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23

Study of the Ethiopian live cattle and beef value chain



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Study of the Ethiopian live cattle and beef value chain

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Acronyms

CSA	Central Statistical Agency
DM	dry matter
EIAR	Ethiopian Institute of Agricultural Research
ESAP	Ethiopian Society of Animal Production
ETB	Ethiopian birr
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
ILRI	International Livestock Research Institute
MoARD	Ministry of Agriculture and Rural Development
SNNPR	Southern Nations, Nationalities and People's Region
SPS-LMM	Sanitary & Phytosanitary Standards and Livestock & Meat Marketing Program
t	tonne
USD	United States dollar(s)

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Introduction

Ethiopia is a largely rural country with an agrarian economy. Livestock are of economic and social importance both at the household and national levels, and have in the past provided significant export earnings. Although estimates vary widely,¹ livestock is thought to contribute 15–17% of Ethiopian gross domestic product (GDP), 35–40% of agricultural GDP and 37–87% of the household incomes; the large variations are due directly or indirectly to climatic variation. Livestock have multiple uses aside from income generation, including cash storage for those beyond the reach of the banking system, draught and pack services, and manure for fuel and fertilizer. In addition to these non-market values, a thriving informal export trade in live animals further emphasizes the significance, albeit unrecognized by official statistics, of livestock (and particularly cattle) in the Ethiopian economy.

The country is ecologically diverse, featuring 18 distinct agroclimatic zones, but it has two major recognized livestock production systems: highland with predominantly mixed farming; and lowland pastoral and agropastoral systems. Ethiopia borders half a dozen countries in the Horn of Africa, and in all cases cultural, linguistic, clan and family links span the boundaries. Such connections employ physical and organizational trading arrangements that predate modern frontiers, and serve Middle Eastern markets for imported cattle and beef.

Ethiopia's domestic meat consumption for 2006–07 has been estimated at 2.4 kg/capita per year for beef, 0.7 kg/capita per year for sheep meat and 0.4 kg/capita per year for goat meat (Negassa and Jabbar 2008). Total meat consumption was close to 276 t in 2006–07, of which beef and mutton account for 68% and 21%, respectively. Pronounced differences have been identified between rural and urban patterns of meat consumption, particularly for beef (1.7 kg *c.f.* 7.0 kg, respectively) and mutton. Aside from economic factors, rural and urban consumption differences can be explained by social and demographic characteristics such as age structure and the rigour of adherence to religion-based fasting (Negassa and Jabbar 2008). Overall production for sale has proven difficult to estimate, but production and export volumes² indicate approximate self-sufficiency in beef, necessitating exports as an outlet for any future increases in production. However, meat production per head of livestock is low by the standards of other significant livestock producing African countries. For instance, de Haan (2003) shows that production of cattle meat in Ethiopia is just 8.5 kg/head of cattle per year, which is significantly lower than in Kenya and Senegal (21 and 16 kg, respectively).

Although substantial numbers of cattle are kept for milk production, per capita annual consumption of milk and dairy products is just 22 kg of milk equivalent in Ethiopia, far below that of Sudan (160 kg) and Kenya (80 kg) (FAOSTAT 2010). Transport logistics confine dairy marketing to selected areas, with the exception of home-produced butter.

The Middle East has been the traditional destination for Ethiopia's formal export of live animals and meat, and remains the major export destination. This applies equally to formal trade as to informal trade. Of the total Ethiopian exports of livestock and livestock products valued at 300–455 million United States dollars (USD)

1. Aklilu (2002); PSD-Hub (2008); Livestock Development Master plan Study (2003).

2. Estimated volumes of informal exports may be used to refute this statement.

annually (FAOSTAT 2010 and expert interviews), approximately USD 150–300 million pass through informal channels (based on Solomon et al. 2003).

Despite the prominence of cattle in Ethiopian society and its economy, relevant qualitative and quantitative information is both scarce and subject to a variety of interpretations. Mobilizing cattle, and their supporting natural and human resource base, in a sustainable manner for development purposes is therefore a challenge that begins with identification of problems and opportunities about which there is limited agreement. It is in this context that the government of Ethiopia requested a diagnostic study, through the Bill & Melinda Gates Foundation, which is supporting the Ethiopian Ministry of Agriculture and Rural Development (MoARD) to undertake a work program requested by Prime Minister Meles Zenawi, to provide strategic input and technical assistance in several key areas of the country's agricultural sector.

Using an extensive review of secondary materials, learning from a series of stakeholders' consultations, and participatory rapid assessments of market actors, this study analyses live cattle and beef marketing. It is focused on two of Ethiopia's major cattle trading routes, representing each of the agropastoral highland production systems and pastoral lowland production, and the respective routes taken by animals to market. The main objective is to diagnose problems based on quantitative measures, and identify associated policy strategies. The study team included local specialists, international management consultants, as well as researchers from the Consultative Group on International Agricultural Research. The team not only interacted with the policymakers on emerging results but also triangulated the results with other experts in the country in the forms of both stakeholders' consultations and one-to-one interviews.

The rest of the report is organized as follows. The next section summarizes existing information concerning Ethiopian cattle production and marketing of live cattle, and offers synthesis of existing research and conventional wisdom on a range of subjects related to the live cattle trade. Issues of disagreement are included in such synthesis, and an attempt is made to reconcile opposing views. The third section presents information concerning inputs and their supply, as related to live cattle marketing. This is followed by the fourth section that reviews selected studies of marketing practice and requirements, and their costs. The fifth section presents the results of the rapid appraisal of the live cattle value chain conducted as part of this study. The sixth section presents the study's conclusions and the paper concludes with a summary of key findings and recommendations.

Ethiopia's cattle and beef system

Animal numbers

Estimates of the numbers of cattle and other livestock species in Ethiopia vary substantially. Table 1 presents regionally disaggregated Central Statistical Agency (CSA) estimates of the livestock population, which shows a cattle population of around 50 million. Similar sets of numbers have recently been assembled by ILRI specialists, for a total of 47.5 million (Fadiga and Amare 2010), but other sources put the numbers higher³ or lower.

Table 1. Livestock populations and regional distribution

Region	Population (in '000 heads)				
	Cattle	Sheep	Goats	Equines	Camels
Ethiopia	49,297	25,017	21,884	7209	759
Tigray	3103	1376	3107	476	32
Afar	473	403	801	26	171
Amara	12,748	8987	6022	2438	50
Oromia	2245	9098	7439	3738	255
Somali	620	1,162	283	96	24
Benishangul Gumuz	411	84	321	49	–
SNNPR	9263	3838	2626	732	–
Gambela	130	17	31	–	–
Harari	44	4	36	8	–
Dire Dawa	48	43	122	13	5

Source: CSA (2009).

Ethiopia's cattle herd structure features relatively high male representation (44.5% of the population), and the largest proportions for both sexes fall into the 3–10 year age category (see Table 2). This is an indication of the uses to which the animals are put: oxen for cultivation and cows for milk production.⁴ Of the 27% of male cattle of over three years of age, about 90% are thought to be used as draught power, although this figure is dominated by highlands' practice. For example, notice that lowland Afar region has 6.77% of its cattle as 'males 3–10 years' while more highland Amhara region has 34.55% in this same class of animal. It is generally thought that in the highland mixed farming areas, cattle are raised primarily to provide bullocks for draught purpose, and that meat and milk are secondary products. In contrast, lowland pastoral areas feature cattle for milk and meat production.

3. CSA estimates for 2006–07 suggest numbers as high as 58 million cattle.

4. For sheep and goats, males make up 26.6% and 30% of their respective herds indicating a higher disposal of males at younger ages while females (48% in sheep and 42% in goats) are kept beyond two years for reproduction.

In all regions, but particularly the pastoral drought-prone areas, animal numbers indicate wealth and social status, and a buffer against uncertain events. Meat is derived almost exclusively from indigenous cattle breeds. Milk is also obtained by and large from indigenous stock with limited numbers of crossbred cows confined to urban and peri-urban areas.

Table 2. Distribution of cattle population by sex and age for each region

Region	Males						Females					
	% in each age category*											
	<6 month	6 month –1 year	1–3 years	3–10 years	10 years +	All male cattle	< 6 month	6 month –1 year	1–3 years	3–10 years	10 years +	All female cattle
Ethiopia	4.3	3.9	7.2	27.5	1.6	44.5	4.5	4.4	9.2	35.9	1.4	55.5
Tigray	4.5	3.8	6.8	29.2	3.0	47.2	5.5	4.5	8.6	32.3	2.0	52.8
Afar	5.9	3.6	3.8	6.8	0.2	20.3	9.3	8.0	12.7	47.4	2.1	79.5
Amara	3.7	3.1	7.2	34.6	2.7	51.2	4.0	3.4	7.9	31.9	1.6	48.8
Oromia	4.3	4.2	0.7	27.1	1.4	37.8	4.2	4.5	0.5	35.7	1.4	46.2
Somali	6.3	5.7	5.3	14.7	0.1	32.1	7.3	6.1	9.2	44.4	0.7	67.6
Benishangul Gumuz	4.1	4.4	7.8	25.2	2.2	43.7	4.9	5.8	9.5	34.2	1.7	56.1
SNNPR	4.7	4.2	6.5	20.3	0.4	36.1	5.1	5.3	10.4	42.0	1.2	63.9
Gambela	5.4	5.4	6.9	10.0	0.8	28.5	6.9	7.7	11.5	41.5	2.3	70.0
Harari	6.8	4.6	11.4	13.6	–	44.5	4.6	4.6	11.4	40.9	1.0	55.5
Dire Dawa	6.1	4.1	12.2	12.2	–	47.2	6.1	6.1	12.2	36.7	1.0	52.8

*Totals may not sum to 100% due to rounding error.

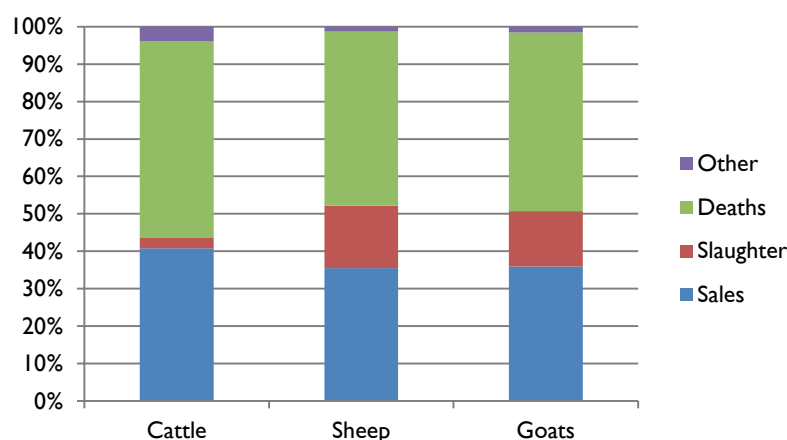
–indicates missing data.

Source: Fadiga and Amare (2010).

Herd dynamics

Most analyses of herd dynamics portray mortality as being rather higher than sales, and as the largest extractor for all species. Figure 1 estimates summarize available data. Notably, cattle for sale are rarely slaughtered at home and hence their sales use the long delivery chains to be discussed below.

Figure 1. Herd dynamics in livestock production systems in Ethiopia



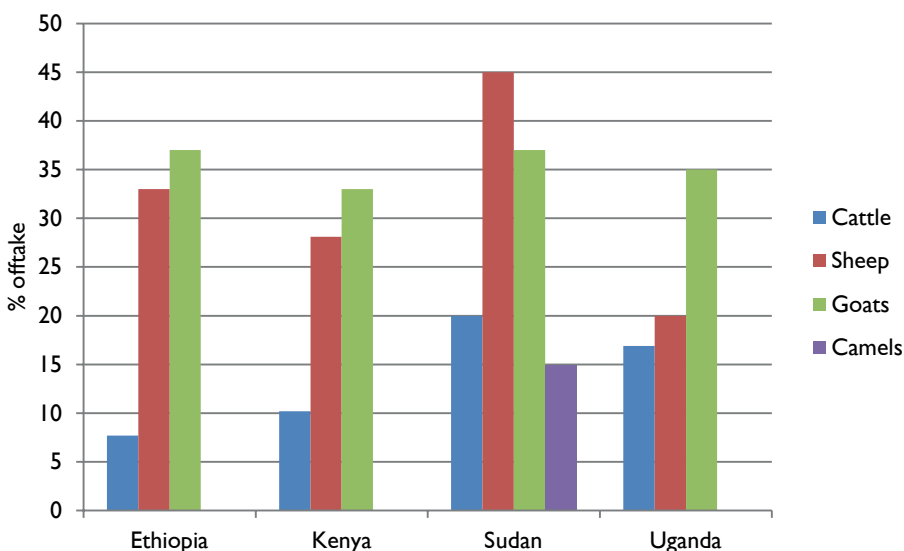
Source: Compiled by Fadiga and Amare (2010).

