Gross Margin Analysis of COCOA Bread Production

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Abstract— *Gross margin analysis of cocoa bread production in CRIN with a view to establishing its profitability was examined. A well-structured questionnaire was administered on 100 randomly selected respondents. Three investment parameters, Benefit Cost Ratio (BCR), Net Present Value (NPV) and internal rate of return (IRR) were also used. Distribution of the respondents according to age revealed that people within the age bracket of 31 – 40 years and 41 – 50 years represents the larger percentage of Cocoa Bread consumer in the study area. Results also indicate Gross Return on CRIN Bread production for the period of study was found to be N2, 889,880 and the total variable cost was N1, 855,400. A positive NPV value, a BCR of 1.142 and an IRR of 38.82% indicate that Cocoa Bread production is worthwhile.*

Keywords— Cocoa bread, Gross margin, variable cost, questionnaires.

I. INTRODUCTION

The current thrust of Agricultural Transformation Agenda (ATA) aimed at meaningful contribution of Agriculture to overall economic development and growth of the country; and cocoa has a great role to play in the achievement of this, as it is the leading agriculture contributor of about 42% (Akoroda, 2012) to the Gross Domestic Product (GDP). In the recent past, Nigeria government through its agricultural policy of increasing Nigeria cocoa production figure had established Cocoa Seed Gardens in all the 14 Cocoa producing states and rehabilitated the existing ones. Nevertheless, for the country not to remain in the buyers' market (Price-taker) the government also deemed if fit to promote its local consumption having considered its health benefits.

The promotion of Cocoa consumption locally motivated CRIN to include Cocoa powder in the production of bread to bring it to the reach of average Nigerian, as there is hardly any household that does not eat bread. Cocoa powder has a high proportion of dietary fiber of up to 30% (ICCO, 2004). Such dietary fiber aids the movement of food in the digestive system, one of the requirements for healthy living.

Bread is a staple food in several parts of the globe and one of the oldest prepared foods. Among all cereals and cereal foods, bread provides best for our nutritional needs (Pomeranz and Shellenberger, 1971). It is a rich source of carbohydrates, fibre, protein, and vitamins.

Bread is an important source of food in Nigeria. It is consumed extensively in homes, restaurant, and hotels. Bread is made of low protein wheat, it usually contain several ingredients apart from flour are table salt, sugar, flavors and at least a flour improver. (Vicki,1997). The bread making process has undergone dramatic development over the ages, from traditional home baking to commercial industrial production on a large-scale basis. Several varieties of bread are available in the market today, allowing consumers to choose according to their preferences (flavor, nutrition, etc) (Sivasekari Balasubramanian, 2007).

Consumption of Cocoa Bread (CB) is fast gaining ground in Nigeria due to its health benefit in preventing age related diseases. Researchers had shown that consumption of food rich in polyphenotic compound might reduce the risk of cardiovascular diseases (Ding et al 2006; Hollenberg 2006). Cocoa contain flavonoid which is a sub class of polyphenols that has been shown to prevent age related health problems, promotion of better cardiovascular and mental and mental health as well as fascinating the treatment of many diseases conditions. It has pronounced effect on the central nervous system, that it can be said to have a "doping" effect.(Cooer et al2008) Therefore Cocoa bread contains nutrients that are not found in the conventional bread because of the presence of cocoa powder which has special benefits in increasing the spoilage- free shelf-life of the product (Stanley and Young, 2006).

It is therefore the objective of this study to provide insight into the cost and Benefit flow of Cocoa Bread Production in CRIN for profitability assessment. The result will also

guide policy prescription for small and medium entrepreneur bakery production using cocoa powder as one of the recipes as well as gather information on Cocoa perception for feedback into the system.

II. METHODOLOGY

The study area, Oluyole Local Government Area of Oyo State, is where CRIN is situated and are predominantly inhabited by CRIN staff. CRIN has mandate to conduct research for development on five crops namely: Cocoa, kola, cashew, coffee, and Tea.

