

**MAJOR LIVESTOCK HEALTH PROBLEMS IN MARKET ORIENTED
LIVESTOCK DEVELOPMENT IN METEMA WOREDA, NORTH
GONDAR ZONE, ETHIOPIA**

BY

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A thesis submitted to Faculty of Veterinary Medicine, Addis Ababa University, in partial fulfillment of the requirements for the attainment of the Degree, Doctor of Veterinary Medicine (DVM)

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LIST OF ABBRVIATIONS

FVM	Faculty of Veterinary Medicine
AAU	Addis Ababa University
LSD	Lumpy Skin Disease
ILRI	International Livestock research Institute
AHA	Animal Health Assistant
CAHWs	Community Animal Health Workers
IPMS	Improving productivity and Market Success
MoARD	Ministry of Agricultural and Rural Development
OoRADMW	Office of Rural and Agricultural Development of Metema woreda
NGOs	Non-Governmental organizations
Orf	Open Reading Frames
NCD	New Castle Disease
RDO	Research Development Officer
CSA	Central statistic Authority
PAs	Peasant Associations
OIE	Office International des Épizootics
GDP	Gross Domestic Products
NGRFPB	North Gondar Regional Finance and Plan Bureau

ABSTRACT

The research was conducted to assess the major animal health problems in market oriented livestock developments and to know the veterinary service in Metema woreda North West of the country from November 2006 to June 2007. A questionnaire survey was conducted in 80 livestock owners to collect information on major livestock health problems, veterinary service of the Woreda and production activities recognized by the farmers in the study area, and supported by group discussions, personal evaluations. Major animal health problems that constraint to be market oriented livestock developments and associated veterinary service are surveyed. These are listed based on the priority of livestock owners and key respondents with their veterinary name and corresponding local name in different age group and the occurrence of the seasons. Major health problems are: In Cattle: LSD, respiratory problem, skin diseases, babesiosis, mastitis and trypanosomosis. In goats and sheep diseases: ORf, respiratory problem, enteritis, pasteurellosis, skin disease. In Poultry: NCD, respiratory problem. In donkey: back sore and respiratory problem. Lack of veterinary service, drugs and vaccines, long distance to get veterinary service, absence of professionals at clinic are major problems.

Key words: Metema, Market-oriented, Questionnaire, veterinary, constraints, health problems

1. INTRODUCTION

Livestock in sub Sahara Africa is a vital resource in promoting development. Rationally they provide 20-30% of the gross Domestic Products (GDP) and as much as 70% of the cash income is generated from livestock at the farm level (Ndikimara *et al.*, 2000).

Ethiopia takes the lead in livestock population in Africa, with an estimated population of 43 million cattle, 23.6 million sheep, 18.6 million goats, 1.7 million horses, 4.5 million donkeys, 0.36 million mules, 0.6 million camels, and finally 34.2 million poultry (CSA, 2006/7). The Amhara regional accounts for 25% of cattle, 36% of sheep and goats, 17.6% horses, 33% donkeys, 25% mule, 5% camel and 30.4% poultry population of the country (CSA, 2006/7). The Amahara Region has the second largest population of livestock in Ethiopia next to Oromia (CSA, 2006 /7).

The livestock sector contributes about 33% of the region GDP and 15% of its agricultural GDP (NGRFPB, 2004). Livestock in the Amahara Regional State is quite important as a source of household income, traction power, and store of wealth. Livestock are especially important to the pro-poor development strategy in the Region. The regional government has recognized livestock as an important pathway out of poverty and has given much emphasis to improve development in its new strategic plan.

There are two ecological divisions which roughly split of the North Gondar Zone livestock production into two high land and low land agro- pastoral system. The highland accounts for 68% while the low land accounts for 32% of the total zone (North Gondar Agricultural and Rural Development, 2006). In the low land, livestock production has become the primary economic activity and an important source of food for the majority of the population. Agro-pastoral system, in the low land areas, is the second dominating production system. It involves seasonal mobility of livestock in search of pasture over a large area of rangeland.

Livestock plays a substantial role in the macro and micro economy of Ethiopia for its contribution to the production of food, industrial raw materials, inputs for crop production and export

earnings. Despite the significant importance of livestock in the country, animal productivity is low due to some important constraints such as inadequate feed, wide spread disease, poor health care services, poor genetic potential of indigenous animals and insufficient knowledge on the dynamics of the different farming systems existing in the country (Yirga and Hassen, 2000)

The International Livestock Research Institute (ILRI) in collaboration with the Ministry of Agriculture and Rural Development (MoARD) initiated a 5 year project entitled “Improving Productivity and Market Success” (IPMS) of Ethiopian farmers. The project aims at contributing to a reduction in poverty of the rural poor through market oriented agricultural development.

The main goal of this research project has been assessing the major health problems of market-oriented livestock development in west Gondar Metema Woreda, which is one of the 10 sites selected by IPMS. The main reason for undertaking the research study arose from the importance of livestock production in the country. The integral part involved the study of the common practices of the production system involving cattle (milk, meat, and market traction power), goats (meat, market) (Table 5) and poultry. Cattle are exported to the Sudan while goats are mainly used for the local market. Transhumance production system is a common practice with highland cattle moving to the low land during the main rainy season from June to October in search of feeds. This research project entails specific objectives engendering from the main goal. They are:

1. To assess the major animal health problems on market oriented livestock development in Metema woreda,
2. To know whether the veterinary services in the woreda were sufficient or not and
3. To characterize the livestock production system in Metema Woreda.

2. MATERIALS AND METHODS

2.1. Description of Metema Woreda

Metema Woreda is located at about 900km far from Northwest of Addis Ababa and about 180km from west of Gondar town. Metema is one of the Woredas of the Amahara Regional State located in the West. The woreda has an international boundary of more than 60km long distance between Ethiopia and Sudan borderline. It is found North of Quarra and Alefa, West of Chilga, South of Tach Armachoho woredas and East of the Sudan border.

The original inhabitants of the area are said to be the `Gumuz`. Due to the settlements programs carried out by the past and current governments, the area is populated of people from different areas of the Region and as result the natives are less in number. The Woreda is composed of 20 peasant associations, it has an estimated population of 78,328 people (54.2% male and 45.8% female) (CSA, 2006).

The main cultivated crops are sesame, sorghum and cotton. The altitude of Metema ranges from as low as 550 to 1608m above sea level (asl), while the minimum annual temperature ranges from between 22⁰C to 28⁰C. Daily temperature are very high during the months of March to May. It reaches up to 42⁰C. The mean annual rainfall in the Woreda also ranges from about 850 to around 1100mm. The extensive rainy months extend from June to the end of September. The soils in the area are predominantly black while some soils are with vertic properties. For this reason, farmers and investors in the area do not apply fertilizers. The total area of the woreda is about 3995 km.sq, much of which is covered by Acacia dominated forest and grassland (CSA, 2006).

Generally, livestock population in the Woreda is quite high, the estimated populations include: 141,494 cattle mainly under extensive grazing system, 40,086 small ruminants, more than 75% are goats, 12,177 donkeys all are male, 37,895 poultry and 4706 beehives. The major cattle breed is Fogera zebu breed, the Rutana cattle, originally from Sudan, and Fultana cattle from Niger and Nigeria, are minor cattle breeds. (OoRADMW).

2.2 Sampling Procedures

Twenty households from each PA (Awolla, Meka, Agamwoha, Shinfu) were selected based on randomly. A total of 80 households were selected where questionnaire survey was conducted. All animals owned by the respondents have been considered as study animals (Table 3). The sampling procedure of the PA was purposive type based on transport accessibility, and the selection of Rural and Agricultural Development of Metema Woreda, and the agro-ecology of the Woreda.

