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Livestock Production and Marketing

Asfaw Negassa, Shahidur Rashid, and Berhanu Gebremedhin

Development Strategy and Governance Division, International Food Policy Research Institute – Ethiopia Strategy Support Program II, Ethiopia

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IFPRI-ADDIS ABABA
P.O. Box 5689
Addis Ababa, Ethiopia
Tel: +251-11-646-2921
Fax: +251-11-646-2318
E-mail: ifpri-addis@cgiar.org

IFPRI HEADQUARTERS
International Food Policy Research Institute
2033 K Street, NW • Washington, DC 20006-1002
USA
Tel: +1-202-862-5600
Skype: IFPRIhomeoffice
Fax: +1-202-467-4439
E-mail: ifpri@cgiar.org
www.ifpri.org

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About the Author(s)

Shahidur Rashid: Senior Research Fellow, Markets, Trade, and Institutions Division, International Food Policy Research Institute

Asfaw Negassa: Agricultural Economist, Consultant, Socioeconomics Program, International Maize and Wheat Improvement Centre, Addis Ababa, Ethiopia

Berhanu Gebremedhin: Scientist-Agricultural Economist, Improving Productivity and Market Success of Ethiopian Farmers (IPMS) – International Livestock Research Institute, Addis Ababa, Ethiopia.

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1. Introduction

The livestock is an important sub-sector within Ethiopia's economy in terms of its contributions to both agricultural value-added and national GDP. Between 1995/96 and 2005/06, the livestock sub-sector's share averaged 24 percent of agricultural GDP and 11 percent of national GDP, with the highest shares recorded at 27 percent and 13 percent, respectively, at its peak (NBE 2005/06). The contribution of livestock and livestock product exports to foreign exchange earnings is also large. The annual average revenue from livestock and livestock product exports was estimated to be 13 percent of the annual national foreign exchange earnings during the period 2000/01 to 2007/08 (NBE 2007/08). Given the large porous border, a large amount of cross-border exports also go un-recorded. Therefore, the official estimates of foreign exchange earnings do not necessarily reflect the actual volume of exports.

At the household level, livestock plays a critical economic and social role in the lives of pastoralists, agro-pastoralists, and smallholder farm households. Livestock fulfills an important function in coping with shocks, accumulating wealth, and serving as a store of value in the absence of formal financial institutions and other missing markets. In the case of smallholder mixed farming systems, livestock provides nutritious food, additional emergency and cash income, transportation, farm outputs and inputs, and fuels for cooking food. In the case of pastoralists, livestock represents a sole means to support and sustain their livelihoods. Furthermore, available research suggests that with economic growth, consumption patterns tend to change towards high value and high protein foods, such as those derived from livestock (Delgado et al. 1999). This implies that, given the economic growth in Ethiopia and the region, the market demand for livestock and livestock products is likely to continue growing in the future. The government recognizes the importance of livestock in poverty alleviation and has increased its emphasis on modernizing and commercializing the livestock sub-sector in recent years (SPS-LMM 2008).

Focusing on four key livestock classes—cattle, sheep, goats, and chicken—this chapter undertakes three tasks: (1) it provides a characterization of the livestock subsector, (2) it assesses livestock and livestock product value chains based on primary data, and (3) analyzes the trends in marketing and trade of live animals and animal products. Carrying out these tasks relies on the critical review of existing literature and policy documents, as well as extensive use of both secondary and primary data, including household and traders' surveys. The paper is organized following the sequence of these major tasks and concludes with a summary and policy implications.

2. Overview of livestock sub-sector

2.1. National livestock population

Ethiopia's livestock population is the largest in Africa. In 2008/09, Ethiopian sedentary private holdings were estimated at about 49 million heads of cattle, 25 million heads of sheep, 22 million heads of goats, and 38 million poultry (CSA 2009). These livestock population estimates exclude the livestock population for pastoral areas, as there are no official statistics for those areas. Some rough expert estimates indicate that pastoral areas account for about 20 percent of cattle, 40 percent of sheep, and 40 percent of goats in the country (Hurissa 2007). Thus, including these rough estimates for the pastoral areas, the estimates of national livestock populations for 2008/09 was 59 million cattle, 35 million sheep, 31 million goats, and 38 million poultry.

Trends of the Ethiopian livestock population over the last four decades are presented in Table 2.1. According to the Food and Agriculture Organization (FAO Statistical Database http://faostat.fao.org), the total number of cattle declined slightly in the 1970s (-0.4 percent), followed by a small increase in the 1980s (1.1 percent), which left the total cattle population more or less unchanged over this 20 year period. Between 1990 and 1999 the cattle population increased slightly by 1.8 percent and between 2000 and 2008 the cattle population increased substantially by 4.2 percent. In the seventies and eighties the trends for sheep and goats were similar to cattle trends: a steady increase in the sheep and goat population. However, between 1990 and 1999 the number of sheep and goats declined sharply by -7.1 percent and -7.5 percent, respectively. This trend reversed in 2000, as the number of sheep and goats grew by roughly 13 percent. However, the total sheep and goat populations have not yet reached the 1970 to 1990 level. The poultry population was more or less stable for the first half of the time period, before declining rapidly in the 1990s. This decline was stopped in the last decade, but the number of poultry has not completely recovered due to several factors: poultry disease, predation, lack of feed, poor housing, insufficient water, and parasites.

Table 2.1 also compares these statistics with those presented by the Central Statistical Agency (CSA) on the total number of cattle, sheep, goats, and chickens for 2001/02 - 2008/09. Consistent with FAO data, the cattle, sheep, and goat populations have shown substantial growth over the period, while contrary to FAO data, according to CSA the poultry population declined during the same period. CSA data indicates that the estimated average annual growth rates were 3.2 percent for cattle, 9.3 percent for sheep, 8.2 percent for goats, and -0.66 percent for poultry. Over the last five years, the total national dairy cattle population varied from 8.0 million in 2004/05 to 9.9 million in 2008/09, which reflects an annual growth rate of 5.4 percent at the national level. It is not clear whether the recent growth in the number of cattle, sheep, and goats is due to increases in productivity and/or due to improvement in feed availability as a result of favorable rainfall conditions. Ideally, a sustainable increase in livestock should come from increased productivity rather than from expanded grazing areas, as the latter could lead to land scarcity and negative environmental impacts such as overgrazing, deforestation, and soil erosion.

Table 2.1. Average livestock trends, 1970 to 2009

	FAO								CSA	
	1970-1979		1980-1989		1990-1999		2000-2008		2001/02-2008/09	
	Number[1] (million of heads)	Growth Rate[2] (Percent)	Number[1] (million of heads)	Growth Rate[2] (Percent)	Number[1] (million of heads)	Growth Rate[2] (Percent)	Number[1] (million of heads)	Growth Rate[2] (Percent)	Number[1] (million of heads)	Growth Rate[2] (Percent)
Cattle	26.2	-0.38	27.2	1.05	31.4	1.84	40.5	4.21	42.7	3.88
Sheep	23.4	-0.39	23.4	0.36	15.2	-7.14	18.5	12.45	20.7	10.44
Goats	17.3	-0.23	17.6	0.40	11.5	-7.54	15.0	13.38	17.3	9.48
Poultry	50.7	0.85	54.4	1.40	37.7	-7.65	35.3	0.11	36.2	-0.16

Source: FAO Statistical Database http://faostat.fao.org; CSA (various years)
Note: [1] Number: annual total number averaged over the time period
[2] Growth rate: calculated from logarithmic regressions

The livestock population is not evenly distributed throughout Ethiopia. The Livestock Population Dot Maps presented in the Atlas of the Ethiopian Rural Economy (CSA-EDRI-IFPRI 2006, 79) show the distribution of cattle, dairy cows, sheep, and goats across the country. Each dot represents 200 animals. According to this map, cattle are found throughout the highlands. Of these cattle, dairy cows are most common in the central highlands and transitional areas in and around the Rift Valley, while other cattle are found in high densities throughout the highlands. Sheep and goats are used in both highland and lowland environments, with goat populations somewhat more uniformly dispersed than sheep. All types of livestock have relatively low densities in the humid lowlands of the west, primarily due to the increased prevalence of tsetse flies (CSA 2006).

2.2. Herd characteristics and the purpose of keeping livestock

The CSA estimates of the proportion of cattle, sheep and goats by age structure and breed type are given in Table 2.2, which shows that 63 percent of the cattle herds consisted of three to ten year old animals. For sheep and goats, 52 percent and 49 percent of animals were more than two years old, and 27 percent and 25 percent of sheep and goats were less than 6 months. This age composition has rarely changed over the last several years. The breeds of cattle, sheep, and goats kept by households are almost entirely indigenous. Over time, one would expect an increased adoption of improved breeds in modernizing livestock sectors; however, this has not happened in Ethiopia.

Households keep cattle for different purposes: milk production, draught use, beef production, and breeding. The main purpose of keeping three to ten year old cattle has been for draught use, followed by breeding, while the main purpose of rearing sheep and goats aged more than two years is for breeding (CSA 2006). In terms of the class composition of cattle, oxen and cows account for about 44 percent and 24 percent of the cattle herd, respectively, while bulls and young animals, like heifers and calves, together account for only about 32 percent (Negassa and Jabbar 2008). The higher proportion of oxen confirms that the main reason for keeping cattle in the highland areas of Ethiopia is for draught use. This finding is consistent with several other micro-level studies on the role of livestock in smallholder crop–livestock systems (Gryseels 1988; Asamenew 1991; Sansoucy et al. 1995).

