Fattening of small and large ruminants as a business is not very common in Ethiopia. Small ruminants are usually reproduced on the farms and are sold around holidays and/or when cash is required. No special efforts, other than grazing the animals, are made by many smallholder farmers and pastoralists to “fatten” them.

A similar situation exists for fattening of large ruminants as a business. Most farmers in the highlands sell their oxen once they have used them to plough their fields for a number of years. Little or no inputs and/or improved management practices have been introduced to “fatten” these animals commercially.

Still, the potential for fattening of animals in Ethiopia is high since the number of animals is large and the demand for meat is increasing both in domestic and export markets. According to data from the CSA survey (2008/09), the total number of cattle, sheep and goat is respectively 49,297, 25,017 and 21,884 thousand of which 55%, 93% and 88% respectively are found in Tigray, Amhara, Oromia and the SNNPR. Most of these animals are kept in the highland crop-livestock mixed system. According to FAO (2004), the total annual meat production comes from cattle (63%), sheep (25%) and goats (12%). At the national level, sheep and goats account for about 90% of the live animal/meat and 92% of skin and hide (FAO, 2004) export trade value. However, meat production per head of ruminant livestock is very low even compared to other African countries.
IPMS introduced a participatory and market-oriented commodity value chain development approach to help boost production and productivity of smallholder farmers. The approach is holistic in that it considers input supply, production, agricultural services, marketing, and business support services as necessary building blocks of commodity development. It stresses business principles (especially market demand) as the driving force for production decisions. Both the public and the private sector are seen as critical actors in commodity value chains. Knowledge sharing and capacity building efforts are encouraged to leverage innovations and increase efficiencies. Gender equity is seen as good business. Environment and natural resource enhancing or neutral development is seen as sustainable. Selection of priority commodities, diagnosis of challenges, and designing of interventions all follow the above approaches. In the end, implementation of the approach is carried out by public and private sector partners in the areas where the project has been active.

**Diagnosis of the large and small ruminant’s value chain**

- Commercial fattening by smallholders of either small and/or large ruminants was diagnosed as having potential in nine of the IPMS Pilot Learning Woredas/Districts (PLWs), i.e. Atsbi and Alamata in Tigray; Metama, Fogera and Bure in Amhara; Ada’a, Goma and Mieso in Oromia; and Alaba in the SNNPR. Key considerations in the selection of the commodity in these Districts were existing/evolving market demand, farmers market participation/orientation and agro-ecological suitability.

- In the highlands in general, cattle reproductive rates are low with calving rates estimated at 45% (Negassa and Jabbar, 2008). Livestock mortality is high, estimated to be 14% for cattle, 33% for sheep and 27% for goats (Fadiga and Amare, unpublished). Poor reproductive performance and high pre-weaning calf mortality characterize herd dynamics.

- Natural pastures, forages and browse are the predominant feed resources in Ethiopia. There is a strong seasonality in supply and quality of feeds. Grazing areas have continuously declined due to increased areas of cultivation and hence crop residues are becoming increasingly important sources of feed. Concentrate feeds are little used due to shortage of surplus over requirements for human consumption. Feed shortage is a critical issue in Ethiopia and the available feed only satisfies about 58% of the requirements.

- Animal health service is mostly provided by the government, and is often limited to vaccination and general disease control. Involvement of the private sector is limited to provision of drugs and treatment of sick animals. Only 27% of cattle are vaccinated and less than 10% of sick animals receive treatment indicating limited public veterinary practice.

- Ruminant livestock off take in Ethiopia are low. For example during the period 2003 to 2005, Negassa and Jabbar (2008) reported net commercial offtake rates for cattle, sheep and goats to be 9, 6 and 7%, respectively. Beef is the major meat type consumed in Ethiopia and contributes about 68% of the total meat followed by mutton at 21%.

