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ECONOMICS OF CATTLE FATTENING WITH CROP RESIDUES IN NORTHERN GUINEA SAVANNAH ECOLOGICAL ZONE OF NIGERIA.

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Target Audience: Cattle fattenners, farm managers, agro-consultants, researchers

ABSTRACT

This study was conducted to investigate the economics of Cattle fattening with crop residues in Northern Guinea Savannah Ecological Zone of Nigeria. Data were collected from 100 respodents between January to December, 1999 using simple random sampling technique. Interview method was employed. The data were analysed using descriptive statistics, farm budgeting technique and regression analysis. The results showed that the net income was N6642 and the rate of Capital turnover was 1.27. Multiple regression analysis showed a coefficient of multiple determination of 89.3% ($P<0.05$). Reduction in the cost of feeds was suggested for enhanced profit maximization.

Key words: Cattle, fattening, crop residues, profit

DESCRIPTION OF PROBLEM

The nations' livestock resources include 16.3 million cattle, 14 million sheep, 24.5 million goats and 124 million chickens (2). Ruminant livestock comprising of sheep, cattle and goats make a substantial contribution to the economy of Nigeria as suppliers of food, raw materials and foreign exchange (4). Similarly, they constitute an important source of capital for the farm household, particularly in the Northern states where cattle, sheep, goats and camels are sold locally and exported to neighbouring states. In Nigeria, the most important ruminant producing areas are the savanna zones which are also the most important cereal crop producing areas (6). The problem of providing adequate good quality feed for livestock during the dry season is the single most important contraint to livestock development in Nigeria, especially in Northern Guinea, Sudan and Sahel savanna zones where the majority of the ruminants are produced (3). During the dry season, which lasts up to 7 months in these areas, the animals have to rely on range grazing (13). In Northern Nigeria, crop residues are economically important source of feed for ruminants. Various studies have

shown that if properly supplemented, these crop residues can be used successfully as a major component of ruminant diets, particularly at or slightly above maintenance feeding levels (8).However, (13) described a system of cropping and animal production in Northern Nigeria in which residues, predominantly at or from Guinea corn and to a lesser extent from cotton and millet constitute the principal source of fodder for grazing animals from November to June each year. Benefits from cereal crop residues consumption during the dry season do not only come from a decrease in weight loss, but from also an improvement in reproductive performance and maintenance of milk yields (9). For more nutritive value of crop residues, cereal straw and legume haulms should be harvested not later than 2 weeks after grain/seed harvest (5).

Cattle fattening depends on use of crop residues, agro-industrial by-products and highly fertilized improved pastures for which the region has tremendous potential. Beef animals bred and raised on improved natural pasture will fatten in 150 days and be ready for market in 35 months after birth. In Nigeria, over 98% of the dry matter needed to produce beef is derived from grasses and browses growing on natural range land (10). The broad objective of the current study was to examine the economics of the cattle fattening using crop residues.

MATERIALS AND METHODS

The area of study covers parts of former Bauchi state (presently Bauchi and Gombe states). One hundred cattle fatteners were sampled from five local government areas namely, Alkaleri, Bauchi and Ganjuwa (Bauchi state), Akko and Gombe (Gombe state). As many fatteners as possible were identified from each of the Local Government Areas with the help of the Local Government Department of Agriculture. A simple random sampling technique was then used to select 100 respondents from the list of all the fatteners identified earlier. The interview method was used to collect data on type of stock, feed used, cost of inputs, fattening time, selling price, and problems encountered.

The specific analytical tools used in this research work included descriptive statistics, budgeting analysis, and regression analysis.

Budgeting Analysis is applied to analyse the financial returns. Total expenses refers to the total cost incurred during the production period, which is obtained by multiplying the various inputs by their unit market prices. Conversely, total revenue refers to the sum of outputs multiplied by their unit prices. The difference between total revenue and the total cost gives the net benefit i.e.