Ethiopian cattle offtake⁵ is low by East African standards, and also low in relation to offtake for other species (Figure 2). Negassa and Jabbar (2008) also cite three-year (2003–05) averages of net⁶ commercial offtake rates for cattle, sheep and goats to be 9%, 6% and 7% respectively. There is thought to be proportionally higher offtake of cattle in the lowlands than highlands as highland animals are kept longer (for draught and as replacements for draught animals). This offtake pattern is thought to deliver a low-quality animal from the highlands; 75% of those sold are culled draught oxen. Lowlands systems, conversely, provide young bulls due to pastoralists’ retaining female animals for dairy.

Box 1: What dictates pastoralists’ sales?

Analysis in the current study indicates that from the estimated 10 million cattle population in the pastoral areas, only about 800,000 (or less than 10%, are male yearlings), the age and sex class most suitable for market sale. Pastoralists are reported to sell, typically, animals to meet immediate cash needs which, during periods of high prices, may mean a decline in the numbers sold. The prevalence of cash sales is, however, called into question by the current study. Risk-related behaviour, lack of rural banking services and the lack of alternative livelihood and/or investment opportunities were all reported to the authors as contributing to reluctance amongst pastoralists to sell in response to high prices. Therefore, conventional supply and demand curves are inverted in the case of pastoral sales; this finding is supported by previous studies on pastoral livestock and cited in McPeak and Little (2006).

Figure 2. East African livestock offtake rates



Source: Compiled from International Trade Centre UNCTAD/WTO (2006).

Explanations for low offtake rates are varied, but most feature the motivation for sale being incidental household expenses (taxes, loan repayments and social and family obligations) rather than pre-planned commercial gain. Livestock producers also typically have few animals for sale, and herd size is known to be positively associated with offtake. Producers’ land area is negatively associated with offtake, due to an increased role of draught power in cultivation (Negassa and Jabbar 2008).

5. Offtake is defined as the animals sold, as a proportion of all animals held within an enterprise.

6. Net offtake subtracts out purchases for replacement, and commercial offtake excludes sales due to age and culling.

Market forms and channels

Domestic markets can be classified into basic/primary 'bush' markets, primary assembly markets, secondary markets for distribution and terminal markets in demand centres. Bush markets are attended by producers both as sellers and buyers and commonly intermediated by brokers, with purchase being primarily for replacements and rarely for fattening. Traders dominate purchases at assembly markets, and sales into secondary and terminal markets. At production level, and to an unknown extent at various market levels, brokers mediate transactions.

Purchases for fattening and for slaughter occur at secondary or terminal markets. Feedlots purchase for fattening on a somewhat large scale, while household fattening units (primarily in highland mixed production systems) fatten retired draught oxen without purchasing in markets. Butchers tend to buy primarily (directly or via a trader) from household fattening units.

Teklewold et al. (2009) described the prevailing channels⁷ as follows:

- Collectors buy only from producers
- Small traders buy 83% of stock from producers and 17% from collectors
- Large traders buy 44% from collectors, 36% from producers and 20% from small traders
- Feedlot operators buy 64% from small traders, 30% from producers and 6% from big traders
- Purchasing agents buy 80% from big traders, 15% from small traders and 5% from producers
- Live animal exporters buy 39% from big traders, 29% from feedlot operators, 20% from purchasing agents and 12% from small traders.

Informal exports of live animals offer an alternative channel. This channel subtends from an assembly function by specialized traders with cross-border links. It is widely reported that such traders also act as suppliers of imported consumer goods. Livestock sales to such traders are the only viable source of such commodities and this factor is likely to be influential in the decision to sell to cross-border traders.

Formal exports of live animals and meat have resulted in the establishment of slaughter and fattening facilities at key locations throughout the country. Such locations are influenced by feed supply, access to air transport, proximity to markets serving domestic demand (principally Addis Ababa), and at certain locations on livestock trekking routes. Domestic demand, centred on Addis Ababa, provides the major demand sink in Ethiopia and therefore heavily influences livestock flows.

7. See Teklewold et al. (2009) for definitions of trader types.

Exports through formal channels

The volume of Ethiopian formal exports of live animals has declined in recent years while the same measure for meat has fluctuated (Table 3).

Table 3. Ethiopian live animal and meat exports through formal channels

	Thousand head			
	2005–06	2006–07	2007–08	2008–09
Live animals				
Cattle	143	156	83	84
Camels	3	19	39	25
Sheep	12	33	140	97
Goats	3	11	31	5
Others	<1	12	2	2
Total Numbers	163	233	297	214
Meat				
Volume (000 t)	7.9	5.9	6.5	7.4
Value (000 USD)	18,488	15,471	20,887	26,581

Source: SPS-LMM (2009).

Live animal exports are subject to periodic interruptions from bans imposed by importing countries due to disease outbreaks. Live Ethiopian livestock imports were banned by one or more importing Middle East countries; an oft-cited statistic is that this occurred a total of seven times during the last three decades. Such bans are widely perceived as being both scientifically and politically driven. As live animal exporters are small businesses,⁸ this adds to instability due to their lack of working capital, which in turn constrains expansion.

Exports through informal channels

Originating primarily from the pastoral areas near international frontiers, Ethiopian exports of live animals are difficult to quantify. Table 4 presents a summary of estimates of exported numbers, with cattle numbers ranging from less than 60,000 to over 300,000 during the years 1981–2001. Informal livestock trade is thought to amount to four to six times that of formal exports by volume and twice formal exports by value.

Table 4. Estimates of informal livestock exports

Source of data	Reference period	Cattle (head)	Sheep and goats (head)	Camel (head)
Concerned Ministries (1983)	1981–82	225,450	758,200	NA
AACM (1984)	1983–84	55,000	330,000	NA
Ministry of Foreign Trade 1987 (unpublished data)	1985–86	260,000	1,200,000	NA
FAO (1993)	1987–88	150,000	300,000	NA
World Bank (1987)	1987	225,000	750,000	100,000
MEDaC (1988)	1998	260,000	1,200,000	Na
Belachew and Jemberu (2002)	2001	325,000	1,150,000	16,000

NA: not applicable.

Source: Solomon et al. (2003).

8. Eighty-eight known exporters on average sent only 2400 animals abroad in the 2008–09 year.

Box 2: Why is informal trade so large?

Informal trade is encouraged by the number of onerous administrative steps required to formally export. This combined with the historical trade routes of pastoralists whose practice of informal cross-border trading (since before the time borders existed) contributes to the high value of informal trading.

Some of the administrative requirements that are burdensome for smallholders and exporters to attain are: export licenses, quarantine requirements, banking clearance requirement for remitting foreign exchange, formal set minimum weight, and informal minimum price requirements.

Principal factors contributing to informal trade are the following:

- Better price and more consistent market across the border (many reasons for this)
- Poor market linkages (e.g. transportation costs, transaction costs, lack of relationships/trust)
- Consumer goods (food, clothes, electronics) more readily available from across border
- Government restrictions (e.g. in-practice price floor of USD 500, weight floors of 320 kg [see Rich et al. statement in Box 4], bringing cattle to required export weight of 400 kg, ban on consignment sales)
- Challenges accessing formal export markets (e.g. Djibouti quarantine, ban on Ethiopian livestock and meat)
- Financial advantages to informality (e.g. taxation, formal vs. black market foreign exchange rate)
- Non-financial advantages to informality (e.g. avoided regulation, health standards, bureaucratic delay and hassle)
- Non-economic factors (e.g. clan, linguistic ties, religious preference)

Inputs and services

Production systems' performance

Ethiopian livestock mortality is high, estimated variously at 8–10% for cattle and 14% for small stock (Negassa and Jabbar 2008). Fadiga and Amare's (2010) estimates are 14% for cattle, 33% for sheep and 27% for goats, and these figures underlie the very high proportions of herd/flock estimates represented by stock losses (see Figure 1 above). In the highlands, cattle reproductive rates are as low as 3%⁹ (Negassa and Jabbar 2008), and Aklilu (2007) cites Bekele's confirmation of a similar situation in the lowlands with conception rates at 50.5%, abortion incidence at 8.5%, and normal births at just 53.5% for cattle. He further reports a survival rate from normal births of just 39% for cattle.

Animal nutrition

Ethiopia's predominant source of animal feed is natural pastures, forages and browse of varying nutritive value. These feeds are generally communal, or are communally administered. These feature strong seasonality in supply, as rains are bimodal in many parts of the country, but highland and lowland areas have differential rainfall patterns. As a result, traditional patterns of seasonal livestock movement have persisted.

Grazing as a source of feed has been continuously declining as a result of increased areas of cultivation, and changing patterns of fallow. The resultant crop residues from farming, and by-products such as straw, are becoming increasingly important sources of feed in crop producing areas as are stubbles and other crop residues. Haymaking for commercial sale is practised in certain high-demand locations such as in urban and semi-urban dairy producing areas. Despite the presence of a vibrant grain industry for human consumption, concentrate feeds from whole grains are little used in Ethiopia, possibly due to the lack of any surplus over requirements for human consumption. Concentrate feeds formulated from by-products of flour and oil mills are used, but are not common.

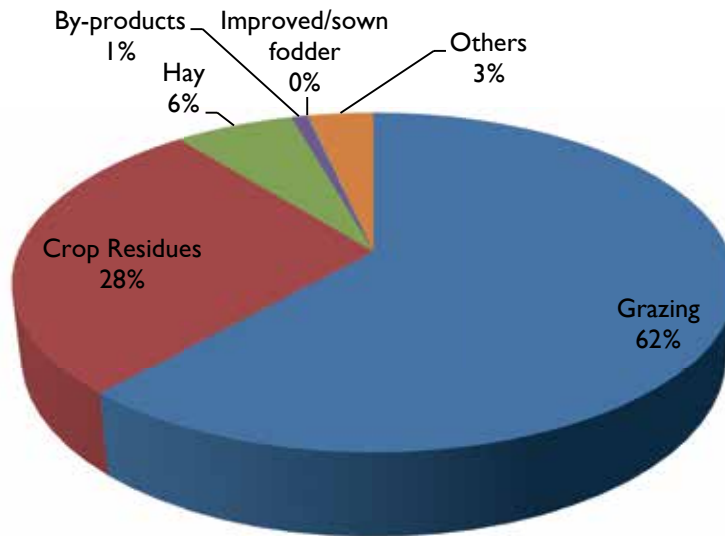
Box 3: How fast are feed costs rising?

This study found that the average price of animal feed increased by 3.2 times over the last five years, faster than the rate of increase for food, and faster than overall inflation. A case in point is that the average price/kg of baled hay was about 0.30 Ethiopian birr (ETB) in 2004 (USD 1 = ETB 18.13 at 7 November 2012, but that this had risen to ETB 1.2 in 2009. Reasons for the increase centre on increased demand for meat and higher consumption of meat (FAOSTAT 2010) particularly in urban areas—driven by increased incomes and increasing urbanization, and the increased demand for animal feed due to awareness of the role of feed/feedlots in productivity and the resultant growth of the industry.

⁹This estimate uses the whole herd as a base, on observations of 50% calving from the breeding females, with parturition occurring every second year.