- Formal exports of live animals and meat have resulted in the establishment of slaughter and fattening facilities at key locations throughout the country. The Middle East has been the traditional destination for Ethiopia’s formal export of live animals and meat, and remains the major export destination. Although exports of live animals are difficult to quantify, informal livestock trade is estimated to be four to six times of formal exports by volume.

- Using participatory methods, the following constraints in the value chains were identified in the small and
large ruminants producing Districts
- Limited knowledge and skills on commercial fattening of animals by farmers as well as service providers
- Limited knowledge on the profitability of commercial fattening of small and large ruminants especially vis-a-vis rising input/service cost and unknown unstable export markets.
- Fodder shortages
- High animal mortality (especially small ruminants) due to fodder shortage and diseases

- Inadequate inputs/services delivery systems required for fattening of animals including concentrate, veterinary services, credit, risk reducing tools.
- Lack of knowledge and linkages with value chain actors

Based on these general diagnostic findings a set of value chain development interventions were designed.

Value chain development

Agricultural extension

The project concentrated on building skills, introducing knowledge, and linking value chain actors to improve the development of the meat value chain in the selected Woredas.

Skills development

Because of the scarcity of trained manpower at Woreda level, linkages were facilitated with trainers from outside the Woredas to provide in-service training to build capacity of staff and meat/animal producers. While the project used innovative approaches to build skills and knowledge of the extension workers and producers; in the long run more emphasis will have to be paid to develop the educational institutions, charged with the responsibility of ‘producing’ skilled staff and fatteners.

- Staff from Regional Research institutions were linked to Woreda Offices of Agricultural and Rural Development to train in the preparation of urea molasses blocks and animal feeding and the selection of animals for fattening
- A plan for knowledge and skills development on fodder improvement was developed for several of the PLWs. Training was provided by a fodder consultant.
- Regional Bureaus of Agriculture and Rural Development trained paravets
- The project assisted the Ethiopian Dairy and Meat Technology Institute (EDMTI) in course development and review
- Extension staff was trained on participatory market oriented extension methods, rapid market assessment; gender mainstreaming, and HIV/AIDS mitigation. For many of these topics, training manuals were also developed to facilitate further scaling out and scaling up. Training was provided by project staff and consultants

Knowledge management

Several interventions were carried out to help stimulate knowledge sharing regarding fattening. Following are some examples of such endeavors.

Ethiopian Agriculture Portal.

The Project and MoARD developed the Ethiopian Agricultural Portal (EAP). The portal (www.eap.gov.et) contains training manuals and documents on meat/animal production, marketing, and business services. In addition, the project established Woreda Knowledge Centers (WKCs) in all 10 PLWs and supported 40 FTCs (4 FTCs per PLW) in capacity building and provision of computers and other ICT equipment and facilitated access by DAs, experts, students and others to the Internet in all WKCs and in the model FTCs. For those sites that had difficulty in accessing the Internet, offline copies of the EAP were supplied. Currently, the availability of CDMA service has created a better opportunity to access Internet from the FTCs.

Study Tours

To create interest and awareness of market-oriented meat/animal production, the project facilitated local study tours for producers, agricultural staff and administrators, especially to Nazareth and Gonder where commercial fattening in the highland system is common. Producers were also taken to export abattoirs to understand the quality requirements of these agribusinesses and to explore linkages.

Student Theses Research

The project engaged MSc students to do their theses research projects on researchable problems in project PLWs and to identify specific intervention options or solving emerging problems along the meat/animal value chains. To facilitate broader knowledge sharing, seminars were organized to present their findings to the stakeholders in the Woredas. Furthermore, the project carried out the documentation of MSc theses and facilitated the publication and dissemination of selected research outputs in the form of working papers and electronic publications.
Field Days

In all Woredas, field days were used to spread knowledge on fattening within and outside the Woredas, especially on key interventions such as feed resources development.

