Smallholder livestock production and marketing systems in the Haramaya district, eastern Ethiopia

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The study was conducted in Haramaya district (Baate lega Hanboo, Xinniqqe and Tuji Gabbissaa) Farmers’ Associations in eastern Hararge Zone of Oromia Reginal State, Ethiopia. The objective of the study was to assess livestock production and marketing systems. The Farmers’ Associations were selected purposively based on their accessibility. Participatory rural appraisal (PRA), informal discussions with farmers and market participants and secondary data were used to collect data. The results show that mixed crop-livestock production system was the dominant production system. All livestock species kept in the study area are indigenous breeds. The major sources of feed were natural pasture and crop residues. Leaves of Waddessa (Cordial Africana), Ebicha (Veranonia amygdalina) and Ejersa (Olea Africana) are the major indigenous fodder trees used to supplement their animals in the dry season. Khat (Catha edulis) leaf when available was supplemented to both sheep and goats. Cattle reach a slaughter age at roughly 4-5 years. Age at first calving is between 4-5 years with subsequent calving interval of two and above years. Milk yield is low seldom exceeding 1-1.5 liters per day. The various livestock market participants were producers, consumers, legal traders, illegal traders, butchers and brokers (middlemen). Feed shortage, poor performance of animals, disease and parasites, lack of adequate livestock production and marketing services, and the involvement of brokers (middlemen) in the marketing systems were considered as the major constraints the farmers in the study area faced.

Keywords: Crop residue, Haramaya, Livestock, Marketing, Middlemen

INTRODUCTION

Ethiopia ranks top of the list of African countries with large livestock population. There are 41.1 million heads of cattle, 23.6 million sheep, 18.6 million goats, 0.62 million camels, 34.2 million chicken, 1.7 million horses, 4.5 million donkeys, 0.33 million mules (CSA, 2008). Even though the livestock wealth is very large, its contribution to the agricultural GDP is 40%, excluding the values of draught power, transport and manure (Winrock International, 1992).

The role played by livestock in the economy of Ethiopia, as in many developing countries, is varied but substantial. Livestock contribute to the production of food (meat, milk, eggs and blood), industrial raw materials (wool, hair, hides and skins), input for crop production (draught power and manure) and export earnings (live animals, skin and hides). They also generate cash income which can be used to purchase food grain, seeds, fertilizer and farm implements (Ayele, 2003; Azage, 2006).

In spite of the vast number of livestock found in Ethiopia, livestock industry has not, for the most part developed beyond that of a subsistence type of enterprise. The livestock found in the country are almost exclusively of unimproved indigenous types which, with few exceptions, have not been selected for improvement in any economically important trait. Under smallholder, the management commonly received by most of the cattle is on a low level so the ability of the cattle to withstand extreme hardship is of major importance as a result; only nature has played any sizable role. Continual exposure to a wide variety of diseases, numerous external and internal parasites, extreme poor nutrition, sever over grazing, and a lack of water for periods of days are hardships to which most Ethiopia livestock are
exposed throughout life. There is a need for a well performing marketing system which satisfies consumer demands with the minimum margin between consumer and producer prices. Higher prices for producers can encourage farmers to adopt new technologies which, though potentially more profitable, may pose greater risk than traditional production system. With this introductory remark, the objective of this study was to assess smallholder livestock production and marketing systems in Haramaya district.

MATERIALS AND METHODS

Description of the study area

The study was carried out at Haramaya district (Baate lega Hanboo, Xinniqqee and Tuji Gabbissa) Farmers’ Associations located in eastern Hararge Zone. The Farmers’ Associations were selected purposively based on its accessibility and proximity to reach on foot. The District has a total land area of 52,163 hectares. The area has an altitude range between 1600-2100 meters above sea level. The predominant soil types are Rigo soil (Haramayan series) 60% and heavy black clay soils (Vertisols) 40%. Soil texture is sandy loam (District’s MoA, 1999). The rainfall of the District is bimodal, the short rain occurring between the months of February to May and the long rain occurring between the months of June to September. The mean annual rain fall is 492 mm ranging from 118-866 mm. The mean maximum and minimum temperatures are 24 and 9 degree Celsius respectively (District MoA, 1999). According to the 1994 population census projection (CSA, 1994), the total human population in 1996 was estimated at 166597, of which 18582 are Urban living in the towns of Haramaya and Aweday and 148015 are rural population. The livestock population of Haramaya district is estimated at 71,205 head of cattle, 15,294 sheep, 28990 goats, 11755 donkey and 250 camels.

