

**HEALTH COMMUNICATION TO PROMOTE FOOD SECURITY AND SAFETY AND
PREVENTION OF HUMAN CASES OF BOVINE TUBERCULOSIS AND
BRUCELLOSIS IN ASELLA, ETHIOPIA**

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A REPORT

Submitted in partial fulfillment of the requirements for the degree

MASTER OF PUBLIC HEALTH

Department of Medicine and Pathology
College of Veterinary Medicine

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2012

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Abstract

The Food and Agriculture Organization of the United Nations (FAO) funded a study in the Arsi Zone (Oromiya) of Ethiopia from August 2011 through February 2012. The aim of the study was to assess the prevalence of bovine tuberculosis and brucellosis in livestock, with the related public health risks. With that regard, the study involved a quantitative component—implemented by the Armauer Hansen Research Institute (AHRI), Addis Ababa, and a qualitative—health communication component—implemented by me. The applied questionnaire survey showed that most respondents had no accurate knowledge about the transmission of the two diseases. The result of the questionnaire survey also revealed that some of their behaviors would potentially facilitate the transmission of the diseases agents to humans. Such key behaviors concern the consumption of raw animal products, including milk and milk products. Even though the prevalence of the two diseases was relatively low (1% and 3.4% respectively), surveillance and prevention may be warranted, taking into account possible animal genetic improvement programs, animal movement in the area, and the community awareness about the two diseases. The identification of risk factors such as consumption of raw animal products, including milk, allows improving the Public Health through communication and awareness-building strategies.

Table of Contents

LIST OF TABLES	V
LIST OF ABBREVIATIONS.....	VI
ACKNOWLEDGEMENTS.....	VII
CHAPTER 1 BACKGROUND	1
<i>TERMS OF REFERENCE</i>	<i>1</i>
<i>RESEARCH QUESTIONNAIRE</i>	<i>2</i>
<i>KNOWLEDGE OF DISEASES.....</i>	<i>2</i>
CHAPTER 2 THE FOOD & AGRICULTURE ORGANIZATION OF THE UNITED NATIONS.....	4
<i>BACKGROUND</i>	<i>4</i>
<i>ORGANIZATIONAL STRUCTURE</i>	<i>5</i>
<i>MISSION MANDATE AND OBJECTIVES</i>	<i>6</i>
<i>BRIEF OVERVIEW OF MAIN ACTIVITIES.....</i>	<i>6</i>
<i>GEOGRAPHICAL SCOPE</i>	<i>7</i>
CHAPTER 3 FAO’S SUB REGIONAL OFFICE FOR EASTERN AFRICA (FAOSFE) ..	11
<i>BACKGROUND</i>	<i>11</i>
<i>MANDATE.....</i>	<i>12</i>
CHAPTER 4 BOVINE TUBERCULOSIS AND BRUCELLOSIS AS PUBLIC HEALTH CHALLENGES IN ETHIOPIA.....	14
<i>BOVINE TUBERCULOSIS</i>	<i>14</i>
<i>Risk Factors for Human Population</i>	<i>15</i>
Close physical contact.....	15
Food hygiene practices.....	15
Immune status	16
<i>Control Measures and Programs in Developing Countries.....</i>	<i>16</i>
<i>BRUCELLOSIS</i>	<i>17</i>
<i>Risk Factors: Human Population.....</i>	<i>18</i>
Close physical contact.....	18
Food hygiene practices.....	19
<i>Control Measures and Programs in Developing Countries.....</i>	<i>20</i>
CHAPTER 5 HEALTH COMMUNICATION AND ZONOSSES PREVENTION IN DEVELOPING COUNTRIES	22
<i>HEALTH COMMUNICATION AND SOCIAL ECOLOGICAL APPROACH</i>	<i>22</i>
<i>THE INTRAPERSONAL OR INDIVIDUAL LEVEL.....</i>	<i>23</i>
<i>THE INTERPERSONAL LEVEL</i>	<i>23</i>
<i>THE ORGANIZATIONAL LEVEL</i>	<i>24</i>
<i>THE COMMUNITY LEVEL.....</i>	<i>24</i>
<i>THE PUBLIC POLICY LEVEL.....</i>	<i>24</i>

CHAPTER 6 THE ROLE OF THE MEDIA IN RISK PERCEPTION	25
<i>HEALTH BELIEF MODEL AS A THEORETICAL FRAMEWORK</i>	26
<i>PERCEIVED SERIOUSNESS</i>	26
<i>PERCEIVED SUSCEPTIBILITY.....</i>	27
<i>PERCEIVED BENEFITS.....</i>	27
<i>PERCEIVED BARRIERS</i>	27
<i>CUES-TO-ACTION</i>	28
<i>SELF-EFFICACY.....</i>	28
<i>IMPORTANCE OF NARRATIVES FOR EFFECTIVE HEALTH COMMUNICATION.....</i>	29
CHAPTER 7 ACTIVITIES, METHODOLOGY, AND OUTCOMES.....	31
<i>ACTIVITIES</i>	31
<i>Developing Guideline Standards along with a Training Manual for the System of the</i> <i>Community Animal Health Workers of South Sudan</i>	31
<i>Participating in the preparation of the IGAD’s Regional CAADP inception workshop</i>	32
<i>Designing a Communication Package for the Prevention of Human Cases of BTB and</i> <i>Brucellosis in the Asella FAO’s project zone.....</i>	33
Communication scenarios and posters production.....	33
Scenario I: BTB.....	33
Scenario II: Brucellosis	34
Identifying and selecting artists for poster production.....	35
<i>FORMATIVE RESEARCH AND VALIDATION OF MESSAGES</i>	35
<i>Formative research</i>	35
<i>Message Design.....</i>	35
<i>PRETESTING COMMUNICATION CONCEPTS AND VALIDATION OF MESSAGES AND MATERIALS.....</i>	36
<i>AWARENESS RISING SESSIONS</i>	36
<i>REVIEW OF TECHNICAL DOCUMENTS</i>	37
<i>PARTICIPATION IN STAFF MEETINGS AND WORKSHOPS</i>	38
<i>Monthly coffee hours.....</i>	38
<i>FAO subregional office for Eastern Africa 5th management meeting.....</i>	38
<i>METHODOLOGY.....</i>	38
<i>OUTCOMES</i>	39
CHAPTER 8 DISCUSSION.....	41
<i>SUCCESS OF THE MISSION.....</i>	44
BIBLIOGRAPHY	45
APPENDIX - FIELD EXPERIENCE PRODUCTS	50

List of Tables

Table 2.1 First Table in Chapter 1	8
Table 2.2 First Table in Chapter 2	9

List of Abbreviations

- AHRI** Armaeur Hansen Research Institute
- AU** African Union
- BTB** Bovine Tuberculosis
- CAADP** Comprehensive African Agriculture Development Program
- CAHW** Community-Based Animal Health Workers
- CAPRIVAX** Contagious Ccaprine Pleuropneumonia Vaccine
- CDC** Center for Disease Prevention & Control
- CSO** Contract Service Organization
- DMP** Department of Diagnostic, Medicine, and Pathology
- ECA** Economic Commission for Africa
- FAO** Food & Agriculture Organization of the United Nations
- HBM** Health Belief Model
- IFPRI** International Food Policy Research Institute
- IGAD** Inter-Governmental Agency for Development
- ILRI** International Livestock Research Institute
- K-State** Kansas State University
- MARF** Ministry of Animal Resources and Fisheries
- MPH** Masters of Public Health
- NGO** Non-Governmental Organization
- OIE** International Organization for Animal Health
- RAF** Regional Office for Africa
- RIFTVAX** Rift Valley Fever Vaccine
- TCP** Technical Cooperation Program
- SFE** Subregional Office for Eastern Africa
- UNESCO** United Nations' Organization for Science, Culture, and Education
- UN** United Nations
- USA** United States of America
- WHO** World Health Organization

Acknowledgements

I would first of all like to thank God for blessing me with the opportunity to do a MPH degree at K-State as a grantee of the Fulbright Scholarship Program. With that regard, I am also grateful to the Federal Government of the US through the International Institute for Education (IIE) for giving me a chance to fulfill all the MPH Program requirements.

Similarly, this report is made possible thanks to a travel grant provided by Dr. Lisa Freeman and Dr. Douglas Rose, so I appreciate their contribution and their love. I thank the Staff of the College of Veterinary Medicine at K-State in general, and the DMP Department, including the MPH Program in particular for the supportive atmosphere provided all over my stay at KSU. It was truly a unique experience that I will always bear in my heart. Heartfelt thank you to my advisor Dr. Michael Cates, and his assistant, Ms. Barta Stevenson, my instructors and Committee Members. All you have been instrumental to my success inside and outside of the classroom during my K-State stay. I am proud to have been there and to remain a “**Wild Cat**” forever. My thanks also go to the Staff of FAOSFE in general, and to Dr Castro P. Camarada, Sub-regional Coordinator, Dr. Getachew Abebe, and Dr Emmanuelle GuerneBleich in particular, for having facilitated my placement at FAOSFE and then supervised my field activities. Last, but not the least, I would like to thank my family, in particular my wife Rose and my three children Herman, Geraldine, and Gisele. Thank you for all of your prayers, words of encouragement, and love. I hope to continue to make you proud.