Table 2.2. Herd structure in smallholder farms, averaged from 2001/02 to 2008/09

Age structure	Cattle (percent)	Age structure	Sheep (percent)	Goat (percent)
under 6 months	9.4	under 6 months	26.8	25.2
6 months to 1 year	8.2	6 months to 1 year	10.3	12.7
1 year to under 3 years	16.3	1 year to under 2 years	10.9	13.2
3 years to under 10 years	62.8	2 years and older	52.0	49.0
10 years and older	3.3			

Source: CSA (2003, 2004, 2005, 2006, 2007, 2008, 2009)

Households produce both chickens and eggs for home consumption and to sale at market. In Ethiopia, about 50 percent of the eggs produced are used for hatching purposes, while about 27 percent and 23 percent are used for sales and home consumption respectively. In terms of chickens, households sell about 46 percent of chickens and use 23 percent for home consumption, with the rest being used for breeding and other purposes. The level of home consumption and market sales were found to be influenced by the wealth status of households (Tadelle et al. 2003). The wealthier the household, the more often the household consumes at home rather than sells in the market. More than 95 percent of households reported keeping indigenous poultry breed types, while two to four percent of the households used hybrid or exotic poultry breeds. In the past there have been various government and non-government schemes to improve local breeds (Dana et al. 2006). Despite these efforts the poultry sub-sector is still at the small-scale or traditional level: the adoption of advanced poultry breeds has been limited by a lack of strong extension follow-up, a lack of complementary inputs, disease, the unavailability of credit services, and marketing problems (Teklewold et al. 2006).

2.3. Livestock production systems

In Ethiopia, livestock is produced under two major production systems: the sedentary mixed crop-livestock production system and the nomadic pastoral or agro-pastoral production system. In both systems women play a significant role in livestock production. The other less important, but growing, livestock production systems are small-scale peri-urban and urban production systems and medium- to large-scale commercial livestock production systems. The mixed crop-livestock production system is based on limited communal and/or private grazing areas and the use of crop residue and stubble. The pastoral production system is based on extensive communal grazing while agro-pastoralists are characterized by a combination of both pastoral and mixed crop-livestock production. Mixed-farm households practice both crop and livestock production.

The percentage of farmers in Ethiopia only growing crops was 18 percent in 2001/02 and decreased to nine percent in 2007/08, while the percentage of farmers keeping livestock only was eight percent in 2001/02 and it decreased to five percent in 2007/08. On the other hand, the percentage of farmers with both crop and livestock holdings was 74 percent in 2001/02 and this percentage increased to 86 percent in 2007/08. Diversification allows producers to mitigate the risk of crop failure or losses of livestock, while livestock is also an important input to crop production and vice versa. Both the mixed crop-livestock and the pastoral production systems are characterized as small-scale, low-input, and less

commercially oriented, with very little or no vertical coordination. The common feature of these production systems is that livestock producers keep different livestock species for multiple uses. Recently, commercially oriented livestock production systems have begun to emerge. Private sector entries and capital investment into meat, dairy, and poultry farms have increased substantially over the last several years.

There are two major poultry production systems: small-scale backyard and the commercial poultry production systems. The backyard scavenging system is the dominant poultry production system in Ethiopia (Dessie and Ogle 2001). The scale of commercial production systems can be small or large. In general, Ethiopia's poultry marketing system is characterized by many suppliers (farmers) and buyers; there are no dominant sellers or buyers (Yadeta et al. 2003). More than half of the households in the mixed crop-livestock production system own poultry. In most cases, women own and manage poultry production and marketing, and control the income generated from poultry sales (Dessie and Ogle 2001; Yadeta et al. 2003; Teklewold et al. 2006).

In Ethiopia, milk production is dominated by smallholder farmers. The total volume of raw milk produced varied from 0.9 million tons in 2000 to 1.3 million tons in 2008, reflecting an annual growth rate of 4.4 percent. Given a human population of about 80 million in Ethiopia in 2008/09, this level of production implies very low per capita raw milk production for the country. Milk is also produced by pastoralists in nomadic or agro-pastoral production systems, but currently this milk is not marketed. More than 95 percent of total milk production comes from cattle, while pastoralists also produce milk from camels and goats. Total milk production from camels in 2008/09 was about 162 million liters, accounting for five percent of total cattle and camel milk production.

Depending on accessibility and distance from major towns, smallholder dairy producers typically supply raw milk to the market for immediate consumption or for further processing by dairy cooperatives or private dairy processing firms. However, farm households lack the capacity to supply sufficient high quality raw milk to meet the demand from local dairy processing plants and the food service sector. In recent studies it is noted that even in major urban markets like Addis Ababa, the dairy market is still dominated by traditional dairy products (Francesconi 2009). Traditional dairy products make up 75 percent of the market, while 17 percent of the market comes from domestic industrially processed dairy products, and eight percent of the dairy market comes from imports.

There are two levels of milk processing in Ethiopia: (1) cottage processing and (2) industrial processing. In the case of cottage processing, individual farmers or cooperatives produce traditional dairy products including fluid milk, fermented or sour milk (*ergo*), butter, traditional cheese (*ayib*), buttermilk (*agwat*), and ghee (butter oil), with a dominance of fresh milk and butter. The traditional dairy products are marketed through the informal wet market channels. Most of the cottage dairy products are consumed on-farm or in near-by towns. Fresh fluid milk is marketed within close proximity of its production areas. The domestic marketing of dairy products over significant distances from the production area is limited to cottage butter, which is less perishable.

At the level of industrial processing, the cooperatives or private processing firms produce and pack pasteurized dairy products and sell these products to supermarkets, restaurants, hotels, and other institutional customers. Until 1991, the public Dairy Development

Enterprise (DDE) was the only processor involved in the formal market of cold chain pasteurized milk. Recently, however, private dairy processors have entered the formal dairy market and are involved in collecting, processing, packing, and distributing milk and other dairy products. The manufactured pasteurized dairy products include liquid milk, cheese, butter, and yoghurt. In general, the dairy processing firms are characterized as small-scale and they produce limited ranges of processed dairy products. The processing firms have not yet developed the capacity to produce UHT (ultra-high temperature processing) milk and milk powders. They are also limited to major urban areas due to less developed marketing infrastructure, such as lack of collection centers and cold chain transport facilities in the rural areas.

On average, Francesconi (2009) estimates the total recent daily milk processing capacity for dairy firms in and around Addis Ababa to be between 41,000 to 44,000 liters per day. Based on CSA population estimates, the total population of Addis Ababa was 2.7 million in 2007. At only one tenth of a liter processed per person per day, existing dairy processing firms cannot supply the quantities of milk demanded in the market. Francesconi (2009) noted that there were at least 12 private milk processing firms operating in and around Addis Ababa. The dairy processing sector is highly concentrated; Agro-Sebeta Industry supplies almost 50 percent of the total industrially processed dairy products and has a processing capacity of 28,000 liters per day. Shola dairy plant, previously a government-owned firm, supplies about 30 percent of industrially processed dairy products and has a dairy processing capacity of 12,000 liters per day. Other processors are considered small and on average process merely 1,000 to 3,000 liters per day.

While some dairy processing firms have their own dairy farms, small herd sizes are quite prevalent, leading to a need for supplementing raw milk production through the collection of raw milk from dairy producers within a milk catchment radius of 100 to 150 kilometers. The nature of milk transactions between dairy producers and raw milk buyers, whether through contractual relationships or spot market transactions, is not well known.

2.4. Livestock productivity

The current level of livestock productivity in Ethiopia is one of the lowest in the world. Table 2.3 shows the livestock productivity levels of Ethiopia and its neighboring countries. The carcass weights in Ethiopia are 108 kg/head for cattle, 10 kg/head for sheep, 8.5 kg/head for goats, and 800 g/head for chickens, all of which are below the average productivity of all least developed countries. Milk yields in Ethiopia are also very low at 210kg/year/cow, a level less than half that of the Kenyan milk yield of 550kg/year/cow. Globally, only Tanzania has lower average milk productivity than Ethiopia at 174kg/year/cow (FAO Statistical Database). Ethiopia reached averaged levels of productivity in egg production.

Trends in total livestock production and productivity are given in Table 2.4 (FAO Statistical Database). The total quantity of meat produced in 2008 was estimated at 572 thousand tons. Beef cattle production accounted for 66 percent of total meat production in the country. During the same year, egg production was estimated at 930 million eggs, while the total quantity of milk production was about 1.3 million tons. Between 2000 and 2008 the total annual meat production increased by 4.6 percent; this was mainly due to strong growth rates in mutton and goat meat production, 12.3 percent and 13.3 percent, respectively. However,

this development is based entirely on an enlargement of the total number of livestock, as productivity growth rates during this period were nearly zero.

Table 2.3: Country level livestock productivity averages, 1999–2008.

	Meat (carcass weight)				Eggs	Milk
Country	Beef (kg/head)	Mutton (kg/head)	Goat (kg/head)	Chicken (g/head)	(g/year/hen)	(kg/year/cow)
Ethiopia	108	10	8	800	4355	210
Kenya	146	12	11	1204	4650	551
Malawi	205	14	12	800	4365	451
Rwanda	104	12	11	900	2974	494
Sudan	119	16	13	1000	5150	400
Tanzania	108	12	12	909	2600	174
Uganda	150	14	12	1300	3747	350
Eastern Africa	127	11	11	966	4232	321
Least Developed Countries	117	13	10	950	3209	318
World	205	16	12	1450	10028	2257

Source: FAO Statistical Database http://faostat.fao.org; FAO calculated data

Table 2.4. Total annual livestock production and livestock productivity in Ethiopia, 2000, 2004, and 2008.

	Production (meat, milk:1000 ton; eggs: million number)				Productivity [2]			
	2000	2004	2008	Growth rate[1] (%)	2000	2004	2008	Growth rate[1] (%)
Meat	393	488	572	4.57%				
beef	294	336	380	2.90%	108	108	109	0.02%
mutton	36	60	82	12.30%	10	10	10	-0.02%
goat	26	44	65	13.31%	9	9	9	0.06%
chicken	38	47	46	0.11%	1	1	1	0.00%
Eggs	720	915	930	1.37%	4,329	4,360	4,360	0.04%
Milk	900	1,050	1,350	4.35%	207	210	211	0.61%

Source: FAO Statistical Database http://faostat.fao.org; Production: FAO estimates; Productivity: FAO calculated data
Notes: [1]Growth rate calculated over 2000–2008
[2] Productivity measures: meat (carcass weight): kg/head; eggs: g/head/year; milk: kg/head/year

Ethiopian livestock sub-sector productivity and production levels are discussed in MOFED (Ministry of Finance and Economic Development) (2006). There is a huge productivity difference between local livestock breeds, which make up the majority of livestock production, and improved livestock breeds. The milk yield for local dairy breeds is about 1.5 liters/day while the milk yield for improved dairy breeds is about 9.0 liters/day. There is also a huge difference in the length of lactation between the local and improved dairy breeds. Similarly, there is a substantial productivity difference between local and improved poultry breeds, with local poultry breeds laying 50 eggs per year while the improved poultry breeds

can give up to 140 eggs/year. It is observed that the traditional herd management system is not supported through the introduction of improved breeding and feeding practices and the local breeds are not differentiated and improved resulting in low productivity and off-takes (Hurissa and Eshetu 2003).