Involvement and linkages between producers and value chain actors

The project facilitated linkages between meat/live animals value chain research and development actors through formation of Woreda Advisory and Learning Committees (WALCs) and meat/live animal development platforms. The project, furthermore, encouraged Woreda level actors to participate in similar platforms organized by sister projects such as the IFAD/ILRI Fodder Innovation Platform in Miesso, Adàá, Alamata and Atsbi. Extension and project staff in the Woredas also facilitated linkages with input/services and marketing organizations as summarized in the following value chain interventions.

Marketing interventions

The project introduced marketing interventions, including:

• Facilitation of linkages between producers and new marketing partners
• Promotion of commercial fattening
• Collective action for marketing
• Provision of market information

To develop these interventions the project conducted rapid market assessment studies in the PLW's and in the four project Regions. These were followed by more detailed theses studies by students.

Facilitation of linkages between producers and new marketing partners

Marketing of fattened animals in most PLW’s passed through existing market channels. The number of animals being fattened is still limited and demand is high, which is reflected in doubling/tripling of prices of meat and live animals in the past years.

Linkages were made between producers and special consumption centers, including military camps near Bure and producers and exporters/companies in Metama, Fogera, and Mieso.

Promotion of commercial fattening

In Mieso, the project organized annual ‘livestock fairs’ to stimulate commercial cattle and small ruminants fattening by smallholders as well as to encourage the use and exchange of good practices. Winners were awarded with prizes. Similarly in Goma farmers, including female farmers, took part in a competition for best sheep fattener.

Collective action for marketing of animals

In Metama, Fogera, Bure and Mieso, farmers “bulked” their animals for marketing by either renting a truck to transport animals to a distant market and/or to assign one farmer to sell animals on behalf of the others.

Providing market information

The project provided price information on animals in the Woreda through billboards and linkages with electronic information, especially the Ethiopian – Livestock Marketing Information System (www.lmiset.net).
Production interventions

To improve the productivity and economics of fattening, the project introduced several interventions based on the diagnosis and lessons learned including:

- Introduction of market oriented fattening system
- Fodder/feed interventions
- Introduction of improved breeds
- Improved shelter
- Improved health care

Market oriented fattening system

- To stimulate fattening, the project introduced a market oriented fattening system for which own animals and/or purchased animals can be used. Fattening of animals with supplementary feeding took place over a 3 to 6 month period, using 2 to 3 cycles per year. To facilitate the purchase of animals, the project provided credit through local lending institutions. The number of animals to be fattened and the fattening cycles were discussed with the farmers and the lending institution. In general, farmers with adequate knowledge and skills, were encouraged to increase the number of fattening cycles and the number of animals to be fattened in one cycle.

Fodder/feed interventions

- To stimulate production of fodder (for fattening and dairy) from sloping grazing areas and bottomlands, grasses and leguminous fodder species and more controlled management of such areas, was encouraged. In some areas, these interventions were accompanied with physical infrastructure development for soil and water conservation, supported by the government’s Safety Net project. Controlled management systems for grazing areas/bottom lands were developed with communities and showed great diversity within and between Districts, indicating the need for context specific collective action arrangements.
  - Backyard fodder development (Oats, Rhodes, Virus free Napier and Desho grasses and some legumes – cow and pigeon peas, vetch, lablab), for fattening was also introduced.
  - Use of crop residues was encouraged together with chopping of stover and treatment of the straw with urea. The use of chopping equipment was tried but was not successful.
  - Use of locally available by-products from agri-processing (wheat bran, rice bran, atella) and commercially available concentrate (cotton meal, nough cake) – was stimulated.
  - Use of urea molasses blocks to supplement roughage was introduced in Miesso and Alaba as a survival or an emergency feed and as a strategic feed reserve.

Improved breeds for enhancing production:

- The project collaborated with partner research institution to test the introduction of improved local sheep breeds in particular Washera sheep in Fogera (with ARARI) and Bonga sheep in Goma.
- Borana cattle breed was introduced in Metama and a nation wide map was prepared to identify suitable areas for introducing the breed.

