Sheep Fattening, Marketing Systems and Constraints of Ethiopia: A Review

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Abstract: The aim of this paper is to understand fattening practices, marketing systems and constraints of sheep in case of Ethiopia. Sheep rearing is one of the main cash income sources for the farmers in our country. The objective of raising sheep under feedlot system is to achieve maximum growth rate in minimum period of time. The sheep can easily adopt intensive system of production under feedlot system. The marketing system of sheep were predominantly characterized as producer-consumer and followed by producer-local trader-consumer in some extent. For most rural and peri-urban and urban sheep fatteners, the fattening activities are seasonal. Among most sheep fatteners, feed ranked first as a constraint. Feed shortage is one of the limiting factors for increasing production and productivity of small ruminant in most of the agro-ecological zones in Ethiopia. Water problem in amount and quality can cause different problems such as - constipation, drying off of digestive tract, low milk and related products and low metabolic activities with lowered body condition (emaciation). Liver flukes (Faciolia hepatica and Faciola gigantic) are causing the main health problem for sheep. The major constraints are the traditional management systems which are not market oriented, underdeveloped marketing systems and poor infrastructure, poor financial facility and presence of cross-border trade. Therefore, to decrease fattening period and to increase income feed availability with quality, access of water, veterinary services and full filed market infrastructures are the most important activities for sheep fattening.

Key words: Constraint · Fattening Cycle · Fattening Practice · Marketing System

INTRODUCTION

Ethiopia has diverse agro-ecological zones suitable for livestock production [1]. Ethiopia is a country in East Africa where agriculture is the main stay of the economy. More than 85% of the population depends on agriculture for their livelihoods [2]. Ethiopia has one of the largest livestock populations in Africa with the estimated number of the total sheep population is to be about 31.30 million [3]. Most of the small ruminant population of the country is kept by smallholder farmers and small ruminant production in the country is traditional [4].

Sheep rearing is one of the main cash income sources for the farmers in our country. Fattening has been defined as intensive feeding of highly nutritious feed to promote fast growth and fat deposition to achieve desired carcass growth and quality [5]. Fattening Programs aim to realize maximum growth rate and higher carcass yields in a minimum period of time, which would raise production per unit of land and the value of the Livestock. Sheep fattening in Ethiopia has been recognized as a potential profitable activity that enhances the income of smallholder farmers.

Traditionally, farmers in Ethiopia are used to fatten a few sheep based on available inputs targeting sales during festive holidays. This is based on limited scientific and technical knowledge in feeding systems and husbandry practice [6]. Sheep are reared in various agro-ecological condition of the country. The suitability of an area for either animal or crop production and the type of animal or crop to be produced depends on the agro-ecological conditions of the area [1]. Traditionally, fattening of animals in both systems concentrates on male and female animals which are either infertile or have finished their reproductive cycle.

According to Estefanose Tadesse *et al.* [7] findings, about 72.5 % of sheep marketing is based on an eye estimation of the weight and on the traditional evaluation of condition score and about 21.7% of sheep marketing is on the basis of live weight using scales. The remaining,

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5.8% of sheep marketing uses both live weight and estimation. Constraints of sheep fattening can be grouped into socio economic limitation. Regarding the infrastructure, Ethiopia has one of the lowest densities of roads of any country, those forcing sheep in almost all cases to trek long distance. The policy issues regarding sheep fattening and natural resources management are influenced by absence of sheep fattening policy, pricing policy, community organization and participation. The technical limitations include feed quantity and quality, breeds of sheep, pests and disease. Therefore, aim of this review is to understand fattening practices, marketing systems and constraints of sheep in case of Ethiopia.

Fattening Practices, Marketing Systems and Constraints of Sheep

Sheep Fattening Practice: The objective of raising sheep under feedlot system is to achieve maximum growth rate in minimum period of time. The sheep can easily adopt intensive system of production under feedlot system. The best feeding option for the sheep is grazing with supplement feeding of high energy concentrate ration [8]. Sheep fattening is a common practice in different parts of the country, though the degree of fattening and resource base differs markedly. Less than 39.0 % of the farmers owning small ruminants practice some form of fattening before marketing and majority of the farmers sale their animals early before attaining optimum market weight [4, 9]. Sheep fattening is not as labor-intensive activity as the fattening of large ruminants. As such, it can be undertaken using family labor as a secondary activity. This is especially true for smallholder rural farmers and peri-urban and urban small scale sheep fatteners whose labor for sheep fattening is shared with other major agricultural and household activities [10].