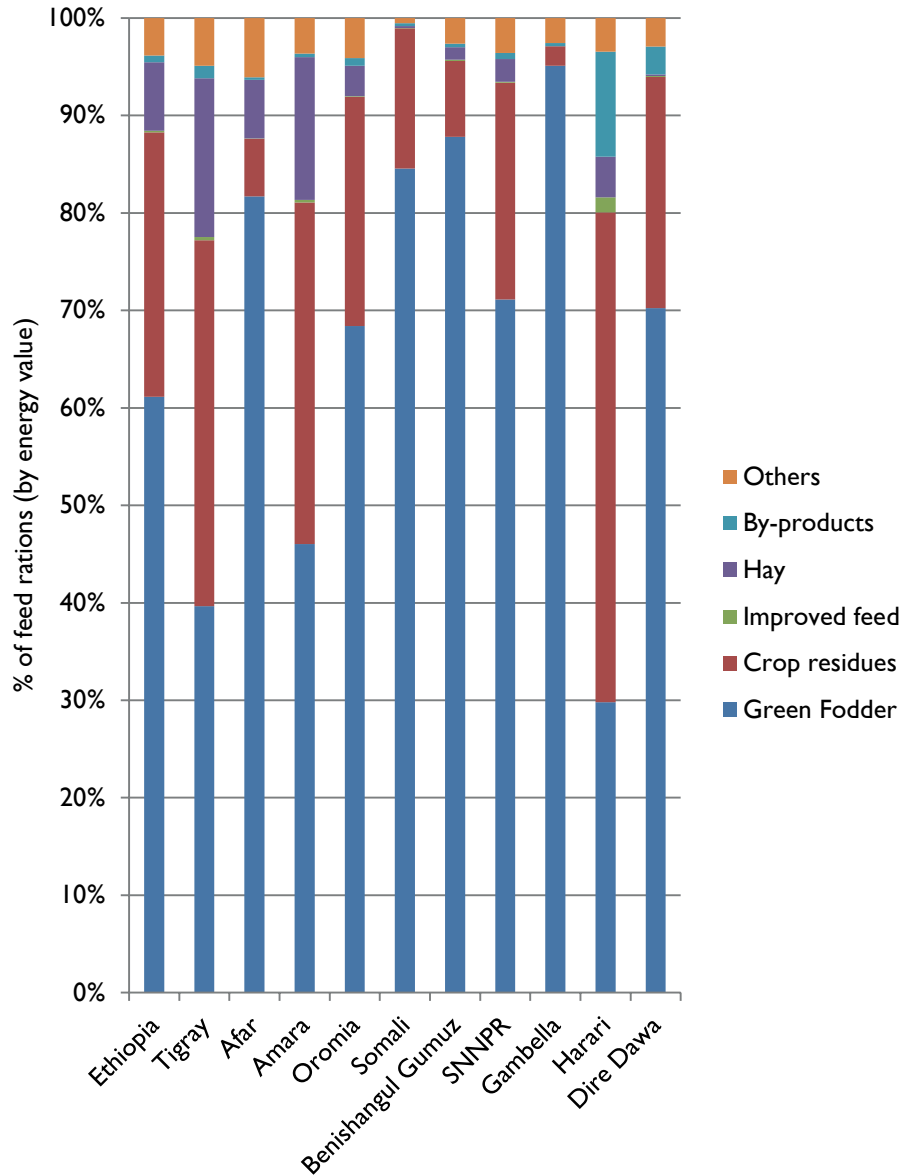
Crop residues are in most cases selectively fed to oxen/bullocks and lactating cows, and sometimes to heifer calves. Their share in the national feeding regime is said recently to have increased, to over one quarter of total feed. Conversely, the share of natural pastures stands at 62% (see Figure 3) of the total. This is especially evident in the highland parts of the country where crop cultivation is increasingly intensive. Industrial by-products from flour mills (bran, shorts and middlings) and oil factories (various by-product supplemental 'cakes'), where available, are mixed with crop residues in commercial dairy and beef feeding systems. This feed source has influenced the location of feedlots to some extent. As shown in Figure 4, regional patterns use of various feed types varies considerably around the national aggregate.

Figure 3. Sources of livestock feed



Source: CSA (2006a).

Figure 4. Regional livestock feeding practices



Compiled by Fadiga and Amare (2010).

Note: Green fodder includes grazing.

In the various beef production systems, feed shortages are pervasive and persistent. In the mixed system (see Table 5), CSA estimates that the great bulk of dry matter originates from pasture, and straw and stover. CSA data and expert interviews indicate that 64 million tonnes of dry matter are required annually to sustain the cattle population in Ethiopia. Ethiopian livestock industry specialists estimate that only about 37 million tonnes are currently available (Table 6), and therefore the system satisfies just 58% of livestock nutrition needs. The feed situation is similar in pastoral areas, for example, Yemane (2001) estimates that there is a feed deficit of 30% of requirements in Afar Region.

Table 5. Available feed in mixed crop–livestock systems

Feed Source	Yield/annum (thousand tonnes DM)
Grazing 7.35 million ha. @ 2.5 t DM/ha.	18,375
Crop residues	
Straw and Stover @ 1.8 t DM/ha	11,871
Aftermath grazing @0.5 t DM/ha	3297
Pulse straws etc. @1.2 t DM/ha	1279
Enset*	1337
Tubers	4
By-products	500

* False banana, a plantain feed.

Source: CSA (2006a).

Table 6. Feed balance in mixed crop–livestock farming systems

Feed balance elements	Yield (thousand tonnes DM)
Feed Available	36,666
Feed Requirement 28,985,310 × 2.2 t DM/annum	63,767
Feed requirement met/unmet	58% / 42%

Source: Adapted from Livestock Master Plan (2008).

Box 4: Feed as a constraint to export competitiveness

Rich et al. (2008) analysed a scenario where animals are tested, vaccinated, and quarantined over a 21-day period, and then finished in feedlots for consistency and quality —bringing them to export weight of 400 kg. They point out that under this professional feedlot management system that includes world standard sanitary and phytosanitary measures, Ethiopian beef would cost USD 1000 more/tonne, more on average than do meat from Brazil and India. The report concludes that Ethiopian meat will only be competitive against the mass-produced meats of countries like Brazil, India, Pakistan and Australia if it is positioned as niche, high value product and marketed as such.

The primary reason for the higher cost cited by Rich et al. (2008) is feed. The combination of feed for energy, dry matter, proteins, and costly concentrates make it prohibitively expensive. The feed cost problem is not exclusive to Ethiopia; in other developing countries, feedlots have historically been built next to low-cost sources of digestible feeds, like pineapple peel in Thailand, or brewery waste in many countries. There are a number of new and existing large sugar plantation and other types of large scale agriculture investments occurring in Ethiopia; these could be potential sites for feedlots.

Animal health

Coverage by animal health services in Ethiopia is summarized in Table 7. Although vaccination and treatment of cattle exceeds that of sheep and goats, just 27% of cattle are vaccinated and less than 10% of sick animals receive treatment. Animal health services are mostly provided by government. Private involvement is limited to provision of drugs and treatment for ailments, with government providing vaccines, anti-parasite treatments and responsibility for disease control. Veterinary personnel totalled 6776 nationally in 2010 (Table 8), which indicates about one veterinarian for every 30,000 Tropical Livestock Units, one assistant veterinarian for every

15,000 and one animal health technician for about 22,000. Gros (1995) cites Sandford's guidelines, wherein veterinary professionals are concerned primarily with visual diagnosis and mass vaccination, a staff intensity rate of one full veterinarian per 200,000 livestock units and one auxiliary (i.e. veterinary nurse) per 7000–10,000 is minimal coverage. This indicates a shortage of lower level professionals for the current public veterinary practice.

Table 7. Estimated number of livestock vaccinated, afflicted and treated (2008–09)

Species	Population (thousand head)	Total vaccinated (thousand head)	Share (%)	Total afflicted (thousand head)	Share (%)	Total treated (thousand head)	Share (%)
Cattle	47,500	12,700	27	9200	19	4000	9
Sheep	26,100	3400	13	7900	30	1900	7
Goats	21,700	2800	13	5600	26	1100	5

Source: Fadiga and Amare (2010).

Table 8. Veterinary personnel in Ethiopia

Personnel	Number
Veterinarians	1500
Assistant veterinarian	3043
Animal health technician	1983
Laboratory technician	216
Meat inspector	345
Total	6776

Source: MoARD (2010).

Veterinary drugs and equipment are widely reported to be in shortage. MoARD (2010) reports that the public veterinary infrastructure comprises one vaccine-producing laboratory, one referral diagnostic laboratory, 14 regional laboratories and 2573 clinics. Conversely, the private sector operates 62 clinics, 149 pharmacies and 239 rural drug retail outlets. Twenty-eight individuals are involved in the import of veterinary drugs. The National Veterinary Institute produces a total of 45–60 million doses of vaccines against 16 diseases. Its current capacity with regard to foot and mouth disease for example, is 80,000 doses for the A and O strains.

Box 5: How is animal health funded and organized?

The Livestock Master Plan, Volume F (2008), and expert interviews, agree that annual non-salary expenditure (drugs, equipment, and transport) on animal health in Ethiopia is currently between ETB 200,000 and 800,000, as opposed to the recommended level of at least ETB 1.5 million. When considered on a per animal basis total spending (salary and non-salary) the total is just under ETB 1/animal, compared to recommended levels of ETB 31. Currently private veterinarians make up a small proportion of the total animal health workers. Private drug distributors (who typically hire the private veterinarians) compete periodically with government-subsidized drugs. The inconsistent availability of government-supplied drugs prevents private companies from developing their rural distribution networks. Expert interviews and field visits indicate that a typical rural vendor can expect to collect revenue of ETB 8000/month on when not competing with discounted drugs, but only ETB 1200 when the enterprise has to compete with discounted government drugs. This study found that penetration of private drug vendors is extremely low in Ethiopia when compared to other countries in the region.

Marketing costs

Transport

Transport costs from production areas to terminal markets and slaughter facilities are thought to be the major costs of marketing for live animals, and for meat exports, estimated at 27% and 32% of the total marketing costs, respectively (Teklewold et al. 2009). For feedlot operators, and for large and small traders, transport from the production area comprises about 46%, 58% and 56% of their cost of marketing operation, respectively. Trekking declines as a share of all animal movement as one moves up in the marketing channels but remains a major cost in the less-advantaged rural areas. At the other end of the value chain, air transport costs are widely reported to present a barrier to Ethiopia's competitive position on export markets; costs range from USD 700/t (Middle East destinations) to USD 2500 (West Africa) (Ethiopian Airlines Cargo Marketing Service 2008).

Taxes and levies

There are reported to be many fees and taxes levied by government (Table 9). Multiple collections and ambiguous interpretations of tax liability are widely reported. Such ambiguities offer a potential source of additional revenue for local authorities, and opportunistic behaviour by various agencies is widely reported.

Table 9. Market service, transit fees and sales tax for cattle

Region	Cost (ETB/head)		
	Market service fee	Transit fee	Sales tax
Somali	3.00–10.00	–	45.00
Oromia	1.00–20.00	1.00–7.00	16.50
Afar	3.00–5.00	–	62.50
SNNPR	2.00–10.00	2.00–10.00	45.00
Amhara	1.00–2.00	1.50	–

Source: Compiled from Aklilu (2002).

Commercial fees

In the trading of cattle, payments are required for a variety of privately-provided services (agency fees such as broker and trader fees, use of barns, slaughter fees). No known studies have been conducted of the nature and application, nor of the cost, of such service fees.

Quarantine

All live animal exports are required to be quarantined at the last port before embarking, usually Djibouti. Quarantine services are offered by just one firm in Djibouti. In addition to the monopoly price power exercised, the problem of space arises and there is competition from formally and informally exported animals.

Export permits

An exporting firm is required to have an export permit from the customs authorities for any given lot of animals, and to meet the minimum requirement of 320 kg live weight/animal. At the time of this study, it was widely reported that a price floor of USD 500/animal was being informally enforced. Several exporters have legal cases against them (related to tax evasion) for exporting below the 'average' price that the National Bank determines. Setting aside the general policy question on the efficacy of such a practice, there are issues related to the relevance of the USD 500 price requirements of exporters. By all accounts, this price is not regularly revised so as to adjust for the long-term change in animal prices. It is also not adjusted for the cyclical nature of animal and meat prices in Ethiopia where prices are suppressed in the months of low natural feed availability. Exporters expressed the view that they are effectively banned from trading during these low-price periods of the year.