2.5. Herd size at the household level

The role of livestock and the potential for its commercialization is largely determined by ownership patterns and herd sizes at the household level. The key question is: do livestock producers have surplus live animals or livestock products that can be tapped through changing market incentives and opportunities? Over the last five years there have been few changes in terms of livestock ownership and the size of livestock holdings. The livestock ownership and size of holdings for smallholder sedentary producers and pastoralists is given in Table 2.5. It is of note that significant proportions of households do not own certain types of livestock. About 20 percent of smallholder sedentary farmers do not own cattle, while more than 60 percent do not own sheep, and more than 70 percent do not own goats. For those who own livestock, the size of livestock holdings also remains very small.

Table 2.5. Levels of livestock ownership among smallholder farmers and pastoralists (% share)

	Smallholder farmers[1] 1999-2000			Smallholder farmers[2] 2004-2005			Borana pastoralists[3] 2003-2005		
	Cattle	Sheep	Goats	Cattle	Sheep	Goats	Cattle	Sheep	Goats
0 head*	17	69	79	20	62	67	22	80	58
1 head*	13	3	2	11	6	4	2	2	2
2 head*	14	4	4	15	8	6	4	2	2
3 head*	12	4	2	14	6	4	3	2	4
≥4 head*	44	20	14	40	18	19	69	14	34
Mean‡	3.7	2.1	1.5	3.7	1.9	2.2	13.1	2.2	4.7
(SD)	(3.6)	(5.1)	(4.0)	(4.7)	(4.4)	(6.1)	(17.5)	(7.4)	(8.3)
Max‡	30	50	57	145	170	160	120	79	43

Notes: [1] Prepared based on ILRI/IFPRI (1999-2000); [2] Prepared based on CSA (2006); [3] Prepared based on GL-CLRSP (2006).
*share (percentage); ‡mean number and maximum number
Figures in parentheses are standard deviations (SD) and the minimum size of cattle and sheep/goats owned was zero in all cases.
Source: Table 5 in Negassa and Jabar (2008)

Similar to smallholder farmers, a significant proportion of Borana pastoralists do not own certain classes of livestock. About 22 percent of pastoralists do not own any cattle at all, 80 percent do not own sheep, and 58 percent do not own goats. In general, pastoralists have larger herd sizes than smallholder sedentary farmers, owning on average 13 head of cattle and five head of goats, compared to four head of cattle and two head of goats for smallholder farmers. In both systems, the average owning is of two head of sheep. Herd size is a very important factor in herd accumulation in pastoral production systems. For example, climatic shocks cause a sharp decrease in herd size and accumulation, and herd recovery after the shock depends on the pre-climatic shock level of herd size (Santos and Barrett 2005). It is argued that in the face of climatic shocks, the cattle holdings of herders with

larger herd sizes recover more quickly. In general, in the pastoral production system, herd accumulation is an effective way of reducing risk (Getachew and McPeak 2004).

The poultry production systems observed in Ethiopia are low-input and small-scale with seven to ten mature birds per household reared in the backyard with inadequate housing, feeding, and health care (Dessie and Ogle 2001). The poultry production statistics for pastoral areas are not available. Furthermore, the mobile nature of pastoralists does not fit well with the sedentary husbandry practices required for poultry.

2.6. Herd dynamics

Negassa and Jabbar (2008) present statistics on the major sources of cattle, sheep, and goat inflows and outflows for smallholder farmers and pastoralists. The majority of smallholders and pastoralists obtain cattle through births from the current herd and purchases from the market. For smallholder farmers as well as for pastoralists, birth is much more important than market purchase in building and maintaining herd size. Markets are not commonly used for restocking by larger pastoral households; poor households rely more heavily on purchases for restocking (Barrett et al. 2004).

Observing the inflow of the sheep and goat population for both production systems, between 74 percent and 86 percent of all inflow is through animal births. Compared to cattle, purchases are even less important components of inflows for sheep and goats. Purchases account for only 23 and 16 percent of the inflows of sheep and goats, respectively, in the case of smallholder farmers, and for about eight percent of sheep and goat inflows in the case of pastoralists.

There are five components of livestock outflows: deaths, sales, slaughters, gifts, and thefts (Table 2.6). Sales and deaths are the major components of cattle outflows. Cattle sale accounts for 50 percent or more of cattle outflows for smallholder farmers and pastoralists. Cattle death accounts for 45 percent of cattle outflows for smallholder farmers, while for pastoralists it accounts for about 25 percent (Negassa and Jabbar 2008). The size of on-farm cattle slaughters, thefts and gifts are found to be very minimal.

For sheep and goats, deaths, sales and on-farm slaughters are the major components of outflows. Sheep and goat deaths account for 40 and 47 percent of sheep and goats outflows, respectively, while sales account for 39 and 35 percent, respectively. The importance of deaths in sheep and goat outflows implies that there is high productivity potential for sheep and goats simply through reducing mortality rates. The size of on-farm sheep and goat slaughters is found to be higher for sheep relative to goats. On-farm slaughter accounts for 19 and 15 percent of sheep and goat outflows, respectively. These rates are much higher than on-farm slaughter of cattle, perhaps because sheep and goats are smaller animals, which can be consumed by a family as needed, whereas cattle, being a larger animal, are only appropriate for slaughter for very large families or for exceptional occasions.

Table 2.6. Herd dynamics: inflow and outflow of livestock in smallholder farms, averaged from 2005/06 to 2008/09

	Cattle			Sheep			Goat			Poultry		
	Number (million)	Share in flow (%)	Share in total population (%)	Number (million)	Share in flow (%)	Share in total population (%)	Number (million)	Share in flow (%)	Share in total population (%)	Number (million)	Share in flow (%)	Share in total population (%)
Inflows												
Births	8.61	70.2	19.1	10.56	73.8	44.2	8.29	81.4	42.2	47.3	88.0	131.3
Purchases	3.17	25.8	7.0	3.33	23.3	14.0	1.67	16.4	8.5	6.12	11.4	17.0
Other	0.59	4.8	1.3	0.4	2.8	1.7	0.23	2.3	1.2	0.34	0.6	0.9
Total inflow	**12.27**	**100.0**	**27.2**	**14.3**	**100.0**	**59.9**	**10.19**	**100.0**	**51.9**	**53.76**	**100.0**	**149.2**
Outflows												
Sales	4.1	46.1	9.1	5.3	38.7	22.3	3.3	35.2	16.8	8.9	17.4	24.6
Home slaughter	0.3	3.7	0.7	2.6	19.0	11.0	1.5	15.5	7.4	9.7	18.9	26.8
Deaths	4.1	45.5	9.0	5.6	40.5	23.4	4.4	47.5	22.6	32.1	63.0	89.2
Other	0.4	4.7	0.9	0.3	1.8	1.0	0.2	1.8	0.9	0.4	0.7	1.0
Total outflow	**8.9**	**100.0**	**19.8**	**13.8**	**100.0**	**57.7**	**9.4**	**100.0**	**47.6**	**51.0**	**100.0**	**141.7**
Total population	**45.1**			**23.9**			**19.6**			**36.0**		

Source: CSA (2006, 2007a, 2008, 2009).

2.7. Market participation and commercialization

Commercialization refers to the degree to which farm households are connected to the market. It is usually measured by the proportion of households who participated in the market and the percentage of total output they marketed. Commercialization is important to increase livestock producers' income and enhance their livelihoods. Many smallholder farmers and pastoralists in Ethiopia do not participate in the livestock market and for those smallholder farmers and pastoralists who do, the size of transactions (sale or purchase of cattle, sheep, or goats) is found to be very small (Tables 2.7 and 2.8). For example, in 1999/2000, about 61 percent of the smallholder farmers in the highland areas of Amhara, Oromia, and Tigray neither sold nor bought cattle while only 39 percent participated in the cattle market as seller, buyer, or both seller and buyer. In the case of sheep and goats, about 49 percent and 55 percent of the smallholder farmers neither sold nor bought sheep or goats, respectively (ILRI/IFPRI 1999-2000). The CSA data for 2004-2005 also indicate that about half of the households neither sold nor bought cattle, while 43 percent and 50 percent of the smallholder farmers neither sold nor bought sheep or goats, respectively. About 47 percent, 72 percent, and 66 percent of Borana pastoralists neither sold nor bought cattle, sheep or goats, respectively, during the period from 2003 to 2005.

Table 2.7. Livestock producers' market participation

	Live animal species		
Market participation regimes	**Cattle**	**Sheep**	**Goats**
Smallholder Farmers[1] (1999-2000)			
% sales only	23	41	37
% purchases only	8	7	6
% sales and purchases	8	3	2
% no sales and no purchases	61	49	55
Smallholder Farmers[2] (2004-2005)			
% sales only	22	26	27
% purchases only	16	23	18
% sales and purchases	12	8	5
% no sales and no purchases	50	43	50
Pastoralists[3] (2003-2005)			
% sales only	47	18	25
% purchases only	2	6	7
% sales and purchases	4	4	2
% no sales and no purchases	47	72	66

Notes: [1] Prepared based on ILRI/IFPRI (1999-2000), [2] Prepared based on CSA (2006). [3] Prepared based on GL-CLRSP (2006).
Source: Negassa and Jabbar (2008).