Selection and Types of Sheep Breeds for Fattening: Generally, the body condition of the sheep is the key attribute during selection of sheep for fattening; target animals with medium body condition (Body condition scores of 2.25-3.0). Wide and deep body frame, height and length, as well as coat color are attributes considered when buying sheep for fattening. The primary selection criteria of sheep used for castration and fattening is body conformation followed age which determine market demand and tenderness of meat [11]. Dentition is also used as a basis to determine the required age for fattening. Active sheep are considered healthy. Visual inspection of the mouth, skin and areas around the anus

are used to guess the general health condition of sheep. For instance, black coat color is not liked by consumers in different areas of Ethiopia and may decrease the profit margin. Rams and culled females are mainly fattened. Rams are fattened because they grow faster. In many places, castration of fattening rams is practiced with the intention to make them grow faster and fatter. Farmers also recognize that castration at an early age results in stunted growth of the animal, thus recommend castration to be done for grown animals. The appropriate age of castrating sheep for fattening appears not to be clearly defined but to prevent unnecessary breeding; sheep need to be castrated at an age earlier than 3 weeks [12]. There are about 14 traditionally recognized sheep populations in Ethiopia [9].

Sheep Fattening System: Sheep fattening is a common practice in different parts of the country, though the degree of fattening and resource base differs markedly. Animal fattening practice should consider the general husbandry practice issues like major feed resources, management practice, records and marketing system [13].

Traditional Fattening: This fattening practice generally depends on natural grazing or planted pastures with variable degrees of supplementation. The naturally occurring grasses, legumes, herbs, shrubs and tree foliage are used as small ruminant feed [14]. Animals require a long period of time to attain market weight and condition. It is also associated with huge fluctuations in the weights and conditions of the animals depending on feed availability. This system can be improved to supply animals of acceptable condition to slaughterhouses for ultimate export. The conditioned animals may also go into a finishing operation targeted to supply the local market [14].

Agro-Industrial Byproduct Based Fattening: Fattening of sheep based on agro-industrial byproduct is practiced in different areas of the Ethiopia [14]. Agro-industrial by-products are potential feed resources that can be used as supplements to crop residues and poor quality natural pasture based diets. These include the by-products from flour milling, oil processing, sugar and brewery factories [15]. Supplementation with agro-industrial by-products has been used in many developed countries for improving locally available nutrients of feed resources. Though the contribution to the total animal feed resource is limited (1.45%), agro-industrial by-products are one of the important feed resources available in Ethiopia [16].

Management Practice of Sheep Fattening: The fattening program should be started after the necessary feed supplies are secured. Underfeeding and incorrect timing are the most common causes of failures in fattening activities. The objective in a fattening operation is to convert as much of the feed to body tissue as possible. It is, thus, necessary to minimize the movement of animals during the fattening period. They should be allowed only limited exercise. The success of a finishing operation depends on the first two weeks after arrival of animals. They may have traveled long distances and will be stressed, hungry and thirsty [17].

Housing System of Fattening Sheep: Housing for fattening sheep varies from fattener to fattener. Some of the sheep fatteners' houses are attached to the side of the main house. Most of the peri-urban and urban fatteners use a separate house for fattening sheep. Cooperative fatteners use separate housing for sheep [18]. Most housing is unclean, poorly ventilated, lack of proper floor bedding and stocking rates are sometimes too high due to lack of awareness and lack of understanding on the space requirement of fattening sheep by most producers [19]. The site selection and orientation of house from the direction of wind play vital role for house construction not only for sheep. There are a number of criteria which must be fulfilled in animal house. These are height of house, good ventilation, space distribution for each animal, roof design and materials used for house and orientation from wind direction and the floor space requirement for covered area is 1.12 m^2 and for open paddock is 2.32 m^2 per animal [20]. Animal's house should be practically or totally protected from the direction of strong winds, temperature and rainfall [12].

Health Care Practice: An important environmental challenges as a party of fattening animal health program is the control of internal and external parasites. So, any effective animal health control program aims to control both internal and external parasites and prevention of other contagious disease. In general, any problems associated with animal health can largely prevent if proper management practices are followed. Therefore, the veterinarian involved in sheep health management program should have the necessary depth of knowledge about the elements that must be addressed in crucial on animal health control [21].

Feeding Practice: According to Umberger [22], nutrition plays a major role in the overall productivity, health and well-being of the sheep flock. The major sources of feed for fattening sheep are roughage, agro-industrial by-products, milling by-products, local brewery by-products, household food leftovers and screenings from cereals. Feeds contain five main types of nutrients, namely: protein, energy, vitamins, minerals and water. But, protein and energy are the most factors affecting sheep productivity. Therefore, Proteins are the principal constituents of the animal body and continuously needed in the feed for growth and cell repair. The availability of feed resource in the highlands of Ethiopia depends on the mode and intensity of crop production as well as population pressure. The major basal feed in the highlands of Ethiopia are natural pasture, crop residue and stubble grazing and their contribution to the total feed resource vary from area to area based on cropping intensity [23]. Almost all castrates (sheep) targeted for fattening are supplemented by non conventional feeds such as; salt, chat left-over, food-leftover, fruit left-over and brewers recipes [24].

Watering Practice: The water intake of fattening animals depends on environmental temperature, the temperature of drinking water itself, the activity of fattening animals; the moisture content of the feed and the amount of feeds fed per day [25]. When cold drinking water is consumed in large volumes, the temperature of the rumen may decrease, which reduces the activity of rumen microorganisms and this affects the fattening operation [26].

