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PRE-EXTENSION DEMONSTRATION OF SWEET LUPIN GRAIN FEEDING FOR WASHERA SHEEP FATTENING AT D/MEWI WATERSHED OF WESTERN AMHARA ETHIOPIA

Molla Haile*, Agraw Amanie, Lijalem Abebaw, Shigdaf Mekuriaw, Yeshiwas Tilahun, Berhanu Demeke, Lisanework Molla

Amhara Agricultural Research Institute, Andassa Livestock Research Center, Bahir Dar Ethiopia.

ABSTRACT

The study was conducted at Debre mewu watershed, western Amhara region, Ethiopia. A total of 10 farmers were selected purposively. A feeding experiment was conducted to evaluate and create awareness on the fattening potential of sweet lupin seed (*Lupinus angustifolius* L.). A total of nineteen yearling washera sheep with an average initial body weight of 21.9 kg was used for the experiment. Each sheep was offered 290g sweet lupin grain twice a day, half in the morning before grazing and the rest half after grazing as a dry matter base for 79 days including the adaptation period. The grain was used as a whole form. The feeding result showed that the live weight of experimental animals changed on average from 21.9kg to 29.4kg. The Partial budget analysis result also shows that; the demonstrated fattening technology was profitable with the average net benefit of 275.32 ETB. The sensitivity analysis result showed that if the price of output becomes constant and the price of the inputs rose by 22.38%, it has a positive return. Farmers are interested to introduce and continue the feed into their production system. Therefore, it shall be further scale upped to the potential areas of mid and highland in Amhara Region.

Keywords: Sweet lupin, Washera sheep, weight gain fattening, Debre Mewu Watershed.

INTRODUCTION

In Ethiopia, productivity of livestock sector is extremely low in terms of production of milk, meat and drought power output pertinent to inadequate nutrition, unimproved genetic resources and prevalence of diseases and parasites, scanty research and extension services (Azage & Alemu, 1998). Shortage of feed in terms of quality and quantity is one of the leading plights. This problem is severe during long dry season because the main feed source is pasture and the farmers lack in experience of feed conservation (Zewdie, 2015). To solve the above problem there are alternative ways of improved annual and perennial forage production such as at a farm land, back yards and through integrating with the natural resource structures (paper about forage production strategy). Local white lupin is a very important traditional multipurpose crop and it's grown

in mixed crop livestock farming systems of the area (Yeheyis *et al.*, 2010). However, use of the crop as human food and as livestock feed is limited due to its bitter taste attributed to its relatively high alkaloid content (1.43%) (Yeheyis *et al.*, 2011). On contrary, low alkaloid containing sweet annual lupins are adaptive and productive in the north western traditional lupin growing area of the country (Yeheyis *et al.*, 2011). Therefore, sweet lupin is used as an alternative source of feed for mid and high-altitude areas of Ethiopia. According the Yeheyis *et al.*, 2011, feeding trial on Washera sheep (on station) supplementing with 290g/head/day sweet lupin grain have average daily body weight gain of 74 g/day and final body weight of 26.1kg. Since the feeding technology was done on station based the result is demonstrated for the end users at farmer's field to meet the objectives of creating awareness and demand on the supplementary and fattening potential of sweet lupin grain on of Washera sheep followed by assessment of economic feasibility of

* Corresponding Author:

Email: molla.haile2005@gmail.com

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the feeding technology and exploring farmers' feedback on the demonstrated fattening technology.

MATERIAL AND METHODS

Description of the study area: Debre Mewi watershed was selected among working areas of water and land resource center project watersheds which is the funder the study, the project was served as a learning site for the integrated watershed development approach. The water shed is found in Yilmana Densa district of West Gojam zone, Amhara region, which is located at about 35km from North West of Bahir dar city, Ethiopia and lies within an altitude range of 2127-2366 m a.s.l. The watershed receives an average annual rainfall of 1238 mm and covers around 770ha of land (WOARD, 2014-unpublished).

Farmer selection and sampling size: A total of 10 farmers, those who can serve as a demonstration host farmer were selected purposively from Debre Mewi watershed with the participation of kebele development agents. Training was delivered by the nutrition researchers for the FREG (farmer research extension group) participants and development agents who are working as an agricultural extension worker in the kebele, on the topics of Sweet lupin production, animal selection, feeding and data recording experimental animals feeding and management.

Feeding and feed management: A total of 19 yearling male Washera sheep with average initial body weight of 21.9 kg, two sheep from each host farmers were used for the trial. All the experimental animals were dewormed against internal parasites and vaccinated for common diseases before the commencement of the trial. Each sheep was offered 290g sweet lupin grain twice a day, half in the morning before gazing and the rest half after grazing as a dry matter base. The grain was used in whole form. Hay was used as basal diet and provides adlib water was delivered freely. The feeding trial was conducted for 79 days including 7 days of acclimatization period.

