INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN 2278 – 0211 (Online)

Assessing Indigenous Knowledge of Pastoralist in Livestock Disease Control: The Case of Borena Zone

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Abstract:
The finding was conducted in four wereda of Borena Zone (D/dawa, Yabello, Arero and Dire) which focused on the indigenous knowledge in livestock disease control. The data was collected from randomly selected household and key informant of 96 people. The study was enclosed personal characteristics of respondents such as, age, marital status and educational level, and the constraints in livestock production, the major disease and parasite in the study area, indigenous methods to control livestock disease and its effectiveness. About 46.9% of the respondents are found in 35-50 years of age which hold the highest values and 87.6% of the whole respondents are categorized under married. Auto of these only 41.7 % of them could contact with the agricultural extension agent once per a year. The data were analyzed by use of SPSS statistical analysis. There are several factors which affect the effectively production of livestock, among this the drought and disease are the major problem in the study area. The effective indigenous methods practiced in parasite and disease control are hygiene, herbs, self-diagnosis, herd sharing, movement and bounding.

Keyword: *Indigenous knowledge, Borena Zone, disease*

1. Introduction

Indigenous knowledge (IK) is the local knowledge that is unique to a given culture or society. Indigenous knowledge contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management, and a host of other activities in rural communities (Warren 1992). It is the information base for a society, which facilitates communication and decision-making. Indigenous information systems are dynamic, and are continually influenced by internal creativity and experimentation as well as by contact with external systems (Flavier et al. 1995). It is not yet fully utilized in the development process. Conventional approaches imply that development processes always require technology transfers from locations that are perceived as more advanced. This has led often to overlooking the potential in local experiences and practices.

Animal disease is a major constraint to livestock production in sub-Saharan Africa. Modem veterinary inputs and services are often not readily available and are unsustainable under local conditions in the course of time. They are either too difficult to obtain or too expensive for the poor farmers and pastoralists. It is estimated that roughly 70% or 150 million of the rural poor in Sub Saharan Africa are at least partially dependent on livestock to sustain their livelihoods (LID, 1999). Poverty, food insecurity and the effects of livestock disease are thus intertwined. Infected animals cannot efficiently be used for draft power because of poor condition, while, sick animals may even die from most of these diseases. With time, surviving animals often tend to develop tolerance to some of these diseases and environmental challenges. In spite of these challenges, livestock production has been recognized as an essential contributing factor for improving the livelihoods of the poorest rural farming communities in Africa

For many poor traditional farmers, livestock is the key asset they depend on to provide for most of their socio-economic needs. As stated earlier, climate change is likely to adversely impact rural communities in parts of Africa. Traditional livestock health care systems, based in indigenous knowledge, seem to add value to the formal livestock health care sector, partly because both the government and the private veterinary services, in certain cases, do not adequately meet the needs of the traditional livestock sector (Holden, 1999). Although some veterinary pharmaceuticals which have undergone clinical tests and trials have been proven positive to certain ailments afflicting traditionally reared livestock (Mesfin & Obsa, 1994; Keyyu et al, 2003; Tabuti et al, 2003; Manganeli et al, 2001), the practical values of traditional health care systems are mainly attributed to their cost-effectiveness, sustainability, environmental friendliness and socio-cultural practicality (McCorkle, 1992; Alawa et al, 2002).

Due to inadequate modern veterinary services in Ethiopia and its inaccessibility in most parts of the country, large proportion of the country's livestock owners heavily depend on traditional healers and herbalists. Many local and traditional communities in Ethiopia conserve rare medicinal plants in home gardens. They select and conserve specific species of plants whose medicinal values and properties they know. They domesticate these in small gardens normally at the back of their home steeds: like Dengetegna, Kebericho and others (Tesfaye, 2003). These traditional veterinary practices include Mechanical /Physical, Pharmacological, Surgical, Rituals

and managerial methods of treatment. Being the leading country in Africa with its cattle population traditional animal husbandry and veterinary practices are widely practiced and provide a substantial animal health care.

Historically, diseases causing pathogens and their vectors have co-existed with livestock under traditional management systems. In most cases, such co-existence has not caused serious devastating damages. This occurrence can be attributed to a number of causes, such as the development of innate resistance in most of the indigenous livestock breeds, too frequently occurring endemic diseases and the utilization of potent indigenous local plant remedies for prevention and cure of diseases.

Diseases are the major constraints in cattle production because they lower productivity, decrease the rate of regeneration and increase the risks of transfer of these diseases to the final consumers. The menace of diseases in the national herd has caused drastic reduction in the number of animals available for the market. The major concern of the herdsmen is to produce optimally hence any effort at controlling the effects of diseases will be very desirable.

