COST-BENEFIT OF SILAGE PRODUCTION IN NATIONAL VETERINARY RESEARCH INSTITUTE, VOM

BY

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Abstract

This study was carried out to evaluate the **Cost-Benefit** of **silage** production in the National Veterinary Research Institute, Vom. A five year retrospective data was collected from the forage conservation section of the Livestock Investigation Department located in the farm of Federal College of Animal Health and Production Technology (under the National Veterinary Research Institute). The data was collected between 2009 and 2013 on **variable cost** and **output** and analyzed using Farm Budgeting Techniques and Multiple regressions. Mean values and percentages were also calculated. The result indicated that the cost of seed and polythene shows no variation in the regression estimate as they were eliminated because their cost price is the same for all the periods of study. This attributes to the fact that a particular supply was maintained throughout the period under study. The result also indicated that silage production was beneficial to the research institute for the period under study. Therefore, it is suggested that farmers, corporate organizations (farms) and government establishments who delve into dairy farming, animal fattening should produce silage for optimum yield.

KEY WORDS: **Cost-Benefit, Silage, Variable Cost, Output, Dairy farming, Animal Fattening**.

Introduction

The livestock industry is generally considered to be of paramount importance to the economy because meat, milk and other animal products derived from from animals have helped tremendously in meeting the nutritive needs of ever growing human population globally. In the food industry, many preservation techniques are available such as cooking, freezing, dehydration, pasteurization, blanching and modified atmosphere storage. While for the preservation of forages for animal feedstuff, methods such as drying (hay) and silage are available. It is therefore necessary to preserve forage crop in the form of silage that will be available throughout the year to ensure continuous and consistent supply of the forage (Wilkins *et al*., 1999).

Scarcity of forage during the dry season is a common problem limiting ruminant production in tropical areas (Malau-Aduli, 2003; Nwaigwe, 2011). Excess forage produced during the rainy season could be conserved in form of hay or silage and fed during dry the season. However, high precipitation and humidity during periods of excess forage production recommend silage-making as the preferred means of forage conservation in these areas (Wong, 2000).

According to Dickerson *et al*., (1991), silage is a fermented high moisture fodder that lasts long and can be fed to ruminants such as cattle, sheep and goats or used as biofuel feedstuff for anaerobic digesters. Silage is fermented and stored in a process called ensilage, ensiling or silaging as it is usually made from grass crops including maize, sorghum, millet or other cereals using the entire green plant not just the grains. Good quality silage has a pleasant odour, a typical colour and texture with a high nutritional value. Silagde preparation should be done carefully in order to be sure of a successful ensiling fermentation.

The benefits of making silage are enormous. It intensifies forage production i.e. increase in yield of forage per hectare; risks associated with weather conditions when trying to harvest high quality forage is minimized, improves the produces control over cutting dates and optimal stage of maturity at harvest and minimizes losses of leaves and other small plant parts of high quality in the field.

Also, storage and incorporation of forage feeds that can be preserved such as hay coupled with agro industrial byproducts such as bran grains makes it possible to balance rations of dairy cows accurately because of their known nutritive value. Diets of grazing cattle cannot be balanced accurately because they ingest pastures of variable nutritive value. (Harrison *et al*.,1991).

The scarcity of grazaeble materials during the dry season in Nigeria is widely recognized and there is need to look for alternative ways to breach the gap and forage in the form of silage has been considered to alleviate this underlying problem. However, there is paucity of information on the material benefit in relation to breaking even in the production and utilization of silage. With this in mind, this study was designed to;

1. Find the cost of silage production in NVRI, Vom.
2. Find out the benefits associated with silage production in NVRI, Vom.
3. Determine the influencing factors associated with silage production.
4. Ascertain the challenges in silage production in NVRI, Vom.