CHAPTER 1 BACKGROUND

Bovine Tuberculosis (BTB) is highly endemic in dairy farms around Addis Ababa (Wondewosen et al., 2010; AHRI, unpublished). Studies on brucellosis prevalence in Ethiopia are only sparse so far. In addition to their serious economic impacts, the two diseases are a public health concern since they can be readily transmitted to humans via consumption of raw dairy products or close contact with infected animals (Cosivi et al., 1998).

Because milk is a staple drink in Ethiopia, the Food and Agriculture Organization of the United Nations (FAO) has signed a Letter of Agreement (LoA) with the Armaeur Hansen Research Institute (AHRI) in mid-2011 to provide up-to-date data about the two infections. The overall objective of the agreement was to assess the prevalence of BTB and Brucellosis in milk cows of the Asella milk cooperatives (Arsi Zone FAO-project sites of the GTFS/ETH/067/ITA) and to investigate risk factors as well as related awareness among the at-risk groups. Building on the results of this first level of work, my contribution as an intern at FAO was to develop a communication package for awareness rising about the public health risks related to the two diseases. My portion of the work was framed by the following terms of reference:

Terms of Reference

Under the general supervision of the FAO Sub Regional Coordinator for Eastern Africa and Representative to Ethiopia, AU and ECA on the one hand, and the technical supervision of SFE livestock officers, and in close collaboration with the AHRI Research Institute on the other hand, the intern will conduct different tasks that include:

- In close collaboration with the livestock experts from the FAO SFE team and the livestock team from the FAO Asella program, identify the priority areas to report from

the field findings AHRI and to bring the information into a simple information packages on Brucellosis and Tuberculosis in milk, challenges, impact and human health risks

- Develop a simple information/sensitization kits with pictures and design that fits to the context of Milk shed in Ethiopia; Brucellosis and Tuberculosis in milk, challenges, impact and human health risks, way to prevent contamination, how to diagnose it in the cattle, transmissions etc.
- Pretest the training packages in some dairy cooperatives and re-adapt the kits from the feedback received during the pilot trainings
- Organize similar training sessions in 1-2 additional milk sheds of in Ethiopia
- Make field visits

Yet, in January 2012, the AHRI has administered a research questionnaire to selected target groups.

Research Questionnaire

A questionnaire survey was applied in January 2012 to selected audiences of Asella FAO/AHRI project site by a team conducted by Dr Rea Tschopp. The interviewees were randomly selected from 130 households out of 620 comprised by the project zone. Verbal consent was obtained from the respondents and the objective of the survey explained to them before the interview. The interview questionnaire was translated from English to the major local languages—Oromo or Amharic—by the team.

Knowledge of Diseases

Seventy-seven percent (77%) of the interviewees claimed their knowledge of BTB, meanwhile 32% of the surveyed knew that the disease can be transmitted from livestock to humans. Moreover, 6% of the respondents thought that BTB cannot be cured while 32.3% did

not have any idea about the treatment outcomes. Furthermore, 4.6% of the respondents revealed that at least one of their family members had swollen cervical lymph nodes (characteristic of TB in humans) and 3.8% had at least one relative with clinically confirmed cases of pulmonary TB over the last 5 years.

On the other hand, 47.7% of the interviewees revealed their knowledge of brucellosis. However, 61.2% of the respondents said they have no idea about whether or not the disease could be treated. Similarly, 3.8% of the target groups recognized that at least one member of their family has been treated at the hospital due to brucellosis over the last 5 years.

As part of the diagnostic interventions, serology testing was applied to diagnose both BTB and Brucellosis in 13 milk cooperatives out of 24 in the project areas. As a result, a cut-off point of 2 mm for the cervical test revealed a prevalence of 1% for BTB, of which 9% were due to *Mycobacterium tuberculosis*—the causative agent of human TB. On the other side, the Rose-Bengal test has been applied to diagnose potential cases of brucellosis. On that basis, the test yielded a prevalence of 2%. Despite the relatively low prevalence rates of both BTB and brucellosis in the target areas, it appears that precise knowledge of the different risk factors is important for developing prevention and control measures (Amenu, Thys, Regassa, and Marcotty, 2008, Tschopp et al., 2011).

CHAPTER 2 THE FOOD & AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Background

The Food and Agriculture Organization of the United Nations (FAO) was founded in October 1945 with a mandate to raise level of nutrition and standards of living, to improve agricultural productivity, and to better the condition of rural populations.

Today, FAO is the largest autonomous agency within the United Nations system with 180 Member Nations plus the European Community (Member Organization) and more than 3700 staff members—1400 professional and 2300 general service staff. The organization's 2000-2001 biennial budget is set at \$650 million and FAO-assisted projects attract more than \$300 million per year from donor agencies and governments for investment in agricultural and rural development projects.

Since its inception, FAO has worked to alleviate poverty and hunger by promoting agricultural development, improved nutrition and the pursuit of food security—the physical and economic access to sufficient, safe and nutritious food people need to meet their dietary needs and food preferences for an active and healthy life. The FAO offers direct development assistance, collects, analyses and disseminates information, provides policy and planning advice to governments and acts as an international forum for debate on food and agriculture issues.

The FAO is active in land and water development, plant and animal production, forestry, fisheries, economic and social policy, investment, nutrition, food standards and commodities and trade. It also plays a major role in dealing with food and agricultural emergencies.

A specific priority of the organization is encouraging sustainable agriculture and rural development, a long-term strategy for the conservation and management of natural resources. It aims to meet the needs of both present and future generations through programs that do not degrade the environment and are technically appropriate, economically viable, and socially acceptable.

Organizational Structure

The FAO is governed by the Conference of Member Nations, which meets every two years to review the work carried out by the organization and approve a Program of Work and Budget for the next biennium.

The Conference elects a Council of 49 Member Nations to act as an interim governing body. Members serve three-year, rotating terms. The Conference also elects a Director-General to head the agency. The current Director-General, José Graziano da Silva, began a three-year term in January 2012.

The FAO is composed of seven departments: Agriculture and Consumer Protection; Economic and Social Development; Fisheries and Aquaculture; Forestry; Corporate Services, Human Resources and Finance; Natural Resources Management and Environment; and Technical Cooperation.

The Organization's work falls into two categories: a regular program, and a field program. The Regular Program covers internal operations, including the maintenance of the highly qualified staff who provide support for field work, advise governments on policy and planning and service a wide range of development needs. It is financed by Member Nations, who contribute according to levels set by the Conference.

The Field Program implements FAO's development strategies and provides assistance to governments and rural communities. Projects are usually undertaken in cooperation with national governments and other agencies. More than 60 percent of Field Program finances come from national trust funds and 22 percent is provided by the United Nations Development Program. FAO contributes about 16 percent - drawn from the Regular Program budget—through its Technical Cooperation Program (TCP).

Mission Mandate and Objectives

The Food and Agriculture Organization of the United Nations leads international efforts to defeat hunger. Serving both developed and developing countries, FAO acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy. FAO is also a source of knowledge and information. The world agriculture agency helps developing countries and countries in transition modernize and improve agriculture, forestry and fisheries practices and ensure good nutrition for all. Since its founding in 1945, FAO has focused special attention on developing rural areas, home to 70 percent of the world's poor and hungry people (UNESCO, 2011).

Brief Overview of Main Activities

The FAO's activities comprise four main areas as they are described below:

- 1. Putting information within reach.** The FAO serves as a knowledge network. The organization uses the expertise of its staff - agronomists, foresters, fisheries and livestock specialists, nutritionists, social scientists, economists, statisticians, and other professionals—to collect, analyze and disseminate data that aid development. A million times a month, someone visits the FAO Internet site to consult a technical document or read about the organization's work with farmers. FAO also publishes hundreds of newsletters, reports and books, distributes several magazines, creates numerous CD-ROMS and hosts dozens of electronic fora.