Domestic prices

A study in May 2009 on the retail price of beef in Addis Ababa and its surroundings revealed that price ranged from ETB 47 to 64/kilogram (Table 10). This translates into free-on-board price range from USD 4087 to 5565/t, which is higher than international prices.

Table 10. Meat retail prices in Addis Ababa and its satellite towns—May 2009

Place	Average price by category of meat (ETB/kg)		
	Red beef for minced beef	Beef for raw or fried meat	Beef for stew
Addis Ababa	61	64	47
Alemgena	60	65	50
Karalo	35	35	25
Burayu	33	33	30
Sululta	60	60	50
Bishoftu	60	60	50
Dukam	58	58	40

Source: SPS-LMM (2009).

Shares of prices in the value chain

A 1983–84 livestock subsector review put the share of the producer at 76% of local retail prices. Aklilu (2002) cites a July 1995 study by Orangewould International indicating that the producer's share was 55% of the retail price in Addis Ababa; 56% in Adama (100 km south of Addis Ababa) and 72% in Chancho (45 km northwest of Addis Ababa).

Value chain analysis conducted

Rapid appraisal of the live cattle value chain

To generate quantitative information about the actors operating in live cattle value chains, their transaction arrangements, the constraints they face and the revenues and costs they generate, primary data were collected. Time and resources constrained the scope of the study, so that a rapid appraisal approach was used whereby a structured interview was held with selected agents, and questionnaires completed. Actors included commercial operators, as well as local municipal and government agents.

To the authors' knowledge, this is one of very few attempts to collect, present and formulate development strategy from data at each point along designated live cattle value chains in Ethiopia serving specified demand sinks. The products involved, the routes and key points along them, and the actors located at each point, were derived from interviews with relevant actors participating in the value chain. Questionnaires were constructed based on the review of existing work, and based on interviews with industry specialists.

Data collected was employed in constructing estimates of the extent of costs and revenues based on means or medians of the observations. These were compiled to provide estimates of shares of total costs for each value chain actor and also to consolidate aggregate measures and assign them to activities and actors. Frequency distributions were also employed to examine and present the activities carried out by the various actors.

The rapid appraisal pursued two livestock delivery routes within Ethiopia, based on demand for cattle for four end uses: (1) slaughter for domestic sale; (2) slaughter for meat export; (3) formal live cattle exports; and (4) informal live cattle exports. To span the two main production systems and include cultural and agro-ecological differences, a 'southern' and 'northern' route was chosen (Figure 5) for which specific locations (Table 11) were identified for application of rapid appraisal questionnaires by industry specialists such as local authorities, brokers, Ministry of Agriculture specialists and butchers.

Table 11. Details of rapid appraisal data access

Details	Southern route	Northern route
Dates of rapid appraisal	February 10–February 21 2010	February 28–March 14 2010
Appraisal locations	Addis Ababa, Debrezeit, Nazareth, Shashemene, Tikur Wuha, Awasa, Dilla, Wenago, Hageremariam, Yabelo, Moyale	Addis Ababa, Fitcha, Gohatsion, Dejen, Debremarkos, Bure, Bahirdar, Gonder, Shehidie, Metema Yohannes
Numbers of actors interviewed		
Producers	20	18
Co-operatives	6	8
Traders	20	15
Brokers	16	13
Feedlots ¹	7	38
Slaughter facilities ²	7	4
Retailers ³	21	23
Exporters	3	6

Notes: (1) 'Feedlots' refers to intensive feeding systems, both large (commercial feedlots) and small (household fattening units). (2) Slaughter facilities include both service operators (charging a fee to other agents for a slaughter service) and those slaughter facilities taking possession of cattle for sale as meat and other products on their own accounts. (3) Retailers are, in general, butchers selling to the final consumer.

Table 12. Detail of actors surveyed: size of enterprise

	Size of enterprise (number of cattle sold/year)							
	Southern route				Northern route			
	Min	Max	Average	Median	Min	Max	Average	Median
Producers	5	250	45	24	4	284	49	22
Co-operatives	5	3100	1350	1325	18	945	182	40
Traders	182	9480	1221	807	100	2230	440	215
Brokers	73	34,450	2839	396	420	4800	1648	860
Feedlots	18	2427	491	120	3	480	80	42
Slaughter facilities	340	12,450	4664	2240	619	8000	4430	4550
Retailers	48	600	225	200	28	1200	218	180
Exporters	260	6326	2462	800	175	720	429	365

Figure 5. Southern and northern routes targeted in rapid appraisal



Results of rapid appraisal

Characterization of the actors

Substantial diversity was observed amongst actors interviewed during the rapid appraisal. Formal analysis of variation between and within the two routes was not conducted, but clearly the data span several organizational divides in terms of size (e.g. cooperatives).

Tables 13 and 14 present further summary information about the actors interviewed, specifically their ownership structures, reasons for owning and engaging in cattle, elements of horizontal and vertical integration and use of contracts. Different patterns emerge in that producers in the southern route appear to be more oriented toward regular commercial (as opposed to forced sale or occasional) sale than are those of the northern route. Purposes for holding cattle and reasons for buying cattle indicate a greater role for draught power and insurance roles of animals on the northern route.

For the most part, the agents interviewed operate entirely on their own account, with the notable exception of feedlots on the Southern route, where a variety of external investors are reported to be shareholders in feedlots. Traders in both routes operate in a variety of sectors beyond livestock and agricultural trading, including input trading, crop purchase and consumer goods trading. It is notable that the producers in the southern route report more involvement in crop production than do those in the northern route; the opposite bias would have been expected, due the producers in the northern route passing through far higher concentrations of agropastoral areas. Co-operatives on both routes report a variety of roles (supply of inputs,

advisory services, purchase as well as brokerage) and services, and that sales to the co-operative are not closely linked to membership.

Revenues, costs and margins

Table 15 presents average results from the rapid appraisal of value chain actors, with each route considered separately. Quite different patterns of costs emerge. The retail price of the northern route is lower than that of the southern route, due both to a lower live weight at sale and a lower retail price/unit of weight. Although not all animals moving along either route are sold at retail, this price provides a significant share of incentives along the chain.

Based on this reported information, numerous differences emerge between the two routes: surprisingly, feed costs at production level are much lower for the northern route (perhaps reflecting use of producers' own crop residues in the latter case); taxes and levies paid are considerably higher for the northern route, and the overall configuration of profits throughout the two chains are quite different. As a summary, the pie charts in Figure 6 present the differences in configuration of costs and profit distribution between the two routes.

Figure 6. Allocation of returns to one beef animal moving along each of the routes

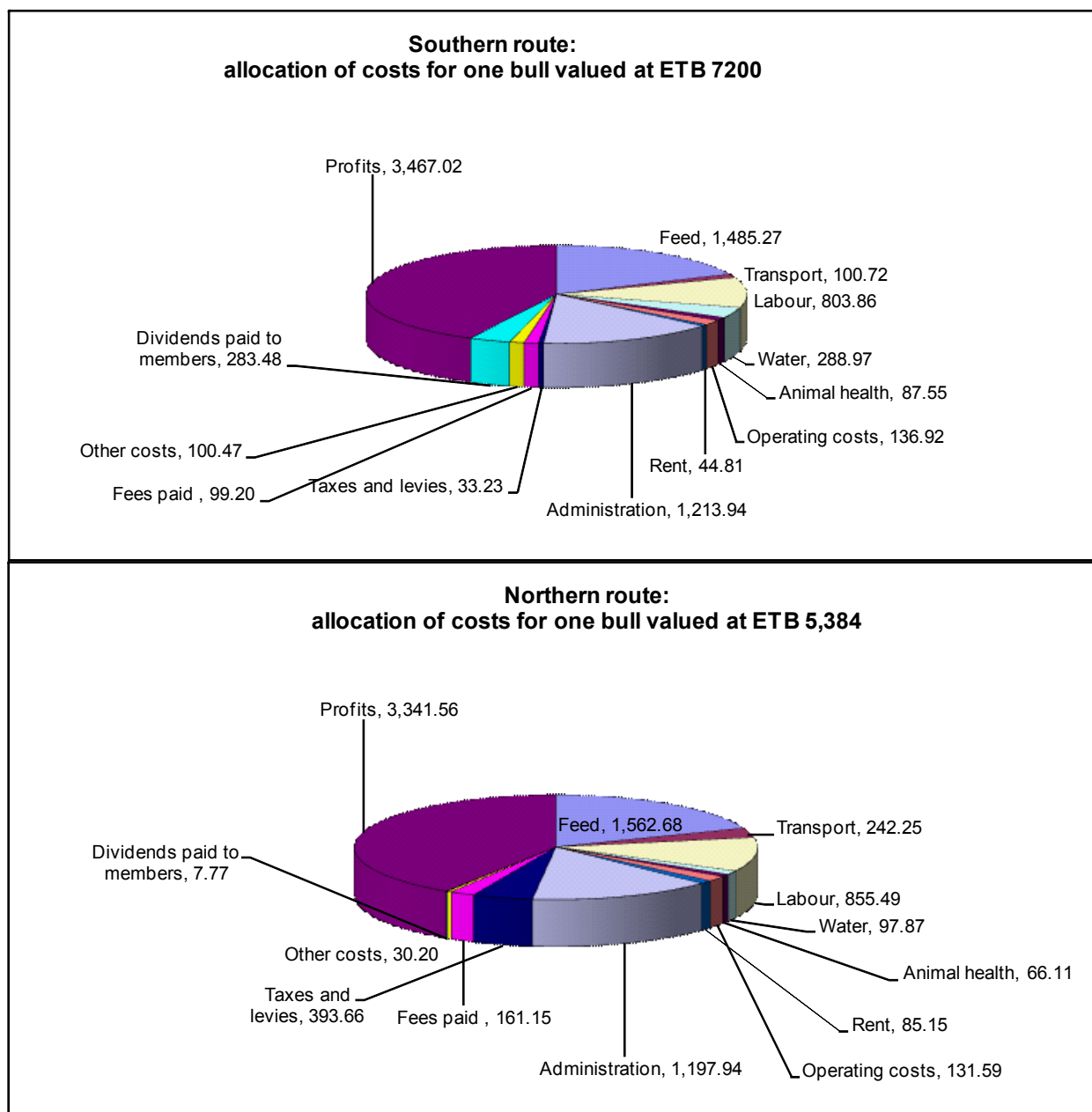


Table 13. Remarks on features of actors in the live cattle value chains in the southern route

	Producer	Trader	Feedlots	Slaughter facilities	Retail	Broker	Co-ops
Ownership	A few run cattle that belong to others. Usually family-related or charitable	Most operate 100% on own account-A few agents of buyers	A great variety of owners: butchers, meat plants, private investors, operators themselves, government			Many act as agents for buyers and/or sellers	
Reason for holding cattle	(1) Financial and (2) cash reserves in time of emergency (natural and financial). Secondarily: regular cash demands Thirdly: as a means of building capital. Fourthly: milk/meat/draught						
Reason for buying cattle	(1) replacements (2) fattening						
Distance to market	Up to 90 km, with few near to markets. This is viewed as a barrier to use of markets (both buying and selling)						
Vertical integration	None	Majority of traders have some feeding operation (grazing or a feedlot)	See above on ownership, much of which is re:VI. No input services etc. provided for suppliers	All meat plants are associated with a livestock market in some sense (partner; organization)	All have retail + restaurant mix. One as a feedlot. All buy live cattle and fatten them. Most sell all to consumers: a few sell to restaurants. None sell to shops or supermarkets. Just one case of services to suppliers (feed, an health, advice)	Coordinated with buyers and/or sellers Brokers claim to provide a range of coordinating services, incl. market information. Note that just a few guarantee payment. None guarantee vaccination or animal health	Some have feedlot-type operations, the rest involved in grazing. Most involved in cattle sales. Half say they are involved in price negotiation
Horizontal integration	Majority claim to grow some crops	Most traders trade only livestock. A few trade crops. NONE trade livestock inputs or consumer goods		Those interviewed only operate as service providers. No other services provided	All are mixed livestock product sellers. Several in consumer product (retailing)	Operate in a range of livestock species and other products. Some active with input.	Many involved in credit provision, social safety net, training
Use of contracts	No	No	About half do. Written or unwritten: much reliance on 'reputation'—but this does not imply regularity. One case of both buying and selling on contract	Some do	No contracts used. None purchase through an agent		No. Few say members sell majority of cattle to co-ops All buy from non-members, and some from traders too