2.3 Study Design

2.3.1 Questionnaire

Questionnaire survey was carried out in a total of 4 Kebele, namely Awollala, Meka, Shinfu, Agamwoha. A total of 80 households randomly selected (Annex III) and interviewed using a structured questionnaire (Annex I). The questionnaire was designed to assess the livestock production system, assess major health problems in livestock, and the veterinary service in the study area.

2.3.2 Clinical evaluation

Animals came to veterinary clinics of Metema Woreda at `Gendewoha` from November 2006 to January 2007 for various of health problem were subjected to thorough physical examination for any associated health problems (Table 10).

2.3.3 Group discussion

Group discussions were conducted among 8-12 key respondents in each selected kebeles focusing on feed and water practice, major problems on livestock marketing system, major diseases and their occurrence and modern veterinary in their area service were the main points (Annex II).

2.4 Data Analysis

The data that has been collected was entered into Microsoft Office Excel Program then simple descriptive statistic was employed to analyze the data.

3. RESULTS

3.1 Characteristics of the Households in the Surveyed Area

The table shows sex, age and education levels of the households. It also indicates most of households are male. The age ranges from 23-70 years old and the average is 44 years old and most of the households do not have modern education.

Table 1. Characteristics of the households in the surveyed area

<i>Sex(N=80)</i>	<i>Age in year</i>			<i>Education level</i>		
Male=76	Min	Max	Average	no	1-6	religious
Female=4	23	44	70	66%	15%	19%

Min = minimum Max = maximum

Most respondents use labor utilization. The major activities are herding (81.5% of total respondents), Ploughing (81.2% of total respondents), harvesting (60% of the total respondents). Only 7 respondents were participating in off-farming employments mainly in local trade. Females in study area participate in decision.

3.2 Private Land Use Pattern

Table shows the land use pattern of the household level in the study area. It also indicates, the land holding ranges in hectare and the average holding.

Table 2. Private land use pattern

Types of land	N	Land holding (hectare) range and N in percent				Average
		< 1	1-2	2-3	> 3	
Crop land						
Owned	60	5	15	20	60	7
Rented	15	0	10	35	55	3.56
Follow land						
Owned	58	6	23	20	51	3.2
Grazing land						
Owned	19	16	35	28	21	1.97

N=number of respondents

3.3 Livestock Production

3.3.1 Livestock holdings

Table 3 shows livestock holding of the households in each selected PA and the corresponding respondents.

Table 3. Livestock holding

	<i>Peasant associations</i>				<i>Total</i>	<i>Average</i>
	Meka	Awolalla	Agamwoha	Shinfa		
N	20	20	19	19	78	19
Cattle	423	435	286	295	1439	360
Calf	112	103	92	81	388	97
Heifer	50	45	55	40	190	48
Cows	191	185	106	121	603	151
Oxen	70	102	33	53	258	65
N	12	17	25	5	59	15
Goat	201	225	300	119	845	211
Kid	61	75	85	53	274	69
Adult	140	150	215	66	571	143
N	-	1	2	3	6	-
Sheep	-	35	95	78	208	52
Lamb	-	12	17	18	47	12
Adult	-	23	78	60	161	40
N	15	19	21	12	68	17
Donkey	15	20	21	15	72	18
N	12	9	5	19	45	11
poultry	145	112	81	121	459	115

N= number of respondents

3.3.2 Purpose of keeping livestock

Cattle are utilized for milk, meat, market, draft power, breeding purposes. Small ruminants are mainly kept for meat, market and breeding. Almost all donkeys are used as packing animals, poultry are kept for meat, market and egg production (Table 4).

Table 4 Purpose of keeping animals and animal by products

(Respondents correlated percentages)

Species /Reason	Cattle	Goat	Sheep	Donkeys	Poultry
	N=78	N=59	N=6	N=68	N=45
Milk	96	-	-	-	-
Meat	91	96	100	-	100
Draft	92	-	-	-	-
Manure	44	2	-	-	-
Market	95	95	100	-	53
Breeding	88	88	83	-	37
Wealth	17	29	-	-	4
Hide	5	42	83	-	-
Egg	-	-	-	-	95
packing	-	-	-	100	-

N=number of respondents

3.3.3 Feed source and watering

As the table 5 shows, the main feed source is natural pasture in all season. The majority of respondents used natural pasture.

Table 5. Feed and feed availability of according to seasons

	N	Percent distribution			
		Dry season	Short rainy	Long rainy	All season
Natural pasture	80	0.0	2.5	2.5	95.5
Cereal and straw	20	75.0	25.0	0.0	0.0
Stover	71	94.4	5.6	0.0	0.0
Oil cake	73	71.2	28.8	0	0.0
Mineral	80	0.0	5.0	91.3	3.7

N= number of respondents

Almost all households use communal grazing land. The average distance of communal grazing land is about 6 km from the residence. About 55% respondents said that it is important throughout the year but more important in long rainy season (around 46.5% of respondents).

There is no, critical water shortage in study area. In this, regard and most respondents (94%) water their livestock on everyday basis from the rivers.

Almost 100% of the respondents apply salt supplements. They also have different salt source

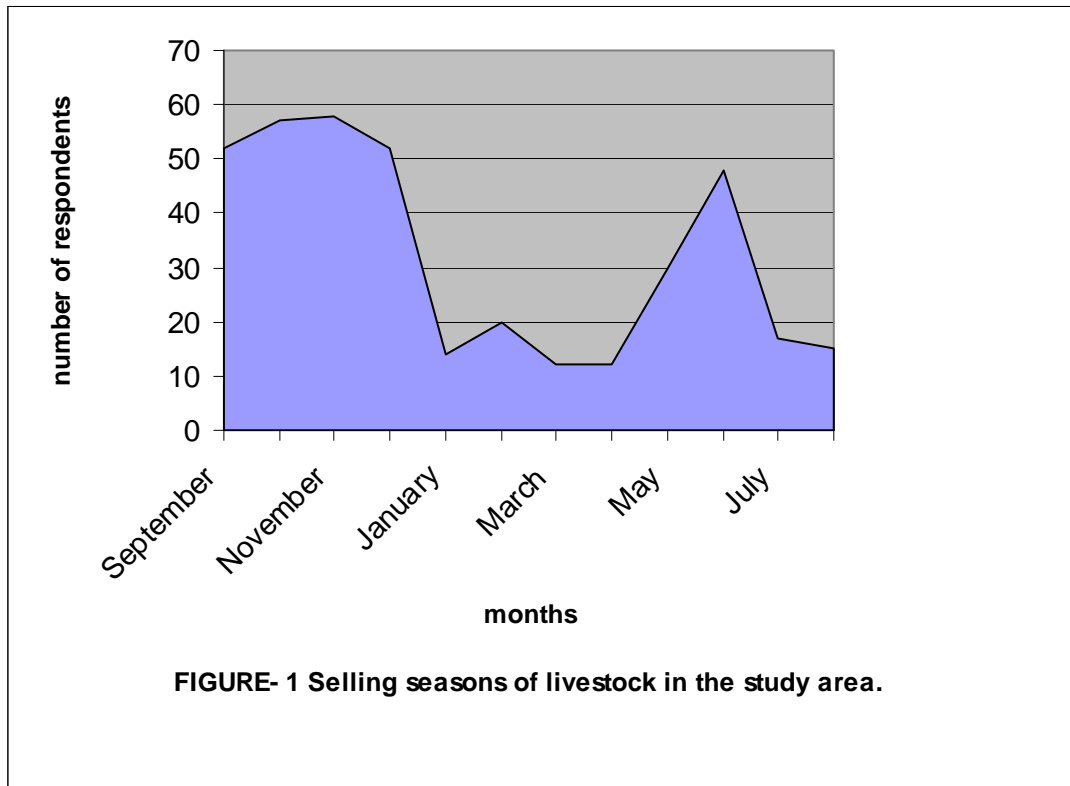
such as market (100% of the respondents). In addition, watering points are indicated as sources (20% of respondents use both watering and market source). Two respondents use plant source and 1 respondent on mineral soils as a source of salt in addition to the market.