2. **Sharing policy expertise.** The FAO lends its years of experience to member countries in devising agricultural policy, supporting planning, drafting effective legislation, and creating national strategies to achieve rural development and hunger alleviation goals.
3. **Providing a meeting place for nations.** On any given day, dozens of policy-makers and experts from around the globe convene at headquarters or in FAO's field offices to forge agreements on major food and agriculture issues. As a neutral forum, FAO provides the setting where rich and poor nations can come together to build common understanding, and promote development.
4. **Bringing knowledge to the field.** The FAO's breadth of knowledge is put to the test in thousands of field projects throughout the world. The organization mobilizes and manages millions of dollars provided by industrialized countries, development banks and other sources to make sure the projects achieve their goals. FAO provides the technical know-how and in a few cases is a limited source of funds. In crisis situations, FAO works side-by-side with the World Food Program and other humanitarian agencies to protect rural livelihoods and help people rebuild their lives.

Geographical Scope

The FAO has embarked on the most significant reorganization since its founding. The fundamental objective is to bring the organization as close as possible to its Members. The reorganization requires more decentralized structure; a management system with increased delegation of authority; and an environment that encourages creativity and initiative.

The reorganization also strengthens FAO as a centre of excellence and a world reference centre with clear delineation of responsibility for global, regional and country-specific activities.

So, in addition to its Headquarters in Rome, Italy, FAO has an extensive decentralized network of:

1. Five (5) Regional Offices (South America; Africa; Asia and the Pacific; Europe and Central Asia, and the Near East)

Specific activities of the Regional Offices are to:

- Ensure a multidisciplinary approach to projects and programs implemented in the Region with FAO's technical assistance.
- Report on the major developments and trends in countries of the Region, based on Regional and Sub-regional objectives for food and agriculture.
- Organize the FAO Regional Conference for the Region, every two years.
- Maintain policy and technical dialogue with and among FAO member countries, involving national and international institutions.
- Follow up on the World Food Summit and issues related to Food Security in the Region.
- Promote technical cooperation among the countries of the Region.

2. Thirteen (13) Subregional Offices (Central America; South America; the Caribbean; West Africa; Central Africa; Eastern Africa; South Africa; Oriental and Near East; Gulf Cooperation Council States and Yemen; Central and Eastern Europe; Central Asia; Pacific Islands; and North Africa).

Specific activities of the Regional Offices are to:

- Ensure a multidisciplinary approach to projects and programs implemented in the Region with FAO's technical assistance.

- Report on the major developments and trends in countries of the Region, based on Regional and Sub-regional objectives for food and agriculture.
- Organize the FAO Regional Conference for the Region, every two years.
- Maintain policy and technical dialogue with and among FAO member countries, involving national and international institutions.
- Follow up on the World Food Summit and issues related to Food Security in the Region.
- Promote technical cooperation among the countries of the Region.

3. One-hundred forty-five (145) Country Offices

Specific activities of the Country Offices are to:

- Implement FAO's field projects and participate in the development of the Field Program by identifying and formulating new projects and by liaising with local donor representations.
- Help governments to prevent and assess the damage of disasters and assist them in reconstruction and rehabilitation of the agricultural sector.
- Carry out public awareness activities and support some important FAO campaigns such as TeleFood and the World Food Day.
- Provide assistance to technical and investment missions from FAO headquarters and from Regional or Sub-regional Offices to the country.
- Serve as the channel of FAO's services to governments and other partners (donors, NGOs, CSOs, research institutions, etc.).

- Keep FAO informed of major social and economic developments in the country and monitoring the situation of the agriculture sector in the country.
- Represent FAO before host governments and all partners involved in FAO activities.

Liaison Offices (five liaison offices and representation in more than 120 countries worldwide)

The Liaison Offices have been established at locations where many UN system organizations and other international, intergovernmental or non-governmental associations or organizations are working. They maintain relations with Members and external development partners operating in these locations. They monitor developments affecting nutrition, food and agriculture, and represent the Organization at meetings addressing matters falling within the mandate of FAO (FAO, 2010).

CHAPTER 3 FAO'S SUB REGIONAL OFFICE FOR EASTERN AFRICA (FAOSFE)

Background

The Subregional Office for Eastern Africa (SFE) serves eight countries: Burundi, Djibouti, Ethiopia, Kenya, Rwanda, Somalia, Sudan and Uganda. SFE is an advisory service centre to the countries it covers, with a core team of professionals based in Addis Ababa and the capacity to also draw upon a large body of expertise in FAO Headquarters and in its Accra-based Regional Office for Africa (RAF).

The sub-region has a population of about 300 million, with this number generally growing faster than 2.5% per annum (and therefore subject to doubling every 30 years). Current pervasive poverty will require extraordinarily rapid income growth for the largely rural populations. The prime challenge for agriculture is therefore, to find ways for its accelerated, but also profitable growth so it can uplift large numbers of people out of poverty. A related need is to find adequate non-farm income opportunities for currently land-dependent rural households to exit agriculture, so leaving more land per unit farm for economies of scale in commercializing the rural economy. Low input/low output approach to agriculture explains the fact that although the SFE sub-region has less than 4 percent of the world's population, it consumes the most food aid in the world (19% of 2001/03 global total) in an Africa that in turn dominates the world as food aid recipient (35% of global total) (Table 1).

Another challenge is indicated by FAO production statistics, that SFE countries are generally marginal producers of mainstream commodities that enter world trade, but are often among the lead producers of an assortment of locally vital, but globally less important products, examples being goat meat, camel milk, camel meat, plantains, sorghum, various millets, sweet

potatoes etc. But even for these internationally low-profile products, SFE production is not enough: if it were, there would be little need for reliance on food aid. For commodities used by other countries to achieve economic success, such as sugar, pineapples (Thailand); rice (Thailand, Vietnam), coffee (Vietnam); sugar (Brazil, Thailand); soyabean (Argentina, Brazil, Paraguay); palm oil (Malaysia, Indonesia); forest products (Indonesia) etc. SFE hardly features on an international scale (Table 2).

Mandate

The SFE mandate mirrors that of FAO in general: within the context of FAO's efforts of achieving food security for all, through the improvement in levels of nutrition, the betterment of rural livelihoods, the improvement of agricultural productivity as well as through the contribution to the growth of world economy.

The SFE's four main activities, all related to agriculture and rural development, can be paraphrased from the global FAO mandate as:

- Putting available and accessible information within reach of all concerned stakeholders;
- Providing policy and strategic advice and sharing expertise;
- Providing a meeting place for nations;
- Bringing knowledge to the field, especially international best practices.

Table 2.1: SFE annual food aid shipments by destination in context (2001-3 averaged)

(Eritrea included for Horn of Africa completeness)

Recipient	Cereals		Non-Cereals		Total	
	Mt/year	% of global	Mt/year	% of global	Mt/year	% of global
Burundi	42816		13724		56540	
Djibouti	10951		1741		12692	
Eritrea	242031		27600		269631	
Ethiopia	861261		20427		881688	
Kenya	139848		23614		163462	
Rwanda	34104		24488		58592	
Somalia	?		?		?	
Sudan	126126		22344		148506	
Uganda	75963		11394		87357	
<i>SFE countries#</i>	<i>1502400</i>	<i>20</i>	<i>176068</i>	<i>17</i>	<i>1678468</i>	<i>19</i>
<i>Africa#</i>	<i>2672161</i>	<i>35</i>	<i>371448</i>	<i>36</i>	<i>3043609</i>	<i>36</i>
World	7467296	100	1025268	100	8492564	100

- # = without Somalia receipts, which are significant. (Source: FAO, 2012).

Table 2.2: Highest SFE rank in production for selected commodities which have global mainstream trade potential

World mainstream commodity	Presence in global top 20 (and global rank)	
	SFE countries	Other African countries
Beef	None	S. Africa (No 15)
Maize	None	S. Africa (No 9); Nigeria (No 19)
Chicken meat	None	S Africa (No 15)
Cow milk	None	None
Mangoes	None	Nigeria (No 9); Egypt (No 10); Madagascar (No 16); Democratic Congo (No 17); Tanzania (No 18); Sudan (No 19)
Potatoes	None	None
Rice	None	Egypt (No 14); Nigeria (No 17); Madagascar (No 20)
Sugar cane	None	S. Africa (No 12); Egypt (No 15)
Tea	Kenya (No 4); Uganda (No 13); Rwanda (No 18)	Malawi (No 12); Tanzania (No 14); Zimbabwe (No 17), S. Africa (No 20)
Tobacco	None	Malawi (No 12); Zimbabwe (No 14)
Wheat	None	None

(Source: FAO, 2012).

CHAPTER 4 BOVINE TUBERCULOSIS AND BRUCELLOSIS AS PUBLIC HEALTH CHALLENGES IN ETHIOPIA

With an estimated 50 million cattle, 24 million goats, 26 million sheep, 2 million camel, Ethiopia possesses the largest livestock size in Africa (Behnke, 2010). However, due to various performance-limiting constraints, including diseases such as Bovine Tuberculosis (BTB), and Brucellosis, the productivity has always been sub-optimal and the two diseases represent part of the major public health concern in the country (Tschopp et al., 2011; Amenu, Thys, Regassa, and Marcotty, 2008).

