

*Full Length Research Paper*

# **Demonstration of maize and noug cake mixture supplementation for women focused small scale sheep fattening in Yilmana Denssa District**

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The study was conducted at Yilmana Denssa district where there is huge population of sheep and traditional sheep fattening is practiced. Six women famers were participating for the trail. Each woman was supposed to purchase three yearling male rams. A total of 18 yearling Washera sheep were used for this research. Experimented sheep were feeding 400 g concentrate /head/day, which is composed of 24.75% maize, 74.25% Noug cake and 1% salt before and after grazing for three month along with 5 h of grazing time per day. The economic benefit was estimated using partial budget analysis while the collected data was analyzed using SPSS software version 16. Grazing supplemented with 400 g concentrate increases the average weight of the sheep from 26.88 kg to 33.56 kg. The variation of body weight gain before and after the experiment was statistically significant ( $p < 0.01$ ). The average daily weight gain was 80.52 g (it ranges from 21.69 to 125.30 g). Partial budget analysis indicated that fattening of sheep using 400 g noug cake and maize mixed supplementation was economical with gross profit of 1741.81 ETB. The economic analysis also showed that the average gross profit from fattening of one sheep is 96.74 ETB. Farmers and technical experts also appreciate this sheep fattening technology. So it is recommended that the extension wing should scale up this fattening technology to the potential areas targeting religious festivals as their main market.

**Key words:** Sheep fattening, body weight gain, initial and final body weight.

## **INTRODUCTION**

Women in developing countries have great role in agriculture production activities. However, the roles of women in agriculture do not significantly realized by the society even by the women themselves (FAO, 2010). There are different research findings that indicate women's abilities and potential and their role in agriculture particularly in developing countries and above 50% roles in agriculture is the role of women (Safo and Mulenga, 1993). Empowering women in fattening sheep can develop their self-esteem in decision making and able to know where, how and when fattening practices carried out by themselves and can increase their livelihood income. Therefore, poor rural women should

be empowered to achieve higher incomes and improved food security (Mayoux and Hartl, 2009).

In most parts of Amhara region, during dry season animal are not able to fulfill the required amount of feed, even for their body maintenance because the availing grazing land is highly degraded. So it cannot give good quality and quantity of green feed for the animals. Besides, if it is possible to produce a certain amount of animal feed from such pasture land its quality very low and quality of crop residues are also too poor (Alemayehu, 2002). As a result, farmers get low benefit from selling animals that are in poor body condition. Furthermore, consumers do not normally get good quality and quantity meat from these animals. Hence, introducing promising fattening practice can increase efficient utilization of available feeds to improve animals body condition, increase meat yield and consequently to

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increase income of the farmers, particularly for the women.

It is easier for rural women to keep sheep and able to get benefits. According to Devendra and Mcleroy (1991), keeping small ruminants such as sheep has several advantages than large ruminants like cows due to low cost of purchasing, little feed intake, products in manageable quantities, low risk of total loss and high fertility rate.

To maximize the benefit to the rural women, they should know economical sheep fattening technique. Therefore, according to Solomon et al. (2005), concentrate supplementation of yearling Horro rams at a level of 400 g/head/day and grazing for about three months was economical and Solomon et al. (1991), also recommended that 400 g /head/day maize and noug cake mixture supplementation has good growth response of Horo sheep. Therefore, the experimented animals were given 400 g concentrate /head/day, which is composed of 24.75% maize, 74.25% noug cake and 1% salt after grazing 400 g for three months. Thus, this study tried to demonstrate this fattening technique to the rural women.

### Objectives of the study

- 1) To demonstrate improved sheep fattening techniques using Maize and Noug cake mixture supplementation.
- 2) To evaluate economical benefit of the fattening practice at small-scale women farmers' level.

## MATERIALS AND METHODS

### Location

The study was conducted at Yilmana Densa district particularly Adet Hana passant association, where there is large population of sheep and traditional sheep fattening practices. This passant association was selected by the development agents and researchers based on its accessibility to the market, potential on sheep rearing and fattening practices.