3.3.4 Housing, breeding, recording, marketing trends

The housing system of livestock is generally separated from the houses of the owners and species are kept separated. Concerning livestock breeding practice in the area, all respondents use natural breeding method applying both controlled and uncontrolled local breed. In addition, most respondents have recording system such as recalling (around 98.5% respondents), measuring, and weighing (around 96.5% of respondents) which are traditional.

About 85% out of total respondents sold livestock last year (2005/6) in order to fulfill house expenses 83%, disease constraints and outbreaks 51.4%, paying credit and tax 42.6%, and 30.9% sold livestock due to old age. Mostly cattle, goat and poultry were sold. Most of the respondents sell their livestock whenever living costs rise. There are also other factors selling for profit particularly from September to December while cattle are getting fat and also animal selling takes place during May to June for the purposes of draft power and milk. In addition, transition seasons are among selling reasons to prevent disease outbreaks such as before March and April, which are critical hot months in the Woreda (Figure 1).

Figure 1 shows selling seasons for the last one year (2005/6)



3.4 Animal Health

3.4.1 Culling and mortality

The table shows the number of respondents' criterion and corresponding percentage. Most respondents cull their livestock when the animals get old, reproductive failure or infertility and poor production. In addition, the problems of diseases feature as one of the criteria for culling livestock.

Table 6 Culling criteria of respondents

Criteria	Respondents (%) N=80
disease	37.7
Old age	76.3
Reproductive failure and infertility	90
Poor production	95

N=Number of respondents

Concerning livestock lost due to health problems in previous one-year (2005/6), young animals have higher respondent percentage, calf (35.9%), kids (59.3%, lambs (66.7%), Poultry 126.7% of the respondent's percentages. The mortality of adult animals was relatively low.

3.4.2 Abortion and trends of disposing after birth, fluids, abortus, and cadaver

Figure 2 shows most respondents dispose after birth by the way of throwing, to direct provision for beasts such as dogs, hang on tree or bury into the hole. Some respondents answered that they dispose by burning.

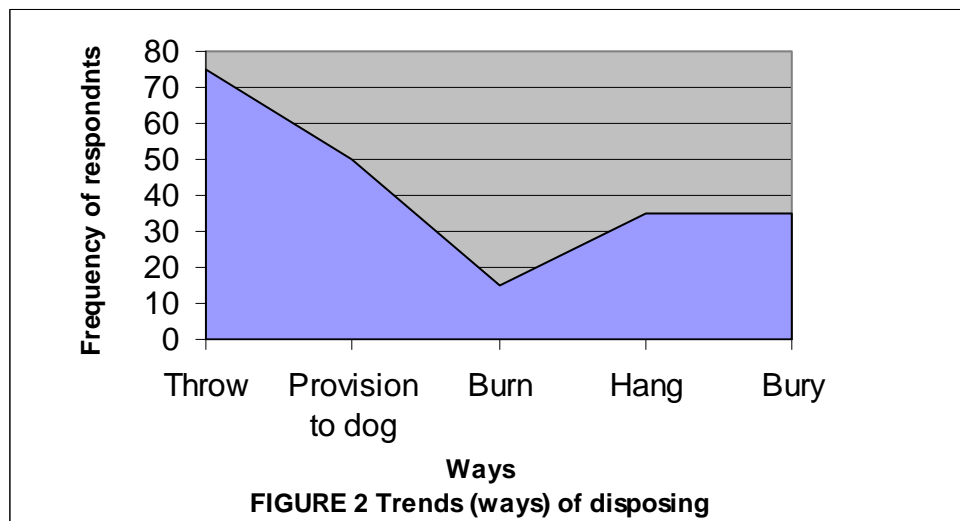


Table 7 shows the number and percentage of species aborted in the last two-year, terms and seasons of abortions. About 30 respondents faced abortion in both cattle and small ruminants in the last two years. The frequency generally shows late pregnancy period has high frequency for all species and abortion relatively high in dry season.

Table 7 Abortion in three species in last two year

Species	Cases	Term			Seasons		
		Early	mid	Late	Dry	Short rainy	Long rainy
Cattle	23	3	3	17	15	0	8
Goat	14	2	0	8	8	0	6
Sheep	4	0	0	4	4	0	0
total	41	5	3	33	27	0	14

3.4.3 Ways of consuming animal products

The respondents gave the following information on milk consuming trend out of 80 respondents 51% of them consume raw milk, 30% of them consume boiled milk, and 19% of them consume both boiled and raw milk. Most respondents consume cooked meat. 62.5% of the respondents consume only cooked meat while 17.5% of the respondents consume both cooked and raw meat

3.4.4 Major health problems

The table shows major cattle health problems in the study area with their vernacular name, the frequency of prioritized percentage in each age, sex category and the probable occurrence of the seasons.

Table 8 Distribution of major disease affecting cattle

<i>Disease</i>	<i>Vernacular name</i>	<i>Calf (%)</i>	<i>Heifer (%)</i>	<i>Cow (%)</i>	<i>Ox (%)</i>	<i>Seasons of occurrence</i>
LSD	<i>Yzehone wotetae</i>	20	20	23	13	Every 4 year
Babesiosis	<i>Dem-ashegnii</i>	4	15	12	15	Long and short rainy seasons
Respiratory problem	<i>sal</i>	10	10	7	12	High in dry seasons
Skin disease	<i>Yewich tegegna</i> <i>Or ekek</i>	9	10	5	9	High in long rainy seasons
Enteritis	<i>masmat</i>	27	6	5	3	All seasons
Mastitis	<i>Yetut beshita</i>			18		All seasons
Trypanosomosis	<i>Gendi</i>	3	5	7	12	After short and long rainy season
Black leg	<i>Abagorba or mich</i>					During long rainy season begins

Table 9 shows major goat health problems in the study area with their vernacular name, the frequency of prioritized percentage in each age category and the probable occurrence of the seasons.

Table 9 Distribution of major diseases affecting goats

Disease	Vernacular name	Kid (%)	Adult (%)	Seasons of occurrence
ORF	<i>Afemaze or Yefyeolch hiwot</i>	28	20	High in dry seasons
Respiratory problems	<i>sal</i>	19	20	All seasons
Pasteurellosis	<i>Gorersa\Ankelikil</i>	8	12	Transitional period
Skin disease	<i>Yewoch tigeegna Or ekek</i>	10	9	High in rainy seasons
Enteritis	<i>masmat</i>	12	7	All seasons

Few respondents motioned those major sheep diseases in their area: orf, respiratory problem, sheep pox, pasteurellosis and enteritis. Actually most of the respondents do not keep sheep.