Bovine Tuberculosis

Bovine tuberculosis is a chronic bacterial disease of cattle that can affect other species of mammals (USDA/APHIS, 2011). The disease is a major zoonosis that can spread to humans—typically by inhalation of aerosols or the ingestion of unpasteurized milk or other animal products (Anna, James, Jane, and Jeanne, 2010). Although eradication programs have resulted in reducing or eliminating the disease from developed countries, this infection is still common in less developed countries where it presents public health concerns (Awah Ndukum et al. 2010) due to absence or poor control programs. For example, of all nations in Africa (55), only seven apply disease control measures as part of a test-and-slaughter policy and consider bovine TB a notifiable disease; the remaining 48 control the disease inadequately or not at all (Cosivi et al. 1998).

As a rule, human tuberculosis can be caused by *Mycobacterium bovis* and the disease is reported from increasing numbers of developing countries where it is poorly controlled (Cosivi, 1998). The disease is endemic in Ethiopia where it is widespread in both humans and cattle. For example, according to the result of a study by Ameni, Amenu, and Tibbo (2010), 24.5% (23 of

94) of the interviewed had experienced at least one case of human tuberculosis in their families. Of these families, 43.5% (10 of 23) had reactor cattle. The disease in cattle is considered one of the major plagues that result in the highest morbidity and mortality. Although the nationwide prevalence of bovine tuberculosis is still unknown, recent studies estimate it to 3.4% for the small holder production system, and 50% for the intensive dairy productions (Shitaye, Tsegaye, and Pavlik, 2007; Tigre, Alemayehu, Abetu, and Deressa, 2011).

Risk Factors for Human Population

Close physical contact

Close physical contact between humans and potentially infected animals is commonplace in developing countries (Peden et al, 2007). For example, in many African areas cattle are an integral part of human social life; they represent wealth and are at the center of many events and, therefore, gatherings. As a result, with 65% of African populations working in agriculture, a significant proportion of the population may be at risk of BTB. Moreover, increasing numbers of socio-professional groups may acquire the disease by inhaling cough spray from infected cattle; they develop typical pulmonary TB. Such patients may infect cattle (Cosivi et al. 1998).

Food hygiene practices

Consumption of pasteurized milk contaminated by *M. bovis* has long been regarded as the principal mode of TB transmission from animals to humans (Solomon, 2009). The highest incidence of bovine TB is generally observed where intensive dairy production is most common, notably in the milk sheds of larger cities (CDC, 1998). In regions where bovine TB is common and uncontrolled, milk borne infection is the principal cause of cervical lymphadenopathy (scrofula) and abdominal, as well as other forms of non-pulmonary TB. Although proper food hygiene practices could play a major role in controlling these forms of TB, such practices are

often difficult to institute in developing countries, due to the weight of the socio-cultural mindset. Moreover, the informal sector can ignore standards of hygiene and quality, making that producers or their intermediaries sell directly raw milk to consumers (Cosivi et al. 1998).

Immune status

HIV infection is the greatest single medical risk factor; because cell-mediated immunity, which is impaired by HIV, is essential for defense against TB. However, other immunosuppressive illnesses (eg, diabetes) or therapies (eg, tumor necrosis factor [TNF] inhibitors, corticosteroids) increase risk but less than HIV (Merk Manual, 2011). Similarly, while Wondewosen et al. (2010) consider that an estimated 10–15% of human TB is caused by *M. bovis*, age has traditionally been considered an independent risk factor for the elderly have more years of potential exposure and are more likely to have impaired immunity. For example, researchers from Harvard University (2012) believe that the aging process somehow leads to a reduction of immune response capability, which in turn contributes to more infections, more inflammatory diseases, including tuberculosis. Moreover, it is established that most of the human cases of BTB in developing countries occur in young persons (Cosivi et al. 1998).

Control Measures and Programs in Developing Countries

Bovine TB can be eliminated from a country or region by implementing a test-and-slaughter policy, if no other reservoir host of infection exists (Cousins, 2001). While the test-and-slaughter policy is likely to remain the backbone of national programs for BTB elimination, the policy has numerous constraints (financial, mainly) in developing countries. Alternative strategies (e.g., programs based on slaughterhouse surveillance and trace back of tuberculous animals to herds of origin) may be technically and economically more appropriate in these countries (Becker, 2007). Even then, a major constraint is represented by the practice of backyard

slaughtering, which is commonplace in Ethiopia (Amenu, Thys, Regassa, and Marcotty, 2008). Therefore, measures to prevent transmission of infection should be the primary objective to be achieved with trained public health personnel, public education, and proper hygienic practices. Test-and-slaughter programs may be feasible and appropriate in an area such as FAO's Asella zone where the prevalence of BTB is still low (Tschopp et al., 2011; Cosivi et al. 1998).

Brucellosis

Brucellosis is a bacterial zoonotic disease caused by members of the genus *Brucella*; the ultimate sources of infection are infected animals. The key species are the major food-producing animals: cattle, sheep, goats, and pigs. However, other animal species, including bison, buffalo, camels, dogs, horses, can be very significant local sources of infection in some regions (FAO, OIE, and WHO, 2006). The disease in ruminants is usually caused by *Brucella melitensis* and *Brucella abortus*, and belongs to the world's major zoonoses, as it causes more than 500,000 human cases reported annually (Seleem, Boyle, and Sriranganathan, 2009). Symptomatically, brucellosis is a multisystemic infection and some symptoms may appear insidiously or abruptly (Anna, James, Jane, and Jeanne, 2010).

Human brucellosis is a severely debilitating disease that requires prolonged treatment with a combination of antibiotics, leaving permanent and disabling sequels, and resulting in considerable medical expenses in addition to losses of income due to losses of working hours (John et al., 2010). The disease presents a serious hazard to persons occupationally exposed to infected animals or tissues or animal products—abattoir workers, milk cooperative workers, cattle farmers, laboratory workers, and animal health workers (WHO, 2011; John et al. 2010).

Although direct person-to-person spread of the disease is extremely rare, cases of sexually transmitted human brucellosis, as well as foodborne transmission, and transmission

from infected mothers to their breast-fed infants are commonplace (CDC, 2008). Bovine infection presents a particularly serious problem because of the large volume of infected milk that can be produced by an individual animal and because of the extensive environmental contamination that even single abortions or infected births can produce (FAO, OIE, and WHO, 2006).

Risk Factors: Human Population

Close physical contact

People in developing countries dependent on livestock and this might explain the close relationship between animals and their owners (John et al, 2010). In many parts of Africa, brucellosis transmission to humans is associated with a wide range of risk factors, including direct contact with animals or their products or indirectly through consumption of raw dairy products.

According to a study in Nigeria (Baba, Sarkindared, and Brisibe, 2001), animal handling activities, including rearing, are not important factors in the prevalence of brucellosis. Instead, the highest prevalence resulted from interpersonal contacts among the rearers: for example, 20 %, which was the highest prevalence, was observed among cattle handlers followed in decreasing order of prevalence by goat rearers (10 %), mixed sheep and cattle rearers (9 %), mixed sheep and goat rearers (8 %), and 4 % among each of sheep rearers and non rearers of animals.

Similarly, distance between households was found to be an important factor in the transmission of brucellosis: the closer the households, the greater the chance of contracting the disease, irrespective of the serostatus of the neighbors (John et al, 2010). The authors also contend that settlement pattern of pastoral communities in Ethiopia is characterized by clustering of households with close proximity of herds in the pastoral camps, with mutual assistance to

neighbor's animal during parturition. Additionally, pastoral households often keep a diverse composite of livestock species as part of a coping mechanism for uncertainties and risks (Megersa B, Biffa D, Niguse F, Rufae T, Asmare K, and Skjerve E, 2011).

Of more potential significance is transmission through blood donation or tissue transplantation (Al-Anazi¹, Jafar, Al-Jasser, Al-Omar, and Al-Mohareb, 2009). Bone marrow transfer in particular carries a significant risk. It is advisable that blood and tissue donors are screened for evidence of brucellosis and that positive reactors with a history of recent infection be excluded. Children can be particularly at risk as they may adopt newborn or sick animals as pets. In some areas they may be the only group presenting with acute symptoms, as older members of the community are likely to be immune or chronically infected (FAO, OIE, and WHO, 2006). Similarly, individuals with immunodeficiency states resulting from disease or treatment with immunosuppressive agents may also be at increased risk of severe brucellosis.

Food hygiene practices

Ingestion of fresh milk or dairy products prepared from unheated milk is the main source of infection for most populations. This appears as a rule in Ethiopia where some socio-cultural practices foster the consumption of raw milk and fresh cheese. (Amenu, Thys, Regassa, and Marcotty, 2008). Brucella-contaminated milk is particularly hazardous as it is drunk in fairly large volume and may contain large numbers of organisms. Butter, cream or ice-cream prepared from such milk also presents a high risk (FAO, OIE, and WHO, 2006).