The indigenous knowledge to control of diseases includes constant and low costs but at most times are curative. The emphasis throughout the world is prevention as found in modern medical care such as the use of vaccines, although where these are available, they are supplied irregularly and sometimes in insufficient quantities and most of the livestock owner found in different parts of the country has practiced traditional treatment by using indigenous knowledge for livestock disease control. However, the use and effective of this indigenous knowledge in livestock disease control has not assessed well with sufficient researches. So, well documented data which give answer for the following question is required.

- What are the indigenous methods in livestock disease control?
- How widely used are these indigenous control methods in the area of study?
- How effective are these indigenous control methods?

The objective of this study was:

- ✓ To identify disease commonly found in the area
- ✓ To assess the indigenous control methods of livestock diseases in the area of study,
- ✓ To determine the effectiveness and limitation of the indigenous knowledge's

2. Material and Methods

2.1. Description of the Study Area

Borana Zone is one of the Oromia Regional State. It is found in southern part of the Region and of the country. The capital city of the zone is Yabello, which far away 575 km from Addis Ababa. Borana zone has a total population of 962,489 of which 878,161 is rural people. It holds up 10 woreda. In average it elevation equal to 1287 meters (CSA, 2011). It locate at altitudes of 350-1800 above sea level

2.2. Livestock Resources

The major livestock species raised by Borena Zone's pastoralists are Goat, Cattle, Camel and Sheep. Large number of donkey and relatively small number of horse are also kept. According to the Borena zone pastoral offices there are about 819,538 of Goats, 1,977,130 of Cattle, 161,581 of Camel, 454,863 of Sheep and 126,863 of equines are found in the zone. Distributions of livestock species by Districts are quite different between Districts. In some Districts cattle is the dominant and in some camels are the dominant livestock species. Livestock production depends on rain feed of natural resources.

No	Name of Woreda	Species and no. livestock							
		Cattle	Sheep	Goat	horse	Mule	Donkey	Camel	Poultry
1	D/Dawa	294,202	17,427	21,528	11	7027	11,620	9817	28,729
2	Yabello	232,949	39,073	98,781	500	200	2000	22,972	39,078
3	Dire	100,401	19,922	59,874	10,92	808	4,386	4,506	8,875
4	Arero	112,000	33,000	45,000	15	975	4085	25,500	11,980

Table 1: Livestock population in the four districts of Borena Zone
Source: Agricultural office of Woreda, 2014

2.3. Sampling Techniques and Sample Size

The study was conducted in indigenous knowledge to control livestock disease in Borana Zone of southern parts of Oromia Regional State. Before coming to actual study, pre-assessments of the study area were occurred. Within this assessments, the environmental condition, the numbers of woreda enclosed under this zone and woreda in which indigenous knowledge in livestock disease control has more been practiced were included. Out of the presented, four woreda with each two peasant association (kebele) which used this indigenous knowledge to control livestock disease was randomly selected. The ten (10) householders and two indigenous people (healers) from each kebele, those have at least five cattle in one peasant association was randomly selected.

2.4. Data Sources and Methods of Collection

Both primary and secondary sources of data were used in this study. Secondary data was obtained from reports of woreda agricultural development office, and other published and unpublished reading materials. Based on the information received from those bodies, record sheet were developed for normal survey. Then the primary data was collected from randomly sampled respondents through open questionnaire and formal discussion. The collection of the information also made at household levels. The researcher was adequately administered and supervised the collected data and its process.

2.5. Collecting of Data

The data regarding with the indigenous knowledge in livestock disease control was collected by presenting question to the randomly selected farmers and indigenous person (healer) who are knowledgeable in this regards. The indigenous person here was used as guidance for the information collected. The formal discussion was made with the elder person purposefully to gather the general information about the indigenous knowledge in livestock disease control. These discussions were mostly focused on the indigenous knowledge practiced in animal health and livestock production constraints. Discussions were also held with professionals and technical auxiliary animal health personnel who were working at woreda level agricultural offices.

Figure 1: Key informants
Source: Field survey, 2014

2.6. Statistical Analysis

The collected data was coded and tabulated for analysis. The statistical analysis used in the study was varied depending up on variable and information obtained. However, since the survey study was based on single visit multiple subject formal survey, methodology, descriptive statistics using SPSS version 12 was applied such as mean and frequency.