Poultry health problem in the study area are taken as flock problem. Most of respondents (42%) put New Castle Disease (*Fengel*) as the first fatal poultry disease which is the highest. The second fatal diseases are mentioned as respiratory problems, enteritis. Back sore (29%) is the major problem affecting donkeys and prioritized as the first problem. The other important disease problems in donkeys, according to respondents are respiratory problem, skin diseases

3.4.5 Provision and utilization of veterinary services

Measures taken to tackle the diseases are modern treatment such as veterinary clinics, self and paravet medication. These are the most important modern treatments rating about 87.5% as the respondents have given answers on. In addition, 42.5% of the respondents use traditional treatment mostly in the case of infectious (97%) and parasitic problems.

Some respondents use traditional ways for non infectious such as wound problems. In addition to this, 12.5% of the respondents apply slaughter method. Concerning disease prevention, farmers mostly use vaccination about 85% of the respondents and 65% of them use quarantine methods. Based on present observations and assessments 33.8% apply good managements. To prevent

transhumances intervention from the high land during the long rainy season, transmit the disease, inhabitants in the low land reported to the government agencies although there is no response until the field work was finished, as the respondents complained. 52.5% of the respondents do not get facilities of modern veterinary clinics and the rest 47.5%) of the respondents do have accesses of veterinary clinics nearby their village. Most farmers apply self medication about (76 owner), 30 respondents use paravet medication and 34 respondents use AHA near by clinics

The problems encountered while treating and vaccinating livestock are lack of veterinary clinics (75% out of the total respondents), lack of drug and vaccine (100% of the total respondents), travel long distance to get veterinary services (80% of the total respondents), absence of professionals at clinic (30% of total respondents). Generally the cost treatment based on respondents is relatively moderate. 70% out of the total respondents said “the cost of treatment was moderate” when 23.5% said “the cost of treatment cheap” while those 6.3% responded “it is expensive”. Regarding the cost of vaccination 77.5% of the respondents said “it is free”. Around 68.7% of the respondents tend to reporting disease outbreak to government agencies. Based on the respondents the government gave response to those about 60% of the total reported outbreaks.

Out of the total respondents 33.8% confirmed the presence of NGOs. Out of those 75.8% were involved in animal health when others were involved in animal production, feed and water provision. 32.5% of the total respondents informed as about the presence of CAHWs in their areas whose involvements in livestock development have been similar to the NGOs.

3.4.6 Clinical evaluation

During the study time, around 200 cases were handled and examined. The following diseases were tentatively diagnosed which were frequently observed in Metema Woreda veterinary clinics and constraints of market oriented livestock developments.

Table 10 Cases tentatively diagnosed in Metema Woreda Veterinary clinics during the study time
(November 2006 to January 2007)

Most frequently encountered diseases	Frequency	Bovine	Caprine	Ovine	Poultry	Donkey
Respiratory Problem/Pneumonia	58	14	16	26	-	2
ORF	21	-	16	5	-	-
Trypanosomosis	14	14	-	-	-	-
Mastitis	12	5	4	3	-	-
Babesiosis	24	24	-	-	-	-
Ectoparasitism	29	12	7	10	-	-
Lumpy Skin Disease(LSD)	12	12	-	-	-	-
Enteritis	20	10	5	3	2	-
Sheep and Goat Pox	12	-	2	10	-	-
Back sore	8	-	-	-	-	8
Dermatophillosis	7	7	-	-	-	-
Lameness	5	2	3	-	-	-
Fungal disease/ringworm	2	2	-	-	-	-
Endoparasitism	5	1	2	2	-	-
Placental retention	4	2	1	1	-	-

4. DISCUSSIONS

4.1 Characteristics of Production System

The result shows that most respondents are low modern education level. The majority of respondents have enough crop land, fallow land and large communal grazing land (Table 2) which is important for livestock keeping. Livestock holding in the respondents is quite high and they keep livestock for different purposes such as milk meat, market, traction power (Table 4) while the productivities are lower than expected due to lack of good management, widespread of disease in the area and insufficient veterinary services, lack of awareness of the owners about livestock productivities and market outcome. The gap should be the responsibility of different sectors such as Rural and Agricultural Development of the Woreda, the Zone, and the Regional State and interested NGOs. Feed and water are not the problems of the Woreda; the problem is the inhabitants do not use this resource properly for the developments of market-oriented livestock developments. Based on the results there is no new methods for breeding, housing and recording. They are natural and traditional. These also have impact in the market-oriented livestock development in the Woreda. So new technologies must be involved. Selling of livestock in the area mostly not market targeted instead to fulfill living problems and other socio-economic problems.

The research has been on important livestock disease in Metema Woreda that constraint market-oriented livestock development; many diseases were diagnosed tentatively due to lack of facilities to confirm the diseases using recommended laboratory tests. These include parasitic, bacterial and viral diseases. parasitic diseases include babesiosis (*Demashgni*), trypanosomosis (*Gendie*), skin disease (*Yewoch tigkeiten or ekek*), bacterial diseases include black leg (*Abasenga or Mich*), general respiratory problems (*Sal*), pasteurellosis (*Gorersa*), mastitis (*Yetut beshita*), general skin problems (dermatophilosis), important viral diseases are LSD (*yezhone wotetae*) which was an out break during the studying time, contagious ecthema (orf) (*Afemaz or Yefiyeloch hiwot*), sheep and goat pox (*Yebeg eana Yefiyel Fentata*), New castle Disease (*Fengil*), undifferentiated diseases such as enteritis and fungal diseases are the most important that are characterized by the respondents (Table 8-9).

4.2 Cattle Health Problems

As it is mentioned in the material and methodology section of the research which is conducted chiefly by using questionnaire survey supported by group discussions and personal evaluations. The results of the study show cattle are affected by different types of diseases, most important of which are listed in (Table 8).

Bacterial diseases: There are several major bacterial diseases which are characterized by clinical signs such as nasal discharge, coughing and death. According to my personal observations tentatively diagnosed major respiratory problems are also pervasive.

Bovine pasteurellosis: the respondents characterized respiratory clinical sign and associating with stress factors such as long transportation, climatic change etc. During group discussions it was motioned as one of the major health problems in their area, during hot seasons, and transitional periods affecting highly adult age groups. *Septicemic pastuerellosis:* This is characterized by per acute septicemia and indicating high mortality rate. The other is *pneumonic persturellosis* which causes fulminating fibrinous lobar pneumonia (Rodastits *et al*, 1993).The disease is widespread in studied area may be due to insufficient veterinary service and lack of routine vaccination and lack of animal management awareness. The other is undifferentiated respiratory problems which is characterized by the interviewees with respiratory signs (locally called *sal*) with high average percentage in both ages.

Black leg locally called *abagorba* and also *michi* is considered as the major cattle health problem mostly affecting heifer and also adult ox (Table 8). There is a highly significant difference between seasons in black leg occurrence. The interviewees confirmed that black leg mostly occur during the mid dry season. The results are agreement with the reports from Tigray areas, North Ethiopia (Leggess, 1996).

Viral diseases: The results of this survey revealed that *lumpy skin disease (LSD)* is one of the major health problems with high frequent occurrence. It affects all age group (Table 8). Based on the respondents and group discussions the occurrence takes once in four years. The occurrence of

this disease was also reported in Dire Dawa, Moyale areas of the country even if it was low incidence (6.7%) (Damte, 2003). *LSD* occurs due to the presence of the insect vector which is important in transmitting the disease from sick to health animal (Damte, 2003)). The disease is widespread throughout the study areas. In the study area most farmers rely on vaccination even if the vaccination from the woreda veterinary clinic is not adequate to cover all households in the area. According to the interviewees and group discussions the interventions of the Woreda veterinary clinics are weak in controlling *LSD*. Based on the research the disease is also of chronic type. It decreases productivities, down grades the quality of hide and skin so that it is assumed one of the major health constraints to market oriented livestock developments in the study area.