NB= TR-TC,
TC= TVC+ TFC
NB= TR- TVC -TFC
Where:
NB = Net Benefit
TR = Total Revenue
TVC = Total Variable Cost
TFC = Total Fixed Cost
TC = Total Cost
Also,
GI = Q x P
Where,
GI = Gross Income
Q = Total Number (animals)
P = Price (of animal)

The multiple regression model employed is specified by (12):

$Y = a + b1x1 + b2x2 + b3x3 + Ui$

Where

Y	=	Net income of fatteners (₦)
X1	=	Cost of cowpea shell /vine (₦ /Ton)
X2	=	Cost of groundnut haulms (₦ /Ton)
X3	=	Cost of grain stovers (₦ /Ton)
Ui	=	Errors term

RESULTS AND DISCUSSION

Description of the social-economics characteristics

The socio-economic characteristics considered included age, fattening experience, family size, number of cattle and sex, (Table 1). They are generally very important in the management of any agricultural enterprise.

Table 1: Socio-economic Indicators of the respondents

	Indicator	Frequency
1.	Average Age (years)	33.4
2.	Average fattening experience (years)	4.7
3.	Average family size	3.6
4.	Number of cattle for fattening	2
5.	Average of fattening period (days)	124
6.	Number of male fatteners (%)	92
7.	Number of fatteners with fully owned capital (%)	86
8.	Contribution of fattening to total annual income (%)	8.3

Age is an invaluable consideration in decision making with respect to risk taking and availability of human labour (11). Average age of the respondents (Table 1) is 33.4 years. Which implies that cattle fattening is mostly practiced by medium aged people probably because they are more able and willing to take all the risk involved in expectation of profit. The average fattening experience of the respondents in 4.7 years implies that the respondents are

moderately experienced in cattle fattening and this may have positive consequences on their productivity especially in management of resources. Also an average of 2 cattle were kept per household and fattening period of 124 days were recorded (Table 1). Beef cattle bred and raised on improved natural pastures will normally fatten in less than 150 days (10). It also shows that most of the fatteners (92%) are meals and the contribution of cattle fattening to their annual income is 8.3%. This level of contribution is generally acceptable and can be improved with good crop residues management (10).

Cost and Returns Analysis of Cattle Fattening

Table 2 shows that the total cost of production incurred averagely per respondent was ₦24,358. The total cost of production comprised of the variable and fixed costs.

Table 2: Cost and Returns Analysis of Cattle Fattening

Cost component		Average Amount per Respondent (N)	Percentage (%)
(a)	**Variable cost (VC):**		
i	Cost of fattening stock	13,750	56.4
ii.	Grain residues	1,005	4.1
iii.	Cowpea shell and vines	2.221	9.1
iv	Groundnut haulms	3,106	12.8
v.	Others feeds	1,650	6.8
vi	Labour	1,000	4.1
vii.	Mediction	425	1.7
	Total Variable Cost (TVC)	23,157	95
(b)	**Fixed Cost (FC)**		
i.	Depreciation on housing and equipments/implements	1,201	4.9
	Total fixed Cost (TFC)	1,201	4.9
(c)	Total cost (TVC + TFC)	24,358	100
(d)	Gross income (GI)	31,000	
(e)	Net income (GI - TC)	6,642	
f)	Rate of capital turnover (GI / TC)	1.27	

From Table 2 variable cost which includes the cost of fattening stock, feeds, labour and medication, represents 95%, while fixed cost accounted for the remaining 5% of the total cost of production. Additionally, feed costs represent 32.8% while labour represent 4.1% of the total cost of production. This shows that feed is the most important component of cattle fattening. (1) and (7) stated that cost of feeding alone accounts for more than 30% of the total cost of production in livestock industry.

Table 2 also reveals that the average net income was N6,642 and the rate of capital turnover was 1.27. Thus cattle fattening is a very profitable venture. However, the profitability level can still be increased by lowering the total cost on feeds. This can be done through popularising of crop residue storage. Crop residue storage will save the consumer from the uncertainty of seasonal supply and increase in prices, thereby decreasing the cost of production and thus increasing profitability (12).

Regression Analysis of Cattle Fattening

The results of the multiple regression analysis are presented in Table 3.