Data collection and Statistical analysis: Body weights of animals were taken every fifteen days interval with a Salter balance. Selling and purchasing price of experimental sheep, each cost incurred (feed, medication, labor) and farmers' perception on the demonstrated technology were collected by trained enumerator. The collected data were coded and entered to the computer and analyzed by using simple descriptive statistics of SPSS (ver.16). Farmer perception

was collected by using lickert scale measurement.

RESULTS AND DISCUSSION

Body weight change: 290g/d/h sweet lupin grain supplementation increases the live weight of experimental animals on average from 21.9kg to 29.4kg. The final body weight, body weight change and daily weight change obtained in the study was higher than the result obtained by (yeheyis *et al.* 2011) with similar experiments, it may be due to the supplementation period difference.

Table 1. body weight change.

Parameter	Mean weight (kg)
Initial body weight (kg)	21.9
Final body weight (kg)	29.4
Daily body weight gain(kg)	0.09

Partial budget analysis: As indicated at table 2, sheep fattening by feeding 290g/d/h sweet lupin grain is profitable with average net benefit of 275.32 ETB. The sensitivity analysis result showed that if the price of output become constant and the price of the inputs rose by 22.38% the fattening has a positive return.

Table 2. Partial Budget Analysis.

Parameter/variables	Amount in ETB	Sensitivity (22.38%)
Benefit (selling price of sheep)	1505.24	1505.24
Costs		
Purchasing price of sheep	873.33	1068.78
Sweet lupine purchasing price	167.04	204.42
Hay purchasing price	184.07	225.26
Medication cost	5.48	6.70
B. Total variable cost	1229.92	1505.17
Net benefit (A-B)	275.32	0.06
Benefit cost ratio A/B	1.22	

ETB= Ethiopian Birr

Farmers perception based on Lickert scale result

Sweet lupin production and utilization: From the total host farmers 81.8% and 18.2% was strongly agreed and agreed respectively about sweet lupin grain was useful and palatable by sheep. Among the participant farmers 90.9% and 9.1% participants strongly agreed and agreed to produce sweet lupin for the future at their farm land easily. Thus, if the farmers volunteer to produce sweet lupin at their farm land the farmers able to substitute the commercial concentrate and save the cost incurred to

purchase it. Moreover, 63.6% farmers respond that 290g sweet lupin grain feeding for the sheep as a whole form has no any health problem.

Marketing of fattened sheep: The average distance of the livestock market is about 20 minutes from the participant farmers' resident area. Also 18.2% of the participants agreed that there is no sheep market problem on the fattened sheep. On the other hand, 18.2% and 9.1% farmers strongly disagreed and agreed about the above idea. It's because of the distance of the regional livestock market is far from their resident, rather the remaining 54.5% participants lay on the between of the above.

Sheep fattening management: Among the participant farmer 90.9% and 9.1% participants strongly agreed and

agreed respectively on the idea of there is no labor problem to participate in sheep fattening and it can also be managed by women and girls easily at home.

CONCLUSION AND RECOMMENDATION

Fattening of washera sheep using sweet lupin grain with hay as a basal diet has a daily gain of 0.09g/day weight change. The average benefit in the sheep fattening is 275.32 ETB. It can generate an alternative income for small holder farmers. From the result, sweet lupin grain can be used as an alternative home-grown protein supplement feed to solve the feed shortage of the region as well as the country. Farmers showed an interest and demand were created by the farmers on the demonstrated area to use sweet lupin. Therefore, it shall be further scale up on mid and highland areas of the Amhara Region.

Table 3. Lickert scale result of farmers' perception.

Attributes	Strongly agree (%)	Agree (%)	Neither (%)	Disagree (%)	Strongly Disagree (%)
Sweet lupin production and utilization					
Sweet lupin grain was useful and palatable by sheep	81.8	18.2	-	-	-
I can produce lupin in my farm land easily	90.9	9.1	-	-	-
Sweet lupin grain has no health problem during feeding time	63.6	18.2	18.2	-	-
Marketing of fattened sheep					
Un castrated sheep was preferred by the market than the castrated one	72.7	18.2	9.1	-	-
There is no sheep market problem on the fattened sheep in our nearest livestock market	-	18.2	54.5	18.2	9.1
Sheep fattening management					
Fattening activity can be managed by women easily at home	36.4	54.5	9.1	-	-
There is no labor problem to participate in sheep fattening	90.9	9.1	-	-	-

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