Table 14. Remarks on features of actors in the live cattle value chains in the northern route

	Producer	Trader	Feedlots	Slaughter facilities	Retail	Broker	Co-ops
Ownership	Almost 100% own the cattle they run	Most operate 100% on own account few operates from loans from microfinances	All operate 100% on own account		100% own account	Many act as agents for buyers and/or sellers	
Reason for holding cattle	(1) consumption (milk and meat), (2) means of generating income to meet financial needs of the household and (3) provision of traction service. Secondarily: As a means of savings						
Reason for buying cattle	(1) replacements						
Distance to market	Up to 70 km and sometimes as near as 1 km. Average around 30 km. This is viewed as a barrier to use of markets (both buying and selling)						
Vertical integration	Back yard fattening	Some have household fattening units and some own feedlots	No input services etc. provided for suppliers	All meat plants are associated with a livestock market in some sense (partner, organization)	All have retail + restaurant mix. Some as a feedlot. All buy live cattle and fatten them. Most sell all to consumers: a few sell to restaurants. None sell to shops or supermarkets	Coordinated with buyers and/or sellers. Brokers claim to provide a range of coordinating services, incl. market information. Note that just a few guarantee payment. None guarantee vaccination or animal health	Facilitate members to have household fattening units, borrow money from NGOs and distribute to members as credit, give animal health advices
Horizontal integration	Crop production	Most traders trade crops as well. Some deal with livestock inputs and consumer goods		Those interviewed only operate as service providers. No other services provided	Some also operates in crop and non-crop items	Operate in a range of livestock species and other products. Some active with inputs	Many involved in credit provision, social safety net, training
Use of contracts	No	No	Few reported use of contract either in buying or selling	No	Some use contract specially in buying cattle		No. Few say members sell majority of cattle to co-ops. All buy from non-members, and Some from traders too

Box 6: How do the forms of fattening differ?

Only a small fraction of Ethiopian beef is raised in feedlots—the vast majority of cattle are fattened in backyard systems by smallholders throughout the country. The widely-held perception is that feedlot fattened cattle generally produce softer meat, with white fat and a good proportion of red meat. This meat is preferred for steaks or Ethiopian *tibbs* (beef cut in strips and fried). Backyard fattened meat is reported to be tougher, with yellow fat, more fat (but less marbling) and less red meat. This is preferred for consumption as raw meat for the local stew called *we'et*.

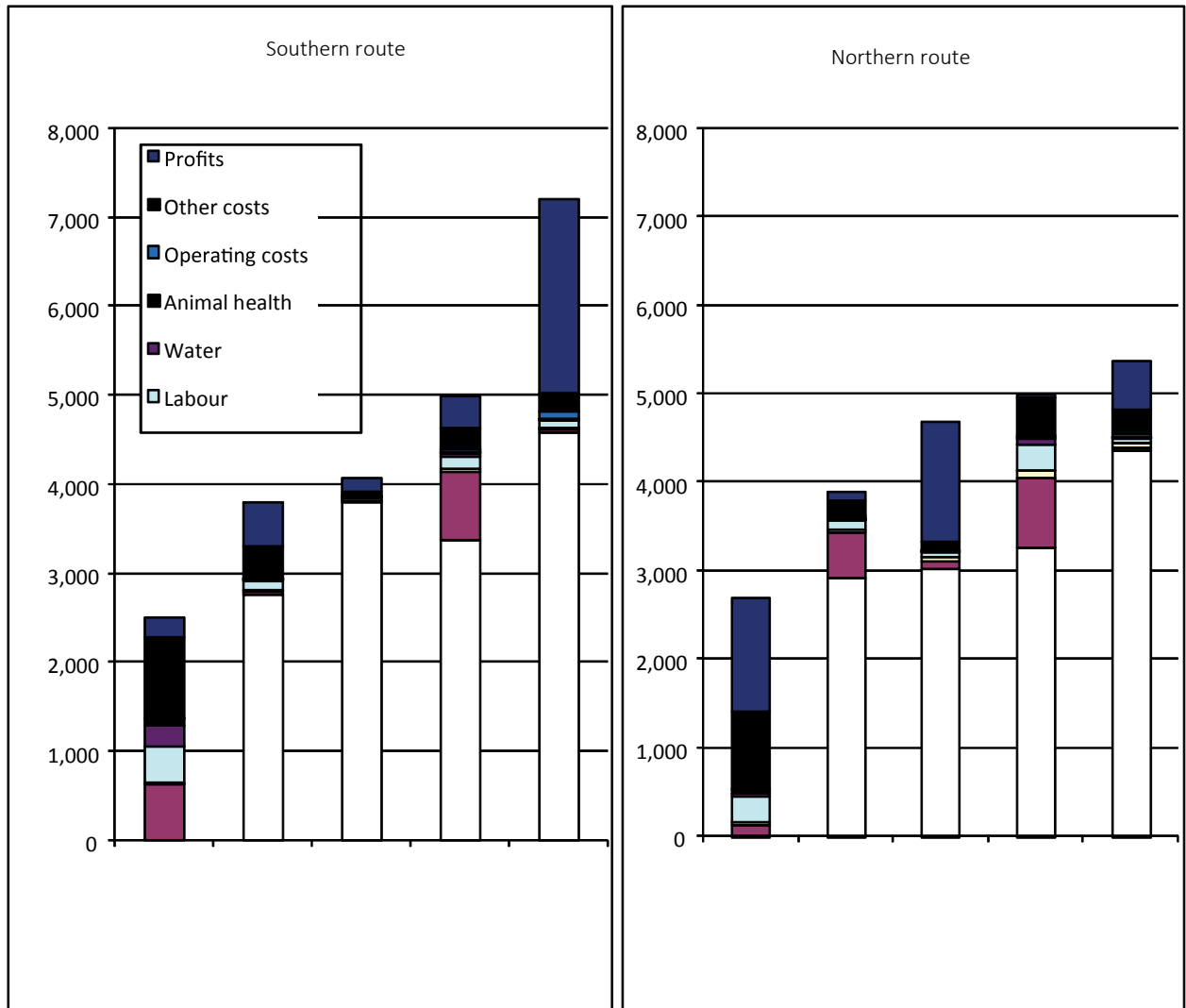
This study's preliminary work found that backyard fattening is cheaper than feedlot operation, but cannot supply large and consistent volumes to a commercial abattoir or trader. This in turn is reported to limit both investment and commitment to individual backyard producers. However, feedlot operators reported that they cannot sell to local butchers' shops as they cannot compete on price with backyard fattening. Moreover, a local butcher cannot absorb the large volumes available from feedlots (averaging around 500 head/cycle) thereby forcing large-volume export sales. Finally, butchers are reported to pay 50% of the purchase price on delivery and the remainder following sale, which would limit feedlots' purchases of replacement stock.

Table 15. Summary of cost and revenue items, per head of animal sold

Southern route	Producer	Co-operative	Trader	Feedlot	Meat plant	Butcher
Feed	631.6	32.3	21.8	766.3	0.0	33.3
Transport	8.3	6.2	27.0	32.2	0.0	27.0
Labour	420.6	129.3	16.5	140.5	11.2	85.8
Water	230.6	0.4	1.6	48.0	1.3	7.1
Animal health	72.5	7.6	0.3	7.0	0.0	0.2
Operating costs	12.9	0.5	2.0	28.5	5.0	88.1
Rent	0.0	0.0	0.3	0.0	1.1	43.5
Administration	874.0	34.2	26.1	216.0	7.5	56.2
Taxes and levies	11.7	7.2	0.0	6.7	0.0	7.6
Fees paid	11.7	37.6	0.0	17.8	0.0	32.1
Other costs	0.0	2.9	31.5	0.0	0.1	66.0
Dividends paid to members	0.0	283.5	0.0	0.0	0.0	0.0
Total	2273.8	541.6	127.0	1263.0	26.1	446.9
Purchase prices		3033	3795	3375		4664
Sales prices	2497	4100	4077	4988		7200
Northern route	Producer	Co-operative	Trader	Feedlot	Meat plant	Butcher
Feed	138.2	510.0	81.1	787.4	12.5	33.5
Transport	19.7	44.2	48.1	78.3	0.0	52.0
Labour	303.2	119.0	70.2	302.2	0.0	60.9
Water	28.5	5.3	5.9	53.3	1.4	3.6
Animal health	34.0	9.0	2.1	19.9	0.0	1.1
Operating costs	24.5	10.0	15.7	18.7	23.4	39.3
Rent	0.0	37.6	10.8	25.0	1.1	10.7
Administration	866.8	129.3	50.2	15.7	24.4	111.6
Taxes and levies	1.3	5.2	6.8	371.5	0.0	8.9
Fees paid	4.2	3.2	19.9	21.4	0.0	112.5
Other costs	0.0	0.0	0.0	0.0	0.0	30.2
Dividends paid to members	0.0	7.8	0.0	0.0	0.0	0.0
Total	1420.3	880.4	310.8	1693.5	62.7	464.2
Purchase prices		3150	3033	3273		3417
Sales prices	2699	3907	4683	4998		5384

Information representing the allocation of costs and profits amongst value chain actors along the two delivery routes is presented in Figure 7. These diagrams suggest significant differences in business structures, as costs of labour, feed, water and administration are found to be different between the two routes. Notable differences include the profitability of both retailers and feedlots, and an apparently different role performed by co-operatives on each route: effectively as a trader on the Southern route and as a barely profitable conduit to traders on the northern route.

Figure 7. Allocation of costs and profits to one beef animal moving along each of the routes