3. Result and Discussion

3.1. Respondent Personal Characteristics

Description	Response	D/dawan (n=24)	Yabello (n=24)	Arero (n=24)	Dire (n=24)	Total Sample (n=96)
		%	%	%	%	%
Gender	Male	100	100	100	100	100
	Female	0	0	0	0	0
	Total					100
	25-35	25	20.8	16.7	20.8	20.8
Age	35-50	33.3	58.3	45.8	37.5	43.8
	50-60	29.2	33.3	25	33.3	30.2
	>60	12.5	4.2	-	4.2	5.2
	Total					100
	Single	25	-	12.5	12.5	12.5
Marital Status	Married	75	100	87.5	87.5	87.5
	Total					100
	PE	25	20.8	25	16.7	21.9
	SE	12.5	12.5	-	-	6.3
Education	IE	29.2	33.3	33.3	29.2	31.3
	NE	37.5	33.3	41.7	54.2	41.7
	Total					100
	Once a month	12.5	16.7	-	-	7.3
CWEA	Once in 2m	25	12.5	25	-	13.3
	Once in 6m	29.2	29.2	41.7	20.8	29.3
	Once in a year	50	41.6	33.3	79.2	50.1
	Total					100

Table 2: Frequency distribution of respondents' personal characteristics and contact with extension agents
** Significant (p<0.05); ns = not significant; n=number of interviewed herd men, while, PE=primary education, SE= secondary education, IE= informal education, NE=no education, CWEA=contact with extension agent, 2m=two month, 6m=six month*

3.2. Constraints of Livestock Production in the Study Area

Name	D/dawaa		Yabello		Arero		Dire	
	Rank	Value (%)	Rank	Value (%)	Rank	Value (%)	Rank	Value (%)
Drought	4	41.7	-	-	3	54.2	-	-
Conflict	-	-	-	-			4	45.8
Shortages of grazing land	2	54.2	3	50	2	583	2	62.5
Shortage of vet.drug	5	37.5	5	41.7	-	-	5	37.5
Distance from water point	1	66.6	1	62.5	4	41.7	3	54.2
L MC	-	-	4	45.8	-	-	-	-
Road	-	-	-	-	-	-	-	-
Diseases	3	45.8	2	54.2	1	79.2	1	75
Bush invasion	-	-	-	-	5	50	-	-
Preditors	-	-	10	5	8	4	10	3

Table 3: Simple ranks (1-5) of constraints in livestock production of the study area
D/dawa=Dugda Dawa, LMc= livestock marketing center

3.3. Pests and Diseases Incidence among Respondents

Pests and diseases	Frequency	Percentage
A. Pests		
Tick	96	100
Mosquitoes	50	52.08
Helminthiasis	15	15.6
B. Diseases		
Streptothricasis	57	59.4
Diarrhoea	91	94.8
Rinderpest	45	46.9
Anthrax	75	78.2
Black quarter	78	81.3
Bovine Contagious Pleuropneumonia (BCPP)	85	88.5
Foot-and-mouth disease (FMD)	93	96.9
Trypanasomiosis	80	83.3
MCF	55	57.3
salmonellosis	90	93.8
Babebiosis	87	90.6

Table 4: Frequency distribution of pests and diseases encountered by respondents (n= 96)
Source: Field Survey 2014

3.4. Major Disease Prevailing in Drought Period of Studies Areas

No	English name	Local name	Woreda			
			D/dawa	Yabello	Arero	Dire
			Rank	**Rank**	**Rank**	**Rank**
1	Babesiosis	Biirtee	1	8	4	1
2	CBPP	Sombessa lonii	3	-	3	2
3	Trypanosomiasis Luxa	Luxa	2	-	-	3
4	FMD	Oyale	5	-	-	4
5	Biting fly	Kitana	-		-	5
6	Parafilariosis	Dhiiddoo	6	1	-	6
7	Ticks	Shilmii	-	-	-	7
8	GIT parasite	Raammoo garaa	-	-	-	8
9	MCF	Tumma	-	-	-	9
10	Abortion	Sallessa	4	-	-	-
11	Septicemic disease	Qannoo	6	-	-	-
12	salmonelosis	Albaatii	-	2	5	
13	Bloat	Boboksaa/barraboota	-	9	6	-
14	Tick	Shilmii	-	4	7	-
15	UDCSGB	Hadhoftu	-	-	1	-
16	Tryps	Awarsa	-	3	2	-
17	Anthrax	Cirmalee	-	7	-	-
18	Bovine Pasteurellosis	Silisaa	-	6	-	-

Table 5: Simple Ranking of the prevailing drought related disease & parasite in four Districts
UDCSGB=Unknown disease causing swelling gall bladder, MCF= Malignant catarrhal fever, FMD= Foot-and-Mouth Disease