For the purpose of this study, primary and secondary data were used. The primary data was used to gather information from cocoa bread consumers on the perception of the novel product while the secondary data was sourcing of information on record of sales of cocoa bread in CRIN from January to December, 2012.

A well-structured questionnaire was administered on 100 randomly selected respondents. The data was then analyzed using descriptive and inferential statistics. The descriptive statistics used includes table, percentages, Gross Margin, and measures of project work.

The Gross Margin (GM) was obtained by subtracting Total Variable Cost (VC) from Gross Return (GR) (Erhabor and Kalu, 1993).

The measures of project worth used in determination of project viability as indicated by Gittinger (1972), Ahmad 1978, Anandarup (1984), are Benefit Cost Ratio (BCR) Net Present Value (NPV) and interval rate of return (IRR) as adapted by Yahaya et al (2012) and Aroyeun et al (2013).

The Mathematical computation assumed that (i) Durable assets have zero salvage value (ii) increased production sequel to customers patronage and cost of input was held constant (iii) straight line depreciation for fixed assets (iv) Ruling interest rate is the discount factor which bring future streams of benefit and cost to a present value.

The decision rules adopted in accepting or rejecting project are as given by Gittinger (1972) as follows:

(i) A project is profitable if NPV is positive and it is rejected if NPV is negative.

(ii) Accept all projects with BCR of one or more and reject all project if BCR is less than 1 and,

(iii) Accept project values whose IRR is greater than cost of capital and a project is rejected if its IRR is less than the cost of capital.

For generation of cash flow, all items of value relating to the project are taken into consideration. Items, which are not strictly bought or sold, have their values imputed and in some cases, opportunity costs for such items are worked out for use in the calculation to ensure that the economic principles of project analysis are followed.

III. RESULTS AND DISCUSSION

The socio-economic variables of the respondents like age, educational level, sex, marital status are presented in Table 1.

The distribution of the respondents according to age revealed that people within the age bracket of 31 – 40 years and 41 – 50 years represents the larger percentage of Cocoa Bread consumer in the study area. None of the respondents was below 20 years of age because at this age, most of these people are in school and not likely to be in CRIN environment when the questionnaire was being administered.

The respondents' distribution according to level of education indicated that people with at least secondary school education dominate in cocoa bread consumption in this study area. This group constitutes 81 percent of the total respondents.

The gender distribution of the respondents showed that the male gender 69 percent patronizes cocoa bread more than their female counterpart 31percent does. This is likely to be so as they are the head of the family, they purchased consumption. Of the respondent classes, greater percentages of the Cocoa Bread consumer are married 58 percent while only 42 percent are single.

Table 2 showed the respondents quality perception of Cocoa Bread. The product pricing compared favorably well with the price of other bread as 95 percent of the respondents were satisfied with the price at which it is being sold. They even thought that it should have been higher than that because of the included cocoa powder, which is very expensive.

The Gross Return on CRIN Bread production for the period of study was found to be N2, 889,880 and the total variable cost was N1, 855,400. The total variable cost is subtracted from the gross revenue to give the gross margin of N1, 034,480. The year under review was never crisis free, as production of Cocoa Bread production was not done in some periods due to strike actions embarked upon by the labor union.

Table 3 presents the Cost Benefit Analysis of Cocoa Bread production. The revenue and the cost of production for some years were discounted at 20 percent to obtain present value of cost and that of benefits. The difference between the two gives the Net Present Value (NPV) of 3,462,358.72

The NPV of benefit divided by NPV of cost gives the Benefit cost ratio of 1.142, which indicates that the project Cocoa Bread production is profitable.

Similarly, the internal Rate of Return (IRR) was found to be 38.82% meaning that the project has a higher earning capacity than the ruling cost of capital (interest rate) that may have been employed in the business. The three investment parameters used (NPV, BCR and IRR) were all positive. Hence, it can be concluded that the Cocoa Bread Production is a viable and worthwhile business that can be embarked upon.

IV. CONCLUSION

Promotion of Consumption of Cocoa powder locally within the country would be achieved through its inclusion in bread making thus improving the health status of the Nigeria citizen. Besides, many young graduates can occupy themselves with this venture thereby reducing the high level of unemployment in the country.