According to a household consumption and expenditure survey in Ethiopia (Pratt, Jabbar, Paulos, and Mulugeta, 2005), livestock products comprise only 8% of total food expenditure, with 4% of the expenses allocated to dairy products. The survey also shows that about 56% of the country's milk is processed into butter, cheese and yoghurt, meanwhile 44% is consumed

fresh. It appears that only a small amount of milk is processed into pasteurized milk, butter, and cheese by large scale commercial processors. Actually, due limited access to local markets, most of the milk produced in Ethiopia is processed on-farm into butter and soft cheese for home consumption and sale to the main butter markets found in towns (SVN, 2008).

As can be seen so far, given the complexity of the health issues facing the Ethiopian dairy sector on the one hand, and the high running costs needed to implement a sanitarily sound industry on the other hand (Haile, 2009), it appears that not only one company can be adequately equipped to meet the sanitary requirements of a rigorous milk value chain; starting from farmers and ending with consumers. As a result, an integrated approach is needed, including health communication strategies to promote the public awareness of both BTB and brucellosis, as well as the measures to reduce their human impacts (Tetra Pak, 2006).

Control Measures and Programs in Developing Countries

While milk pasteurization and education and awareness building have varying degrees of success, it remains primarily a veterinary responsibility to control brucellosis, including application of principles of epidemiology and animal husbandry. This can be better achieved through intersectoral collaborative strategies, because, according to WHO (2006), the implementation of any disease control program requires collaboration between many sectors if it is to be successful. Moreover, given the complexity of the health issues facing the Ethiopian dairy sector on the one hand, and the high running costs needed to implement a sanitarily sound milk industry on the other hand (Haile, 2009), it appears that not only one company can be adequately equipped to meet the sanitary requirements of a rigorous milk value chain, starting from farmers and ending with consumers. As a result, an integrated approach is needed, including health communication strategies to promote public awareness of both BTB and

brucellosis, the ultimate result being to reduce human health impacts in the project areas (Tetra Pak, 2006).

CHAPTER 5 HEALTH COMMUNICATION AND ZOOSES PREVENTION IN DEVELOPING COUNTRIES

Animal health-related foodborne diseases such as brucellosis and BTB, have a negative impact on livestock production in general, and milk production in particular (FAO, OIE, and WHO, 2006; Amenu, Thys, Regassa, and Marcotty, 2008). The effects of these pathologies are felt economically—through reduced production efficiency, carcass condemnation, and restriction of international trade, as well as sanitarily—through their public health implications, leading to permanent and disabling sequels with increased numbers of missed working days, considerable medical expenses, and losses of income (John et al., 2010). On that basis, public health education should be always included among the core activities in the framework of brucellosis and BTB prevention and control programs (FAO, OIE, and WHO, 2006).

As a rule, health communication campaigns are considered to be a major aspect of any public health program (Prilutski, 2010). However, effective risk communication has proved a daunting task, given the diverse situations in which the messages are required. Indeed, the way men and women understand disease, perceive risks and are prepared to change their behavior may differ according to their socio-cultural, economic, religious, educational, and other related backgrounds (Alders, 2006a). As a result, any solution approaches should be tailored so as to meet these specific determinants (Tetra Pak, 2006), and this can be effectively achieved through individuals' social ecology.

Health Communication and Social Ecological Approach

Proponents of the Social Ecological Approach argues that individuals exist in a nested hierarchy of social, cultural and environmental relationships – that, their attitudes and behaviors are the result of the complex interplay of factors on every level. Consequently, this framework

has provided the basis for effective public health interventions since the late 1970's (Koch & Souder, 2009).

Owing to the precepts of the Social Ecological Framework, the Social Ecology is divided into five levels and the most effective approach leading to the adoption of healthy behaviors is the combination of efforts at all levels—individual, interpersonal, organizational, community, and public policy (Jeannine, 2010).

The Intrapersonal or Individual Level

This involves strategies aiming at helping individuals to promote initiatives they need to get rid of a specific condition they have been facing so far; they need to answer the question “what can I do?” (Wilson, 2011). Individuals need to acquire appropriate knowledge/awareness, attitudes, and skills to adhere to the principle that by altering specific professional/lifestyle behaviors—providing the community with effectively pasteurized milk, for example, can reduce their risk of developing human brucellosis or tuberculosis (Jeannine, 2010; Wilson, 2011).

The Interpersonal Level

Family pressure, friends' pressure, and social networks' pressure can help individuals to increase their awareness of their risk of contracting brucellosis or tuberculosis through consumption of raw milk or milk products made from unpasteurized milk—fresh cheese, home-made butter, yogurt, etc., and therefore, to adhere to the idea that systematically boiling milk before consumption or avoiding consumption of fresh cheese, home-made butter or other milk products can reduce their risk of developing brucellosis or tuberculosis. Parents for example, can serve as good role models by always boiling milk before home consumption and by drawing the children's attention on that practice.

The Organizational Level

The assumption here is that organizations and social institutions to which we belong have an influence on our individual behaviors. For example, one can mention the importance of peer pressure (school, milk cooperatives, clubs and associations, work) to adopt specific behaviors

The Community Level

Relationships among organizations and community members affect our individual behaviors. This is particularly obvious in a realm where the human being has that potential to learn from the error of the others. Knowing that cases of human tuberculosis and brucellosis can result from consumption of raw milk, community members as milk cooperatives clients can become more demanding so as to make the cooperatives effectively adhere to the principle of pasteurizing milk before commercialization and regularly cleaning bulk milk containers and equipment. Similarly, media images depicting the advantages of consuming pasteurized milk and milk products.

The Public Policy Level

This involves the influence of national, state, and local legislative and other elective bodies in regulating specific activities—a milk boiling law, for example.

But, Health communication has much to celebrate and contribute. The field is gaining recognition in part because of its emphasis on combining theory and practice in understanding communication processes and changing human behavior (Rimal & Lapinski, 2009). This approach is pertinent at a time when many of the threats to global public health (through diseases and environmental calamities) are rooted in human behavior, and when media becomes instrumental in promoting risk perceptions.

CHAPTER 6 THE ROLE OF THE MEDIA IN RISK PERCEPTION

According to the online dictionary “Dictionary.com” (2012), the word “Media” stands for any kind of data including graphics, images, audio and video. Similarly, from an empirical perspective, risk is a concept that is inherent to thinking. This seems logical as far as different behaviors must be weighted in some way to enable the most beneficial to be chosen (Wahlberg & Sjoberg, 2000). But, media are often believed to be very important for risk perception, for media messages can efficiently and powerfully increase individuals’ awareness of a health topic, enhance knowledge of facts relevant to the health topic, influence people’s attitudes about the topic, enhance perceptions of self-efficacy to achieve healthful behavior change, and demonstrate skills necessary to successfully change behavior (Edwards, Schooler, Pawliw-Fry, & Hershfield, 2007).

As far as BTB and brucellosis are concerned, risk communication aims to heighten disease-specific perceptions and to persuade the public to adopt less risky and more healthy behaviors, which is, avoiding consumption of raw animal products such as milk, related milk products, and raw meat. However, although media can influence general risk perception, it still seems that personal risk judgments are resistant to change from this source; because personal experience has the strongest impact on risk perception, with other people’s experience told by themselves as second, and all other (at least third hand) information last in line—this means that lower-order experience will be suppressed (or ignored) if some higher-order information is present (Wahlberg & Sjoberg, 2000).

As one can see, by bringing together researchers and practitioners from diverse disciplines and adopting multilevel theoretical approaches, health communicators have a unique opportunity to provide meaningful input in improving and saving lives (Rimal & Lapinski, 2009).

Health Belief Model as a Theoretical Framework

The Health Belief Model (HBM) is the theoretical framework used during the awareness campaign in the frame of this project. Its underlying concept is that health behavior is determined by personal beliefs or perceptions about a disease and the strategies available to decrease its occurrence (John and Bartlett Publishers). On the other hand, personal perception is influenced by the whole range of interpersonal factors—the social ecology--affecting health behavior. Dutta-Bergman (2005), considers that there are seven perceptions serving as the main constructs of the model: perceived seriousness, perceived susceptibility, perceived benefits, and perceived barriers, cues to action, motivating factors, and self-efficacy.

Perceived Seriousness

The construct of perceived seriousness speaks to an individual's belief about the seriousness or severity of a disease. While the perception of seriousness is often based on medical information or knowledge, it may also come from beliefs a person has about the difficulties BTB or Brucellosis would create or the effects it would have on his/her life in general as a result of raw animal products consumption. For example, most of us view the flu as a relatively minor ailment. We get it, stay home a few days, and get better. However, if you have asthma, contracting the flu could lead you to the hospital. In that case, your perception of the flu might be that it is a serious disease. Or if you are self-employed, having the flu might mean a

week or more of lost wages. Again, this would influence your perception of the seriousness of the disease.