Data collection

Both secondary and primary data were collected from the three selected peasant associations. The primary data were collected through observations, focus group discussions and participatory rural appraisal (PRA). Sixty key informants were selected from the three farmers’ association. The key informants were selected based on their good knowledge on traditional livestock production and their willingness and co-operation to participate in providing information to the study. The secondary sources of data were obtained from District Office of Agriculture Development, Animal Health Center and Haramaya town municipality. The market study was under taken through informal interview of traders, middlemen/brokers, butchers and tax collectors. On top of these, personal observation and visit to individual farmers was used to collect pertinent information.

RESULTS AND DISCUSSION

Farming system

Smallholder mixed farming system is the dominant mode of production of the farmers in the area. According to the information obtained from the districts office of agriculture, the farmers practice a cereal dominated cropping system with Sorghum (Sorghum bicolor), as the most important crop followed by maize (zea mays), groundnut, and wheat. The farming business is supported by growing small plots of various vegetables through both rain fed and irrigation and chat (Catha edulis), grown as source of cash crop. Good soil and moderate climatic conditions for the growth of a variety of crops have enabled the existence of high density human and livestock population in the area. Livestock are of critical importance in the system; however, production is largely traditional, and characterized by low per animal output. They generally depend on communal grazing with coarse pasture, crop-residue, and in small cases with bought agro-industrial by products.

Livestock feeding management

The farmers in the study area keep cattle, sheep, and goats. Livestock are generally grazed on natural pasture in the care of herdsman, who are often children except fattening animals which are looked after by adults. Children of 6 years old and above were observed as herders where animals graze. Animals of sex, all age group and species except fatting and sucking graze together on communal native grazing land. Due to the very limited communal grazing area available resulting from increasing human population and intensive cropping, some over grazing or overstocking of pasture exists throughout much of the year. According to the farmers, as a result of large variation in the total annual rain fall, the over grazing problem was greater in some years than in others. As an example, the late coming and low distribution of the rain during this study was the best evidence for the variations observed. During such shortage of the rain, the farmers made attempt to regulate the herd size according to the available pasture by selling some of their animals before they loss weight.

Actual grazing time rarely exceeds 9 hours; cattle remain until 9 a.m. around the backyard and are driven out to the grazing fields except fattening animals which are tethered near the crop farm. The cattle stay in communal grazing area until 6:00 pm local time when they are driven back. The grazing area was within a
distance of 0.5-1.0 km from the farmers’ residence. Improved forage cultivation has not yet generally developed in the study area. There is a vast amount to be done in this regard and the same must be said with regard to the introduction of forage trees and shrubs and the development of extension activities connected with forage cultivation.

Feed shortage is the most important limiting factor to livestock production that the farmers claim in the area. Due to feed shortage farmers in Tuji Gabbissa illegally penetrate into Haramaya University’s pasture land to graze their animal. This has resulted in some conflicts between the farmers and the University guards who put under control the farmers’ animals entering and grazing on the university pasture and the farmers has to pay a fine to free their animals.

Leaves of Wadessa (Cordial Africana), Ebicha (Veranonia amygdalina) and Ejersa (Olea Africana) are the major indigenous fodder trees used to supplement their animals in the dry season.

Breeding system

Natural and uncontrolled breeding was the common method of mating animal in the study area. Cows in heat bred naturally to the local bull. The mating is done by tying the cow to the pole and allowing the bull to inseminate the cow three times. According to the farmers’ more than three times insemination will result in abortion five months after conception. But this was not verified by research and needs investigation. Farmers who had no their own breeding bull shares from neighbors. Calving takes place all year round. Cow seldom return to heat (estrous) for the first time after calving until one year or more after which may be attributed by low management and shortage feed both in quantity and quality.