Protozoa disease: The result reveals that *babesiosis* is important disease in the study area. Accordingly significant result was observed in all age groups (Table 8), which is common in rainy seasons. The geography determines by insect vector that transmits the disease (Rodastits *et al.*, 1993). As complained by the interviewees, *babesiosis* is the major cause of dehydration and blood urine finally leading to death. This disease also widespread over the Woreda due to lack of sufficient veterinary clinic and laboratory facility to diagnose, Owner's medication, paravet are also responsible of facilitating the widespread of the disease according to the group discussion of key respondents. In addition, they strongly complain about loss of productivity and market opportunity due this cattle health problem.

Trypanosomosis according to the respondents and group discussions, the disease occurs mostly after long rainy seasons and is important in cattle (ox, cow, and heifers) (Table 8). It is characterized by gradual body weight loss, inappetance locally called *gendi*. Based on the results the interventions of Woreda veterinary clinic and other related sectors on control and prevention of the disease is low. Trypanosomosis is transmitted mechanically by biting flies and cyclically by tsetse fly (Liggelt *et al.*, 1986). So, transmission relates to the presence of such vectors. According to (Lack *et al.*, 1993) fly population increases after the short rainy season which lies from April to June and also September to November. According to this survey higher proportion of male animals are affected which is very similar to the results drawn by different researchers (Muturi, 1996; Afework, 1998; Tewolde, 2001).

Lactating stress results into higher prevalence of trypanosomosis than non-lactating cows. The chronicity of the disease affects most animals that obscure the detection of the organism in the blood. (Rowlands *et al.*, 1995). Smear and the phenomenon of self-cure may have contributed for the relatively lower infection ranges in adult animals (Terefe and Abebe, 1999). The results of this study research finding are different from these reports with relatively more average percentage in adult cattle than young.

The result reveals that *mastitis* as major disease problem in female adult cattle and prioritized as a second disease in cows. Key respondents at group discussions, and clinical observations reveal that the disease is widespread in all the study area. Although there is no feed and water shortage the production of milk is very low due to this health problem. The problem is also aggravated by lack of good management in milking procedures, lack of modern treatment, and poor awareness of farmers on hygienic. These problems result in lose of productivity, income from the milk sale, culling of high producing cattle. Generally mastitis features as the major health problem in livestock developments in the study area. The research findings were agreement with the higher yielding cows moving susceptible to mastitis and teat injuries and which might happen due to some other confounding such as hygiene procedure, housing, climate, feed and management which facilitates transmission of mastitis. (Rodastits *et al*, 1994). Deep mud and excessive moisture in barn yard greatly increases the likely hood of coliform contaminating udder (Williams, 1995).

As the results also show calf are more affected by *enteritis*. In this case most of the respondents consider it as the major problem in calf health. It was also observed that this was the frequent problem.

Method of feeding colostrums was associated with the occurrence of diarrheas or enteritis with significant effect. Calves left with their dams for more than 24 hrs have higher blood IgM than those removed at birth or immediate after sucking prevent from calf *diahroea (enteritis)* (Andrews, 2000). It has always been assumed that the level of infectious, disease experienced by the newborn calf is directly proportional to the concentration of pathogen in the environment

(Andrews, 2000). One way of decrease those pathogens is by clearing the house of the calves. One research found that calves with partial or complete failure of passive transfer will survive when farm management and cleanliness carefully handled (Rebhun, 1995).

Skin diseases: The respondents considered this as important health problem in cattle and high occurrence in rainy season. The major cause is *ectoparasitism* such as tick infestation mangmites, bacterial and *Fungi (ring worm)* and viruses are know to cause general skin problem (Chalachew, 2001). Thus according the views of the respondents and group discussions the skin problems cause reduction of skin and hide quality, productivity of live animals and occasional death will result. In general skin diseases are the major problem in cattle and widespread in the worda. This is due to lack sufficient veterinary service, lack of control and prevention using different acaricide which affect the incomes of farmers, the economy of the area and market opportunities of the livestock.

4.3 Small Ruminants Health Problems

The most important disease constraints in small ruminant productivities in the study area presently are viral, bacterial and respiratory problems and skin diseases.

Viral disease: orf, the respondents characterized it by clinical sign such as ulcer, pus like sores on mouth, lips, ears, unable to feed and death. Regarding this disease, the result reveals in both young and adult of small ruminants which is the leading health problem in the study area (Table 9). As verified by respondents it is one of the most important disease arising from problems of keeping both goats and sheep resulting in an average percentage 28% in kids, 20% in adult goats a being prioritized as the first health problem in goats during hot and dry season. The disease is most common in lambs 3-6 months of ages although lams from 10 to 12 days and adult animals can be severely affected are outbreaks occur at any time. But they are most common in dry season when the sheep are at pasture (Radostits *et al*, 1993).

Bacterial disease: The respondents also consider pasteurellosis as the major health problem both in goat and sheep. This health problem has average percentage frequency 19% in kids and 20% in adult goats (Table 9). Respondents mentioned some important manifestations and histories of such as nasal discharge, coughing, stress and occurrence of sudden death and local name of the

diseases. The occurrence of the disease which is during hot season and transitional periods is similar occurrence to *bovine pasteurellosis* (Radostits *et al.*, 1994).

The result shows general *respiratory problems*. This is also one of the major health problems in small ruminants all age are susceptible. This health problem manifests in nasal discharge, chronic coughing and rarely death. And locally named as *Sal*. The occurrence of this disease is common in all seasons although it is very high during long rainy season. It is widespread in the study area due to lacks of sufficient veterinary service, modern education and lack of management awareness in the study area.

The results also indicate *skin diseases* in this case the respondents consider it as major health problem in the area. During group discussions, the respondents mention that the skin diseases are cause reduction of skin and hide quality, productivity of live animals and vocational death. Skin problems caused by lice, keds, ticks and mange mites result in serious economic loss of smallholder farmers affecting raw materials for the tanning industry meaning the income of the country as a whole. The diseases also result in mortality, decrease of production and rejection of skins. According to (Bayou, 1998) skin problem due to ectoparasite cause 35% sheep skin and 56% of goat skin rejections. Other skin diseases are bacterial (*dermatophilosis*) viral such as *sheep and goat pox*, *LSD* and *fungal dermatophylosis* (Chalachew, 2001)

Sheep and goat pox these health problems are motioned as a problem in small ruminants' production and considered as one major health problem. The respondent characterized it by typical pox lesions on peritoneal area under the tail and general distribution of lesions in lambs the disease occur by contact with infected animals and contaminated articles and inhalation (Radostits *et al.*, 1993).The disease is widespread in the study area .The veterinary service in the area is insufficient to control the spread this further decrease productivity of small ruminant both for household service and income generation. In Sudan it was reported that the lesion were generalized covering most of the body in young goat while in adult the lesion were discrete and seen on the udder, mouth and shoulder.(Muhammed *et al.*,1982).The disease are highly contagious and spread quickly among healthy in contact animals (Kitching *et al*,1987).

4.4 Equine Health Problems (Donkey)

Donkeys are important to almost all households. This study establishes similarity from another report from North Gondar (Aweke, 1995). In Metema Woreda an adult male donkey cost 1000-1500 Birr. This may indicate the importance of the role of donkey in the rural and urban life of the woreda. But concerning the management in general the peasants and urban owners do not generally pay good attention to their donkeys. The overload and poor treatments harness material with high average percentage of 29% back sore has been surveyed. Concerning other diseases aspects undifferentiated *respiratory problems* have been surveyed as major health problem. *Skin disease* the respondent considered it one of the major health problem and constraint to decrease working power. Generally poor quality harness material, widespread of infection and skin diseases, lack of awareness of owners to modern veterinary clinics and lack of sufficient veterinary service all above have a serious impact on the their longevity, and productivity of donkeys in the study area.

