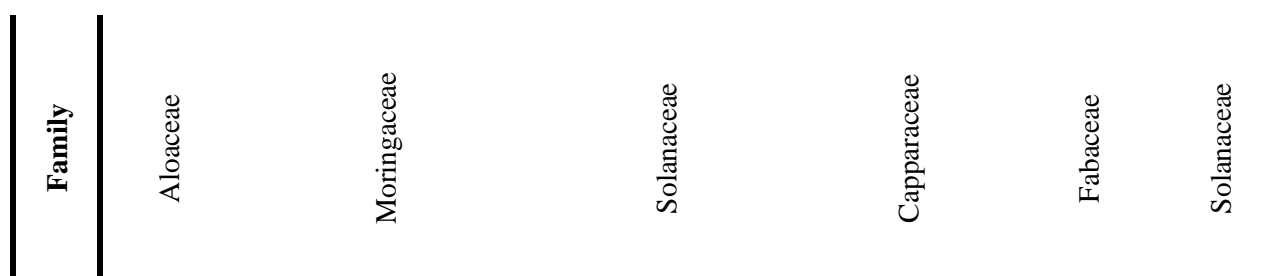


Table 4: Family chicken parasites that troubled respondents that benefited from BONEPWA+ food security project in the four selected villages of Botswana

Parasite	Mokubilo	Mogobane	Serowe	Khudumelapye	Overall (%)
Fleas	7	0	5	6	35.29
Mites	2	1	3	3	17.65
Fowl ticks	0	1	1	0	3.92
Fleas and fowl ticks	4	0	2	2	15.69
Fleas and mites	2	3	2	0	13.73
Fleas, mites and fowl ticks	1	3	2	1	13.73

Table 5: Methods of controlling parasites in family chicken used by respondents that benefited from BONEPWA+ food security project in the in the four selected villages of Botswana

Parasites control methods	Mokubilo	Mogobane	Serowe	Khudumelapye	Overall
Wood ash	15 (21.13)	2(2.82)	4(5.63)	5(7.04)	26(36.62)
Karba dust and wood ash	3(4.23)	4(5.63)	3(4.23)	2(2.82)	12(16.90)
Jeyes fluid	0	0	3(4.23)	1(1.41)	4(5.63)
Wood ash and Blue Death	1(1.41)	1(1.41)	1(1.41)	0	3(4.23)
Burn grass in poultry house	1(1.41)	0	2(2.82)	0	3(4.23)
Wood ash and used car oils	0	0	0	3(4.23)	3(4.23)
Boiling water	0	0	2(2.82)	0	2(2.82)
Karba dust and blue death	1(1.41)	1(1.41)	0	0	2(2.82)
Tobacco leaves	2(2.82)	4(5.63)	2(2.82)	1(1.41)	9(12.68)
Relocate shelter and burn old shelter	3(4.23)	0	0	0	3(4.23)
Karba dust, wood ash and burn grass in poultry house	1(1.41)	0	0	0	1(1.41)
Mix paraffin with water and spread on chickens	1(1.41)	0	0	0	1(1.41)
Water mixed with washing powder	0	0	2(2.82)	0	2(2.82)

*Values in brackets are percentages

Extension service

In the present study, 92% of the respondents said they had access to extension services while the remainder had no access. Furthermore, 42% of the respondents said they were visited by extension service agents once a year,

41% twice a year, 11% monthly, 2% bimonthly, 2% three times a year and 1% quarterly. These results indicate that respondents received technical support from extensive services which was provided by BONEPWA+ and Ministry of Agriculture (Department of Veterinary Services). In contrast, Moreki (2012) stated that there is inadequate

support to BONEPWA+ beneficiaries due to the vastness of the country and inadequacy of resources.

Seventy-four percent of the respondents in the current study said they never attended training in poultry production while the remainder said they did. In agreement with current findings, Moreki et al. (2010a) reported that 90% of rearers never had training in poultry management.

The respondents who attended training in poultry production said it helped them to raise their chickens. Guèye (2003) stated that training and education in family chickens are the channels for spreading information among family chickenkeepers and help to develop appropriate interventions in areas such as disease prevention and control, predator control, poultry housing, feeding and watering systems, genetic improvement, marketing of poultry products, training and information exchange system. The respondents who never attended training in poultry management in the current study mentioned that they were interested in attending training in the future to enable them to manage and care for their chickens properly.

Conclusion

- Family chicken losses were attributed mainly to predators followed by diseases, parasites and theft.
- The main diseases experienced by respondents were NCD, fowl pox, sudden death and infectious bronchitis.
- The use of modern medicines was predominant compared to traditional remedies. The high usage of modern medicines could be attributed to the free supply of vaccines to the beneficiaries by BONEPWA+.
- Six medicinal plants that were used for control and treatment of family chicken diseases were identified. These are *Aloe spp.*, *Moringa oleifera*, *Nicotiana tabacum*, *Boscia albitrunca*, *Senna italica*, and *Capsicum annum*.

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