Table 2.8. Frequency distributions of livestock producers according to the numbers of cattle sold/purchased in Ethiopia for those who participate in the market, various years

	Smallholder farmers[1]		Smallholder farmers[2]		Pastoralists[3]	
Number sold/ purchased	% Sellers	% Buyers	% Sellers	% Buyers	% Sellers	% Buyers
Cattle						
1	73	83	73	76	60	38
2	20	12	19	19	20	29
3	4	3	5	3	8	19
≥4	4	2	3	2	12	14
Mean (SD)	1.4(0.8)	1.2(0.6)	1.5(2.5)	1.4(2.9)	1.8(1.4)	2.3(1.6)
Max	6	4	238	240	9	7
Sheep						
1	20	49	40	56	52	78
2	26	30	29	25	14	0
3	19	12	13	8	10	11
≥4	35	9	18	11	24	11
Mean (SD)	3.4(3.5)	1.8(1.1)	2.7(8.9)	2.2(9.5)	3.6(4.9)	1.7(1.4)
Max	35	5	506	500	20	5
Goats						
1	18	63	37	57	38	12
2	33	21	27	25	33	47
3	19	11	14	8	17	23
≥4	30	5	22	10	12	18
Mean (SD)	3.2(2.2)	1.7(1.3)	2.7(2.)	1.9(1.9)	2.0(1.2)	2.5(1.1)
Max	10	6	47	45	6	5

Notes: [1] Prepared based on ILRI/IFPRI (1999-2000), [2] Prepared based on CSA (2006). [3] Prepared based on GL-CLRSP (2006). The figures in parenthesis are standard deviations and the minimum size of cattle and sheep and goats owned was zero in all cases.
Source: Negassa and Jabbar (2008).

Barrett et al. (2004) also indicate that pastoral households in Ethiopia participate in livestock markets, but in relatively small volumes and at varying rates over time. In pastoral areas livestock are sold to meet family cash needs to purchase food and clothes and pay for educational and medical expenses (Hurissa and Eshetu 2003; Gebremedhin et al. 2007). Barrett et al. (2004) discussed several reasons for the limited nature of market off-take from the pastoral areas. First, there are few investment opportunities in the pastoral areas, making live animal herd-building the best investment alternative. Second, as most of the resources required for livestock production are free, pastoralists have limited demand for cash income. Further, pastoralists are typically self-sufficient and there is a short supply of consumer goods. As a result, the cash need of pastoralists is usually met by selling a few animals. Pastoralists have limited supply response to prices. Other factors which can limit pastoralists' market participation include: high transactions costs, difficulties in contract enforcement, limited throughput capacity, and low and variable producer prices for livestock (Barrett 2001). Generally pastoralists are more interested in building large herds and flocks

for cultural prestige, accumulating wealth, paying dowries (social functions), and as drought-coping mechanisms, than building a large herd for increased commercial off-take.

The recent estimates of gross and net commercial off-take rates for cattle, sheep, and goats under different production systems are given in Table 2.9. In general, very low commercial off-take rates were observed over different time periods for cattle, sheep, and goats for smallholder farmers and pastoralists. For example, in 1999/2000, the average net commercial off-take rate of cattle, sheep, and goats for smallholder farmers in the highland areas of Amhara, Oromiya and Tigray was 8 percent, 22 percent and 18 percent, respectively. In 2004/05, the average net commercial off-take rate of cattle, sheep, and goats for smallholder farmers in highland and lowland sedentary areas of Ethiopia was seven percent, seven percent and eight percent, respectively. Likewise, net commercial off-take rates from pastoral production system were low: in 2003-2005 average net commercial off-take rates of cattle, sheep, and goats were 9 percent, 6 percent, and 7 percent, respectively. The differences between gross and net commercial off-take rates were lowest for the Borana pastoral production system. This shows limited purchases of live animals made by Borana pastoralists. On the other hand, there are large differences between gross and net commercial off-take rates for the highland areas of the three regions and for all regions of Ethiopia, which shows the importance of both sale and purchase activities by sedentary livestock producers, as compared to the pastoral areas where sale is more important than purchase.

Table 2.9. Gross and net commercial off-take rates for live animals by different production systems in Ethiopia, various years

Production system	Reference year	Annual gross commercial off-take rates (%)			Annual net commercial off-take rates (%)		
		Cattle	Sheep	Goats	Cattle	Sheep	Goats
Smallholder farmers [1]	1999-2000	16(37)	34(56)	30(58)	8(42)	22(71)	18(78)
Smallholder farmers [2]	2004-2005	17(50)	19(68)	15(31)	7(40)	7(41)	8(34)
Pastoral [3]	2003-2005	11(34)	10(43)	11(44)	9(34)	6(44)	7(50)

Notes: [1] Based on ILRI-IFPRI survey data for 1999/2000 which includes highland areas of Amhara, Oromia, and Tigray regions;
[2] Based on CSA national survey data for 2004/2005 but it excludes pastoral livestock;
[3] Based on the GL-CRSP survey data for 2003 to 2005 which was collected for Borana pastoral area only;
[4] Figures in parenthesis are standard deviations. The computation of commercial off-take rates are discussed in Negassa and Jabbar 2008.
Source: Table 1 in Negassa and Jabbar (2008).

In terms of sex composition, for cattle about half of the net commercial off-take rate (2004/05) involves male animals for all production systems (Negassa and Jabbar 2008). However, for sheep and goats more than 70 percent of the net commercial off-take rates were in terms of males for smallholder sedentary farmers. For Borana pastoral production systems, the net commercial off-take rate was entirely in terms of male sheep and goats.

Analysis of the composition of household's annual gross and net commercial off-take rates by classes of cattle, sheep, and goats in the highland areas of the three regions (Tigray, Amhara and Oromiya) of Ethiopia indicates not only that the net commercial off-take rate of cattle was fairly low, but also that the bulk of this net commercial off-take was of low quality cattle, such as culled draught oxen (Negassa and Jabbar 2008). Oxen accounted for 62 and

75 percent of the gross and net commercial off-take rate for cattle, respectively. Next to oxen, bulls accounted for a significant proportion (25 percent) of the annual net commercial off-take rate. The annual net commercial market off-take rates for calves and heifers were found to be negligible. Cattle sale, then, can be considered as an input into crop production in the mixed crop–livestock production systems of Ethiopia, rather than an output of a livestock production system. The estimated off-take rates, especially for sheep and goats, appear to be lower than some of the earlier estimates and conventional wisdom prevailing in the country. For example, Hurissa and Eshetu (2003) had estimated an annual off-take rate of 10 percent for cattle, 35 percent for sheep, and 38 percent for goats nationally.

Information on the off-take rates in terms of age, weight, and time of sale is very scant. However, a study by Ayele et al. (2006) based on a survey of over 2,500 animal transactions in nine small ruminant markets in eastern Ethiopia indicated that about half of the sheep and goats are marketed at the age of 15 months or younger. Ayele et al. (2006) also indicated that about 57 percent of the sheep and 55 percent of the goats marketed had good body conditions, while the remainder had poor body conditions at the time of sale. In terms of the timing of sale, there is also seasonality in supply of live animals due to various reasons: there are strong peaks and troughs of producer sales of animals at different times in different locations. These strong spatial and seasonal dimensions are induced by various factors, e.g. cash need, drought, feed shortage, and festivals.

To conclude, the market participation analysis indicates that the majority of the smallholder farmers and pastoralists do not participate in the livestock market. In general, low levels of off-take were observed both in terms of quantity and quality.

3. Market structure and domestic consumption patterns

In general, many actors are involved in livestock product marketing, broadly classified as: livestock producers, traders, processors, retailers, food service providers, and consumers. Private and public livestock inputs and service providers are other important market actors. Detailed information on structural parameters like the number of actors, their market share, pricing behavior, etc., which can be used to gauge whether the market actors are behaving according to a competitive market condition, is beyond the scope of this paper.

The main objective of this section is to describe domestic consumption patterns and identify key market actors for specific key livestock product value chains. The section also highlights the key operational characteristics and the main constraints facing the value chain. Three important value chains are examined: red meat (beef, mutton, and goat meat), dairy, and poultry.

3.1. Domestic consumption patterns

Table 3.1 presents patterns of utilization of livestock products in Ethiopia for 2001/02. Most household livestock production was consumed in the household and market disposal of livestock products was very limited. It is particularly interesting to note that more than 85 percent of goat meat and mutton is consumed by farm households, leaving a small amount for market disposal. The highest proportion of milk, butter, cheese, and beef produced at home are also used for own consumption. However, most eggs produced were sold at market.

Table 3.1. Patterns of smallholder farm livestock producer's utilization of homemade livestock products, 2001/02

	Utilization (%)			
Product	**Household consumption**	**Sale**	**Used for wage payments in kind**	**Other**
Milk	48.10	5.01	0.31	46.53
Butter	60.23	35.84	0.19	3.74
Cheese	83.80	12.82	0.10	3.28
Beef	45.56	41.65	0.62	12.16
Goats meat/mutton	85.38	10.70	0.15	3.77
Eggs	31.64	38.06	0.08	30.22

Source: CSA (2003).

The national annual per capita livestock product consumption, calorie intake, and per capita expenditure for cereals and livestock products are presented in Table 3.2. Per capita annual meat consumption was estimated at 2.7 kilograms in 1995/1996 and at 3.3 kilograms in 1999/2000, which represents a 5.7 percent annual growth rate. In absolute terms, per capita meat consumption has increased for all meat categories except chicken. Beef was the most important type of meat consumed, accounting for more than 60 percent of all meat consumed, though that proportion has been decreasing. The proportion of total meat consumption coming from goat's meat has been decreasing, while the proportion of mutton in total meat consumed has been increasing. Meat consumption varies by location as well,

with higher meat consumption in urban areas than in rural areas, for all meat types. The average per capita beef consumption for urban areas was about seven kilograms per year while it was about two kilograms per year for rural areas. Overall, average annual per capita consumption of animal products is extremely low in Ethiopia, leaving room for significant consumption increases with an improvement in households' and individuals' disposable income (purchasing power).