Perceived Susceptibility

Personal risk or susceptibility is one of the more powerful perceptions in prompting people to adopt healthier behaviors. The greater the perceived risk of contracting tuberculosis or brucellosis, the greater the likelihood of engaging in behaviors to decrease the risk (John and Bartlett Publishers).

Perceived Benefits

Perceived benefits are the individual's beliefs regarding the effectiveness of the proposed preventive behavior—systematically boiling milk before consumption to reduce exposure to TB or brucellosis. People tend to adopt healthier behaviors when they believe the new behavior will decrease their chance of contracting a disease.

Perceived Barriers

Perceived barriers to change decrease the individual's ability to engage in consuming raw milk or other related products (Schiavo, 2007). This is an individual's own evaluation of the obstacles in the way of him or her adopting a new behavior. Of all the constructs, perceived barriers are the most significant in determining behavior change (John and Bartlett Publishers). In order for a new behavior to be adopted, a person needs to believe the benefits of the new behavior outweigh the consequences of continuing the old behavior—consuming raw animal products (CDC, 2004). This enables barriers to be overcome and the new behavior to be adopted.

Cues-to-Action

The HBM also considers that behavior is also influenced by cues-to-action, which is, events, people, or things that move people to change their behavior. Cues-to-action are the specific stimuli that are needed to trigger the appropriate TB/brucellosis-related healthy behaviors (Schiavo, 2007; Coreil, 2009). Examples include illness of a family member, media reports, mass media campaigns, advice from others, reminder postcards from health care provider or health warning labels on a product.

Self-Efficacy

According to Bandura (1977), self-efficacy is the belief in one's own ability to do something. With regard to BTB and brucellosis, the concept taps into the amount of confidence individuals have in their ability to avoid consumption of raw milk; self-efficacy positively predicts the adoption of the preventive behaviors (Schiavo, 2007; Coreil, 2009).

However, the primacy of beliefs and the perceptual assessments in the HBM are founded in an individualistic theory of knowledge where the locus of choice is the individual (Dutter-Bergman 2005). Located within the individual's cognitive space, the enactment or non-enactment of a behavior is a result of individual-level processes that precede the behavior. Consider, in this realm of a collectivistic culture, in which the emphasis is on collective identity, and the barriers to action are located within this collectivistic context, it appears that the behavior is located in the characteristics of the collective and becomes a part of the collective being of the culture. On that basis, the meanings associated with the behavior and the behavioral outcome might very well be located in the social networks—the collective fabric of the community (Dutter-Bergman 2005).

Owing to this precept, although the HBM is my primary theoretical framework, a particular emphasis will be on culture-centered approaches, which are more likely to promote collective efficacy; because the proposed behavior in the frame of the HBM alone, might not be in harmony with the values and goals of the collective (Dutta, 2008). Therefore, it becomes important to develop culturally sensitive communication programs and policies, especially in resource poor countries where narratives are part of the culture (Kreps & Sivaram, 2008).

Importance of Narratives for Effective Health Communication

Ideally, narratives are essentially stories that people tell each other; but they can also be any verbal or nonverbal account of a sequence of events (Fisher, 1987). As forms of storytelling, narratives are common activities in all facets of life, including health situations. Fisher also considers that the entire narrative builds up a theme suggested through the stories of several lives, as can be related to cases of human tuberculosis or brucellosis resulting from raw milk or other animal products. In other words, the truthfulness of a narrative is experienced in readers' identification with the representation (Fisher, 1987).

While it is easy to think of narratives as “just stories,” they can be a powerful influence on the way that we see the world; because narratives are rarely neutral (Wright, Spark, and Ohair, 2008). When people tell stories, they frame events and the way they experience them in specific ways. This involves sequencing and interpreting events in meaningful ways that make sense to them. According to Fisher (1987), we process our lives in a series of events in an unfolding narrative—one with characters, a particular setting, and a plot. Narratives are also used to communicate experience to others, and when stories are told again and again, they can influence the way that large groups of people (and even whole cultures) interpret everyday life events. In

terms of health, narratives can be used to create, recreate, and sustain cultural beliefs about health issues (Harter, Japp, & Beck, 2005; O’Hair, Scannell et al., 2005).

For example, people who are living with a specific disease—let’s say tuberculosis—have a unique perspective of what it is like to live with such a disease on a daily basis. Even though physicians may know much more about TB than the patients they treat, if they have not lived with TB themselves, they likely have a much different perspective of the disease than someone who has had to cope with fear associated with a TB diagnosis, the sickness itself, or changes in relationship with others (Wright, Spark, and Ohair, 2008). On that basis, when people coping with the same type of disease or health condition meet one another, they often share stories about their experience and can therefore, influence not only one another’s perceptions, but more broadly the perceptions of their social environment about their common health issue in a variety of ways. A person who has lived with a health problem or who has a relative with a specific health condition can often be very significant in influencing the thought and behaviors of someone with a similar exposure due to the enhanced credibility associated with “having been there.” This is one of the reasons why peer support, including support among cooperative members, can be so influential in helping people to cope with health problems and maintain healthy behaviors.

Owing to what is above said, it is believed that narratives play an important role in changing the worldview of a community when it comes to dealing with health-related issues (Anderson & Geist-Martin, 2003; Arntson & Dodge, 1987; Cline, 1999). Stories told before a community is a way of conveying advice in a non-didactic fashion, which means that people do not give each other advice directly. Instead, people tell their stories about their personal experiences and what type of thoughts and behaviors helped them to cope.

CHAPTER 7 ACTIVITIES, METHODOLOGY, AND OUTCOMES

Activities

Developing Guideline Standards along with a Training Manual for the System of the Community Animal Health Workers of South Sudan

Poor animal health services at the grassroots level are one of the major constraints facing the rural populations of South Sudan in general and those of the states of the Greater Bahr El Ghazal in particular, albeit livestock production is the pillar of the livelihood in the country. In the 1990s, the concept of Community-based Animal Health Workers (CAHW) has been promoted with the purpose of eradicating rinderpest. As a result, that initiative has been well adopted by the local communities and was found to be conclusive in eradicating the disease in isolated and inaccessible areas of a country, which moreover was enduring the burden of a long civil war.

So, until recently, the promotion of the paraveterinary practice in South Sudan has been mostly possible thanks to funding from external donors through development NGOs and agencies. Hopefully, the 2005 Comprehensive Peace Agreement resulted in the effective independence of the country in July 2011. Thereby, the government can focus on its regulatory role to reorganize the livestock sector through the Ministry of Animal Resources and Fisheries (MARF). As a matter of fact, FAO, with its legendary expertise in that field has been in charge of assisting the government to develop a framework to better structure the paraveterinary practice while promoting the privatization of the veterinary services in the country.

Owing to his extensive experience as a community-based veterinarian, I have been called upon to input the CAHW component of the FAO's ongoing program "Sudan's Productive Capacity Recovery Program" in South Sudan. Although at a first glance these activities might not

be directly related to the field of public health, a close attention reveals that they are part of the mainstay of the local livelihood, for they strongly contribute to food security and safety, infectious diseases/zoonoses prevention, rural income, education, social and environmental equity, which are all key components of the health determinants.

Participating in the Preparation of the IGAD's Regional CAADP Inception Workshop

Following the severe drought affecting some 13 million people in the Horn of Africa, the regional governments along with international donors reinvigorated the push towards a shift from emergency response to more sustained medium to long term investment by both public and private sector actors (Muchina Munyua, 2012). The proposed Platform will bring together the partners and stakeholders to mobilize resources (human, financial, and physical) and coordinate the implementation of identified priority regional, and related national interventions /initiatives that create and/or enhance resilience against drought-related disasters. With that regard, the leadership role of FAO has been called upon, and that role will be materialized in terms of support to both the development of an IGAD Regional CAADP and the AfDB project identification process. The inception workshop of the IGAD Regional CAADP was held on January 22nd & 23rd 2012 in Djibouti, and my contribution in the preparatory activities has been multiform, including translating the platform's roadmap and other work documents and agenda either from English to French or vice-versa, handling participants' travel information and accommodation files, screening-selecting CVs of thirty-two candidates to various positions (related to the fields of Natural Resources Management, Agricultural Policy, Livestock Production & Fisheries), drafting a terms of references for each position under consideration.

Designing a Communication Package for the Prevention of Human Cases of BTB and Brucellosis in the Asella FAO's project zone

Communication scenarios and posters production

Four drafts of scenarios have been developed—two for BTB and two for brucellosis. For both the two diseases, one scenario portrays a farm whereby prevail disease-specific unhealthy behaviors and their consequences, meanwhile another scenario depicts the same farm with disease-specific healthy behaviors and their sanitary and economic consequences.