3.5. Indigenous Control Methods of Livestock Diseases

Name	Part used	Preparation	Treatment/control/ for
Hammaressa/Accacia brevispica	root	Paste infusion	Grind the root into piece and squeezed administered orally For Cowdriasi and Diarrhea
Hargessa/Aloe scundi flora	shoot	sap	Squeezed and poured on area of pain ear, opthalmia, wound and burn
Makkanisa/Croton Macrostachys	Leaf	infusion	The leaf are simmerized in hot water and squeezed then used for prevention/treatments of bloat
Oda/Ficus Sycomoros	Leaf	paste	Formed from leaf +butter+coffee srabs Used for prevent/treat/ skin disease
Xaxessa/Rhus abyssinica	Leaf	paste	-Skin and eye disease -are pounded and the extract is smeared on the affected skin (mange)
Baddana/Balanites rotundifolia	Branches	Paste/Ash	To prevent/control/ tick infestation
Qorsa dima	Root	decoction	To control Rabies

Table 6: Name of medicinal Plant used in indigenous knowledge's of livestock disease control

ICM	Frequency					Percentage
		woreda				
	Yabello (n=24)	D/dawa (n=24)	Arero (n=24)	Dire (n=24)	Total	
Hygiene	3	4	3	2	12	12.5
Herbs	3	5	6	7	21	22
Self diagnosis	2	2	3	3	10	10.1
Movement	4	2	-	2	8	8.8
Bush burning	3	1	4	2	10	10.1
IS	-	-	-	-	-	-
Herd sharing	4	3	2	4	13	13.5
Breeding	-	-	-	-	-	-
Bounding	5	7	6	4	22	23
Total					96	100

Table 7: Frequency distribution according to indigenous methods of control of pest and diseases of cattle (n = 96) IS =incantation spiritual, ICM=Indigenous control methods

3.6. Effectiveness of These Indigenous Control Methods

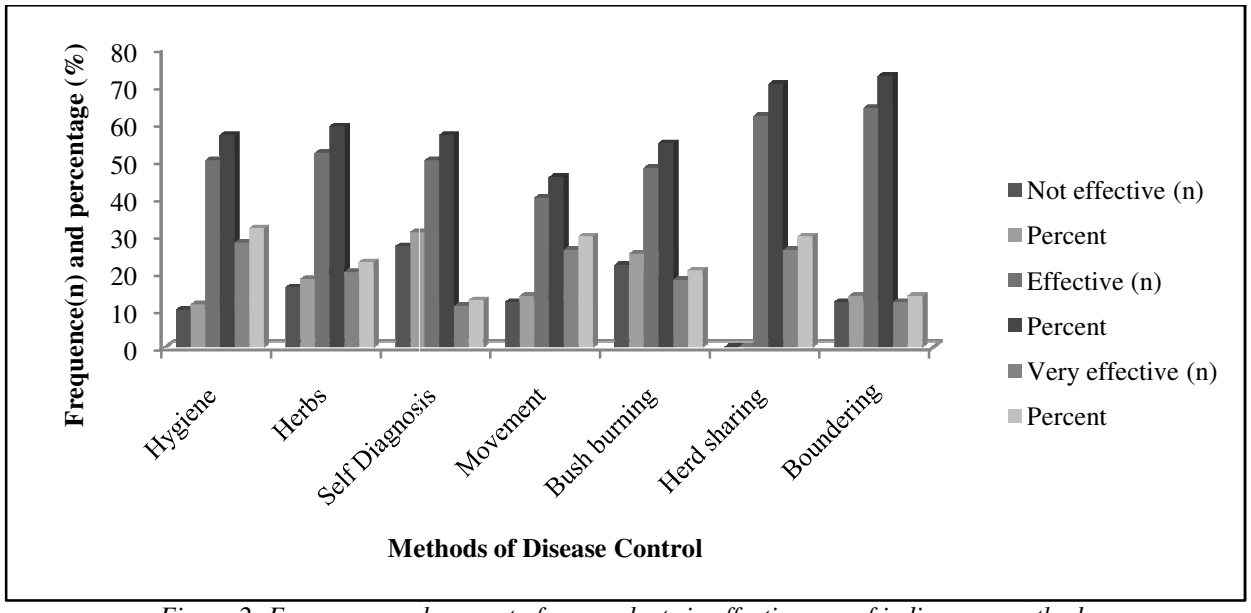

Figure 2: Frequency and percent of respondents in effectiveness of indigenous methods

3.7. Correlation Analysis of the Use of Indigenous Livestock Diseases Control and Some Independent Variables

Variables	r	Prob.
Age	0.55	P < 0.05
Marital status	0.83	P < 0.05
Contact with extension agent	0.26	P > 0.05
Educational level	0.44	P > 0.05

Table 9: Correlation analysis of the use of indigenous livestock disease control and some independent variables
**=significant, ns=non significant*

4. Discussion

4.1. Respondent Personal Characteristics

All the respondents were male. This may not be unconnected with the fact that cattle rearing are a male dominated occupation. Even where a few numbers of heads of cattle are owned by the women, the culture does not permit the women to claim ownership in the presence of a stranger. This is viewed as disrespect for the husband.