4.5 Poultry Health Problems

As the results show the respondent have an interests in raising poultry, however almost all of them complained of the wide spread of fatal diseases causing high mortality of chickens. The major health problems in poultry are *NCD*, *respiratory problem*, *enteritis* and *ectoparasitism*. But all the respondent considered *NCD* as the most total health problem poultry mortality (of 42% average percentage) which agrees with the results other works such for example with that of (Ashenafi, 2000 and Dessie, 1996) .As to my observation some of the farmers have abandon raising poultry due to the disease problem. The epidemiology of *NCD* not clearly understood in village Ethiopia (Nasser, 1998). There has been frequent mass death of chickens in various parts of the country; this has not been substantiated with laboratory investigations (Aschalew *et al.*, 2005). Strains of *NCD* virus are widely distributed throughout Ethiopia (Nasser, 1998). Therefore in high temperature of the Woreda this widely distributed poultry disease and also lack of control and proper managements cause high mortality, loss of productivity, lead to low market income from the poultry.

5. CONCLUSION AND RECOMMENDATIONS

The goal of this research study has been to assess the major health problems in market oriented livestock development. Although the feed resource and grazing land are quite enough, the research that was carried out in Metema Woreda reveals of how widespread the diseases are the health problems of livestock. The study indicates Metema woreda has a high livestock population, which plays a substantial role in the livelihood of the farmers. In general, livestock is the most important unit of the Agricultural Community in both the market and the households' level. Unfortunately, animal productivity is very low in the area there are many reasons for this, among which is the major obstacle of widespread animal health problems.

In this research, the impact of livestock health problems and insufficient modern veterinary services figure out as the major problems in market-oriented livestock development and loss of productivities.

The major findings of livestock health problems drawn out of this study are:

- (1) In Cattle: (a) LSD, (b) Babesiosis, (c) Trypanosomosis , (d) Black leg, (e) Mastitis, (f) Enteritis, (g) Skin diseases, (h) Respiratory problems
- (2) In Goat and Sheep: (a) ORF, (b) Pasteurellosis, (c) Respiratory problems, (d) Sheep and Goat Pox, (e) Skin diseases
- (3) In Poultry: (a) NCD, (b) Respiratory problems, (c) Enteritis
- (4) In Donkey: (a) Back sore, (b) Respiratory problems. These diseases constraint livestock development in the market- oriented system of the Woreda.
- (5) As the results reveals lack of sufficient modern veterinary services are the other obstacle to achieve the goal.

On base of the results, the following important recommendations are suggested:

- Studies should be conducted on already assessed diseases in the area.
- Training and educating of the livestock owners in modern veterinary service awareness, disease control and prevention.
- Animal production and managements are very vital for the market-oriented livestock development as well as increasing productivity.

- Establishment of veterinary clinics with drug shops both in public and private sectors with qualified professionals, if possible in each Kebele, is imperative to reduce the problem.
- The facilities of laboratory equipments as well as different drugs availability in the clinics should also be enhanced.
- The transhumance interventions from the high land into the Woreda needs be solved.
- Routine vaccination for important diseases should be carried out before outbreaks takes place.
- The results of this study may serves as grounds for those who are doing further study on similar questions related to the rural and agricultural developments in Metema and other contingent areas.

6. REFERENCES

- Afework, Y. (1998): A Field Investigation on the Appearance of Drug Resistance of Trypanosomes in Metekel District, North West Ethiopia. Faculty of Veterinary Medicine, Free University of Berlin, Msc. thesis.
- Andrews, A.H. (2001). Calf Health: Managing Calf Health. The health of Dairy cattle Clarrida Company, USA.
- Aschalew, Z., Teshale, S., Esayas, G. And Gelagaye, A. (2005). New Castle Disease in Village Chickens in Southern and Rift Valley Districts of Ethiopia. National Veterinary Institute and Addis Ababa University, Faculty of Veterinary Medicine, Debrezeit, Ethiopia.
- Ashenafi, H. (2000). Survey on Identification of Major Disease of Local Chickens in Three Selected Agro-Climatic Zones in Central Ethiopia. Addis Ababa University Faculty of Veterinary Medicine, Debre Zeit, Ethiopia
- Aweke T. (1995). Donkey in North Gondar Socio-Economic Importance, Management and Health and Health Constraints. Addis Ababa University. Faculty of Veterinary Medicine, Debrezeit, Ethiopia. Pp. 23.
- Bayou, K. (1998). Control of Sheep and Goats Skin Diseases. In: B. C. LAN and Bayou, (eds). Proceeding of Control of Sheep and Goat Skin Diseases for Improved Quality of Hides/Skin. FAO, February 1998, Addis Ababa. Pp.13-14.
- Chalachew, N. (2001). Study on Skin Disease in Cattle, Sheep, and Goats in Around Welayta Soddo South. Addis Ababa University, Faculty of Veterinary Medicine, Debrezeit, Ethiopia. DVM. Thesis.
- Damte, D. (2003): Major health problems of cattle and camel in the field and Abattoir, Around Dire Dawa, DVM thesis, Addis Ababa University, Faculty of Veterinary Medicine, Deber Zeit, Ethiopia. DVM. Thesis.

- Dessie, H. And B. Ogle. (1996). A Survey of Village Poultry Production in the Central High Lands of Ethiopia. Part One of Msc. Thesis, Sweden University of Agricultural Science. Department of Animal Nutrition and Management, Uppsala, Sweden.
- Central statistical Authority. (February 2006/7 or 1999 E.C). Agricultural sample survey Report on Livestock and Livestock characteristics. *Volume II* Addis Ababa, Ethiopia.
- Kitching,R.P., Mcgrane, J.J., Hammond, J.M., Miah, A.H., Mustofa, A.H.M, and Majunder,J.R. (1987). Capripoxin Bangladeshi. *Trop. Anm. Hlth. Prod.* 19, Pp. 203-208.
- Leggess, G. (1996). Livestock Health Conditions in Central Tigray. In: Rural Exploratory Studies Processing of a Workshop, Oyhus, and A.O. and Gebru,G. (Ed). Agricultural University of Norwegian (AUN). Pp.85-100.
- Muhammed, K. A., Hago, B. E. D., Tayler, W.P., Nayil, A. A. and Abusamara, M. T. (1982). Goat Pox in the Sudan.*Trop.Anim.Hlth.Prod.* 14. Sudan. Pp 104-108.
- Muturi, K.S. (1999): Epidemiology of Bovine Trypanosomosis in Selected Sites of the Southern Rift Valley of Ethiopia, Debrezeit: Addis Ababa University, Faculty of Veterinary Medicine, Debrezeit, Ethiopia. Msc. Thesis.
- Nasser, M. (1998). Oral NCD Vaccine Trial and Studies of NCD in Ethiopia. Msc. Thesis. Firest Joint Msc. Course Program in Veterinary Medicine Epidemiology and Preventive Medicine. Addis Ababa University, Ethiopia and Freie Universitat, Berlin, Germany.
- Ndikimara,G., Suth, J., Kamadi, R., Ossera, S., Marambi, R., And Hamlet, P. (2000). Coping Machines and Their Efficiency in Disastering Prone Pastoral System of Greater Horn of Africa. Effects of the 1995-1997 ELNINO Rains and Response of Pastorals and Livestock. International Livestock Research Institute (ILRI), Nairobi, Kenya. Pp. 2-4.
- Radostits, O.M., Blood, D.C., Gay, C.C. (1993). *Veterinary Medicine a Text Book of the Disease of Cattle, Sheep, Pigs, Goats, and Horses.* Bailliaaere Tindall, London. Pp. 1138.
- Radostits, O.M., Blood, D.C and Gay, C.C (1994). Mastitis .In: *Veterinary Medicine Text Book of Disease of Cattle, Sheep, Goat, Pigs and Horses.* Ballaiaere Tindal, London.