Sources of water

Lake Haramaya provides the water the animals need for the sample farmers at Guji Gabbisa peasant association in wet and dry periods. Farmers at Tinke peasant association use the upper source of the Lake Haramaya and other permanent and seasonal water sources. Farmers around Bate lega Hambo use Laga Hambo River which is permanent and decline in volume as the dry season advances. Almost all of watering is carried out by children, both boys and girls. Young stock and sick animals around homestead are watered by women. Watering frequency is twice during dry season, once or once in two days in the rainy season. Watering sheep and goats was not considered essential by most of the farmers interviewed, while others said occasionally watering is important.

Milk practices

For milking to take place the calf is allowed to suckle the dam for few minutes to initiate milk let down. The calf is then tethered to the standing pole with rope or controlled by some one to prevent the calf from suckling during milking. The hind legs of the dam are tied with rope or strip of animal skin to prevent her from kicking who ever milks her. After milking is completed the calf is released and allowed to suckle the dam for some time. In the study area, cows are milked three times a day. The milking practice is hand milking and is usually done by women or their daughters. Smoked bottle goured is used for handling milk. Fresh whole milk is consumed by the family and used to prepare Hoja-milk boiled with fresh leaves of coffee and sugar mostly consumed by the household heads and male children when working at farm as energizer. The surplus milk from household consumption (young children) is sold informally either to the neighbors who had no milking cow or in the local market as liquid milk.

The money from the sale of the milk is used to purchase household commodities such as cooking (edible) oil, sugar and salt. During the present study women of the same village had traditional milk producer association (Faraqa Aannani). These are self-organized groups, which involve women who have milking cows. Member in the group contribute an agreed amount of milk and is pooled on daily basis and allocated to individual woman on a shift basis and the daily income belongs to her. This result is in agreement with the report of Kedija (2008). It is a mandatory to contribute the daily share of milk to stay in the membership of the traditional association, unless there is other factor beyond the capacity of the member of the group, such as when the cow becomes dry. In this association variation in daily milk price is not put into consideration. It is up to the chance of the member of the group on her shift to sell the milk either with high or low price. Butter making is not common at the study area except when needed as hair-dressing. In the study area, goats are milked in Tuji Gabbissa farmers association.

Livestock housing

All animals are kept in housing during the night. The family leaving quarter is divided into three parts, one part for bedding the animals, one part for the farmer and his family, and the last one for a kitchen. The roof of the house is either thatched or corrugated iron sheets based on the wealth of the farmer. Male, female and those of different age and species are housed separately in the space partitioned for each group. Almost all animal housing consisted earthen floors. Cleaning was irregular and the space provided was inadequate for the adult
animals when observed while the animals were in their shed especially where the farmer own more number of animals.

**Traditional fattening**

Draught oxen and bulls are given better management for their draught power and subsequent fattening. The observation revealed that, farmers attempt to maximize male animals than female for this reason. A more intensive feeding system is experienced by the farmers where bulls and oxen for fattening are tethered near crop farm and fed on thinned sorghum and maize and their leaf, sorghum and maize stover, cut fresh grasses and weeds from crop area. The farmers reported that they supplement fattening animals with molasses and salt. The seeds of late emerging tillers of sorghum were used to supplement fattening animals. During harvesting the leaves of sorghum (*Hoba*) was collected and conserved at the center of standing sorghum stalk (*Qora*)-preserved for fuel wood.

Weak sorghum and maize plants are thinned, splitted, chopped and supplemented to the fattening bulls and oxen. According to the respondents, they deliberately increase the seed rate when planting sorghum and maize for later thinning to use it for feeding their animals. The thinning are locally called *Cinqii*. This is in agreement with the report of Kedija (2008) in Mi’esso district. Roasted maize grain (*uniqa Boqqollo*) and sorghum (*uniqa bishinga*) were supplemented when available excess of family consumption. Moreover, leaf of vegetables, especially cabbage, red beet and carrot are very important sources of supplementary feeds for fattening.