Age is an important variable when considering the use of indigenous knowledge in agricultural production. Table 2 shows age distribution of respondents. From the table, none of the respondent is less than 25 years; therefore they would be well experienced in cattle rearing and so be knowledgeable in indigenous methods of control of diseases of livestock. Similar with the finding of *Adekunle et al*, (1995) reported as none of the respondent is less than 30 years, therefore they would be well experienced in cattle rearing and so be knowledgeable in indigenous methods of control of pests and diseases of cattle. Data in the table 2 below revealed as the majority of respondents are range between 35-50 years of age which hold about 43.8% and proceeded with the respondents involved in 50-60 years of age with 30.2%. This probably due to the lack of veterinary service in previous so, the livestock holder or herd men voluntarily or involuntarily had develop some practice that help them to kept their stock from disease and disease caused vectors in their resident. Majority of indigenous knowledges has been practicing in different parts of the country are mostly covered by elder men than youth (*Adekunle et al*, (1995).

From the results in Table 2, it can be seen that the majority of herdsmen were married (only 12.4 percent were unmarried). When this is viewed against the age distribution, this may be expected, as all the respondents were adult herdsmen. According to the result the majorities of herdsmen was married and carry the high percents (about 87.5%) of the respondents presented as general, but specifically 100% of the respondents were married in Yabello woreda. This might be due to the person who go in age has high contribution in developments of indigenous knowledge's which is the same with the study result reported by *Adekunle et al*, (1995)

The frequency of contact between herdsmen and extension agents shows that extension service as related to livestock production is not elaborated. Those that indicated a visit every month are herdsmen that are close to government livestock farms especially in Borena Zone. According to the respondents idea the contact between the herdsmen and agricultural extension agents is very low, about 50.1% of the respondents are said they are contact with extension only once per a year and about the 7.3% of them contact once per a month. As the respondents, although contact with extension agent is aid in development of knowledge's in different aspects, the frequency of contact has not any influence on practice of indigenous knowledge in health managements of their herds because, indigenous knowledge came through habit. There was also significant difference between the districts in terms of having extension services.

4.2. Constraints of Livestock Production in the Study Area

Livestock is the main parts in livelihood of pastoral and agro-pastoral ecological zone of the country. This sector of agriculture has high contribution in economy of the country in different aspects. That means the products and by-product obtained from livestock such as, live animal, meat, milk, skin and hide are the major resource acquired from livestock and being the center in economic development. Currently the country is receiving about 45% of income from cattle and its products through foreign exchange. The diversified income come from livestock's products and by-products are playing a great role in decrements of malnutrition of the farmers. However, the income obtained from livestock is very low, which is similar with the study result reported, the income generated from that livestock is very low due to major livestock production constraints identified by the community during current drought period (YRVL, 2011)

Even though, livestock are playing the great role in economic and livelihoods of the people in the country, the amounts of income and service they provide has not satisfactory till. This probably connected with short comes in livestock production and management practiced. As the respondents reacted for the question present to them, the several challenging factors are making us to reduce the use and services obtained from livestock. Among of these factors shortage of water point, diseases, road, drought, shortages of grazing land and lack of good veterinary service are the major and bottleneck of the livestock production and managements in the area.

In table 3. Below the different factors were ranked based on their intensively which start from one/ first to fifth ranks by considering the values provided by the respondents. The highest value could rank first while; the lowest values had ranked as fifth. Under this point may we can be confused with the factors available and the value it held, probably due to the degree of seriousness of these different factors found in different districts are not the same, which means, the problem serious in one are not serious in others. So, it makes the factors to be involved in the rank and out of the rank. The small line in the tables is representing the factors found in the area but, not involved in the rank based on frequent value given by the respondents.