Feeding system

- Farmers were encouraged to use stall feeding of animals with limited grazing, to minimize weight loss.
- Farmers were advised on the use of concentrate and roughage depending on locally available or purchased inputs.

Shelter

- Farmers were advised to construct simple structures for their animals to protect them from the sun.

Improved health care

- Farmers were encouraged to de-worm their animals at the start of the fattening period. Linkages were made with the available veterinary services to treat diseases during the fattening period.
Input supply and service provision interventions

To support improved fattening the project addressed the following input and service supply interventions:

- Improved breed delivery systems
- Improved access to concentrate/supplementary feed
- Multiplication fodders seeds and planting materials
- Credit to purchase animals and the required inputs
- Community based insurance scheme

**Improved breed delivery systems**

- Community based breeding was introduced with Washera rams in collaboration with ARARI. Farmers liked the offspring and arranged for the separation of their own local rams from the flock.

- In Metama, the project arranged credit for a group of farmers to breed sheep for subsequent fattening of male animals, starting with 4 females and 1 male/farm.

- For the reproduction of large ruminants in rural areas, bull station with new/improved breeds was used in particular Boran bulls in Metama. Based on the low acceptance of the bull station concepts in the rural areas, a change was made by putting the Boran bulls with local herds, from which the local bulls had been sperated.

- In Metama, the project also introduced the use of AI services to inseminate local cows with semen of Boran bulls. Since AI service delivery in this meat and butter based rural production system is not operational, the project tried to improve the efficiency of the available resources by combining AI service delivery with hormonal oestrus synchronization (to induce heat at a planned time). This approach is based on the ‘polio vaccination campaign style’ used by the Ministry of Health, in which all available resources are pooled/mobilized for a short period of time to accomplish a certain task.

**Improved access to concentrate/supplementary feed**

- To improve access to concentrate feed, linkages were made between suppliers and producers, often combined with collective purchasing by groups of fatteners. In Miesso and Alaba the project trained individuals in the production of urea molasses blocks (UMB), which were sold in rural shops.

**Multiplication of forage seeds and planting materials**

- To stimulate the production of various fodder species on farm the project stimulated the development of forage seed and cuttings production systems. With planting materials obtained from ILRI’s gene bank and/or regional nurseries, forage seed production units and grass plots (for vegetative propagation) were established in Farmer Training Centres (FTCs) and on private farms. Such materials are mostly distributed free of charge from the FTCs. Some famers entered commercial seed production

**Credit**

- IPMS established a credit innovation fund with local Micro Finance Institutions (MFIs) in the Regions/Districts. These MFIs provided credit for new loan types. Particular attention was paid to loans for small and large ruminants fattening in which the loan period, number of animals and collateral system was made more flexible than existing loan systems.

**Community based insurance scheme**

- The high prevalence of various animal diseases in Goma used to cause high animal mortality, and the lack of arrangement to manage such risks were discouraging to farmers. Community-based insurance was initiated to help the community to develop own safety net against risk of sheep mortality by making contribution to common pool fund and setting their own management structure to administer the fund. The initiation was facilitated through a participatory process. The insurance premium was set at ETB 10.00 per sheep. The premium was financed from the credit obtained from the MFI.

An executive committee is responsible for receiving, examining and approving/rejecting claims for compensation by members in the event of sheep mortality. Linkages were created with grassroots level Saving and Credit Group (SCG) to facilitate the administration of the insurance fund and a saving account was opened at Goma branch Oromia Credit and Saving Share Co (OCSS Co) to deposit the insurance premium.
Production, productivity and income

Fodder production interventions

Improvement in fodder production through grazing areas, bottomlands and back yard interventions were used for different animals in the rural areas, including dairy animals and small and large ruminants for fattening. Since studies indicate that most farmers use the additional fodder in first instance for dual purpose dairy/meat animals, results have been described in the dairy value chain synthesis.