Sheep and goats for fattening are supplemented with salt and scraps of household wastes, leftover *injera* after being mixed with salt. *Injera* is a porous, pancake, a few millimeters thick and 40 to 50 cm in diameter made from teff (*Eragrostis teff*), barley, wheat, sorghum and maize. In the study area *injera* is made from sorghum and maize. khat (*Catha edulis*) leaf when available was supplemented to both sheep and goats. Concentrate supplementation was rarely provided to them.

**Castration**

Castration is not a very common practice in the area mainly because according to the farmers the market demand for castrated animals is very low. In addition the meat of castrated animals is very tough in view of farmers’ and traders interviewed.

**Livestock productivity**

Livestock productivity is poor for all classes of animals because of inadequate nutrition particularly during the dry season, low genetic potential and poor management system they receive. Even though complete work has not been done regarding the productivity, the farmers indicated that under traditional management, their cattle reach a slaughter age at roughly 4-5 years and if well fed at 3-4 years. Age at first calving is between 4-5 years with subsequent calving interval of two years and above years. Milk yield is low seldom exceeding 1 -1.5 liters per day.

**Diseases and parasites**

According to the farmers and animal health experts of the district, disease challenge and the risk of parasitic infection of livestock is high in *Tuji Gabbisa* and *Tinke* peasant associations. As a result the respondents have lost and are losing large number of small ruminants because of internal parasites. They cause death or severely constrain animal production activities in the area.

The major factors which aggravate the effect of livestock disease and parasites in the area were inadequate feed and grazing on marshy area near Lake Haramaya. The natural vegetation used as animal feed show seasonality. Nutritional requirements are adequately met between June and September when there is good amount of rain fall. There is no excess forage available to conserve as hay during this period. According to the farmers, because of low agricultural production resulting from traditional management and lack of enough land, crop-residues produced in the area will only supplement to feed livestock for short period. Moreover, as the livestock are relying on the grazing area on dried up area of the lake Haramaya and near the existing water of the lake, this coincides with an increase in the internal parasites density. These will certainly result in an increased internal parasites contact rate and a high prevalence.

During this study, losses arising from these diseases and parasites have not been quantified. But, according to information obtained from animal health clinic of the district consistently mentioned anthrax, black-leg, skin disease (*streptoricasis*), actinomyosis are predominant during late rainy season and internal parasites such as fasciola, strangles, lung worm are common the year round including ecto-parasites like ticks. Brucellosis is occasional. A disease locally called *utaiia* (anthrax) was claimed in the study area as cause of sudden and immediate death. Farmers indicated that it is the most
important disease responsible for more than 80% of mortality than any other loss. The animals are found dead without showing any symptom of illness. Two plants locally named Qoricha and Baalle growing in marshy area during rainy season were also reported (identified) to cause a death in sheep and goat after bloating and diarrhoea.

A high incidence of mastitis was observed in milking cows during the course of this study. Farmers claim ticks as the major cause of mastitis (jigo). Respondents indicated that it is a very common disease in the area. Two picks for aggregated morbidity were noted during the beginning of small and long rainy seasons, respectively. Farmers use traditional medicine to treat mastitis using a tree, which they locally name it muka jigo. They took the root of muka jigo (tree) pound it with mortar and pistil, mix with water and drench the animal. They indicated that one day after drenching, blood and pus come out through the teat indicating the recovery of the cow from mastitis. This needs to be verified through research. The farmers were able to tell observation symptoms of mastitis, such as swelling of udder, closing of teats, blood spots in milk and decreased milk yield.

**Internal parasites**

According the respondents, all animals types are subjected to heavy endo-parasitic burdens. The informants indicated that internal parasites have existed for long and year round infestation is a serious problem. The reason is that animals graze through out the year near Lake Haramaya which is the source of these parasites. The farmers indicated that although effective drugs against some of the internal parasites are available, their cost and the possibility of re-infection do not permit their effective control.