According to the reacts of the respondents the major constraints in livestock production and managements in four districts of the zones is disease, distance from water point, shortages of grazing land, shortages of veterinary drug and drought respectively. Even though

the study area covers the large land of the zone, water resource and shortage of grazing land (feed) is the main problem particularly in agro-pastoral Peasant Association of the districts. This probably due to the large numbers of the land are covered with plant (herbaceous and bush) which suddenly dry and die in the dry season of the year, and also the crop residues produced is not sufficient to fed the animals in hard condition of the year. Animal and plant relationship has been counted as an inseparable bond in nature (Dibager, 2000).

Although the above point mentioned as shortcomings have been aggravated, the frequent conflict and bush invasion was the main problems in Dire and Arero districts, respectively. As the respondents said, the problem of conflict was cause for disentitlement and unstable livelihood. At this districts the informant described that the conflict caused since the area has been nearest to the boundary of the country where the frequent conflicts has been conducted which comparable with the idea of (***Rashid et al., 2010***)

4.3. Pests and Diseases Incidence among Respondents

The respondents have encountered the following pests and diseases among their herds. According to them the pests and diseases presented on Table 4 are the common pests and diseases in the four districts. Based on the respondents indicated that all of them have encountered ticks and mosquitoes among their herd; this shows that these two pests are very serious problems to cattle production. In fact, in Borena Zone, a herdsman indicated a new variant of ticks, which they locally called ***dendrisa*** that lives between the hooves of cattle resulting in lameness. .

FMD, Diarrhoea, Salmonellosis, Babebiosis, BCPP, and Trypanasomiosis are the very serious diseases of cattle in the study areas; they were encountered by 96.9, 94.8, 93.8, 90.6, 88.5, and 83.3 percent respectively of the respondents. Rinderpest, a popular disease of cattle was reported by about 46.9 percent of respondents, this is because rinderpest is a terminal disease that has received serious governmental attention through yearly vaccination programmed.

As the respondents, Tick is the main ecto-parasasite which has dominated the study area and cause for widely spread of different kinds of disease through direct or indirect contribution. All of the respondents interviewed are revealed that this parasite could hold the major place in disturbance of animals in their feeding time and place.

4.4. Major Disease Prevailing in Drought Period of Studies Areas

Diseases and the new emerging disease which are prevailing in their locality during the drought period were identified by probing the community. This enabled to identify the livestock top known diseases during this drought period in the selected PAs. As the top known disease in drought period in the study area like trypanasomisis, Babesiosis, Bovine contagious pleuropnemonia and Foot and mouth disease were analyzed and ranked respectively. Accordingly, the top known diseases highly prevailing and causing livestock death due to drought were ranked in each districts of the study as follows. Here ranking had made based on frequently occurrences of the disease in the area and the line could show the disease presented occasionally in these particular area not just common as the ranked one

4.5. Indigenous Control Methods of Livestock Diseases

Various indigenous methods used to control pests and diseases of cattle in their herds were presented in Table 7. Because of the higher price of modern medicines and lack of accessibility to a modern veterinarian in the rural areas, farmers rely on traditional veterinary medicinal healers for treatment of livestock ailments (***Rashid et al., 2010***). **However,** in most parts of Ethiopia, traditional healers are not willing to share their knowledge and experience (*Mesfin et al.*, 1994). The small line in the table () here was represent the indigenous methods could not be practiced in the district.

4.5.1. Hygiene

About 12.5 percent of respondents practiced this control method; this involves keeping the environment clean, setting fire to warm the environment at cold nights. This according to them prevents contagious Bovine pleuropneumonia and related disease which come through poor sanitation. Which similar with *Adekunle et al*, (1995), about 93 percent of respondents practiced this control method, to keep their herd from contagious *Bovine pleuropneumonia.* As the respondents said they practiced this method mostly in and around the night staying shed of animals. .

4.5.2. Herbs

This is practiced by about 22 percent of respondent's hand involves cutting different parts of herbs and boiling them for their animals to administer at different route. According to the respondents they used different plant parts to safe their animals from different disease and the vectors those cause for transition of disease. The most commonly used plants as treatments and control of livestock diseases with their part and routes of application can be describe in the following table below. Most of the indigenous knowledge used to prevent and treat the animals from different kinds of disease in the study area were, using different types and parts of herbs and implemented in different ways. Nearly 90% of livestock population in the country used plant based traditional medicines as their major health care system (Endashaw, 2007)

The commonly known plants and its part used in preparation of traditional drug which the residents or the people in the area used are list in the table.

Among these hammaressa/ Accacia brevispica/ and hargessa /Aloe scundi flora/ are plants which used for treatments diarrhea, cowdriasi, opthalmia, wound and burn in the study area.