Household level fattening practices and income

Selected economic results on cattle fattening from household level surveys conducted for the year 2007/08 are shown in the table below.

Gross return analysis on oxen fattening (2007/08 production year)

<table>
<thead>
<tr>
<th>Woreda</th>
<th>Obs.</th>
<th>Average</th>
<th>Average</th>
<th>Average</th>
<th>Average</th>
<th>Average</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Hfes)</td>
<td>buying price</td>
<td>selling price</td>
<td>cash outlay</td>
<td>return</td>
<td>labor and</td>
<td>number</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Brn/kf)</td>
<td>(Brn/kf)</td>
<td>(Brn/kf)</td>
<td>(Brn/fm)</td>
<td>feed (Brn/kf)</td>
<td>month</td>
</tr>
<tr>
<td>Mieso</td>
<td>14</td>
<td>1791.58</td>
<td>2878.81</td>
<td>214.34</td>
<td>872.69</td>
<td>3.2</td>
<td>272.72</td>
</tr>
<tr>
<td>Bure</td>
<td>21</td>
<td>1294.17</td>
<td>2094.70</td>
<td>46.70</td>
<td>756.83</td>
<td>3.4</td>
<td>222.60</td>
</tr>
<tr>
<td>Ada’a</td>
<td>19</td>
<td>2055.98</td>
<td>3813.16</td>
<td>1116.05</td>
<td>641.21</td>
<td>4.2</td>
<td>152.67</td>
</tr>
<tr>
<td>Mieso</td>
<td>11</td>
<td>2139.00</td>
<td>5150.00</td>
<td>201.34</td>
<td>2800.00</td>
<td>7.0</td>
<td>372.57</td>
</tr>
</tbody>
</table>

Source: Household survey data (2009)

Note: Cash outlay is expenditure on purchased feed, drug, and veterinary services

The table shows that on average farmers benefited from fattening of purchased oxen, with highest returns shown in Mieso. As far as adoption of improved production practices is concerned, it was noticed that most farmers have started using shorter fattening periods and use stall feeding to fatten their animals. Shelters, constructed from local materials, were also introduced by several farmers. Most farmers de-wormed their animals at the beginning of the fattening period and sought treatment from nearby veterinary services when animals were sick. Use of concentrates during the fattening period is commonly accepted, although farmers mostly used locally available protein or energy rich materials.

Fattening animals. Storing grasses for the dry season in the form of hay is not yet common, except in Atsbi. As a result of the credit interventions, multiple cycles of fattening have been introduced within a year, notably in Mieso and Bure, however feed limitations have hampered the efforts of some farmers. Although the project encouraged farmers to fatten several oxen within a cycle, most farmers fattened one or two animals at time, because of credit restriction and/or lack of experience. An exception was Fogera, where experienced farmers were allowed to take credit for more than 2 oxen. In Ada’a, credit was issued only once, since default by some farmers, resulted in the credit institution not willing to issue credit again.

Fattening of small ruminants in general has been a successful intervention in several PLWs, in particular for women. However, returns per animal are relatively low. Most farmers were therefore fattening several animals (5 or more) at the same time to make it economically attractive. In Alamata and Bure, farmers initially fattened animals in a group, and distributed labor duties amongst members on a daily basis to reduce input cost per animal as well as to learn from each other. In Mieso, where fattening by women groups was initiated in 2009, women switched from fattening sheep after 2 cycles to other businesses, including fattening of oxen, cattle trade and dairy cows. Still they considered the initial start up in sheep fattening as a good strategy to get into market oriented production. Adoption of production interventions followed a similar pattern as cattle fattening.