Table 3: Multiple Regression Analysis of the factors determining net income in Cattle fattening

Variable	Regression Coefficient	T-values
Constant	0.0436	0.217
Cowpea shell and vine (X_1)	0.288	2.190*
Groundnut haulms (X_2)	0.364	3.642**
Grain residues (X_3)	0.511	2.475**

R^2 = Significant** F-value = 16.77

* = Significant (P<0.05)

** = Significant (P<0.01)

The coefficient of multiple determination (R^2) of 0.89 means that 89% of the dependent variable is explained by variation in the explanatory variables included in the model. The F-ratio of 16.77 was found to be significant (P<0.01), which implied that all the explanatory variables (X_1, X_2 and X_3) significantly explained the variation in the dependent variable (Y). Table 3 similarly shows that cowpea shell and grain residues as independent variables significantly (P<0.05) influenced the dependent variable. Similarly groundnut haulms (X_2) as independent varaible significantly (P<0.01) contributed to the Net income. The estimated coefficinets of X_1, X_2 and X_3 all carry positive signs, which shows that an increase in each of them would lead to an increase in the dependent variable (Y) by 28.8%, 36.4% and 51.1% respectively. This means that profit can still be increased in cattle fattening by lowering the cost of fedds. Crop residue storage is therefore suggested as a means of reducing the cost of fattening (12).

CONCLUSION

The costs and returns analysis shows that cattle fattening with crop residues is profitable and there is a significant relationship between profitability and cost of feeds. Thus there is the need to reduce cost on feeds through crop residue storage. Prospects are similarly good for the future and some

inteventions are required in order to fully exploit the potentials of cattle fattening using crop residues.

REFERENCES

1. Abubakar, M. M. 1988a. Slaughterhouse by-products for sustainable Livestock Production in the Tropics. In: Strategies and Tactics of Sustainable Agriculture in the Tropics. (Badejo M. A. and Togun A. O. (eds), College press Ibadan and Enproct Consultants, Lagos pp 196 - 210.
2. Abubakar, M. M. 1998b. Contributions of Nigerian Society for Animal Production to Livestock Research. In: O. A. Osinowo (ed.), 25 years of Nigerian Society for Animal Production from 1973 - 1998 Shika, Zaria, pp. 79 - 98.
3. Abubakar, M. M. 1998c. Utilization of Unconventional Feedstuffs for sustainable Livestock Production A.T.B.U. Inaugural lecture. Series No. 9 44pp.
4. Ademosun, A. A. 1985. Contributions of Research to Small Ruminant Production in Nigeria. in: Adu, I. F., Osinowo, O. A., Taiwo, B. B. A. and Alhassan, W. S. (eds), Small Ruminant Production in Nigeria, pp 18 - 34.
5. Alhassan, W. S., Kallah, M. S. and Bello, S. A. 1987. Influence of duration of stay on the field on the chemical composition and nutritive value of crop residues. Tropical Agriculture (Trinidad) 64 (1): 61 - 64.
6. Alhassan, W. S., Shehu, y., Mensah, G. W. K and Aliyu, A. 1988. Cereal Crop residue/Legume Complete Trials at Bauchi. A Progress Report. School of Agriculture, Abubakar Tafawa Balewa University, 37pp.
7. Bamgbose, A. M., Sani, R. M., Sanusi, M. and Rurum, U. S. 1988. Major Constraints of Poultry Production in Bauchi Metropolis. Proceedings of Animal Science Association of Nigeria (Ologhobo, A. D. and Iyayi, E. A. (eds). pp. 103 - 107.
8. Coombe, J. B. 1981. Utilization of low-quality residues. In: F.H.W. Morley (ed). Grazing Animals, Elsevier Scientific Publication Company, Amsterdam. 159 - 164pp
9. Otchere, E. O. 1986. Traditional cattle production in the sub-humid zone of Nigeria. Proceedings of the 2nd ILCA/NAPRI symposium, Kaduna, ILCA, Addis Ababa, Ethiopia, pp. 100 - 140.
10. Sandford, S. G. 1990. Crop residue/livestock and water management system in sudan sahelian zone. Proceedings of an international workshop, ICRISAT Sahelian centre, Niamey, niger 11 - 16 January,

1989. Patornchery Andrah Pradesh, India. 135 - 139pp.

11. **Sani, R. M., A. E. David, S. Kushwaha and J. Mbanasor 1999.** Sustainable fish production: An Economic Analysis of Fish Farming in Northern Guinea Savanah Ecological Zone of Nigeria. Ph.D Thesis, A.T.B.U., Bauchi 125pp.

13. **Van Raay, J. G. I. and Van de Leeuw, P. N. 1979.** The importance of crop residues as fodder: A resource analysis in Katsina province, Nigeria. Samaru, Zaria, Nigeria. 10pp.