Table 3.2. Trends in Ethiopian per capita daily calorie intake and per capita expenditure for cereals and livestock products, 1995/1996 to 2004/05

Item	1995/1996	1999/2000	2004/2005
Per capita meat consumption (grams/year)	2667	3331	NA
Percent beef	64.7	62.7	NA
Percent mutton	9.2	17.5	NA
Percent goats meat	13.7	11.7	NA
Percent chicken	11.6	7.0	NA
Per capita milk, cheese and eggs consumption (grams/year)	12366	9667	NA
Percent milk	59.5	52.0	NA
Percent milk powdered	0.1	0.1	NA
Percent cottage cheese	9.4	5.2	NA
Percent yoghurt (clotted)	2.5	2.6	NA
Percent butter milk	28.2	38.1	NA
Per capita calorie intake (kcal/day)	1938.6	2211.2	2352.4
Percent cereal	67.9	64.0	61.8
Percent meat	0.7	0.8	0.8
Percent milk, cheese and eggs	1.2	1.1	1.0
Percent oils and fats	2.6	1.7	2.3
Per capita total expenditure (Birr/year)	1319.1	1411.8	1697.4
Per capita food expenditure (Birr/year)	686.0	727.2	863.9
Percent of food in total expenditure	52.0	51.5	50.9
Percent of cereal in total expenditure	23.9	23.2	20.4
Percent of cereal in food expenditure	46.6	45.0	40.0
Percent of meat in food expenditure	3.5	4.8	5.0
Percent of milk, cheese and eggs in food expenditure	3.8	3.2	NA
Percent of oils and fats in food expenditure	3.5	3.8	4.0

Source: CSA (1998, 2001, 2007b)
Notes: NA indicates 'not available'

In general, Ethiopia is characterized by low per capita dairy consumption levels, few types of dairy products, and with a strong preference for fresh fluid milk. In terms of the specific dairy products consumed, household's dairy consumption in Addis Ababa in 2006 was: 30 percent raw milk, 38 percent fermented butter, 15 percent pasteurized milk, 8 percent powder milk, and 6 percent *ayib* (cottage cheese) (Francesconi et al. 2009)[1]. The national annual per capita milk, cheese, and egg consumption for Ethiopia decreased from 12.4 kilograms in 1995/1996 to 9.7 kilogram in 1999/2000. Most of this consumption was in the form of liquid milk, which accounted for more than 56 percent of all milk, cheese, and eggs consumed. There is a very strong consumer preference for fresh raw milk consumption as it is perceived

[1] This is based on sample survey of consumers in Addis Ababa and may not be representative of the whole country.

to be more natural, of higher nutritional value, and with more fat and flavor. The consumption of UHT milk is almost zero.

Dairy production is insufficient to meet demand in most parts of Ethiopia: consumers report that low availability of dairy products is a major reason for not consuming dairy products. A study by Negassa (2009) in the Arsi zone shows that about 72, 62, 43, and 38 percent of consumers surveyed indicated that their current monthly levels of consumption of fluid milk, edible butter, cheese, and cosmetic butter (used for hair care) respectively are insufficient . More than 95 percent of those who reported inadequate levels of consumption also indicated their interest to increase their level of consumption. Given the low levels of per capita dairy product consumption and consumer's willingness to increase dairy consumption, the prospect for market-oriented dairy production in Ethiopia is promising. The most important consumer concerns include issues surrounding availability, quality, and food safety. Buyers are especially concerned about the unhygienic condition of containers and possibility of milk contamination by external agents (Negassa and Jabbar 2008; Land O'Lakes 2006).

The relative share of livestock product expenditure in total household expenditure is fairly low, though increasing (Table 3.2). The average annual per capita total expenditure increased from 1,319 Birr in 1995/96 to 1,697 Birr in 2004/05, while food expenditure increased from 686 Birr to 864 Birr during the same time period. Livestock product consumption expenditure in the household budget is less important than that of the cereal consumption expenditure. Data collected in the three most recent household income and expenditure surveys for Ethiopia indicate that cereal product purchases account for more than 20 percent of total expenditure and more than 40 percent of the total food bill. Despite the fact that the share is increasing, the expenditure for livestock products like meat, cheese, and eggs represents less than 10 percent of the total household food bill.

In terms of per capita calorie intake, more than 60 percent of Ethiopian per capita daily calorie intake comes from cereals. Livestock products like meat, milk, cheese, eggs, oils, and fats cumulatively contribute to less than five percent of daily per capita calorie intake. Animal products continue to make up a small protein source for Ethiopian households. Furthermore, due to Ethiopian orthodox christian fasting practices, consumption of livestock and livestock products varies dramatically throughout the year.

3.2. Market channels and key operational characteristics

3.2.1. Red meat

The red meat value chain map and its description is found in recent studies by Kerebih (2008), Teklewold et al. (2008), Jabbar et al. (2007), Negassa and Jabbar (2008), and Saperstein and Farmer (2006). There are several marketing channels through which cattle, sheep, and goats flow to final consumers in both the domestic and export markets. In general, the cattle, sheep, and goat marketing channels are lengthy, without significant value-added activities. The livestock marketing channels, which start with the smallholder livestock producers from the mixed crop-livestock farming system, mainly cater to the domestic market. The marketing channel starting with the pastoralists is for both domestic and export markets. The market actors may be involved in cattle only, sheep and goats only, or cattle, sheep, and goat transactions.

Livestock marketing operations are generally small-scale family businesses. The livestock producers' supply to the market is not based on market demand, rather buyers must choose from whatever is available in the market. The live animals are either transported in trucks or herded over long distances to feedlot operators, export abattoirs, or major markets. These final market destinations are far away from supply sources, and the transportation costs associated with getting live animals to markets can result in significant weight loss and even death; stock routes are characterized by lack of adequate feed, water, and resting places. It can be argued that the long supply channels lead to high costs and reduce the competitiveness of live animal or meat exports. The spot market transaction dominates livestock marketing activities. In some cases repeat transactions are possible. However, there are no binding contractual arrangements among different market actors. Price is determined through bargaining at the market; livestock producers are usually less informed about price, supply, and demand situations. Suppliers (producers) are highly fragmented, while there is a concentration of major livestock buyers, a situation which might lead to non-competitive pricing and marketing behavior.

3.2.2. Poultry

The poultry value chain is relatively short in comparison to the red meat value chain. Parent stocks are sold either directly to farms or through distributor agents. Small-scale backyard poultry producers sell poultry directly to consumers in the local market or to actors in the middle who then sell to traders who sell to final consumers in the urban and peri-urban markets. Commercial poultry producers sell directly to consumers or to supermarkets, which ultimately sell to different consumers. Supermarkets sell eggs, whole chickens, and cut chicken pieces. Live chickens and eggs are sold in wet markets.

Detailed discussions of the characteristics of poultry production and marketing systems in Ethiopia can be found in Dessie and Ogle (2001), Tadelle et al. (2003), Yadeta et al. (2003), and Dana et al. (2006). The opportunity for poultry production is seasonal, following religious festivals and New Year, and the market opportunities are mainly for those smallholders close to the urban centers as the poultry transport system and infrastructure is not developed enough to support transport and marketing over longer distances. For example, the care required for handling eggs makes long-distance trade difficult.

There is also a lack of detailed information on operational characteristics of commercial poultry production and marketing in Ethiopia, as well as the major constraints facing it. However, it is observed that the commercial poultry production system is constrained by the shortage of day-old chicks. Currently, the day-old chicks are mainly imported from different countries, including Kenya, and are not available in sufficient quantities for those firms engaged in broiler production and those who would like to engage in poultry production.

3.2.3. Dairy

There are several marketing channels for raw milk and home-processed milk products produced by small-scale rural dairy producers. The first channel may be the most important one, in terms of volume sold: it is the direct sale of raw milk or home-processed milk products by the small dairy producer to consumers in the local rural or urban wet markets. Alternatively, small-scale rural dairy producers can also organize themselves as a producer group to collect raw milk from their members and non-members for direct sale to consumers or to private milk collection centers for private industrial milk processing. In the third channel,

small-scale rural dairy producers supply raw milk to their cooperative milk collection centers for cottage or industrial processing. Fourth, smallholder producers also supply raw milk to private collection centers collecting milk for private industrial milk processing firms.

Small-scale urban and peri-urban dairy producers also sell directly to urban consumers in the informal wet market, or directly deliver to consumers, or through regular milk pick-ups which can be arranged by the buyer. In most cases fresh milk is supplied to consumers by dairy producers on contractual basis (negotiated delivery prices of eight to ten Birr per liter, with seasonal variations) (authors' observations 2010). Francesconi (2009) reports that more than 80 percent of the milk is unregulated and marketed through informal marketing channels; only about 11 percent of the total dairy product sales in Addis Ababa is distributed through the supermarkets.

In the more formal marketing channels, dairy processing companies (vertically coordinated or integrated) sell their dairy products through supermarkets or directly supply to food service providers, caterers, traders, food manufacturers, and institutions including schools, hospitals, the military, etc. Formal milk markets are limited to the urban areas of Addis Ababa and other towns. However, the formal market appears to have been expanding during the last decade with the private sector entering the dairy processing industry. Dairy products which need refrigeration, such as fresh pasteurized milk, yogurt, and cheese, are either directly supplied to consumers or sold in supermarkets. In 2006, about 29 percent of industrially processed dairy products were sold through supermarkets and only 2 percent of traditional dairy products were sold in supermarkets (Francesconi et al. 2009).

4. Exports and Imports

Ethiopia exports both live animals and meat to various Africa countries, as well as the Middle East, where live animals are demanded due to religious and cultural practices. On the other hand, Ethiopia is a net importer of dairy products, primarily including milk powder, baby milk, cheese, and yoghurt. In this section, we address the constraints and opportunities in the emerging export market for live animals and meat.