**Livestock marketing system**

The primary terminal market for farmers in the study area was Haramaya market, which meets twice a week on Monday and Thursday. Monday is with the highest transaction. Haramaya district is quite close to Harar and Dire Dawa towns and in a position to supply livestock to this major urban center of meat consumption. The livestock market place was enclosed with concrete fence. The enclosed place seems inadequate during high transactions. It has only one gate for both entry and exit. Enclosure of the market place was constructed primarily to facilitate tax collection. Tax collectors from town municipality and Office of District Finance were placed at the left and right of the entry gate. The tax collectors from the town municipality collect entry tax to the market place, which is 1 Ethiopian birr per head of cattle/donkey, 0.5 Ethiopian birr per sheep and goat. No animal can enter the market place without paying the entry tax. The tax collectors from the Office of Finance collect tax from sold animals. It is the buyers who pay this tax. The rate for sold animal is 5% of the price of the animal. No departure of sold animal was allowed without paying tax.

**Meat consumption**

Cattle are not the main source of meat for home consumption and are rarely slaughtered for special ceremony of religious festival when a group of farmers jointly purchase an ox or cow for slaughter. The informants indicated that no cattle had been slaughtered during this study. Small ruminants are very seldom slaughtered for regular consumption and they are used as a source of cash. They seem to have specific occasions such as religious festivals and family festivities (birth of child). In the study area goat meat is more preferred than sheep. Thus, goats are more commonly slaughtered. Sheep meat is more generally preferred for the tail fat, which is considered an important for women who gave birth to a child.

**Number of animals offered to the market**

The numbers of animals offered to the market are determined by counting animals entering the market place at the entrance gate throughout market day or can be obtained from tax collectors. Table 1.

**Number of animals sold**

Determination of the number of animals sold was done at the same gate, because the market place is enclosed.

**Table 1. Number of animals offered to Haramaya market in 1998 and 1999**

<table>
<thead>
<tr>
<th>Animal type</th>
<th>Year</th>
<th>1998</th>
<th>1999</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td></td>
<td>15651</td>
<td>17169</td>
<td>32820</td>
</tr>
<tr>
<td>Sheep</td>
<td></td>
<td>11210</td>
<td>11110</td>
<td>22320</td>
</tr>
<tr>
<td>Goat</td>
<td></td>
<td>12844</td>
<td>10646</td>
<td>23490</td>
</tr>
</tbody>
</table>

and exit route was identified very carefully, that practically no sold animal leave the market unrecorded by the tax collectors. Table 2.

### Mode of animal transportation

Trekking is the most important mode of transportation of live animal from grazing or production area to the market places. Not only farmers, but also traders interviewed indicated that they trek their animals to Harar, Jijjiga and Dire Dawa congregated in herds either individually or in groups of two or more. Owners (traders) identify their animals by coloring.

### Market participants

According to personal observation and livestock marketing experts of district Office of Agriculture, the various market actors were producers, consumers, legal traders, illegal traders, local butchers and middlemen/brokers.

**Traders**

Are those who have full time license to buy animals from any market. Their task is to buy animals from markets where prices are low and for sell in markets where prices are high.

**Illegal (unlicensed) traders**

Are those who come from Somali Regional State but have no license for buying and selling livestock and paying no tax. They did not involve directly in buying animals. Their involvement is through those traders who have legal license and paid high commission. The office of agriculture of the district indicated that, they could not be avoided even though attempt was made, because they have strong agreement with local legal traders. They are known to illegally trek animals for export to Somalia. The local butcheries were claiming that when they come to the transaction price went up and farmers are benefited from this increased price.

### Middlemen/brokers

So many brokers attend the market at Haramaya. However, only 20 of them have license. Initially the license was given to them to collect tax for government from what they earn. But since the number of brokers without license was increased beyond control no tax is collected from them during the study time. The main income of them is the difference between the seller’s and buyer’s price and a tip from the buyer. The price paid by the buyer is composed of the seller’s price, the broker’s commission and tax. However, the buyer is ignorant of the fact that he is also making extra payment for the broker.

Generally brokers where not willing to reveal the margin they made. The information obtained from tax collectors indicted that the lowest margin is 30 Ethiopian birr per head of cattle and 10 Ethiopian birr per head of small stock (sheep and goats). Sometimes the highest for cattle reach 50-100 Ethiopian birr per head. Because of the involvement of these brokers the producer sell his/her animals to the middlemen at prices that are not attractive and do not encourage the produce to producer more and quality animals. The brokers took large a margin to the disadvantage of the producer.