Marketing and input/service supply

Improved breed delivery system

- Private bull stations in the rural areas were not very successful due to lack of knowledge on heat detection, fear of spread of reproductive diseases and prevailing cultural practices. In rural areas it is unusual to allow payment for such services and communities prefer mating in natural surroundings (herds). Emphasis is now being placed on natural mating in large communal or private herds with local bulls being separated from the herd.
The use of AI with hormonal oestrus synchronization (to induce heat at a planned time) was also tested to improve efficiency and effectiveness of AI services. The main lesson learned is that this approach can work, but considerable investments and improvements are needed in awareness raising, mobilizing the community and staff capacity. It can be further field tested with the help of partner institutions (EDMTI, EIAR, RARIs, BoA) which have shown considerable interest. This strategy could also be enhanced by introducing sexed semen and embryos; with choices for either dairy using the fluid milk and butter systems (female) or beef (male) production.

Initial results from the project on reproducing small ruminants for fattening purposes in Metama, showed flocks of 18 – 24 animals/farm in 2.5 years/farm – including the initial stock of 5. However several farmers suffered losses due to diseases.

The placement of Washera sheep in flocks in Fogera was well accepted and managed by the community. However attention should be paid to a follow up breeding strategy, with replacement rams to avoid inbreeding in the future.

**Improved access to concentrate/ supplementary feed**

Many of the linkages made between fatteners and suppliers of concentrate and or supplementary feed, are still in the early stages of development and many changes took place during the project life. Because of increasing prices, several farmers decided to stop and/or reduce buying concentrate/ supplementary feed and use more home produced feeds instead. Also changes took place in the supply system, e.g. in Goma the cotton ginnery ceased operation and was no longer able to supply the cotton meal. So far, cooperatives have played a limited role in the supply of feed for fattening, however with the increase in business, this could change.

It was interesting to note that some of the linkages created were established as a result of study tours organized for key actors. Examples are linkages between fatteners in Bure and fatteners’ cooperatives in Gonder.

The projects’ intervention on the production and sale of UMBs for fattening is used in Miesso, however still on a limited scale, partly as a result of change in the availability of basic ingredients i.e. molasses.

**Multiplication of forage seeds and planting materials**

The multiplication and distribution of cuttings and seeds, grown on demonstration areas in the different PLWs, was well accepted, with some FTCs charging small fees. Part of the customers included government/donor funded projects.

Multiplication of seeds/cuttings by private farmers with free distribution to neighboring farmers is also reportedly working in several PLWs, notably distribution of cow pea seeds in Mieso and Napier grass cuttings in almost all PLWs. Commercial production of seeds by farmers has been initiated but has not resulted in a commercially viable business.

**Credit**

The credit used to stimulate the introduction of commercial cattle fattening by smallholders had varying results.

• A loan offered for large ruminant fattening with experienced farmers was repaid on time and showed that farmers can handle more than the traditional one animal fattening enterprise (average loan size ETB 20,000/farm). Subsequent loans to these farmers were obtained from other lending sources.

• Most loans were however provided to relatively new farmers, who were only allowed 1 to 2 animals in the first cycle, examples are Ada’a, Bure, Alamata and Mieso. In Bure funds were successfully recycled 2 to 3 times and in Mieso, which only started in 2009, plans are made to recycle. In the other two PLWs (Ada’a, Alamata), poor attitude of fatteners and the lending institutes towards “project funded”loans, coupled with poor rainfall (Alamata), led to default and no recycling of funds took place.

The credit provided for commercial sheep/goat reproduction and fattening by small holders showed the following results.

• Credit provided for reproduction of goats in Metama was given for a three year period and repayment after 2 years is 100% on schedule, despite some death of animals which occurred. It is noted that 40% of the loans were provided to female farmers.