According to the respondents, utilization of this plant and its parts is not restricted to used only at the occurrences of disease as treatments but, also they used it as controlling of disease by drinking or painting the body of health animals before the animals caught by the disease if they have any suspect about out breaking of the disease in the surrounding. Also they informed that they have used the leaf of hargessa /Aloe scundi flora by preserving at home to smoke it to the bite flies when its invasions in the area are predominant, particularly in the periods of onset and offset of the season which similar with the finding reported by Zelleke Dagnatchew (1997). The efficacy of some the herbs such as *Albezia anthelimentica* against intestinal helminthosis and that of the *Aloe* species in treating *Trychostogylus* species in sheep has also been confirmed and their pharmaceutical ingredients identified (*Ensermu et al, 2004)*

Moreover, the people in the study area practiced /use/Baddana/Balanites rotundifolia branches of the plants by chopping and rubbing with the body of animals to treat/prevent from the suffer of parasite like ticks and mange mite and also they wash the body of animals which infested with mite by sorghum grain. These might be due to the unfavorability of odour from the solution for bite flies. The root of the harkeena tree (common name) is used as a medicine to encourage cows to lactate, and koboo is used as a treatment for scabies which similar with the study of (Girma Adudga, 2004)

4.5.3. Self Diagnosis

This control method was practiced by about 10.5 percent of the respondents. Here the respondents relied on experience gained over time to arrive at the type of ailment. This knowledge come through experience is mostly observed on elder person of the respondents. This probably due to the elder person had the good information about the disease and its symptom in the last years when there was no/lack of modern veterinary service in the country. Furthermore, the elder person can have the ability spiced traditional drugs from locally available resources than the youth. The community uses clinical signs and circumstantial evidence to diagnose helminthosis. Particularly the presence of round worms and/or segments of cestodes in feacal material and flat "leaf-like" worms in the liver ducts, poor body condition and diarrhea are highlighted as their guide to diagnosis also revealed by Zelleke Dagnatchew (1997)

Even though self diagnosis ability between the districts of the study can slightly different as the react of the informant this controlling method is commonly practiced in four districts. Among theirs Arero districts has the highest value as compared to others. This is common with tick infestation, diarrhoea, helminthiasis mange mite and other common cattle disease in the area based on the following symptoms include loss in weight, body temperature, frequent defecation and through the critical observation of physical changes on the body of animals, which similar with the study of *Adekunle et al*, (1995).

4.5.4. Movement

In the study area about 8.8 percent of respondents practice this type of indigenous control method. It involves leaving an area for another when they notice the presence of pests or diseases especially in a case of sudden death of cattle. In case of Borena the movements of herd men with their livestock can take place in the season where the infestation of ecto-parasite is highly observed in the area to keep their animal at normal state. According to the respondents idea the movement is mostly connected with the drought and shortages of feed resources as the result in infestation of disease transmitting vectors. According to YVL (2011), movement of livestock, particularly in dry season when animals have reduced immunity due to scarcity of feed, is believed to be the main mechanism of FMD spread in pastoral areas. As a result, movement restriction of infected herds will very much reduce the spread and thus impact of FMD in the areas.

4.5.5. Bush Burning

The respondents believed burning surrounding bush would reduce the menace of tick infestation by burning of the eggs of the tick, as well as the elimination of possible intermediate host for pests and diseases. Ten percent (10.1%) of the respondents in the study area has practiced the bush burning methods of livestock disease control. As the respondent said, burning of the bush has high contribution in decreasing the spreads of disease transmitted agents in the grazing land and shed of animals, which similar with the study of *Adekunle et al*, (1995). In other ways, the eradication of some parasite like as ticks are result in decreasing the intensity of the disease those affect the welfareness of the livestock. Based on the data set in the Table 3 below the lowest frequencies can be seen in D/dawa districts', this may be due to the lower coverage's of land with undesirable bush which could be obstacle in grazing of animals in case of this district.

4.5.6. Herd Sharing

This involves the distribution of cattle among relatives in other location apart from the area of infestation during emergency disease and pest invasion in order to lessen rate of casualties. This method was practiced by 13.5 percent of respondents. In the study area this type of controlling methods were practiced in certain parts of the study area and this would have the advantages of keeping herds from disease and any parasite by taking their stock from area where the disease outbreak dominate to the area free from just the same problems.

Moreover, this method are importance to stay the stock in the area conducive for grazing and have the nutrients which aid the animals to develop muscle and other physiological function in appropriate ways. Also it help the herdsmen to allow the pasture on grazing land have optimum growth and reduce the problem of boat and any health problem come through moist pasture.