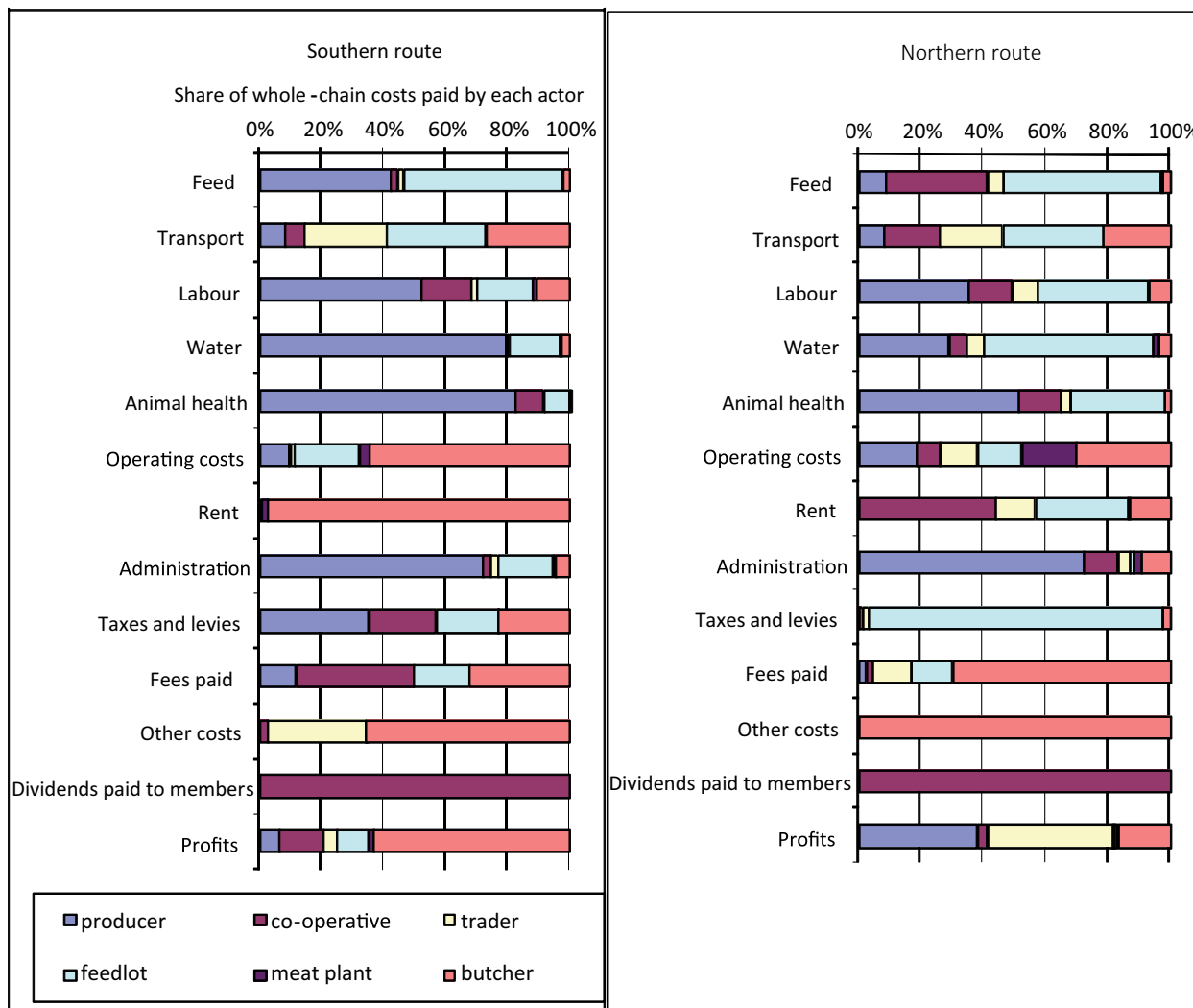


Note: white colour represents purchase price of animals.

Cost allocations

Figure 8 identifies different roles played by actors along the two routes: a notable item is the dominance of producers and feedlots in feed use for the southern route, but in contrast, the significant feed use by co-operatives on the northern route. In general the northern route’s actors portray a more evenly distributed share of costs than occurs in the southern route. This may indicate less specialization on the northern route, but notably suggests an accompanying feature of a more even sharing of profits within the chain.

Figure 8. Allocation of whole-chain costs amongst actors



Feeds

Feed uses¹⁰ vary substantially amongst actors, and between routes (Figures 9 and 10). This probably reflects availability and cost of the various feeds. To some extent the between-route differences reflect the agro-ecological conditions and production systems: particularly for feed which is reported as a relatively low cost to producers, but a high cost to co-operative (Figure 8), on the northern route. However, the agents on the northern route report a larger variety of feeds being used than their southern route counterparts, as well as exhibiting more widespread use of hay, crop by-products and crop residues.

10. Questionnaires used in rapid appraisal interviews asked first whether agents 'used' selected inputs, and then 'cost' were addressed. The results presented here use only the 'use' results, due to difficulties in estimating cost.

Figure 9. Reported uses of feed types in the southern route

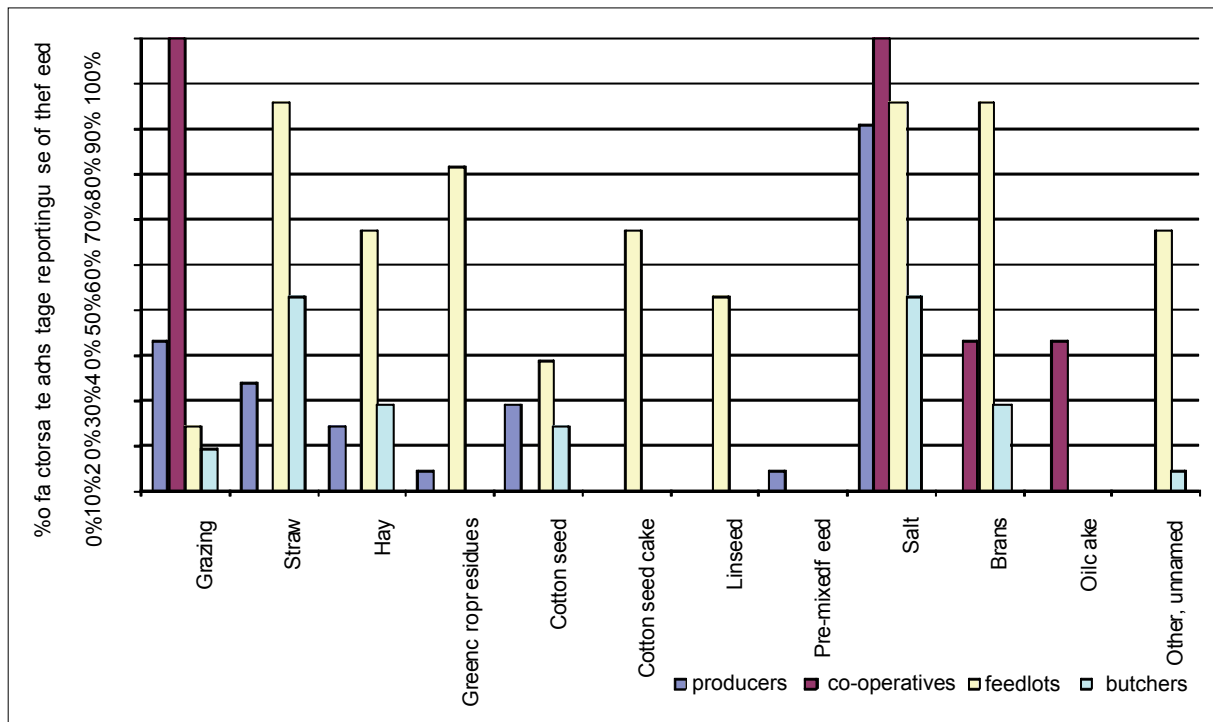
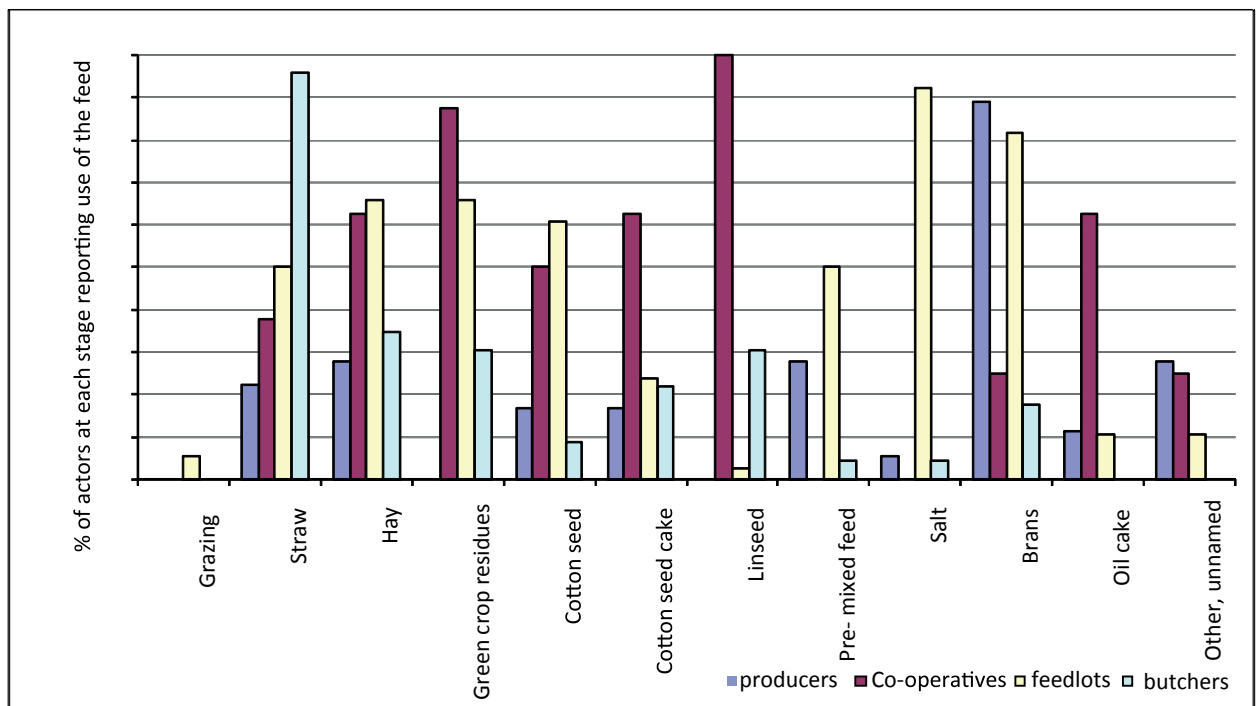


Figure 10. Reported uses of feed types in the northern route



Animal health

Feedlots clearly administer a substantial number of animal health items (Figures 11 and 12), in addition to those used by producers and co-operatives. This indicates a possible duplication of effort, and is likely to be a consequence of mixed lines of animals arriving from the supply areas, so that feedlot management is required to treat all animals, particularly those destined for export. It should be noted that this removes the incentive for producers' provision of vaccinated and disease-free stock, as the feedlots face the same costs regardless of producers' husbandry.

Figure 11. Reported uses of animal health items on the southern route

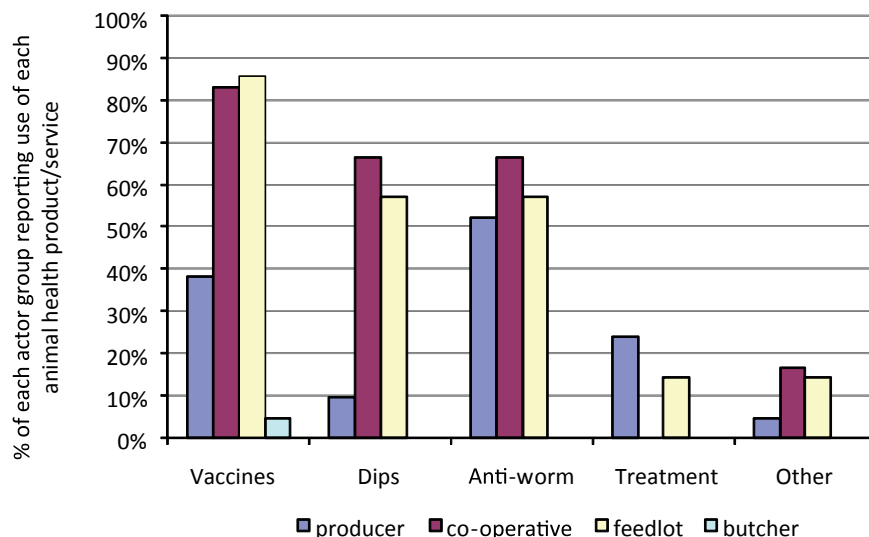
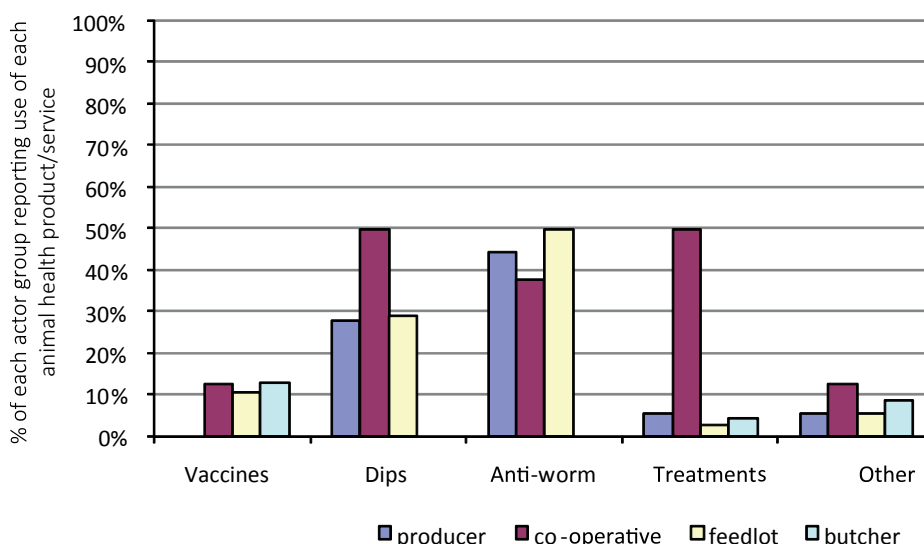


Figure 12. Reported uses of animal health items in the northern route



Use of animal health products and services, particularly vaccines, are reported far more widely by actors on the southern route than the northern. This particularly applies to vaccines, but is also apparent for dips and anti-worm treatments. More of the feedlots on the southern route appear to use animal health products than do those on the northern route.