- Rebhun, W.C. (1995): Disease of Dairy Cattle. Department of Clinical Science, College of Veterinary Medicine Cornell University, Ithaca, New York, USA.
- Rowlands, G.J., Mulatu, W., D`Ieneren, G.D.M., Nagda, S.M. And Dolan, R.B. (1995). Genetic Variation of PCV and Frequency of Parasitemia in E.Africa Zebu Cattle Exposed to Drug Resistant Trypanosomosis *Livestock Production Science* **43**. Nairobi, Kenya. Pp. 75-84.
- Terefe, G. and Abebe, G. (1999). Prevalence of Bovine Trypanosomosis in Two Woreda of West Gojjam Zone of, Amhara Region *Journal of Ethiopia Veterinary Association Volume-3*. Addis Ababa, Ethiopia. Pp. 1-8
- Tewolde, T. (2000) : Study on The Occurrence of Drug Resistant Trypanosomosis in Cattle in The Forming on Tsetse Fly Controlled Areas (FITCA) Project West Ethiopia. Addis Ababa University, Faculty of Veterinary Medicine, Debrezeit. Msc. Thesis.
- Williams, C.R. (1995). Disease of Dairy Cattle, 1st Ed. Philadelphia; Lea and Febiger Book. William and Wilkins .Pp. 287.
- Yirga, C, and Hassen M. (2000). Crop-Livestock Farming System in the Highland of Ethiopia: Smallholder Farmers Management Practice and Constraints In: Wheat and Weeds; Food and Feeds Processing of Two Stakeholder Workshop. Improving The Production of Crop-Livestock Production in Wheat Based Farming System in Ethiopia. Addis Ababa, Ethiopia, Octo, 10-20, 2000.

Annex I

A questionnaire format to assess major animal health problems

In Metema Woreda

I. Animal Production

1. Code [/ / /]		1.1. Date of interview [/ /]		
2. Kebele [/]		2.1. Peasant Association (PA) [/ /]		
3. Name of village []				
4. Name of the farmer []				
5. Owner's sex		6.1. Male []	6.2. Female []	6.3. Age []
6. Owner's education level	6.1.No []	6.2. Religious []	6.3. 1-6 Grades []	6.4.> 6 Grade []
7. Number of family members		7.1. ≤ 15 years []		7.2. > 15 years []
8. Private land use pattern		Own (ha)		Rented (ha)
8.1. Cropland				
8.2. Fallow land				
8.3. Grazing land				
8.4. Other				

9. Livestock inventory (number)

Species	Calves		Heifer	Cow		Oxen Castr.	Bull	Total
	Male	Female		Dry	Lact.			
9.1. Cattle								
9.2. Camel								
Species	Kid/lamb		Yearling	Doe/ewe	Castr.	Buck/ram	Total	
	Male	Female						
9.3. Goat								
9.4. Sheep								
Species	Young	Mature female	Mature male	Total	Species			
9.5. Donkey						9.7. Poultry	9.8. Bees	
9.6. Horse								

10. Livestock products and function

Cattle	Goat	Sheep	Camel	Equi.	Camel	Poultry	Bees

11. Feeding practice (prioritise according to order)

Type feeds	Rank
11.1. Natural pasture	
11.2. Cultivated pasture	
11.3. Cereal straws ('teff', barley, wheat...)	
11.4. Stover (sorghum and maize)	
11.5. Salt and minerals	
11.6. Oil cake	
11.7.	

12. Communal grazing land

12.1. Is there communal grazing land?	Yes []	No []
12.2. Distance from the village (km)?		
12.3. In which season is most important?		

13. Availability and seasonality of feeds

Type feeds	Dry season	Short rainy season	Long rainy season
13.1. Natural pasture	[]	[]	[]
13.2. Cultivated pasture	[]	[]	[]
13.3. Cereal straws ('teff', barley, wheat...)	[]	[]	[]
13.4. Stover (sorghum and maize)	[]	[]	[]
13.5. Salt and minerals	[]	[]	[]
13.6.	[]	[]	[]
13.7.	[]	[]	[]
13.8.	[]	[]	[]
13.9.	[]	[]	[]
13.10.	[]	[]	[]

12. Traditional salt supplements

14.1. Do farmers traditionally supplement salt?	Yes []	No []
14.2. Natural source of salt	Watering points []	Plants [] Mineral soil []
14.3. Which salt source is most available?	Watering points []	Plants [] Mineral soil []
14.4. Time of the year for supplementation	[]	
14.5. List deficiencies observed (based on farmers perception) in order of importance:		

15. Watering

15.1. Watering source	River []	Stream []	Pond [] well []
15.2. Critical season of water shortage			
15.3. Frequency of watering during this time	Alternate day []	Every 3 days []	
15.4. Other strategy adopted:			

16. Housing

16.1. Separate from home	Species mixed	Species separated
16.2. Communal	Species mixed	Species separated

17. Breeding

17.1. Controlled	Natural	AI
17.2. Uncontrolled	Natural	AI

18. Recording

18.1. Do you know the performance of your animals?	Yes	No
18.2. If yes, how?		

19. Labour utilization

19.1. Do you use hired labour?	Yes	No
19.2. If yes, for what activities?		
19.3. Do you do other income farm activities (off-farm employment)?	Yes	No
19.4. If yes list the activities usually performed		
19.5. Do females involve in decision-making?	Yes	No
19.6. If yes, list those activities requiring her decision		

20. Marketing

20.1. Did you sell livestock during the last year?	Yes	No
20.2. What are the main reasons of selling livestock		
20.3. The main season of selling livestock		

II. Animal Health

21. What are your culling criteria?

Disease old age reproductive disease/infertility poor production other

22. How do you dispose the after birth/fluids/abortus/cadaver?

23. Have you encountered abortions in the last 2 years?

Yes No

24. If your answer to question 23 is yes;

Which species Which term which month/season

25. How do you consume animal products?

Way/product	milk	meat	eggs
raw			
Cooked/boiled			
other			

26. List (and rank) five important health problems in your area that affect livestock production and markets.

(i) Cattle

Calf (<1 year)	heifer	cow	Adult male cattle
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5

(ii) Sheep

(a) Age and season

Young (1- 12 months)	adult (>12 months)
1	1
2	2
3	3
4	4
5	5

(iii) Goats

Young(1- 12 months)	Adult(> 12 months)
1	1
2	2
3	3
4	4
5	5

(iv) Equine (horses, mules, donkeys)

Foal (1 year)	adult
1	1
2	2
3	3
4	4
5	5

(v) Camel

Calf (1 year)	Adult female	adult male
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5

(vi) Poultry

1
2
3
4
5

27. What measures are taken to tackle when the above health problems occur?

- a. Slaughter
- b. Modern treatment
- c. Traditional treatment
- d. Other

28. If you use traditional treatment, for which diseases?

- a. Infectious
- b. Parasitic
- c. non infectious
- d. surgical
- e. other

29. What measures are taken to prevent the disease?

- a. Slaughter
- b. Vaccination
- c. Quarantine
- d. Other

30. Is there access to modern veterinary service?

- a. Yes
- b. No

31. Who performs the treatment?

- a. veterinarian
- b. animal health assistant
- c. animal health technician
- d. owner
- e. other