4.5.7. Bounding

Among the common activities the pastoralist has practiced in keeping their herds from any harmful things that like sudden departure of the disease by separating from the use of common resources which may cause for expanding of the disease. In case of Borena or the study area the respondent's safe /control/their cattle from disease by bounding from the area where the outbreak of disease is occurred. About 23 percent of the respondents in the study can use this method of disease control, particularly fence or refused to drink and graze together with the neighbour on common water resources and grazing land. Since they have believed the common resources can be the media for many harmful things, so they ordered not to bring the cattle into the area where the common resources are available. However, the current study is contrast to the study report revealed by *Barecha et al.,* (2009) about livestock movement across the border was a challenge for implementation of prevention and control program since each country has been performing those prevention and control activities separately without communicating each other

4.6. Effectiveness of These Indigenous Control Methods

The respondents rating of the effectiveness of the various indigenous control methods of livestock diseases is presented in Table 4. From the survey, the effectiveness of these control methods of diseases control depends on the type of pests and diseases concerned and the complexity of the attack. According to Table 4, indigenous control methods using hygiene, herd sharing, and herbs are effective in controlling the effects of livestock diseases of cattle. The effectiveness of the controlling methods list below was valued based on the value the respondents give accordingly.

Although the intensity of its effectiveness was show difference in percentage, the majority of respondents categorize under effective and very effective classification of the indigenous disease controlling methods. The highest percentage was recorded in boundering methods which means 72.2 % that have the greater value than the remaining methods

Next to the boundering the herd sharing is a second selective in its effectiveness by holding 70.5 percent as the respondents informs. The least one was bush burning according to the value placed in the table above of 54.6 percent. This might be due suspect, some parasite can pass through burn by hiding themselves in the soil then stand to attack and contribute a lot in spreading of disease among the herds. According to the respondents the herd sharing did not have not-effectiveness value because they believed that this method clearly kept the stock free from the disease when sharing occurred prior to bring of the disease into the area.

Generally the figure below can show the frequency and percentage of the effectiveness of the indigenous methods as a whole. So anybody can understand the value each method have on the bar chart with it difference.

4.7. Limitations of Indigenous Methods in Livestock Disease Control

The fact that some herbs are available only in certain seasons often limits the application of traditional medicine. Moreover, some of the preparations are mixtures of many kinds of plants which may be difficult to find at the same time and also may have negative impact since the dosage has been given by estimation, unless it is administered by more experienced person. In herd sharing also might be cause for the conflict among the herd men when the herd shared has been infected and make the herds in other side to be attacked. If it is not carried out in appropriated /carefully / the bush burning methods just burn the desirable parts of feed resource and other essential materials.

4.8. Correlation Analysis of the Use of Indigenous Livestock Diseases Control and Some Independent Variables

Of the four variables used in the correlation analysis only contact with extension agent, and educational level were not significant ($r = 0.26$). $p > 0.05$ and, ($r = 0.44$), $p > 0.05$ respectively). The fact that livestock extension services are not as active as crop extension services in may be responsible for the low correlation coefficient for contact with extension agent. A plausible reason for the non-significance of education is that the use of indigenous knowledge is a habit, which cannot be easily broken.

On the other hand, age, and marital status are significantly correlated to the use of indigenous knowledge ($r = 0.55$) $p < 0.05$, and ($r = 0.83$) $p < 0.05$ respectively).

The significance of age and the use of indigenous knowledge may be due to the fact that age is important when custodians of traditional knowledge are examined. The years of experience of the herdsmen would have afforded them the familiarity with the practice of indigenous methods, which are long enough to encourage their adherence to these methods.

5. Summary and Recommendation

Indigenous knowledge is the local knowledge that is unique to a culture or society. Is also known as local knowledge, folk knowledge, people's knowledge, traditional wisdom or traditional science that has been practiced in the area. The personal characteristics have their own role in developments of indigenous development such as age, year of experience, married status and illiteracy. Because, the people range in adult age of the year had good experiences in development of indigenous knowledge and has positive relationship with indigenous. Drought, disease, road, water sources, grazing land and lack of the sufficient veterinary service are the main constraints of livestock production in the area The different indigenous methods which practiced by local people to control the disease and disease caused agents are, hygiene, herbs, self diagnosis, movements, herd sharing and bounding. Boundering methods of disease control can used to kept animals not to reach the area infested with disease and disease transmit vectors and its contrast. The effectiveness of these methods are based on the time when and the way they apply the methods.

Indigenous knowledge's are important in decreasing the expense payee for health managements of livestock. Moreover, it contributes a lot in saving animals from the problem come through the healths of animals. So, using the indigenous knowledge in livestock disease control should be recommended if it practiced well and take place in appropriate way of implementation.

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