To analyze the trade performance of livestock and livestock products over time we use raw data of the National Bank of Ethiopia (NBE 2007/08) on volume and value of livestock and livestock products exported. Tables 4.1 and 4.2 present the trends in the volume and value of Ethiopian livestock and livestock product exports from 1970/71 to 2007/08. For the whole period, the annual volume of live animal export and of meat and meat product exports averaged 6.6 thousand metric tons and 19.6 thousand metric tons, respectively (with coefficient variations of 145 percent and 384 percent, respectively). The volume of hides and skins exported was 10.3 thousand metric tons (with a coefficient of variation of 45.6 percent). The high variation coefficients indicate very high inter-year variability in the volume of meat exports.

For the whole period, the livestock and livestock products share of the total value of exports was about 13 percent, fluctuating between 12 percent and 16 percent for different periods. It is important to note that hides and skins accounted for most of the export earnings.

Table 4.1. Trends in the volume of Ethiopian livestock and livestock product exports, 1970/71 to 2007/08

	1970/71 to 1979/80	1980/81 to 1989/90	1990/91 to 1999/00	2000/01 to 2007/08	Whole Period
Live animals					
Mean annual volume (tons)	6,733.6	6,721.2	1,130.6	14,616.2	6,705.7
Annual growth rate (%)	-28.4	11.5	10.2	193.2	-2.6
Meat and meat products					
Mean annual volume (tons)	67,179.7	1,475.7	905.2	4,048.7	19,566.1
Annual growth rate (%)	-45.2	-13.2	75.6	54.2	-5.9
Hides and skins					
Mean annual volume (tons)	12,624.0	9,585.1	6,957.8	12,786.3	10,302.0
Annual growth rate (%)	3.8	0.1	5.5	7.1	-0.2

Note: The average annual growth rates were calculated for each period and for the whole period by fitting a least-squares trend regression line to the logarithmic annual value of the variable in the relevant period. The average annual growth rate is computed by taking the antilog of the coefficient on the trend line and subtracting 1 and multiplying the whole by 100.
Source: Raw data was collected and published by the National Bank of Ethiopia (2007/08).

Table 4.2. Trends in the value of Ethiopian livestock and livestock product exports, 1970/71 to 2007/08

	1970/71 to 1979/80	1980/81 to 1989/90	1990/91 to 1999/00	2000/01 to 2007/08	Whole period
Live animals					
Mean annual value (million Birr)	139	53	10	98	73
Annual growth rate (%)	-8.1	3.3	16.5	140.1	-4.1
Export share (%)	3.1	2.0	0.3	1.4	1.8
Meat and meat products					
Mean annual value (million Birr)	78	16	19	80	46
Annual growth rate (%)	-26.6	-17.6	90.9	55.2	-1.5
Export share (%)	1.8	0.6	0.6	1.2	1.1
Hides and skins					
Mean annual value (million Birr)	410	338	361	644	422
Annual growth rate (%)	3.9	1.2	10.8	-1.2	1.4
Export share (%)	9.3	12.8	10.6	9.4	10.2
Livestock share of total exports (%)	14.2	15.5	11.5	12.0	13.1

Note: The average annual growth rates were calculated for each period and for the whole period by fitting a least-squares trend regression line to the logarithmic annual value of the variable in the relevant period. The average annual growth rate is computed by taking the antilog of the coefficient on the trend line and subtracting 1 and multiplying the whole by 100. The coefficient of variation was computed in two different ways. First, the usual coefficient of variation (CV) was obtained by dividing the standard deviation by the mean and multiplying by 100. Second, the trend adjusted coefficient of variation (CV_t) was computed by multiplying the normal CV with the square root of 1 minus the coefficient of determination (R^2) obtained by regressing a given variable on trend variable. Values are in constant 2005 prices, using the IMF CPI for Ethiopia.
Source: Raw data was collected and published by the National Bank of Ethiopia (2007/08).

4.1. Live animal exports

Table 4.3 summarizes the structure of live animal exports from Ethiopia by livestock species, total number of exports, and country of destination from July 2007 to June 2008. The main live animal species exported include cattle, sheep, goats, and camels. During this one year period, the total number of live animals exported was about 297,644, which represents about 0.3 percent of the estimated total cattle, sheep, goat, and camel population. In terms of the composition of live animal exports, sheep accounted for the largest export share (47 percent) followed by cattle, which accounted for about 28 percent of the total live animal exports. The three major import markets were the Kingdom of Saudi Arabia (KSA), Djibouti, and Yemen, accounting for 48 percent, 17 percent, and 15 percent, respectively, of the total live animal exports from Ethiopia. Yemen alone accounted for 47 percent of cattle export from Ethiopia while Djibouti accounted for 50 percent of total Ethiopian camels exports.

Table 4.3. The structure of live animal exports from Ethiopia, 2007/08

Country of destination	Species: Cattle number (percent)	Camels number (percent)	Sheep number (percent)	Goats number (percent)	Other number (percent)	Total number (percent)
Djibouti	5,238(6.38)	20,091(50.32)	19,015(13.55)	5,736(18.39)	207(7.20)	50,287(16.90)
Somalia	17,230(20.67)	145(0.36)	0(0.00)	0 (0.00)	0(0.00)	17,375(5.84)
Sudan	13,258(15.91)	2,323(5.82)	0(0.00)	0(0.00)	597(20.77)	16,178(5.44)
Yemen	39,255(47.09)	168(0.42)	1,600(1.14)	2,361(7.57)	0(0.00)	43,384(14.58)
KSA	290(0.35)	3,585(8.98)	117,980(84.10)	21,800(69.88)	400(13.91)	144,055(48.40)
UAE	8,085(9.70)	5,894(14.76)	700(0.50)	1,300(4.17)	350(12.17)	16,329(5.49)
Egypt	0(0.00)	7,720(19.34)	0(0.00)	0(0.00)	0(0.00)	7,720(2.59)
Jordan	0(0.00)	0(0.00)	995(0.71)	0(0.00)	0(0.00)	995(0.33)
Others	0(0.00)	0(0.00)	0 (0.00)	0(0.00)	1,321(45.95)	1,321(0.44)
Total	83, 356	39,926	140,290	31,197	2,875	297,644
Share (%)	28	13	47	11	1	100

Source: SPS-LMM (2008).
Note: Figures in the parentheses are market shares (%) of Ethiopian exports by country of destination.
KSA: Kingdom of Saudi Arabia; UAE: United Arab Emirates

Table 4.4. Total value of live animal exports from Ethiopia, 2007/08

Country of destination	Species: Cattle '000 US$ (percent)	Camels '000 US$ (percent)	Sheep '000 US$ (percent)	Goats '000 US$ (percent)	Other '000 US$ (percent)	Total '000 US$ (percent)
Djibouti	1,009(5.06)	5,782(42.93)	769(13.54)	224(19.16)	118(35.76)	7,902(19.46)
Somalia	2,868(14.37)	30(0.22)	0(0.00)	0(0.00)	0(0.00)	2,898(7.14)
Sudan	3,193(16.00)	711(5.28)	0(0.00)	0(0.00)	86(26.06)	3,990(9.83)
Yemen	10,476(52.51)	33(0.25)	54(0.95)	90(7.70)	3(0.91)	10,656(26.25)
KSA	109(0.55)	932(6.92)	4,809(84.68)	798(68.26)	120(36.36)	6,768(16.67)
UAE	2,297(11.51)	2,350(17.45)	22(0.39)	57(4.88)	182(55.15)	4,726(11.64)
Egypt	0(0.00)	3,630(26.95)	0(0.00)	0(0.00)	0(0.00)	3,630(8.94)
Jordan	0(0.00)	0()	25(0.44)	0(0.00)	0(0.00)	25(0.01)
Others	0(0.00)	0()	0 (0.00)	0(0.00)	3(0.91)	3(0.00)
Total	19,952	13,468	5,679	1,169	330	40,598
Share (%)	49	33	14	3	1	100

Source: Raw data was compiled by the National Bank of Ethiopia (2007/08).
Note: Figures in the parenthesis are market shares of total value of export by destination.
KSA: Kingdom of Saudi Arabia; UAE: United Arab Emirates

For sheep and goats, KSA was the most important importer, accounting for 84 percent of total sheep exports and 70 percent of total goat exports from Ethiopia in 2007/08. It is interesting to note that the live animal exports to Djibouti, Yemen, Somalia, and Sudan are for re-export to other Middle Eastern countries, indicating that a large proportion of live animals are not directly exported from Ethiopia to final Middle Eastern consumers. We do not have information on the size of the Middle Eastern markets for live animals and Ethiopia's market share in these markets. Table 4.4 provides the total value of live animal

exports from Ethiopia by species and country of destinations for the period from July 2007 to June 2008. The total value of live animal exports over the one year period was about 41 million USD. Cattle exports accounted for the largest share at 49 percent, followed by camels which accounted for 33 percent, while sheep ranked third, accounting for about 14 percent of the total value of live animal exports. In terms of importing countries, live animal exports to Yemen accounted for 26 percent of the total value of exports followed by Djibouti which accounted for about 19 percent. Thus, Yemen and Djibouti account for significant volume and value of live animals exported from Ethiopia.

There is a clear seasonal pattern in live animal exports from Ethiopia, especially for sheep and goats because live animal consumption is mainly for seasonal religious and cultural festivals. Cattle and camel exportation has been continuous throughout 2007/08, but there are no exports of sheep and goats during some months. There are price variations by country of destination and intra-year price variations for different importing countries.

4.2. Meat exports

Table 4.5 presents the structure of Ethiopia's meat exports. The main meat products exported from Ethiopia are chilled whole sheep and goat carcasses, chilled beef, chilled camel meat, chilled offal, and preparation of poultry. The total volume of meat exported between July 2007 and June 2008 was about 6,486 metric tons and chilled sheep and goat carcasses accounted for about 99 percent of the total quantity of meat exported. In terms of the total value of meat exported, Ethiopia obtained about 21 million USD from meat exports; chilled sheep and goat carcasses exports accounted for more than 99 percent of the total value of meat exports. The bulk of meat exports in the form of whole sheep and goat carcass indicates the lack of product diversification in meat exports. During the period July 2007 to June 2008, Ethiopia exported chilled meat to eight different countries: KSA, United Arab Emirates (UAE), Yemen, the Republic of Congo, Djibouti, Sudan, India, and Oman. The total volume of meat exported was 6,487 metric tons. The countries importing live animals from Ethiopia are also the importers of meat. The two major meat importers from Ethiopia were KSA and UAE and each accounted for about 49 percent of Ethiopia's total meat exports. As opposed to the volume of live animal export, there was no pronounced seasonality in the volume of meat exports from Ethiopia.