32. What problems do you face when treating or vaccinating livestock in your area (rank them)?

- a. lack of modern services/clinics
- b. lack of drugs and vaccines
- c. transport/distance
- d. other

33. How do you judge the cost of modern treatment/vaccination?

	treatment	vaccination
expensive		
moderate		
cheap		

34. How many animals you lost during the last year due to health problem?

Species	Calves	Heifer	Adult male	Adult female
9.1. Cattle				
9.2. Camel				
Species	Young (1-12 months)		Adult (>12 months)	
9.3. Goat				
9.4. Sheep				
Species				
9.5. Donkey				Poultry
9.6. Horse				

35. Do you report any diseases/outbreak to the government body?

Yes [] No []

36. If your answer to question 35 is yes, did the government body respond?

Yes [] No []

37. If the government body responded, what measures were taken by the government?

Treatment [] Vaccination [] Other []

38. Has any training been provided to you in animal health care delivery in the last five years?

Yes [] No []

39. If your answer to question 38 is yes, what was the nature of the training?

40. Are there any community based animal health workers/NGOs in your area of operation?

Yes [] No []

41. If your answer to question 40 is yes, what is their area of engagement?

Animal health [] Animal production [] Feed and water provision [] Animal management [] other []

42. What suggestion do you give for improvement of animal health care activities in your area?

Annex II

Checklists for Group Discussion

Key respondents (8-15 known individuals identified by the DA for about 1 hr)

- Major feed types in the area
- When feed /water is a problem
- Use of natural (plants or water source) mineral supplements: when, where, where, major symptoms of the deficiency
- Known problems on livestock marketing system identified by farmers and measures taken.
- Major disease/site of the area and occurrence across seasons
- Modern veterinary service in their area
- Serious health and/or feed problems last year, before five years, 15 years, 20 years
- Priority of major livestock problems and anticipated solutions
- About extension service
- Presence of NGO in the area and their involvement in livestock development

Annex III
Randomly selected respondents from the four PAs

No	PAs	Village	Name of households	sex	Age
1	Meka	Meka	Kasaye Tekuare	1	44
2	Meka	Bisewer	Yaye Kebede	1	30
3	Meka	Feshifashit	Bilata Abay	1	25
4	Meka	ErtibBahir	Sissay Yirdaw	1	47
5	Meka	DerekBahir	Sewnet Fenta	1	60
6	Meka	Kikiret	Dinku Negede	1	40
7	Meka	Jirenwuha	Manasib Asema	1	50
8	Meka	Kunchaban	Alebe Ketema	1	55
9	Meka	Bisewer	Wudie Derejie	1	40
10	Meka	Feshifashit	Melkamu Desta	1	40
11	Meka	Jerenwuha	Biadgilign Worku	1	26
12	Meka	Jerenwuha	Sitotaw Abera	1	48
13	Meka	Meka	Birku Tigab	1	55
14	Meka	kikiret	Abiye Malede	1	57
15	Meka	Feshifashit	Derso Demissie	1	40
16	Meka	Meka	Gobeze brihanu	1	40
17	Meka	Bisewer	Fenta Demissie	1	40
18	Meka	Meka	Kebe Engdayehu	1	55
19	Meka	Kunchamb	Mekonen Negash	1	45
20	Meka	Feshifashit	GiZat Abiye	1	33
21	Agamwoha	Agamwoha	Abebaw Shume	1	70
22	Agamwoha	Agamwoha	Fatuma Yesuf	2	60
23	Agamwoha	Lemlem t	Yenus Kassa	1	55
24	Agamwoha	Arbaenba	Seid Abebe	1	48
25	Agamwoha	Erbrab	Mumamed yesuf	1	30
26	Agamwoha	Arbaenba	Tadesse Yimer	1	60
27	Agamwoha	Fendika	Hussen Bogale	1	60
28	Agamwoha	Arbaenba	Birhan Adamu	1	40
29	Agamwoha	Fedika	Mulat Wassie	1	42
30	Agamwoha	Agerbata	Muhamed Ali	1	54
31	Agamwoha	Agerbata	Muhamed Argaw	1	23
32	Agamwoha	Erbirab	Ausman Arebu	1	36
33	Agamwoha	Erbirab	Hussen Yirga	1	50
34	Agamwoha	Fendika	Jemal Kibret	1	38
35	Agamwoha	Erbirab	Yemame Shibshi	1	57
36	Agamwoha	Erbirab	Endris Nuru	1	55
37	Agamwoha	Agerbata	Adem Kibret	1	43
38	Agamwoha	Lemlemter	Nuru Yimer	1	60
39	Agamwoha	jalomeda	Hussen Ali	1	55
40	Agamwoha	Erbirab	Muhamed Hssen	1	40
41	Akushera	Barye	Alemu Techane	1	45

42	Akushera	Akushera	Ayalew Yeshabel	1	50
43	Akushera	Kumer	Anduaem Asefa	1	36
44	Akushera	mesh	Mebrat kassay	1	36
45	Akushera	Kumer	Mekaunet Dmile	1	37
46	Akushera	Mesh	Yideg Ayalew	1	40
47	Akushera	mesh	Abie Mebrat	1	30
48	Akushera	kobel	Anchinalu Alem	2	50
49	Akushera	Kumer	Abebe Anage	1	41
50	Akushera	Mesh	kenaw	1	45
51	Akushera	Kobel	Girmaw Adane	1	35
52	Akushera	Mesh	Abay Belachew	1	30
53	Akushera	Levasa	Tesfaye Alemu	1	40
54	Akushera	Guaria	Agmas Kassay	1	37
55	Akushera	Barye	Shiferaw Kassay	1	50
56	Akushera	Abaye	Derso Aklilu	1	40
57	Akushera	Mesh	Derso Wassie	1	36
58	Akushera	Awollal	Ejargew Dereje	1	48
59	Akushera	Akushera	Asmare Kassay	1	40
60	Akushera	Levasa	Mulatu tateke	1	50
61	Shinfa	Villahge-2	Wodaje Melke	1	45
62	Shinfa	Village-1	Tebebe Yirgaw	1	39
63	Shinfa	Village-4	Hagos Hailu	1	54
64	Shinfa	Village-1	G/Abizgie Kidane	1	47
65	Shinfa	Shukuria	Fisha Gebru	1	43
66	Shinfa	Village-2	Yismaw Sisay	1	32
67	Shinfa	Village-2	Etagegn Nega	2	39
68	Shinfa	Village-2	Amare Sisay	1	46
69	Shinfa	Village-5	Terfu Wobneh	1	47
70	Shinfa	MatebiaW	Adane Dejene	1	45
71	Shinfa	Village-4	Abie Bezabih	1	44
72	Shinfa	Village-3	Abye takele	1	51
73	Shinfa	Village-1	Serkie Birkie	1	33
74	Shinfa	Village-3	Woreket Adane	1	33
75	Shinfa	Village-2	Gashaw Takele	1	51
76	Shinfa	Village-3	Birhanu Tadege	1	40
77	Shinfa	Village-3	Sisay Siealu	1	50
78	Shinfa	Village-2	Enkuaye Atinafu	2	45
79	Shinfa	Village-3	Malde Mulu	1	34
80	Shinfa	Village-4	Worku tamirat	1	46

Key: 1=male, 2=Female