Payments

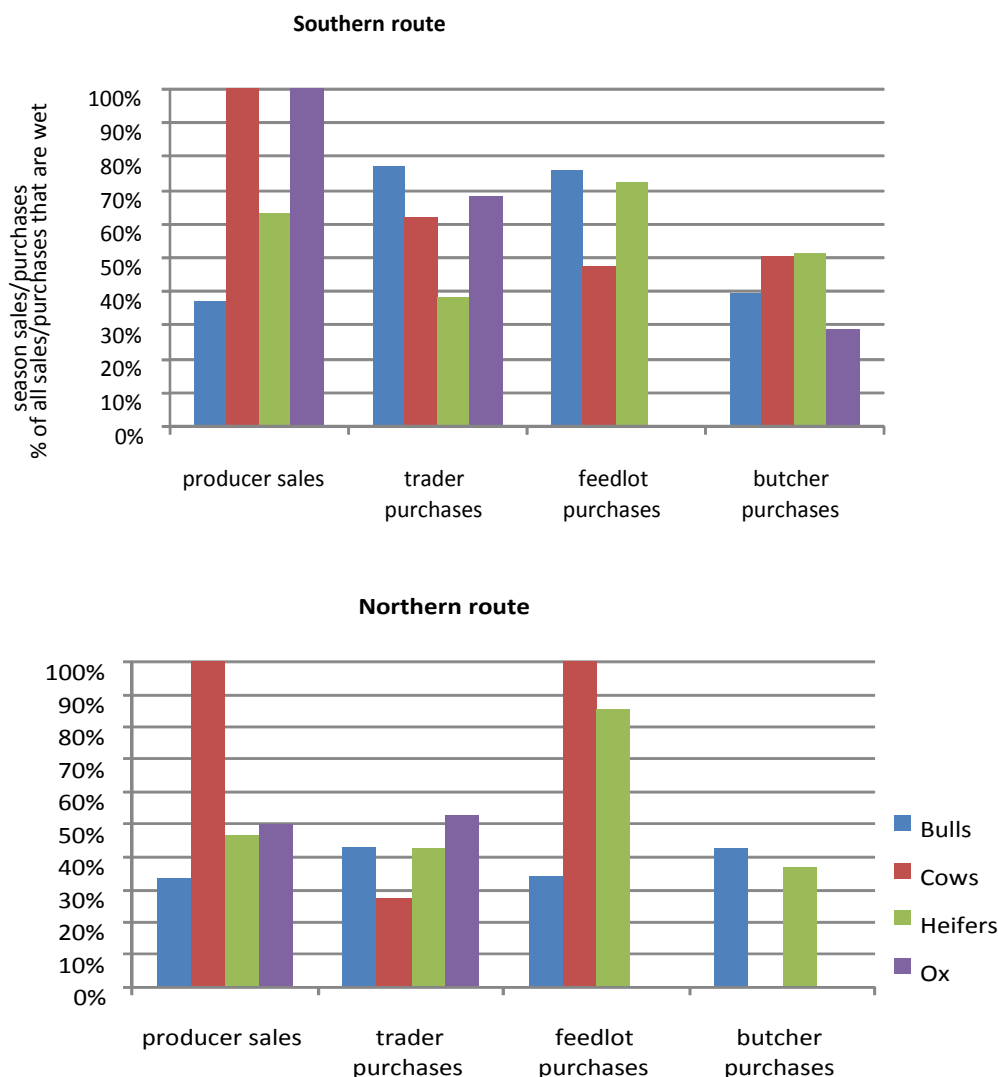
Actors in the Ethiopian live cattle value chain report the widespread use of late payment in transactions. Almost all actors report their own funds as the sole source of working capital. However, almost all actors also report both selling and buying on credit. Both statements support the common claim of shortage of capital as a constraint. The terms of this informal credit represent simply a delayed payment (one week to three months delay was commonly reported), with no interest paid on outstanding balances. The only exception appears to be

co-operatives, hinting at functions that are beneficial to producers in terms of accelerated payment. There is no pronounced difference in the prevalence or form of delayed payments between northern and southern routes.

Sales patterns

Sales patterns for cattle differ significantly between the two routes and within each route depending on the actor involved (Figure 13). Particularly for cows, wet season sales dominate for producers, but other actors do not, in general, buy all cows in the wet season. This mismatch of sales patterns in the value chain indicates a potential return to actors that can buy and hold animals until the next-stage actor is ready to buy them.

Figure 13. Reported seasonal sales patterns



Perceptions of price patterns

Table 16 summarizes actors' perceptions of the price patterns; very little agreement is observed across actors, and several actor sets expressed very different views even on the identification of the highest price period in the year. Similarly, views on the causes of within-year price fluctuations were diverse both within and between actor sets.

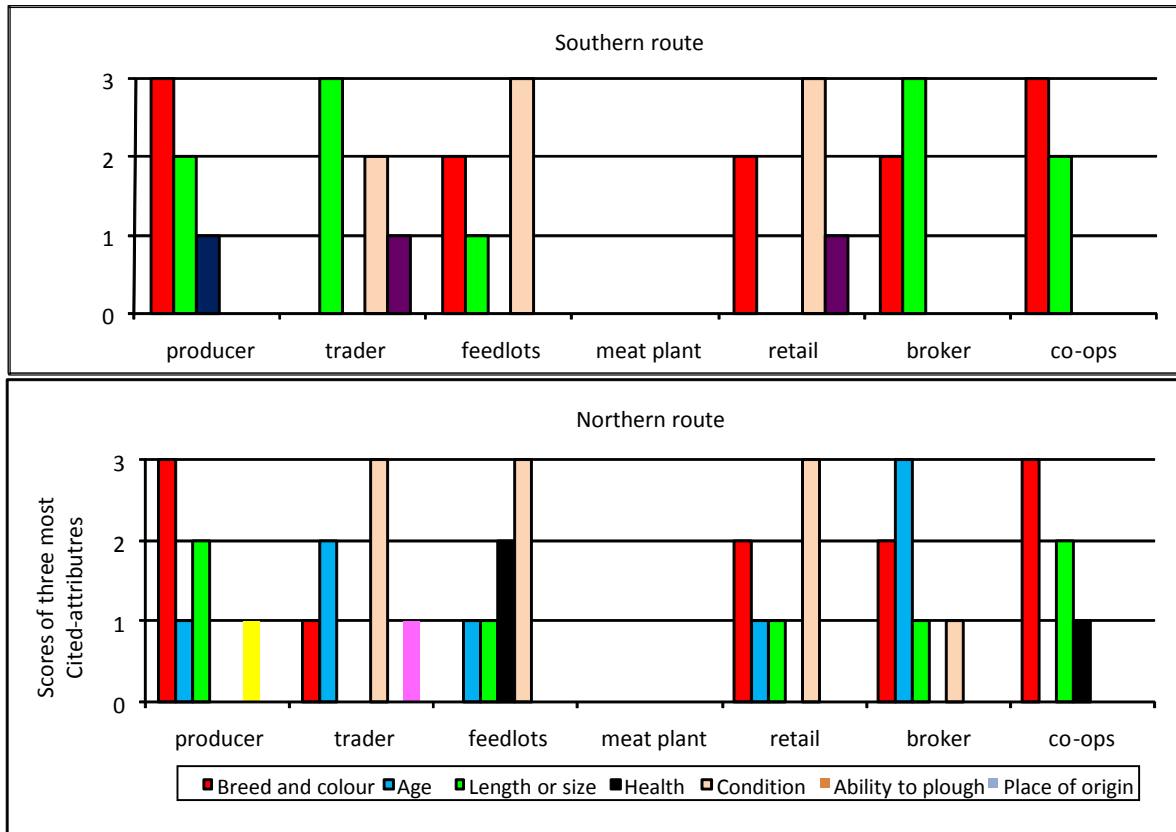
Table 16. Reported price patterns and justification

Southern route	Producer	Trader	Feedlots	Meat plant	Retail	Broker	Co-ops
Months of highest price		April, June	Mixed opinions	January	March–April	January, February	Mixed
Explanations offered		Plenty of feed leads to a shortage of volume Wedding season Holiday season Draught cattle needed	Plenty of feed leads to a shortage of volume Wedding season Holiday season Draught cattle needed	Consumer demand-related	Meat prices are driven by cattle purchasing prices Holiday season Farmers have cash after selling crops	Holiday season Farmers have cash after selling crops	Plenty of feed leads to a shortage of volume Highest prices are in months when farmers do not want to sell due to draught requirements
Northern route	Producer	Trader	Feedlots	Meat plant	Retail	Broker	Co-ops
Months of highest price		April, December, September, October, May, June	Mixed opinions		April, May, December, January, February, June, July	April, May, June, February, April	April June July
Explanations offered		Limited Cattle availability Holiday seasons hence high demand Draught cattle needed	High demand in the Sudanese market Wedding season Holiday season Draught cattle needed		Meat prices are driven by cattle purchasing prices Holiday season Farmers have cash after selling crops	Holiday season High demand in Sudan Low supply Animals needed for draught Farmers have cash after selling crops	Low cattle supply to the market as cattle are used for draught Holidays Highest demand

Quality attributes sought

Figure 14 presents the differences in quality perceptions along the beef value chain. On both routes, producers claim that buyers express the strongest preference for breeds and colours of animal, but on both routes the traders and feedlots rank age, and length and size, as well as condition, higher than breed. Several other such anomalies appear.

Figure 14. Reported preferences of buyers, by value chain actor



Problems as defined by value chain actors

In response to an open-ended question about problems faced in the live cattle and beef value chain, value chain actors expressed a view summarized in Table 17. The position on the table indicates frequency of statement (the top row in each table is the most frequently recorded), and the columns headed ‘S’ and ‘N’ refer to the separate routes.

Table 17. Reported major problems in raising, buying and selling cattle

	Producer		Trader		Feedlots		Meat plant		Retail		Broker		Co-ops	
	S	N	S	N	S	N	S	N	S	N	S	N	S	N
Raising cattle	Feed, Water shortage, Shortage of money, Vaccination	Feed, Water shortage, Shortage of money, Theft	Land occupied by crops, Feed, Vaccination	Theft, Feed and Water shortage, Vaccination, Finance	Feed shortage, Availability of veterinary care	Vaccination, Feed and water shortage, Availability of veterinary care, Theft, Finance	Shortage of grazing land, Feed shortage, Availability of veterinary care	Shortage of grazing land, Feed shortage, Disease	Shortage of grazing land, Feed shortage, Water shortage	Shortage of grazing land, Feed shortage, Water shortage, Theft, Poor animal breeds, Finance, Disease	Shortage of grazing land, Feed shortage, Water shortage	Shortage of grazing land, Feed shortage, Water shortage, Theft	Shortage of grazing land, Feed shortage, Theft	Shortage of grazing land, Feed and water shortage, Availability of veterinary care, Poor animal breeds, Theft
Buying cattle	Distance to market or difficulties in using markets, Shortage of money, Restricted supply of cattle	Distance to market or difficulties in using markets, Shortage of money, Restricted supply of cattle	Shortage of cattle of right type, Shortage of money	Disease, Distance to markets, Restricted supply of cattle	Mixed qualities and health status, Brokers' costs or actions, Distance to markets	Animal health, Restricted supply of cattle, Distances to market	Mixed qualities and health status, Brokers' costs or actions, Lack of transport	Animal health, Restricted supply of cattle, Quality of cattle available	Distances to market, Brokers' costs or actions, Lack of transport	Distances to market, Brokers' costs or actions, Competition with exporters	-	-	Distances to market, Quality of animals, Lack of market information	Distances to market, Quality of animals, Lack of market information
Selling cattle	Slow payment of credit arrears, Low demand, Low prices	Slow payment of credit arrears, Low demand, Low prices	Slow payment of credit arrears, Low demand, Low prices	Slow payment of credit arrears, Low demand, Low prices	Brokers' costs or actions, Distance to market, Slow payment of credit arrears	Brokers' costs or actions, Distance to market, Slow payment of credit arrears	Mixed qualities and health status, Lack of transport, Payment in foreign currency needed	Mixed qualities and health status, Lack of transport, Payment in foreign currency needed	Low demand, Low consumer incomes, Slow payments of credit arrears	Low demand, Low consumer incomes, Slow payments of credit arrears	-	-	Distances to market, Mixed qualities and health status, Slow payment of credit arrears	Distances to market, Mixed qualities and health status, Brokers' costs or actions

N: northern route; S: southern route.