Table 4.5. The structure of Ethiopia's meat exports, 2007/08

	Volume of exports		Value of exports	
	Turnover (tons)	Market share (%)	Turnover ('000 US$)	Market share (%)
Product type				
Chilled sheep/goat carcass	6,446.0	99.4	20,809.0	99.6
Chilled beef	6.0	0.1	19.0	0.1
Camel meat	2.0	0.0	4.0	0.0
Offal	32.2	0.5	53.0	0.3
Preparation of poultry	0.1	0.0	1.0	0.0
Total	6,486.0	100.0	20,886.0	100.0
Country of destination				
KSA	3,210.5	49.5	10,011.0	47.8
UAE	3,214.6	49.6	10,715.0	51.1
Yemen	37.3	0.6	171.0	0.8
Republic of Congo	4.5	0.1	14.0	0.1
Djibouti	1.6	0.0	7.0	0.0
Sudan	1.0	0.0	1.0	0.0
India	11.8	0.2	23.0	0.1
Oman	5.3	0.1	17.0	0.1
Total	6,487.0	100.0	20,958.0	100.0

Source: SPS-LMM Project (2008).
Note: The period 2007/2008 corresponds to the Ethiopian fiscal year from July 2007 to June 2008.
KSA: Kingdom of Saudi Arabia; UAE: United Arab Emirates

4.3. Import of dairy products

Based on the Ethiopian Customs and Revenues Authority import database, there were several dairy products which were imported to Ethiopia during the 2004 to 2009 period. During this period, the average annual volume of dairy products imported to Ethiopia was about 10.4 million kilograms, at a nominal value of 245.6 million Birr (27.9 million USD). Imports are mainly in the form of unsweetened milk powder. Imports of value-added dairy products like cheese, butter, and yoghurt are relatively small, according to the official statistics. European imports accounted for more than 65 percent of the total volume and 70 percent of the total value of dairy imports from 2004 to 2008. The Netherlands accounted for more than 40 percent of the total quantities of dairy imports for Ethiopia over the last five years. The distribution and consumption of imported dairy products are limited to major cities and sold through supermarkets, kiosks, and grocery stores.

Over the last five years, there has been a dramatic increase in the volume and value of dairy products imported to Ethiopia which reflects changing eating habits of local consumers, such as eating out of home, and fast growth in the food service sector. The increasing demand for dairy products due to the growing food service sector cannot be easily met by local dairy production alone. This is because of inadequate and unreliable supply of quality and safe dairy products from the domestic production. Furthermore, inefficient and expensive milk collection, storage, and transportation to the processing plants restrict the growth of the commercial domestic dairy market.

5. Opportunities and challenges

Recently, there has been a trend of continuous and rapid increases in global consumption, production, and trade of livestock products in developing countries (Hall et al. 2004; Delgado et al. 1999). This trend has been known by the term livestock revolution. The factors that led to this increased demand are: population growth, urbanization, rise in income in growing urban centers of developing countries, international influences (globalization and more liberal international trade), and technological changes in the production, communication, and transport sectors (Delgado et al. 1999; Hall et al. 2004; De Haen et al. 2003). The rapid growth in demand for meat products in the world represents a great opportunity for livestock resource-rich countries. For Ethiopia, opportunities to export meat to Middle Eastern countries and other African countries have been growing. Clearly, Ethiopia has comparative advantage in terms of geographic proximity to the Middle Eastern markets, with the potential for the quickest delivery time of fresh meat or meat products. Ethiopia's lowland cattle, sheep, goat, and camel breeds are also highly demanded in the Middle East due to their better taste and the organic nature of their production (Hurissa and Eshetu 2003). There is also a possibility for organic grass-fed and produced meat for niches in the European Union (EU) markets. In addition to the growing opportunity to export live animals and meat, there will also be an increase in domestic demand due to urbanization and economic growth.

Additionally, there is a rising (and unmet) domestic demand for dairy products. Consumers report that low availability of dairy products is a major reason for not consuming dairy products and more than 95 percent of those who reported inadequate level of consumption also indicated their interest in increasing their level of consumption. Hence, the low levels of per capita dairy consumption and consumer's willingness to increase dairy consumption show the potential to expand the domestic dairy market.

With growing urbanization, there has been a rapidly developing food service sector (fast food outlets, restaurants, and hotels) in Ethiopia, particularly in Addis Ababa. This will increase the demand for high quality processed dairy products and dairy ingredients. Additionally, the food manufacturing sector, which utilizes dairy ingredients, has been expanding in Ethiopia. There are several bakeries and confectionary factories which require dairy products as their main ingredients; these represent another area of growing market opportunities for dairy producers and dairy product processors and suppliers. Due to a high level of widespread malnutrition in Ethiopia, there is also a growing interest in the preparation of nutritional foods like corn-soya blends which require milk powder (milk solids).. Detailed information on the demand and utilization of dairy ingredients in the industrial and food manufacturing sector in Ethiopia is not available[2].

In order to exploit emerging market opportunities there is a need to improve both the quantity and quality of livestock and livestock products under the different production systems. There are challenges at the household level, at the domestic market level, and at the export level, including the high mortality rates of livestock.

[2] Malnutrition is one of the main public health problems for children and women in Ethiopia. The Demographic Health Survey from 2005 shows that 47 percent of children are still stunted, 38 percent are underweight, and 11 percent are wasted (The Reporter, Saturday December 26, 2009, volume XIV No. 694). As a result, the government, in collaboration with the donor community, is planning on starting local production and utilization of complementary food.

5.1. Challenges at the household level

Farmers with no or with only a small number of animals need different production techniques than producers with larger herds, i.e. smallholder mixed farming systems versus pastoralists. Those producers without or with little livestock need support to acquire stocks and sustain their herd sizes by increasing productivity and protecting the producers from becoming stockless. On the other hand, producers with large herds of cattle and small ruminants need support in improving livestock quality, marketing, and increasing off-take. However, the fact that many households have few or no livestock indicates that the potential for commercialization exists for only a small number of households.

In general, commercialization of the livestock sector in Ethiopia is very limited. Livestock producers are not primarily producing for market; actions are required to improve their market access and participation. Given the small herd size, for both the smallholder farmers and pastoralists, scholars have suggested that the need is to identify policies and market opportunities that allow producers to sell better, at higher remuneration rates, rather than sell more (McPeak 2001). As livestock production is not treated as a commercial activity, but is rather ad hoc in nature, livestock producers' supply to the market has not been based on the market requirement. Buyers must choose from whatever is available in the market, making it very difficult to meet quality requirements in end markets. Livestock supplies are fragmented, which means herds must be bulked up before trekking or transporting across long distances.

For pastoralists there is still the potential to increase commercial off-takes, even under the existing production practices. If their marketing systems are improved, pastoralists can obtain agribusiness advice and favorable investment opportunities, which would improve value chain coordination. If these market constraints are improved, and markets provide sufficient incentives to invest in improved management, the key to growth for pastoralists lies in production intensification.

Smallholder farmers face greater challenges to commercialization than pastoralists. Unless significant changes are made in smallholder farmers' production systems to increase the quantity and quality of animals raised for the market, it will be difficult to obtain significant off-take, both in terms of quantity and quality. The most notable constraints to increase the quantity and quality of animals are feed shortage and diseases (Gebremedhin et al. 2007). As there is limited grazing land in the mixed-farming system, improving livestock production could occur through intensification and better integration of crop and livestock production practices. There is a need to overcome the competition between on-farm use and market disposal of livestock and livestock products.

5.2. Constraints and challenges of the domestic livestock market

The key constraints that the domestic livestock markets are facing include: lack of and unequal access to up-to-date market information on prices; time-specific demands and quality requirements; poorly developed road networks connecting the livestock supply areas (e.g., pastoralist areas) to the markets; an inadequate number of market centers for live animals with adequate waiting and holding ground, feeding, watering, resting facilities, livestock scales, loading ramps, crushes, etc.; clan conflicts due to competition for limited land and water resources; lack of grades and standards; and a lack of effective value chain

coordination/consultation forum among the livestock value chain participants. More detailed discussions of several constraints confronting the smooth flow of cattle, sheep, and goats from the production areas to the feedlots, processing, and consumption points in Ethiopia are found in Aklilu (2002), Hurissa and Eshetu (2003), Negassa and Jabbar (2008), Hurissa and Legesse (2008), and Teklewold et al. (2008).

The potential to expand the domestic dairy market is constrained by low productivity at the farm level, inefficient and expensive milk collection and storage, and transportation to the processing plants. Access to adequate quantities and quality of safe raw milk on a sustainable and competitive price basis is critical to the success of processing firms. Other issues are: access to technology and effective response to changes in consumer tastes, market dynamics, and policies. Promotional work to create awareness of the nutritional value of milk is also critical to overcome some of the cultural factors affecting the consumption of dairy products in Ethiopia.

The major constraints affecting poultry production and marketing in the central highland areas of Ethiopia are discussed in Dessie and Ogle (2001) and Dessie et al. (2003). The most important constraint is poultry disease followed by predation, lack of feed, poor housing, insufficient water, and parasites. There is also a lack of information and training on improved trading practices and marketing management. The backyard poultry production system in Ethiopia is also characterized by very low productivity (Tadelle et al. 2003). It is argued that low productivity is caused by a number of factors, such as sub-optimal management, lack of supplementary feed, low genetic potential, and diseases. These highlight the need for research and development to improve poultry production and marketing systems.