Yilmana Densa district is found in west Gojam zone of the Amhara Region. Adet, the capital of the district is found 45 km southeast of Bahir Dar (capital of the region) along the highway to Addis Ababa via Motta. The district has a total land area of 99,180 ha of which 46.5% is under cultivation. Its altitude range from 500 to 3,200 m above sea level. The mean minimum and maximum temperature in Yilmana Densa district are 5.2 and 28.8 degree centigrade, respectively. Its rainfall pattern is unimodal with mean seasonal rainfall during the growing period (May to October) is 1,193 ml. From mid-October to January, dry weather prevails and extends to May (Daniel, 2008).

### Select of farmer and experimental animals

#### Farmers select

Since fattening of sheep using 400 g concentrate (which is

composed of 24.75% maize, 74.25% noug cake and 1% salt) had been conducted at on-station of the research center, the result of this fattening technique should be taken out from the research center and reach into farmers. To introduce and disseminate the improved agricultural technologies to the farming community, closely working with farmers and arranging demonstration to farmers and able to listen to the opinion of the farmers and extension workers is very important. So that, before scaling of this result, it needs some sort of pre-extension demonstration works. Therefore, six voluntary women farmers were selected with the collaboration of the district agricultural and rural development office's experts.

Each woman farmers were supposed to purchase three washera sheep from the market. These women farmers and extension workers were trained about sheep production, marketing, management, fattening and health control and prevention methods. After training and discussion, the farmers agreed to prepare three sheep for the study and to fatten the animals individually by their own house.

### Experimental sheep

Around yearling 18 washera sheep were fattened for demonstration purpose. These sheep were handled by six voluntary women farmers. Each of them was supposed to hold three yearling washera sheep. The experimented animals were purchased from Adet marketing area by the participant farmers with the aid of experts. They were purchased at time of low price and the fattened sheep were sold for Easter when the marketing price of the fattened animals becomes higher.

Before starting fattening the animals, initial body weight was taken. Preventive health care included de-worming for internal parasites and vaccination against sheep pox and pasteurellosis was done. Feeding troughs were prepared for feeding the animals at each participant farmers' house. Sheep were supplemented 400 g concentrate /head/day, which is composed of 24.75% maize, 74.25% noug cake and 1% salt after grazing for 90 days. The experimented sheep were supplemented 200 g before grazing and 200 g after grazing. The total time of grazing was about 5 h per day. Supplemental feed and medicaments were provided from Andassa Livestock Research Center.

### Data collection and analysis

Initial and final body weight of the animal and their costs (feed cost, animal purchasing and medicament cost) were collected. Farmers' and experts' opinion was gathered at the time of field day. To collect their real feeling and opinion, group discussion was undertaken. To initiate this discussion about the technology and what will happen to promote it to the rest of the rural community, checklist was used for interviewing the participants of the field day. Finally, the collected data were analyzed using SPSS software, version 16. The economic benefit was estimated using partial budget analysis.

## RESULT AND DISCUSSION

### Body weight change

Supplementing sheep with concentrate feed can bring positive body weight gain change. As Table 1 show, in the study area supplementing 400 g concentrate feed (75% maize, 74.25% noug cake and 1% salt after

**Table 1.** Body weight change using 400 gm concentrated feed supplementation.

Variable	N	Mean	Standard deviation	t-test	Sig. value
Initial body weight	18	26.88	2.87	11.90	0.000
Final weight final body weight	18	33.56	2.38		
Daily body weight gain	18	0.07			

grazing) to Washera sheep increases their body weight. According to the result of the study, average body weight gain of experimented animal within three months was 33.56 kg. The variation of final body weight gain from the initial body weight of experimented animals was statistically highly significant ( $P < 0.01$ ). This implies that it is possible to fattening Washera sheep breed by supplementing 400 gm of concentrate feed. The average daily weight gain of the experimented animals was 0.07 kg.

#### Farmers' and experts' opinion on the practice

After fattening of the sheep, field day was organized to farmers and extension workers in order to evaluate the overall fattening trail. To help farmers and extension workers to recognize and evaluate the impact of concentrate supplementation over the traditional fattening techniques, there were two fattened animal groups (that is fattened animals with concentrated and fattened animals with conventional fattening techniques). Physical body condition of fattened animals with concentrated feed supplemented was highly appreciated by all participant of the field day than fattened sheep with conventional one.