• Credit for sheep fattening was issued in Alamata, Gomma, Bure and Mieso. The group who fattened sheep in Alamata repaid in full after the first cycle but did not use credit again. In Gomma, several groups took credit and repayment was high, except for a few farmers. This
affected recycling the loan funds for a second cycle to the same group, since no consensus could be obtained on the repayment of defaulted loans by other group members. It was noted that loans provided to groups comprised of female farmers had hardly any defaulters. In Bure loans were provided for a 2 year period and repayment is on schedule. Most of these loans (90%) were provided to female farmers. In Miesso loans were issued for a one year period and repayment is ongoing.

Community-based safety-net insurance

- Since the launching of the scheme in Goma, 15 sheep were reported dead due to disease (87%) and wild animal attack (13%). Farmers reported the loss of their sheep through Savings and Credit Group (4 farmers) and DA (13). Of the 15 claims, 13 of them were approved and the claimants immediately compensated (80% of buying price) for the loss by CBSN, whilst two claims for compensation were rejected on logical ground. Although the process of verifying and approving claims and effecting the compensation on average took about a month, this was not perceived by the claimants as a big problem. It was noted that while death ought to be verified by a veterinarian or health assistant, of the reported 15 sheep deaths, only two were confirmed by veterinarian, whilst the rest were verified by credit and saving committee and approved by CBSN fund management committee.

- An assessment was made about the level of awareness of members about the community-based insurance scheme and their perceptions with regard to the level of premium, the management of the common pool fund, claim application and compensation process, and over all importance of such a scheme. The result shows overwhelming support for the scheme by the participants. Almost all of the scheme members expressed their satisfaction with the service.

Marketing

- So far, marketing of small and large ruminants has not encountered any major challenges. Most animals are sold in nearby local markets, through individual or collective action. A linkage between a group of cattle fatteners in Fogera and the Gonder/Metama export market was successfully organized by one of the lead fatteners. Other linkages created with export markets for producers in Miesso, Alamata and Metama were subject to change. In Miesso, the link was established but became dysfunctional from time to time because of export restrictions imposed by importing countries. In Alamata, linkages with an export company did not materialize since the construction of the abattoir took long and prices offered by the company for live animals was below prices offered in the local market. Finally in Metama, where live animals were exported across the border to Sudan, trade stopped because of foreign exchange regulations for exporters. Initial problems with quarantine requirements were solved. All in all, it is clear that the export market value chains are still “maturing”, which may eventually lead to stable linkages with smallholder producers.

Gender

- The project conducted a special survey on fattening of small ruminants by female farmers (including females in male headed households). The study showed that none of these female farmers had access to knowledge and skills on fattening before. Almost all “project” women received training on different aspects of market oriented shoats development. As a result the survey showed that almost 83% of the interviewed women started using supplementary feeding and 68% selected shoats especially for short term fattening using new criteria on age, body size and sex. The survey also showed that on average female farmers roughly doubled the sale of sheep from 4.6 to 9.4 animals/year, and women have a say in the control of the funds generated either by themselves or jointly with their husbands – only 10% of the women reported that husbands controlled the income from the sale of sheep.

- It was also interesting to note that many women considered small ruminants fattening as a stepping stone to other (more lucrative) business opportunities such as cattle fattening and rearing of dairy animals.

Environment

- Environmentally, the introduction of zero grazing technology has had beneficial effect on the environment because there is less trampling/compaction of the soils and in protected grazing areas more flowers develop which not only provide forage for animals but also for bees.

Actors and linkages

- A number of actors have been directly or indirectly involved in different stages in the cattle and small ruminants fattening chain intervention. The key actors included concentrate feed supplier, private edible oil/cotton ginneries/food processing plant, private, public and community-based veterinary service providers, and micro-finance institutions. Key public actors encompass regional Livestock Production and Development Agency, Animal Health teams, Urban Agriculture, Women Affairs, DAs, Saving and Credit Groups, Community insurance groups,
The meat value chain development through fattening of large and small ruminants is a continuous process, which requires new responses in knowledge, skills and interventions and sets of actors (including private sector) depending on differences in the level of commercialization of households and Districts and the specific resource availability.