5.3. Main constraints of the export of live animals and meat

The rapid growth in demand for meat products in the world represents great opportunities for livestock resource-rich countries like Ethiopia to exploit. However, there are several constraints that limit Ethiopia's exploitation of export potential of livestock and livestock products. The critical constraints as identified based on the Ethiopia Sanitary and Phytosanitary Standards and Livestock and Meat Marketing Program (SPS-LMM) project and other studies are summarized below:

- Inadequate information regarding the country's livestock number, annual off-take, productivity, and consumption levels;
- Archaic traditional production systems;
- High domestic demand relative to low supply of export-quality live animals;
- Insufficient and inconsistent supply of price competitive quality livestock and meat;
- Prevalence of livestock diseases;
- Import restrictions based on Ethiopia Sanitary and Phytosanitary Standards (SPS) requirements imposed by importing countries;
- Inadequate infrastructure supporting domestic and export markets for live animals (e.g., livestock markets, stock routes, resting places, quarantine stations for assembling and transporting livestock are inadequate);
- Absence of a grading system, a market information system, and promotional activities;

- Lack of capacity for cattle slaughter and for cold chain processing and packaging of export-quality beef products;
- Shortage of cold chain facilities and cargo space;
- Lack of capability for cost-effective, cold chain transport of meat products by road and sea for delivery to the Middle East, North Africa, and other international markets;
- Inadequate port facilities: the Djibouti port is the only port used and it is ill-equipped for handling a large number of livestock, lacks adequate resting places, sufficient fencing, compartments for handling different categories of livestock, and facilities for isolation of sick animals;
- Excessive taxes and fees on exports and time-consuming tax collection procedures which make exporting less competitive in the global market;
- The requirement of a letter of credit to authorize the exportation of livestock and livestock products, which does not work well with livestock marketing practices in importing countries;
- Inadequate financial and technical sources for livestock-related businesses in terms of the assistance in the preparation of loan applications (feasibility studies, cash flow forecasts, etc) to access trade finance/ capital investment loans from different banks;
- Limited access to foreign exchange earnings. In Ethiopia, exporters and importers can only access foreign exchange through the bi-weekly auctions at the national bank;
- Illegal export trade.

It can be argued that Ethiopia would benefit more by exporting meat rather than live animals as there are several problems in exporting live animals. First, there is limited marketing infrastructure, and feeding and watering facilities en-route to the live animal export markets, which results in high transaction costs and reduces the quality of live animals upon arrival in destination markets. Second, live animal exports have also been observed to enhance the chances of disease transmissions and as a result the exports of live animals have faced frequent bans by importing countries whenever there are animal disease outbreaks within Ethiopia or bordering countries. Import bans have been prevalent in Ethiopia over the last several years; these can be very expensive and disruptive to the livestock sub-sector growth. Furthermore, as discussed above, live animal export trade from Ethiopia is seasonal for sheep and goat, usually concentrated around the time of religious celebrations in Middle Eastern countries, while the meat export trade could be a year-long activity providing year-round employment.

As compared to live animal trade, there are also other advantages of exporting meat aside from overcoming market infrastructure problems, import restrictions and bans on live animals due to fear of disease transmissions (Negassa and Jabbar 2008). Theoretically, the export of meat offers opportunities for value-addition within the country of origin which increases the levels of employment and income, and maximizes the number of people participating and benefiting from value-adding activities. Meat exports also have the potential to generate increased tax revenue for the government of country of origin from various services, processing, marketing, and other associated activities catered to the preparation of meat for export. Meat by-products like hides and skins could also be key sources of revenue through further processing and manufacturing within the country or through direct exports of raw or semi-processed hides and skins. The by-products like offal left in the country could also provide cheaper sources of protein for domestic consumers in the country or could be another export item.

Government policies have been supporting the development of the live animal export markets and domestic value-adding activities, such as the export of chilled meat instead of exporting live animals. The Ethiopian government had planned to increase the current level of meat and meat products export from 6,000 tons per annum to 30,000 tons per annum by 2010 (SPS-LMM 2008). To this effect, the Ethiopian government and USAID have initiated an SPS-LMM project with the main objective to develop and support the private sector capacity to export meat. Recently, the government has also established the Ethiopian Meat and Dairy Technology Institute (EMDTI) to support private sector participation in meat and dairy development.

Low levels of export and lack of diversification show the potential growth areas for meat exports in terms of increasing the volume of exports and diversifying into different meat products with more value addition. Export diversification is also important to reduce the risk of the meat export market due to demand and price instability. The chilled whole carcass also has a limited shelf-life which requires fast delivery for timely access to the market through channels such as expensive airfreight. To address such problems, it is suggested that vacuum packaging needs to be developed to increase the shelf-life of meat to use cheaper means of transportation (SPS-LMM 2008).

5.4. High mortality rates

As mentioned above, deaths account for a significant proportion of cattle, sheep, and goat outflows. High mortality rates, coupled with low birth rates, lead to low herd recovery in cases of herd reduction. It is argued that poor nutrition and feed shortages are the root causes behind poor performance of the livestock sector in Ethiopia (Tolera 2007). The same study points out that more than 60 percent of households in the sample use green fodder/grazing as the source of feed for their livestock production. Manufactured feed, improved feed, and hay have been limited: between 2001/02 and 2008/09, less than one percent of farm households used improved feed, less than 10 percent of farm households used improved hay, and more than 25 percent of farm households used crop residues. Thus, there is limited commercialization of livestock feed production in Ethiopia to support a modern intensive commercial livestock production system.

Table 5.1 summarizes the proportion of animals that are vaccinated, diseased, or treated in smallholder farms (CSA 2006, 2007, 2008, 2009). Of all the animal types, cattle are vaccinated most frequently. From 2005/06 to 2008/09, 25 percent of the cattle population in smallholder farms was vaccinated, yet 15 percent was diseased and less than half of the sick animals were treated. A much lower proportion, only 12 percent, of the sheep and goats were vaccinated and about 22 percent was diseased. Furthermore, treatment frequency was even lower than in cattle. One in every five chickens was diseased; vaccination and treatment of poultry is insignificant. Higher vaccination and treatment levels would most likely contribute to lower mortality rates.

Table 5.1. Animals vaccinated, diseased and treated in smallholder farms, averaged from 2005/06 to 2008/09.

	Cattle		Sheep		Goat		Poultry	
	Number (million)	**Share** (%)	**Number** (million)	**Share** (%)	**Number** (million)	**Share** (%)	**Number** (million)	**Share** (%)
Vaccinated	11.6	25.6	2.8	11.8	2.4	12.3	0.1	0.2
Diseased	7.0	15.5	5.7	23.7	4.4	22.2	7.3	20.3
Treated	3.1	6.9	1.4	5.7	0.9	4.4	0.2	0.6
Total population	**45.1**		**23.9**		**19.6**		**36.0**	

Source: CSA (2006, 2007, 2008, 2009)

Reducing mortality rates would significantly impact livestock production in Ethiopia: through reaching a sustainable herd base and so reducing the risk of herd depletion, through increasing production, and through achieving a greater potential for commercial off-takes. Investing more in improved management technologies, dry season feeding, and animal health could help farmers reduce mortality rates.

6. Conclusions and policy implications

In Ethiopia, livestock production follows two major systems: the sedentary mixed crop-livestock production system and the nomadic pastoral or agro-pastoral production system. The other less important, but growing, livestock production systems are small-scale peri-urban and urban production systems and the medium to large scale commercial livestock production systems.

The livestock sub-sector plays a significant role in the Ethiopian economy at both the national and household levels. Its contributions to both agricultural value-added and national GDP are substantial. At the household level, livestock plays a critical economic and social role in the lives of pastoralists, agro-pastoralists, and smallholder farm households. Livestock fulfills an important function in coping with shocks, accumulating wealth, and serving as a store of value in the absence of financial institutions for saving and given missing factor and output markets. In the case of smallholder mixed farming systems, livestock provides nutritious food, additional emergency and cash income, a means of transportation, farm outputs and inputs, and fuels for cooking. In the case of pastoralists, livestock solely represents a means to support and sustain their livelihoods. Improving livestock production and marketing is critical to enhancing livelihoods and to alleviating poverty in Ethiopia.

The total number of livestock in Ethiopia is the largest in Africa. However, the number of livestock at the level of the individual smallholder farmers and pastoralists remains low. Besides the small herd size, the livestock sub-sector is characterized by multiple species and multipurpose activities, one of the lowest levels of productivity in the world, less commercially oriented production systems, low commercial market off-takes, inadequate production and marketing infrastructure, and inadequate services, institutions, and support systems.

Furthermore, the smallholder farmers' and pastoralist's livestock production and marketing structures have not substantially changed over the last several years. There are also no major noticeable changes in the objectives and practices of traditional livestock production from multiple species and multipurpose activities to more commercially oriented and vertically integrated/coordinated business activities. The traditional production systems, products, and marketing systems still dominate. Recently, some developments have been observed in terms of the emergence of new commercially-oriented livestock production systems. Private sector entries and capital investment into meat, dairy, and poultry farms have increased substantially over the last several years. However, the emerging commercially oriented livestock sector is constrained by lack of feed, improved breeds, and adequate support services such as veterinary, extension, credit, information, etc. Overall, the transformation of the livestock sector is limited and the livestock revolution has yet to come to Ethiopia, suggesting the potential to expand the role of livestock in smallholder livelihoods and income.

The reliable and adequate supply of quality live animals and meat has been one of the major challenges facing the meat export sector in Ethiopia. There is a need to adapt production and marketing methods to export market requirements. Development of the private sector and institutional capacity to reliably deliver the required quantities of live animals and meat of a specified quality standard as agreed upon by the importers is crucial. In this regard, some of the major challenges are related to animal mortality, disease outbreaks, food safety, and sanitary standards. There is also a need to vertically integrate/coordinate to reduce transaction costs and improve information flows, and thus, enhance market access, market linkages, and traceability of live animal and livestock product movements along the different value chains.

In general, the exploitation of the huge national livestock resources for national growth and poverty reduction requires the reorientation of the livestock production and the marketing systems, investment in research and development to improve the livestock productivities and increase marketable surpluses, regarding both quality and quantity, effective value chain coordination and development, reliable input and service provisions, and improvement in policies.

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