MATERIALS AND METHODS

- **Study area:** This study was carried out at the FCAHPT, Vom farm.
- **Data collection:** A retrospective data between 2009 and 2013 was collected from the forage conservation section of the college farm on variable cost and output. Items considered in the variable cost were seed, fertilizer, labour, polythene, agro chemicals, and land preparation.
- **Data analysis:** Data collected were subjected to statistical analysis using mean values and percentages, Farm budgeting ration (FBR) and Multiple regressions.

In the Farm budgeting ratio, a market cost price of silage was used to calculate the Total Revenue (TR). The market price of N7:15K/Kg local price as against the conventional price of N10/Kg of each of the production years under study was used to multiply the market price N7:1484/Kg to obtain the total revenue (TR) (i.e. output in tones X 1000).

NFI = GR – TC.
GR = GR/TC
RROI = NFI/TC

RESULTS AND DISCUSSIONS

1. Variable cost of silage production.

The cost of silage production in the National Veterinary Research Institute, Vom between 2009 and 2013 is presented in table 1. The table shows the production parameters which include cost variables such as seed, fertilizer, labour, additives, polythene, agrochemicals and cost of land preparation (plough, harrow, sowing). The cost of seeds and polythene shows no variation because the seed were always obtained from one source* while polythene was always obtained from IDF* for all the years under investigation. Other variable costs of production showed an increase in cost as the years advanced.

Table 1: Variable cost of silage production in Vom between 2009 – 2013.

Production Parameters	Amount(N)				
	2009	2010	2011	2012	2013
Seed	100 000	100 000	100 000	100 000	100 000
Fertilizer	450 000	480 000	550 000	550 000	580 000
Labour	75 000	95 000	101 000	120 000	123 100
Additives	64 600	64 700	64 800	64 900	65 100
Polythene	120 000	120 000	120 000	120 000	120 000
Agrochemicals	871 500	981 500	989 500	999 500	1 630020
Land Preparation	220 000	360 000	360 000	360 000	480 000
Output (in tons)	1 255	1 315	1 270	1 140	1 214
Total cost	**1 901100**	**2 201200**	**2 285300**	**2 314400**	**3 098020**

The benefits and financial indicators of silage production

The benefits and financial indicators of silage production in National Veterinary Research Institute, Vom between 2009 and 2013 is presented in table 2. The Total Revenue (TR), Net Farm Income (NFI), Gross Ratio are analyzed and the Rate of Return On Investment (RROI).

Table 2: Benefits and Financial indicators of silage Production in Vom between 2009 and 2013

Financial Indicators	Amount(N)					
	2009	2010	2011	2012	2013	MEAN
TR	8 971242	9 400146	9 078464	8 147176	8 678157	8 855347
NFI	7 070142	7 198946	6 793168	5 832776	5 580137	6 495033
GR	4.17	4.27	3.97	3.52	2.8	3.85
RROI	3.71	3.27	2.97	2.52	1.8	2.85

NB: RROI shows a positive value which means the production of silage for periods under investigation is beneficial to the institute.

KEY: TR Total Revenue
NFI Net Farm Income
GR Gross Ratio
RROI Rate of Return of On Investment

Regression and estimates of the effects of inputs on the yield of silage production

Regression estimates of the effects of inputs on yield of silage produced in NVRI, Vom between 2009 and 2013 is presented in Table 3. Since the relationship between the predictors and the t-value is affirmative, the increase on the coefficient of the variable inputs will also increase the yield of the silage produced

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Table 3: Regression estimates of the effects of input on yield of silage produced in Vom between 2009-2013

Predictor	Coefiicient	St.Error	t-value
Constant	1.435	1536.735	934040.645
Fertilizer X_3	21.026	0.000	770277.752***
Labour X_4	65.46	0.000	601694.012***
Additives X_5	-22392.287	0.024	-9227519.401***
Agrochemicals X_7	6.619	0.000	979824.923***
Land preparation X_8	42.396	0.000	842987.764***
R-Square Adjust (%)	100		
R-Square Adjust (%)	100		

NB: X_2 and X_6 were eliminated by the 17.00 version of SPSS because the values show no variation.

KEY: *** variables significant at P<0.001

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