In general the public sector staff and farmers knowledge and skills required for commercial fattening were inadequate and were therefore augmented with i) study tours, ii) in service training with follow up learning sessions in the field, iii) improved access to knowledge through Woreda Knowledge Centers and FTCs and iv) use of trainers from research and consultants. Paying attention to skills and knowledge development for female farmers did show a positive impact, especially for small ruminants.

In the long term, capacity development of farmers and extension staff in more advanced fattening technologies has to be upgraded and specialized training institutions like EDMTI should be supported.

Marketing

Marketing of small and large ruminants has so far not been a major problem and prices received have been increasing over time. Most sales are targeted at the domestic seasonal holiday market. Export markets have so far shown limited potential for “highland fatteners” and linkages/arrangements made for (collective) marketing require further development especially when volumes increase. For export market development regulatory bodies and quarantine services also need improvement.

Production

Returns to labour of short term commercial fattening of large and small ruminants with supplementary feeding, improved health care and appropriate shelter and other interventions was found to be profitable. These interventions can be scaled out, however to contribute substantially to the family income, the number of animals fattened/farm should be increased once skills and knowledge have been gained. Also new production methods for fattening may be considered including fattening of young animals.

The main production intervention was the supplementary feeding of animals with agricultural industrial by products over a short period. Many farmers are experimenting, especially since availability and prices of different products varied over time and between Districts. More knowledge is required to assist farmers in formulating economically viable rations using locally available resources.
The fodder production interventions also contributed to the fattening business and can be scaled out in combination with arrangements for the sustainable supply of forage seeds and planting material reproduction.

It was noted that mortality of small ruminants was low in the short fattening cycle, however in the 3 year reproduction of small ruminants in Metama an undiagnosed disease (suspected to be peste des petite ruminants – PPR), occurred which resulted in the death of a considerable number of animals on one of the farms. This calls for a better health diagnostic system both at the community and District levels and ILRI has recently developed diagnostic approaches/kits, which could be field tested in new project sites. Furthermore ILRI has developed a thermo stable vaccine plus delivery system for PPR - which will be ready for field testing.

While farmers like the introduced breeds of large and small ruminants, no concrete impact can be seen as yet and further research and development efforts are required to support possible scaling out.

**Input supply/services**

- Differences existed between Districts and households in fattening practices, i.e. at the early stages of commercialization Districts/households fattened their own draft animals, while at a more advanced stage farmers purchased animals mainly for fattening. To stimulate this development, credit to purchase animals is required. The project demonstrated successfully the use of credit to purchase a varying number of animals, depending on the skills/capacity of the fattener. Both farmers and credit institutions should however adopt a commercial attitude towards credit rather than the usual (project) attitude in which credit is considered as a subsidy. Also, once the amount of credit required per farm increases, group collateral systems should be replaced by other systems.

- The use of a community based insurance scheme for small ruminants can be used to stimulate commercial fattening with credit. Such a scheme may be used for existing social groupings – like Idir – or group structures created by microfinance institutions. This insurance scheme which operates separately from the loans of the MFIs may also be considered as collateral for the individual and/or group loans.

- While fattening is still at a relatively modest level, supply of the right type of animals for fattening was not yet limited, however it is likely to become a constraint in the future. More attention needs to be paid to an animal delivery system for fattening.

- Once the scale of the fattening businesses increases, feed agro dealerships should be further developed to ensure a regular supply of quality feeds.
Research outputs and publications

Transhumance cattle production system in North Gondar, Amhara Region, Ethiopia: Is it sustainable?

Feed marketing in Ethiopia: Results of rapid market appraisal

Sheep and goat production and marketing systems in Ethiopia: Characteristics and strategies for improvement

Breeding strategy to improve Ethiopian Boran cattle for meat and milk production

For publications and other documents:

Project Website: http://www.ipms-ethiopia.org

Ethiopian Agriculture Portal: http://www.eap.gov.et