Scenario I: BTB

Farm I: Consuming only raw milk and the consequences of that practice

- Farmer + family drinking raw milk
- Farmers + skinny and sad kids, coughing, spitting bloody saliva
- Skinny herd; animals coughing, sneezing, a few calves...
- Milking cows (reduced milk production), serving raw milk to children & visitors
- Farmer taking milk (only 1-2 gallons) to Cooperative
- Hospital: Many patients with various symptoms of TB (skinny people coughing, bloody saliva ...)
- At local school: classes empty—kids/teachers sick
- Extension agent talking to the village

Farm I: Consuming only boiled milk and the consequences of that practice:

Women systematically boiling milk before household consumption

Result:

- Mothers boiling milk and serving it to children
- Farmer + family healthy, happy, children attending school, teachers healthy...

- Healthy herd
- More milk produced
- Technical staff talking to farmer's household
- Farmer taking more milk (more gallons) to cooperative
- Hospital: No patients;
- More children per household, happy, attending school; playing
- New houses build around

Scenario II: Brucellosis

Consuming only raw milk and the consequences of that practice

- Cows with hygromas; abortive fetus; fewer calves (yet, it is the reproductive season)
- Milking cows—reduced milk production (fewer milk for sale to cooperatives)
- Hospital: Many patients with symptoms of brucellosis (fever, head each, back pain, swollen testis...)
- School: fewer children, teacher absent, due to sickness

Farm 1 after months:

Consuming only boiled milk and the consequences of that practice:

- Healthy family,
- Healthy herd; more calves (reproduction season)
- More people to milk cows;
- More milk to sale to cooperatives
- Cooperative agent + extension staff talking to farmers
- Hospital: No patients

- School: many children in class
- Farmers talking to farmers for experience sharing (peer training)

Identifying and selecting artists for poster production

For that purpose, Professor Getachew Abebe and Muluneh Berhanu have been helpful in identifying each, one resource person for the work. Workneh Bezu Kassa on the one hand, and the duo Henok Wendirad (member of the Ethiopian Veterinary Association), and Yohannes Fitsumbirhan (member of the Ethiopian Visual Artists Association), on the other hand.

On top of assessing their respective professional backgrounds, each candidate has been asked to translate some written scenarios in rough sketch. As a result, the duo Dr Henok Wendirad, and Yohannes Fitsumbirhan has been selected as the best candidates from both technical and financial aspects for the required tasks. So this is to suggest the consideration of their recruitment.

Formative research and validation of messages

Formative Research

This activity is conducted in the early stages of designing a health communication program to understand the current practices, motivators, and barriers related to ideal behaviors (AED, 2004). As so, this research was conducted for the situation analysis and audience profile in order to assess the health communication environment, and the key needs and characteristics of all intended audiences. Other activities were also related to messages and material pretesting with intended audiences.

Message Design

A sound message design cuts across all communication channels, such as interpersonal or face-to-face communication, community-based activities (poetry, traditional folk media,

narratives, churches, local markets, community meetings, etc.), and mass media because, the more the messages reinforce each other across channels, the higher is the probability of effective impact (Schiavo, 2007). Ideally, effective strategic health communication messages are consistent and relevant to all channels and tools (Integrated Marketing Communication). This consistency and relevance contributes to the overall effectiveness of the communication strategy by ensuring that, for example, the service provider, the community mobilizer, and the actor featured in a radio announcement all reinforce the same key message points. This approach does not mean that planners create only one message for all these venues. It does mean that they identify the key points that are to be made in every message that is communicated to the audience, no matter which channel or tool is used.

Pretesting Communication Concepts and Validation of Messages and Materials

Pretesting is a way to assess whether communication concepts, messages, and materials meet the needs of intended audiences and are culturally appropriate (Schiavo, 2007). The pretesting of the posters produced as part of the BTB and Brucellosis communication package took place on Monday, 12 March 2012 in Asella (see pictures). The obtained feedback allowed to readjust the content of the posters and set appointment for the implementation of the public awareness campaign on March 26th and 27th in four milk shades of the FAO's Asella project zone.

Awareness Rising Sessions

It is generally accepted that rising public awareness of a topic or issue is to attempt to inform a community's attitudes, behaviors and beliefs (Sayers, 2006). Through information sharing, it is intended to positively influence these attitudes, behaviors and beliefs in the achievement of a defined purpose or goal: for example, preventing human cases of BTB and

Brucellosis for enhanced public health. The theory and practice of public awareness-raising has always drawn heavily on the literature of mass communication and social or "social change" marketing. Social change marketing refers to the practice of communicating or selling a 'good idea' with the stated object of changing community attitudes and actions. Promoting messages about public health (consuming only pasteurized milk to prevent the risk of human cases of BTB and brucellosis), education, environmental concerns and social inclusion are examples of such "good ideas." The implementation of the BTB, and brucellosis awareness campaign occurred from March 26th to 27th in four milk shades in Asella, including Harro Bilalo; Gondee, Denkaka Konicha, and Berite.

Review of Technical Documents

As a MPH graduate student, one of my expectations during this placement was to contribute to the improvement of services for FAOSFE's target populations. Therefore, I am glad I could effectively assist with the technical review of a series of documents, some of which are related to:

- A Pilot Project on Rabies Control through cost sharing with the community in Addis Ababa
- A Phase II Draft Report on the Assessment of Cross Border Informal Livestock Trade In the Somali Region of Ethiopia (as part of the Regional Initiative in Support to Vulnerable Pastoralists and Agro-Pastoralists in the Horn of Africa)
- Strategic Priorities for FAO/SFE in the Livestock Sector in Eastern Africa:
Strategic Plan (2011-2015) for the FAO/SFE Livestock Component

- A Pre-Liminary Inspection Report Ref.: Rt/1112178 on the delivery of 500,000 doses of CAPRIVAX vaccines in vials of 100 doses; and 400,000 doses of RIFTVAX vaccines in vials 100 doses to FAO on March 09, 2012
- A request from the Ministry of Agriculture of Djibouti for a goat milk project

Participation in Staff Meetings and Workshops

Monthly Coffee Hours

The FAOSFE Monthly Coffee Hour is an activity which aims to gather staff on a frequency basis—usually on a Friday every month so as to spend a good time together. During my stay, I could enjoy two of such meetings along with the staff.

FAO Subregional Office for Eastern Africa 5th Management Meeting

Held from Feb 28th through March 2nd, 2012, the gathering was the opportunity for Government Representatives to unveil their country-specific agriculture and food security-related key priorities: “Working together for Improved Food and Nutrition Security—Renewed Commitment to a Hunger-Free Horn of Africa.” I was admitted to the entirety of the sessions and I could intervene as much as I wished. The meeting was for me an opportunity to shape my awareness about activities planning process at the level of a UN agency such as FAO.

Methodology

All the activities carried out in the frame of this mission were conducted in friendship with the philosophy characterizing the UN principles in general, and FAO’s environment in particular, with in mind the need for complying with security norms, transparency standards, as well as a quest for a maximum participation of the target groups. The need for observing these principles has been brought to my attention through a series of two briefing sessions: including a FAOSFE briefing session at the onset of my placement and a UN Security brief later on.

Outcomes

The major outcome of my field experience is the designing of three posters for the promotion of human cases of BTB and Brucellosis. As a rule, the two diseases are endemic in Ethiopia where Bovine Tuberculosis is known to cause 10-15% of human cases of Tuberculosis. Similarly, according to Dinka & Duressa (2011), the prevalence of BTB in the intensive dairy industry (around Addis Ababa) is as high as 50% against 3.4% in smallholder production. On the other hand, according to Dinka & Chala (2009), the prevalence of Brucellosis in Ethiopia varies from 10 to 15%, against 1,5-2% in the study area.

As a result, the idea of generalizing the use of the health communication for the prevention of the two diseases all over the country has been agreed upon. For example, Dr. Getachew, former Prof. of UC Berkeley, former Dean of the Veterinary School of Addis Ababa, and currently head of FAO Country Office in Ethiopia said the following: “Thank you so much for giving us an inspiring presentation on the work you have been doing during your three months attachment program at FAOSFE. The communication tool you developed for two zoonotic diseases is very simple and illustrative with clear messages. I am sure the work you started will continue through other studies in close collaboration with our counterparts.” Later on, Dr. Getachew shared with me that the document will become part of the extension material in Ethiopia. The staff of the FAO Country Office is also looking forward to setting up a multisectorial framework for the adoption of the documents I have produced.