### Purpose of buying animals

During market observation, the purposes why they buy animals were identified. According to the respondents five possible purpose of buying animals were for: sell meat, slaughter at butchers, breeding and draught power.

### Condition score

Condition of the animals was assessed by certain physical characteristics of apparent in livestock of different degrees of fatness. The assessment was made on and around back in the loin area. The traders know which animal is at good condition (fat) by doing this.

### Price determination

At market place group of farmers keep their animals or

<table>
<thead>
<tr>
<th>Animal type</th>
<th>Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>1998</td>
<td>3167</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td>3798</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6965</td>
</tr>
<tr>
<td>Sheep</td>
<td>1998</td>
<td>3308</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td>2300</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>5608</td>
</tr>
<tr>
<td>Goat</td>
<td>1998</td>
<td>2470</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td>2754</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>5224</td>
</tr>
</tbody>
</table>
individual sellers stood by the animals. Buyers identifying the animals they want to buy and inspect its/their condition of the purpose for which the buy and approach the owner to negotiable price. Agreement on price is reached after a long bargaining between a seller and a buyer, and a broker is involved between them.

The absence of market services such as animal weighing scale, grades and standards have encouraged the activities of the brokers. According to information obtained from the marketing expert of office of agriculture, to tackle these technical constraints on efficient operation of the traditional marketing system and limit the involvement of brokers, a pilot project was prepared to provide market information services including grading animals. It was designed to enable farmers to sell their animals based on weight and to use Harar, Jijjiga, and Dire Dewa markets where price is high depending on the information provided to them.

Traders and sellers indicated that price depends on supply and demand which may vary weekly, seasonally as well as during national and religious festivity. When this study was carried out the price of animals was very low because of a drought in the area and the farmers brought many animals to the market as a strategy to avoid risk of animal loss attributed to feed shortage. The animals bought by traders are destined for other transactions such as Addis Ababa, Dire Dawa, Jijjiga, and to Somalia (through illegal routine). Animals purchased by local butchers are destined for slaughter and those bought by producers are for rearing and home consumption. Table 3.

### Table 3. Price of cattle of different ages and sex at Haramaya market

<table>
<thead>
<tr>
<th>Group of animal</th>
<th>Minimum</th>
<th>Medium</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senga</td>
<td>1100</td>
<td>2000</td>
<td>1550</td>
</tr>
<tr>
<td>Mature bull</td>
<td>730</td>
<td>1200</td>
<td>1965</td>
</tr>
<tr>
<td>Cow</td>
<td>550</td>
<td>1030</td>
<td>790</td>
</tr>
<tr>
<td>Sterile cow</td>
<td>700</td>
<td>1150</td>
<td>907.5</td>
</tr>
<tr>
<td>Young bull</td>
<td>690</td>
<td>930</td>
<td>810</td>
</tr>
<tr>
<td>Heifer</td>
<td>400</td>
<td>550</td>
<td>475</td>
</tr>
<tr>
<td>Calf</td>
<td>160</td>
<td>300</td>
<td>230</td>
</tr>
</tbody>
</table>


**Constraints**

The major constraints affecting livestock production and marketing in the study area were:

- Feed shortage due to scarcity of grazing land and high human populations was the most important limiting factor to livestock production.
- Poor productive and reproductive performance of animals.
- Disease and the challenge of parasitic infestation.
- Lack of livestock services, particularly lack of effective animal health care and high cost of medicines.
- Lack of market services and information and the involvement of brokers (middlemen) in the marketing systems.

**CONCLUSION**

Increased human population and small land holdings have resulted in feed shortage and overgrazing. Improved forage production and conservation was not in place. There is a vast amount to be done to overcome feed shortage through proper conservation and utilization of hay and crop residues. Improving veterinary services and drug supply at affordable cost is vital for improving livestock health problems. Supply of cross breed cattle with appropriate inputs is needed to improve productivity of the indigenous animals. The participation of brokers in the market chain deserves government intervention.

**ACKNOWLEDGMENTS**

The author would like to thank livestock and animal health experts of Haramaya district Office of Agriculture, farmers, traders, middlemen and tax collectors of the town municipality for their cooperation in this study.

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