Marketing System: According to Estefanose Tadesse *et al.* [7], about 72.5 % of sheep marketing is based on eye estimation of the weight and on the traditional evaluation of condition score of the sheep. About 21.7% of sheep markets are on the basis of live weight using scales. The remaining, 5.8 % of sheep marketing uses both live weight and estimation. Most of the people use visual estimation for purchase and sell of sheep. They believe that visual estimation (traditional evaluation of condition score by farmers) is the method which saves time and energy. Moreover, most purchasers like this method than price setting based on live weight. This may be because the farmers believed that they will fetch better price through estimation than the use of weight scales. In Ethiopia, marketing of livestock and livestock products is underdeveloped.

The net commercial off-take rate has been very low over different time periods for sheep for smallholder farmers and pastoralists in Ethiopia [27, 28]. The marketing system must provide information flows from the consumer back to the producer through the processing

transportation and storage function, the producer responds to the price signals by producing commodities of relative quantities [29]. Markets can be classified depending on the purpose of the animal buyers into for reproduction, for resale and for consumption, [29]. In Ethiopia the marketing process in general follows a three-step system with primary, intermediate and terminal markets through which marketable animal and animal products pass from producers to small traders and on to large traders or butchers. However, most producers sale their stock and livestock products at local markets directly or consumers or small traders at relatively low price [6].

Fattening Cycle of Sheep: For most rural and peri-urban and urban sheep fatteners, the fattening activities are seasonal. This is mainly associated with market demand seasons for fattened sheep and to a smaller extent due to feed availability for fattening. Some of the rural farmers are use 2 to 3 fattening cycles commonly. The dominantly 2 fattening cycles practiced by majority of rural, peri-urban and urban fatteners in the target two peak demand seasons for fattened sheep that are highly profitable. The length of sheep fattening varies depending primarily on the availability of sufficient and quality feed for fattening. If there is good management, sheep takes three rounds of fattening in a year (120 days are required for each round [20].

Constraints of Sheep Fattening: Among most sheep fatteners, feed ranked first as a constraint. Feed shortage is one of the limiting factors for increasing production and productivity of small ruminant in most of the agro-ecological zones in Ethiopia. In the extensive lowland crop–livestock system, feed availability in terms of quantity as perceived by farmers is better than in other ecologies. This could be due to the vast grazing land available. Poor nutritive values of feeds lower the production capacity and fertility potential of animals [25]. The system of feeding of animals for mutton production varies in different agro-ecological zones of the country. It depends up on the availability of resources in terms of grazing area, land for cultivation of fodders, facilities for hay making and provision of concentrate feed [8].

Water problem in the amount and the quality can cause different problems including constipation, drying off of digestive tract, low milk and related products and low metabolic activities with lowered body condition (emaciation). Water shortage is seen in most low land areas in which a limited amount of rain fall is available at a time in mid altitudes.

In most of the areas of Ethiopia, liver fluke (Faciolia hepatica and Facila gigantic) is mentioned as the main health problem for sheep [10]. To minimize risks associated with disease there is a need to enhance the service delivery system and ensure availability of enough health services. Strategic deforming and proper vaccination must be developed and in place. Risks associated with predators and theft can be minimized using proper housing [19].

Poor marketing information and problems of credit facilities reduced the benefit gained by the smallholders. In Ethiopia, the marketing of livestock and livestock products is underdeveloped. The major problems are the traditional management systems which are not market oriented, underdeveloped marketing systems and poor infrastructure, poor financial facility and presence of cross-border trade [30]. This may have an impact on the farmer not getting the price they deserve for sale of sheep. Half of sheep market information comes from visitors, but a few from traders. Market information from traders and visitors has its own impact on profitability of product brought to market by farmers [31]. Buyers are often price setters. Major problems related to marketing of sheep are characterized by strong seasonality and subject to fluctuation. Demand and price increases during festival period's, Estefanose Tadesse, *et al.* [7].

CONCLUSIONS

The objective of raising sheep under feedlot system is to achieve maximum growth rate in minimum period of time and to increase the income of small holder farmers. The marketing system of sheep are predominantly characterized as producer-consumer and followed by producer-local trader-consumer in some extent. The most fattening activities of sheep are seasonal due to lack of market. Among most sheep fatteners, feed ranked first as a major constraint. Feed shortage is one of the limiting factors for increasing production and productivity of small ruminant in most of the agro-ecological zones in Ethiopia. Water shortage also the other major constraints in quantity and quality can cause different problems like: - constipation, drying off of digestive tract, low milk and related products and low metabolic activities with lowered body condition (emaciation). Liver fluke (Faciolia hepatica and Facila gigantic) is mentioned as the main health problem for sheep. The major constraints are the traditional management systems which are not market oriented, underdeveloped marketing systems and poor infrastructure, poor financial facility and presence of

cross-border trade. Therefore, to decrease fattening period and to increase income feed availability with quality, access of water, veterinary services and full filed market infrastructures are the most important activities for sheep fattening.

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