Farmers tried to set different evaluating criteria to evaluate the fattened sheep. Some of them were the time taken to reach for marketing, body conformation, the age of fattened animals, type of animal that highly demanded by market, time of fattening. With these criteria, sheep fattening technique using concentrate feed supplementation has got high value by farmers and extension workers because it could reduce the overall cost of fattening process and increase returns from fattening technique.

#### Economic analysis

Purchasing and selling price of one experimental sheep and its gross benefit of the practice are illustrated in Table 2. The average purchasing price of one sheep was  $239.44 \pm 26.95$  ETB and its final selling price was  $415.46 \pm 49.85$  ETB. The average gross profit from fattening of one sheep is 96.74 ETB (Table 2). Since this trail was conducted at small scale level and provide an alternative source of income for women farmers, the trail only

consider the cost of animals purchasing, medication and animal feed.

As indicated in Table 3, the partial budget analysis indicated that sheep fattening using 400 g nouge cake and maize mixed supplementation was economical with gross profit of 1741.81 ETB. The marginal revenue indicated that one ETB investment on inputs for fattening of sheep provides gross profit of 1.3034 ETB. This result was in line with Solomon et al. (2005), the concentrate supplementation of yearling Horro rams at a level of 400 g/head/day and grazing for about three months was economical.

On the other way predicting future price of input and output is challenging. However, sensitivity analysis predicting a close to accurate forecast using Newtons backward and forward interpolation equation is possible. From the equation result, there will be 10% price increase for input costs and 10% decrease for outputs prices. The result of sensitivity analysis indicated that fattening of sheep with 400 gm nouge cake and maize mixed supplementation was still economical with gross profit of 419.47 ETB. The marginal revenue indicated that one ETB investment on inputs for fattening of sheep provides gross profit of 1.07 ETB.

As indicated in Table 3, both cost-benefit and partial budget analysis show that this fattening technique is economical to small family-owned farmers particularly women farmers. Women farmers, specially the have-nots, can use small scale fattening practice to supplement this main livelihood. It needs some initial cost for sheep and feed purchasing cost at a minimum level. At this time government and non government organizations, should provide credit and credit service to small family-owned farmers, particularly women farmers.

#### Conclusion

The study indicated that it is possible to fattened yearling Washera sheep with supplementation of 400 gm concentrate composed of 74.25% Nougecake, 24.75% maize and 1% salt. It was also economical at small-scale farmers' level, with average gross profit of 96.74 ETB in the study area. Besides, farmers and extension workers had appreciate fattening practice with concentrated feed supplementation than conventional fattening practice. Thus, it is economical and socially acceptable fattening

**Table 2.** Mean of purchasing and selling price of experimented sheep and gross profit.

Items	No	Mean (ETB)	Standard deviation
Sheep purchase price	18	239.44	26.947
Final selling price	18	415.46	49.849
Input costs (feed and medicaments)	18	79.28	-
Gross profit	18	96.74	-

**Table 3.** Economic analysis of sheep fattening technology using partial budgeting.

Items	Amount in ETB
Benefits from sheep fattening	
Sheep selling	7480.00
A. Total gross benefit	7480.00
Input cost	
Sheep purchase	4310.00
Feed cost	1122.66
Medication cost	306.00
B. Total input cost	5738.66
Marginal revenue(A/B)	1.3034
Gross profit (A-B)	1741.81
Sensitivity analysis (10%)	
Total gross benefit	6732.00
Total cost of fattening	6312.53
Gross profit	419.47
Marginal revenue	1.07

practice in the study area.

## RECOMMENDATIONS

It is recommended that extension wing of agricultural and rural development office should scale up the 400 gm nouge cake and maize mixed supplementation fattening technology on yearling Washera sheep breed to the potential areas targeting religious festivals as their main market time. Besides, it should be beneficiary for the rural women poor farmers.

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