Amongst cattle raising-related problems, feed takes centre stage. Indirectly, this is reinforced by statements regarding shortages of grazing land and encroachment by cropland into grazing systems. Water shortages also feature prominently, although lack of veterinary care is observed as a problem more intensely at levels beyond the producer. Breeding receives little emphasis.

Problems of cattle purchase focus to some extent on distance to market and credit. However, several actors identify the mixed qualities of animals (within a sales lot) presented for sale. As noted earlier, this requires costly treatment of all animals, and differential feeding, for further fattening. The actions of brokers occasion much complaint.

Statements of problems of cattle sale are dominated by complaints about the payments system—late payments are apparently frequent and disrupt smooth (possibly timely) operations. Low demand and low prices also appear as claims, but appear to be of less importance than the payment issues.

Conclusions

Cattle play a significant economic role in rural Ethiopia, including the generation of income for traders, service providers and butchers, and exporters. The financial accounting of this role is problematic due to non-market roles and functions of livestock and informal trade (notably in export trade). The perceived level of economic activity in the livestock sector varies substantially from year to year due to external factors (climate and disease, changing regulation and policy environment, as well as trade restrictions associated with disease). Factors internal to the live cattle and beef trading system also limit its performance as a driver of pro-poor development. This study has set out to diagnose problems, and propose a strategic approach to them. Generation of improved livelihoods throughout such chains requires an understanding of how they work, who operates within them, how they relate to each other, and what costs and revenues appear in the chain and how they are allocated. This study employs both the prevailing wisdom and quantitative assessments to characterize the Ethiopian live cattle and beef value chains for this purpose.

Received communication and previous studies portray the cattle production and marketing system as poorly productive, and with low offtake. Ethiopia is approximately self-sufficient in cattle, with surpluses primarily exported through informal channels. Clearly the domestic markets do not compete effectively with cross-border traders' terms of purchase.

The bases of low productivity identified here simply echo past studies: lack of feed (quality and quantity, and probably with seasonal volume mismatches), poor provision of veterinary health services, and weak service infrastructure. This study's contribution is to accentuate the importance of feed constraints, but also identify possible connections to changing land use, and water and land shortages as voiced by market agents during the interviews.

The low productivity is one cause of low offtake, but further explanation is drawn from the received wisdom: alternative uses of cattle that are not geared for commercial sales and poor access to markets and market information. An apparent lack of understanding of what the market demands, and the absence of a prompt and complete payments system, as identified in the current study, are likely to be further contributing factors to low offtake. The effectiveness of the live cattle value chains in transmitting information was examined in terms of transmission of (1) commercial knowledge (time of, and basis for, highest sales volumes, effect of climate on year-round sales prices) and (2) incentives (reported buyers' desired characteristics). The preliminary results of this study demonstrate conflicting versions of information at different points in the chain.

Despite widespread recognition of resource constraints, both short-term (feed) and long-term (water and soil quality), financial and social pressures exist for producers to accumulate greater numbers of animals. However, few incentives exist for them to sell in an organized fashion (including supply smoothing so as to offer cattle for sale outside of periods when feeds are available) so as to boost offtake and moderate overstocking effects. Notably, increased offtake would enable economies of scale elsewhere in the value chain and thus increase the downstream employment benefits flowing from the livestock sector. In the current study, scale of operation was found to have an effect on trading relationships between fattening operations and buyers, favouring backyard operations.

The received wisdom is that export competitiveness presents a challenge to the Ethiopian cattle value chain, as domestic prices exceed those at international level and Ethiopian feed costs are high. However, export would be the only outlet for increased cattle numbers due to increased offtake or increased productivity at prevailing offtake rates. Interviews suggest that export markets are the only viable outlets for feedlot-fattened cattle except in specific periods where naturally fattened animals are not available (middle of dry season to early rainy seasons) and relatively small quantities—compared to exporters—of fattened animals are demanded by butchers. Further examination of export competitiveness, across a range of production and marketing functions and systems, is called for.

The study has characterized value chain actors as being largely self-employed, at all stages but feedlots, where external investment is common. Actors are commonly found to be diversified within and beyond the livestock sectors, and unanimously to claim to lack capital for expansion. Co-operatives were found to be somewhat active in livestock trading in some contexts, but their connections and commitment to livestock-owning members was difficult to identify. Producers largely listed marketing and sale for income generation amongst principal reasons for owning livestock, but as expected draught power plays a significant role along the northern route, with its cropping systems.

Numerous differences emerged between the southern and northern routes studied here. It was anticipated that actors, and particularly producers, on the northern route would feature a greater emphasis on crops than their southern counterparts. The opposite was observed, which emphasizes the increasing expansion of crops in pastoral areas. However, the result occurs with little precision and requires further investigation. The northern route's animal feeding practices clearly favoured crop residues and by-products and featured very little grazing.

Consistent with past studies, this diagnostic study identifies a plethora of private sector and government-related transaction costs. Also in agreement with past work, this study identifies high domestic prices in interaction with high marketing costs, to select against Ethiopian beef's competitiveness on formal export markets (however, this can also be attributed to what is perceived by economists as the Ethiopian birr being overvalued compared to world currencies; the birr has depreciated approximately by 30% over the last two years partly as a result of an agreement with the International Monetary Fund). In some disagreement with existing work, this study identifies apparent profits throughout the live cattle value chain, albeit one that favours retailers in some settings and traders in others. Further research and benchmarking is needed to provide evidence on the extent of margins and profits achieved. This study reports the widespread use of late payment throughout the cattle value chain, as an informal type of credit for which no interest is collected. The burden of late payment is then likely to fall on the producer, who is not making significant cattle purchases so cannot pass on the late payment.

Feedlots report profitable fattening operations, as portrayed in this study's analysis, albeit with low margins. Low margins are, in theory, compensated for by high throughput, but many Ethiopian feedlots are poor users of available capacity and produce small numbers of animals. On a smaller and less intensive scale, the household fattening unit (primarily in the highlands) is an alternative model, but little is known about its potential based on feeds produced within the single farm operation, and using old draught oxen rather than purchased animals. A number of organizational and technical issues remain to be addressed in scaling up this model, and in demonstrating its effectiveness.

To accompany the competitiveness issues mentioned above, live animal exports appear to be constrained by a number of administrative and structural factors, ranging from the lack of an internationally-recognized quarantine station, through minimum weight and price regulations at the border, to the inability to source a uniform line of high-quality stock, and lack of access to working capital and the necessity of late payments.

Recommendations

The reported aversion of producers to sales of cattle needs to be addressed by attacking its root cause: low prices to producers, due to sales that do not match buyer requirements for quality, uniformity, seasonal supply and guarantee of disease status. These disincentives for sale are magnified by a hard and soft infrastructure that encourages non-market use of livestock, particularly cattle.

The engagement of the private sector is a clear requirement for encouraging transactions and boosting offtake. It can provide advances in provision of animal health services, credit (working capital and investment capital), and in export development and promotion. The private sector can provide the impetus for, and practical applications of, standardization so as to achieve uniformity of product lines, and to implement it with risk management tools such as contracting and regular payment schedules.

An apparent problem is in animal health, for which government dominance has not been a solution. A program of privatization would introduce a profit motive for provision of an effective and competitively-priced service, but a pre-requisite for this development would be the cessation of government vaccination programs which, by free provision, currently crowd out private involvement. However, the private sector cannot be expected to enter the live cattle value chain with enthusiasm unless fundamental issues of the profitability of live cattle production are resolved. Alternative models, such as franchises and branding of Ethiopian meats abroad as high quality and/or possibly grass finished beef, will need to be piloted.

The communication of market requirements by traders, feedlot operators, retailers and exporters is currently restricted due to the availability of substantial profits from moving animals between locations and over time. This is due to poorly integrated markets and highly seasonal sales practices by producers. Government action is justified in the promotion of market information: through collection, analysis and dissemination. Substantial experience suggests that sustainability of such activities is difficult, so low-cost options need to be identified and examined, perhaps focusing on dissemination via co-operatives that are currently operating more as traders than as service providers to members.

An integrated set of activities may be identified whereby value chain actors can be provided with incentives to buy at designated times (perhaps to alleviate drought) and places, and using specific desirable methods (contracts, standard quality descriptors) by credit allocations to boost working capital and alleviate the problems caused by the prevailing informal credit system of late payments. This scheme might be piloted with banks lending to cattle value chain actors such as traders or co-operatives, initially relying on collateral available from the diverse business interests of current actors.

Private action is needed in differentiating Ethiopian beef due to its inability to compete in low quality undifferentiated international markets. A major branding initiative will be required that although beyond the responsibility of government, will draw on government competence in establishing standards, and compliance behaviour in respect of animal health and hygiene.

A further market-related development is required to solve the fundamental problem of the shortage of animal feed. This problem appears to have multiple causes, drought being just one. Others include the changes in land use that see grazing displaced by crop land encroachment, the geographic and seasonal displacement of crop residues from production-level feeding demand, and extremely low productivity that limits the profits available from any feeding regime that uses expensive feeds, labour and animal health inputs. The combination of poor incentives for feeding and input use results in the observed non-uniform lines of animals being marketed, and the necessity for the observed duplication of feeding and animal husbandry steps. It is recognized that no single feed solution will fit all locations, production systems and market situations: even in this narrow current study, a substantial variation in feed practice and accompanying cost was identified. This justifies a program of research into feed production, marketing and use, and piloting of the most promising results. Of necessity this will need to examine crop choice by farmers on former grazing lands, with an emphasis on feed production as by-products, residues, and marketed fodders.

On the demand side of the feed equation, government can play a valuable role in promoting systems that enhance the efficiency of use of feed. This advance will reduce the waste of feed resources and materials due to maintenance (or below) feeding and duplication of weight gain by a succession of actors. Feedlots are an alternative that has been tried, with mixed success: substantial evidence suggests that feed costs constrain their performance. Smaller scale alternatives should be trialled and the results disseminated: new organizational forms of highland household fattening systems offer one interesting option; a changed role for existing co-operatives in pastoral areas offer another; highland–lowland interaction to transmit demand for animals and supply of feed is a third; household dairy as a source of animals for fattening is yet another. A full range of workable options will be revealed through engagement of producers and other market participants by way of participatory extension and applied research.

This study has identified a number of problem areas, and with limited time and resources have attached quantitative measures to both technical and financial issues. The actions recommended above will need to be informed by more formal analysis, and following an appropriate timeline. It is therefore recommended that a task force drawn from industry, the research community, and government be established to review these recommendations in light of further information on:

- crop–livestock interactions (e.g. expansion of crop areas, use of crop residues) in traditional grazing areas
- dairy/beef interactions
- options for market-driven feed provision at each stage in the value chain, in each region and in a variety of crop contexts
- costs and barriers to formal export, and the factors enabling informal exports
- infrastructure and procedures for quarantine
- availability and possible use of market information

This task set necessitates formation of a beef industry organization. It would ideally commission studies and pilot programs, and make recommendations to government based on the results achieved. The funding of such a body would ideally be based on levies of industry actors, supplemented by government funding where public interest is served. The genesis of such an organization would ideally be through the rationalization of existing bodies.

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