On the other hand, instead conducting awareness meetings in 1-2 milk shades as prescribed in my terms of references, I was able to do the work in 3 additional milk shades, summing up to 5 communication meeting held in two days, gathering in total 565 participants, including 78 females, and 487 males.

At the end of the mission, I took three interviews (one with ILRI, one with IFPRI, and one with FAO). Back to the US, I received a terms of reference for a renewable position (6 months) on a FAO project in Djibouti, Horn of Africa.

On a practical aspect, the outcomes of my placement can be summarized as follows;

- Finalized the development of two technical documents for the Ministry of Livestock and Fisheries of South Sudan: (a) A Standard Guideline for the Community-Based Animal Health Workers, and (b) a Training Manual for the training of new Community-based Animal Health Workers; this document is also aimed to be used to support refresher sessions for old CAHWs
- A communication package developed, including three posters and five communication messages for the prevention of human cases of BTB and brucellosis
- Five public health communication meetings facilitated in five milk shades of the Asella zone
- Participated in FAO Subregional Office for Eastern Africa' 5th Management (annual) Meeting
- IGAD Regional CAADP documents for the Inception Workshop (road map and agenda) translated from English to French
- Facilitated the handling of IGAD's CAADP Inception workshop participants data (travel information and accommodation files)
- Wrote two mission reports and held two debriefing sessions
- Held an End of Placement presentation on March 30th

CHAPTER 8 DISCUSSION

As I look back on my field experience at the FAOSFE, I feel that I was provided with a real-world perspective in public health. The internship met my expectations by allowing the unique opportunity of understanding how specialized agencies of the UN system such as FAO perceive concepts such as development, and poverty and their connection with the increasingly self-promoted concept of Global Health or One Health. According to this concept, the human health, and therefore, the population development is inherently related to the health of the animals (both domestic and wild) and the environmental health.

By working with the livestock development and production division, I was able to observe how FAO can be even more instrumental by putting a particular emphasis not only on infectious diseases and zoonoses prevention, but also by actualizing its staff competences in transboundary livestock trade and policy arrangements. The relevance of these activities becomes self-conspicuous in a context where preventing zoonotic diseases on the one hand, and agricultural trade and health on the other hand are key components of the public health. I found the experience very rewarding, as I was able to attend several meetings, involving not only staff members from the FAOSFE, but also from country Offices and the Headquarters. I even got an opportunity to act on the behalf of the FAO at the government level with the Ministry of Livestock and Fisheries of South Sudan. The experience of internship at a UN agency also gave me valuable insight into the fact that except the framework of the WHO, the concept of public health is broadly under estimated even at the level of FAO. But, food security & safety, rural income, education, social/gender equity, etc. are all key components of the health determinants. As a result, FAO needs to more directly consider public health aspects of each of its field agendas.

I am glad to realize that I did not have much time for observation and I was often involved and referred to for specific decisions. As a result, I have a better understanding of the skills and abilities needed to be not only a public health professional, but also as a mature staff of a development agency such as FAO. Working at FAOSFE, I learned that public health professionals must be team-oriented, effective in seeking and maintaining partnerships, creative and critical thinkers, and passionate about their work. I was able to acquire many of these qualities as I was under a supervisor who systematically exposed me to specific work conditions requiring those specific skills. On top of that, I was lucky to have a supervisor who never minded drawing my attention on the importance appropriate body language while working in an institution such as FAO.

The activities I participated in allowed me to directly apply my K-State Master of Public Health (MPH) education. In creating my communication package, I drew from two courses: MC 740: Mass Communication, Health Communication, and DMP 753: Zoonoses and Preventive Medicine. In MC 740, I learned about the process of advocating for and improving individual or public health outcomes. I learned about designing health communication material to target specific audiences with specific messages. DMP 753 Enhanced my knowledge and skills related to zoonotic diseases, shaped my understanding of food safety, and other aspects of the veterinary public health concern, with a particular emphasis on the current issues related to connections between animal and human health. The course also improved my communication skills related to risk management of infectious diseases and zoonoses. Similarly, taking KIN 818: Social & Behavior Bases of Public Health prepared me with an array of behavior change theories and how they apply to communication strategies, and health coaching. This proved beneficial during my internship as the targeted unhealthy behaviors putting the population at risk of human cases of

TB and brucellosis are mainly rooted in behavior theory and frameworks (e.g., the Health Belief Model, and Social Ecological Model). It is noteworthy to mention that the field work in the frame of this assignment has been a team work between Armuur Hansen Research Institute—in charge of the quantitative assessment of the two diseases, and myself—in charge of health communication component of the program. With regard, central to the understanding of the results of the diagnostic tests were for me my classes in DPM 754: Introduction to Epidemiology, and DMP 855: Disease Surveillance and Risk Assessment. Although I was not directly involved in the testing processes, I am glad to realize that taking these classes allowed me to professionally discuss relevant issues with the AHRI staff, especially in relation with the interpretation of the tests results.

Another revelation in the frame of my field experience is related to the importance of courses such as DMP 815: Multidisciplinary Tough and Writing on the one hand, and DMP 816: Trade & Agricultural Health on the other hand. DMP 815 was instrumental in that it equipped me with high writing skills whereby I could effectively communicate with other staff members, including my supervisor, but more importantly, to professionally review the technical documents submitted to my appreciation with well-structured suggestions technical feedback. Furthermore, the appropriateness of the DMP 816 has been felt through the review of the Phase II Draft Report on the “Assessment of Cross Border Informal Livestock Trade In the Somali Region of Ethiopia.” Having taken that course allowed me to make a substantial change to both the form and the content of the document. While I did not have a chance to directly apply my new skills in relation with DMP 860: Pathogenic Mechanisms and DMP 850: Immunology of Domestic Animals, I am glad the knowledge in these two fields regularly fueled my discussion with my

supervisor and other staff members. Although I have concluded my internship at FAOSFE, I am confident that I will continue to utilize my K-State education.

Success of the Mission

The main success of this mission is related to the fact that it took place in a real-world setting, made possible by a travel grant provided by broadminded people along with the DMP Department and the MPH Program. My assessment of the mission is highly positive as given enough tasks to work on throughout the day. I was regularly involved in activities which apparently did not have to do with the field of public health, but which were currently carried out by my supervisor. As someone who likes learning on-the-job, I truly appreciate that initiative and I would encourage other interns to be prepared for such a context.

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APPENDIX - FIELD EXPERIENCE PRODUCTS

Bovine TB causing cases of human TB as result of raw milk consumption



(Source: Sabi, 2012)

Brucellosis in cattle with its consequences on livelihood and health as a result of raw milk consumption



(Source: Sabi, 2012)

Drinking only boiled milk is the best way to prevent your family from human cases of Brucellosis and TB



(Source: Sabi, 2012)

Prevention Message: (Brucellosis)

Brucellosis is a dangerous disease of cattle and other animals. The disease can affect humans (cattle farmers, milk cooperative workers and their families, and all the population) through consumption of raw animal products (milk, cheese, meat...). But if you always boil milk and cook other animal products before consumption, you will reduce your risk of getting the disease.

Dear cooperative workers, brucellosis can be transmitted to humans through consumption of raw milk. But if you always boil milk before selling it, and if you regularly clean your bulk milk container(s), you will surely protect the population against the disease.

Be minded! You should not be responsible of a disease that kills or destroys the lives of your clients.

This message is brought to you by FAO, your Partner for Food Security, Safety, and Public Health

Prevention Message: (BTB)

Bovine Tuberculosis is a dangerous disease of cattle. It can affect cattle farmers, milk cooperative workers and their families, and all the population if you consumption of raw milk or other animal products (cheese, meat...). However, if you always boil milk and cook other animal products before consumption, you will reduce your risk of getting the disease.

Dear cooperative workers, Bovine tuberculosis can be transmitted to humans through consumption of raw milk. But if you always boil milk before selling it, and if you regularly clean your bulk milk container(s), you will surely protect the population against the disease.

Be minded! You should not be responsible of the disease that kills or destroys the lives your clients.

This message is brought to you by FAO; your partner for food security and safety, and Public Health

Prevention Message: (Brucellosis and Tuberculosis Prevention)

- Brucellosis and bovine tuberculosis are highly dangerous cattle (and other animals) diseases
- These diseases are mainly transmitted to humans when they consume raw animal products such as milk, meat, cheese.
- But if you always boil milk or cook meat before consumption, you can avoid these diseases.

Dear cooperative members, dear parents, the choice you make every day to boil milk before selling it, and to regularly clean your bulk milk container(s), that choice saves your customers' lives.

Be minded! You should not be responsible of a disease that kills or destroys the population's life. Together, we can prevent Brucellosis/Tuberculosis from killing our people.

Cooperative workers must be proud of being part of Brucellosis/Tuberculosis prevention effort in Ethiopia.

This message is brought to you by FAO, your Partner for Food Security & Safety, and Public Health