Table.1: Socio-Economic Distribution of Cocoa Bread Consumers

Socio-Economic Variable		Number	Percentage(%)
(1)	**Age**		
	<20	0	0
	21 – 30	5	5
	31 – 40	43	43
	41 – 50	32	32
	51 and above	20	20
(2)	**Educational Level**		
	No formal education	0	0
	Primary school	19	19
	Secondary school	22	22
	Tertiary	59	59
(3)	**Purchasing frequency**		
	Daily	71	71
	Weekly	18	18
	Fortnightly	3	3
	Monthly	0	0
	Occasionally	8	8
(4)	**Gender**		
	Male	69	69
	Female	31	31
(5)	**Marital status**		
	Married	58	58
	Single	42	42

Source: Field survey, 2014

Table.2: Quality Perception of Cocoa Bread by the Respondents.

Percentage Response

Parameter	Excellent	Good	Fair	Poor
Product Pricing	30	65	5	0
Packaging Quality	13	16	43	28
Taste	49	37	11	3
Storability	62	33	3	2
Fluffiness	22	49	29	0
Awareness	100	0	0	0

Source: Field survey, 2012

Table.3: Cost Benefit Analysis

YR	Cost	Benefit	Inc. Benefit	DF@20%	Ds Cost	DsBen	NPV@20%	DF@50%	NPV@50%
1	8640200	9660000	1019800	0.8333	7199878.7	8049678	849799.34	0.6667	679900.66
2	7274300	8930250	1655950	0.6944	5051273.9	6201165.6	1149891.7	0.4444	735904.18
3	8001730	9376762.5	1375032.5	0.5787	4630601.2	5426332.5	795731.31	0.2963	407422.13
4	8801903	9845600.6	1043697.6	0.4823	4245157.8	4748533.2	503375.35	0.1975	206130.28
5	9682093	10337881	655787.6	0.4019	3891233.2	4154794.2	263561.04	0.1317	86367.23
					25018145	28580503	3562358.7		2115724.47

Source: Computed values

Table.3b: Profitability (Decision rule)

Estimate	Value	Remark
NPV	3462358.7	Positive
BCR	1.142	>1
IRR	38.82%	>ERR of 20%

REFERENCES

[1] Ahmad, M. (1978): The Economic Analysis of Projects. Agricultural Extension and Research Liaison Services; A.B.U. Zamaru, Zaria.

[2] Akoroda, M. O. (2012): Repositioning Nigeria's Agriculture through Cocoa Rebirth. College of Agriculture Distinguished Annual Lecture Series, Osun State University, Osogbo, Osun State, Nigeria held on 27 November. 2012.

[3] Anandarup (1984): Cost Result Analysis Issues and Methodologies. A World Bank publication. The John Hopkang, University Press Baltimore, Maryland 21218.U.S.A.

[4] Aroyeun, S. O., Shittu, T. R., Yahaya, A. T., Sowunmi, F., Odunmbaku, L. A., Okelana, F. A., Akoroda, M. O., (2013): Green Tea Processing in Nigeria and its economic implication. Global Advance Research Journal of Management and Business Studies (ISSN – 2315 – 5086) Vol. 2(1) pp 050-055 Jan. 2013.

[5] Cooper, K; Donovan, J., Waterhouse, A and Willisamson, G (2008). Cocoa Health Adecade of Reasearch. Br.J Nur., Pp. 99-111.

[6] Erhabor and Kalu (1993): Economic Appraisal of Proven Technologies of On- Farm Adaptive Research (OFAR) Results. 1987- 91. Benue State Agricultural and Rural Development Authority Markurdi.

[7] Gittinger, J. P. (1972): Economic Analysis of Agricultural Projects. The John Hopkins University Press. London. Pp 299-362.

[8] Pomeranz, Y. and Shellenberger, J. A.(1971):Bread science and technology. An AviPub.Co., Wesport, Conn.

[9] SivasekariBalasubramanian (2007): Quality of Breads from Hard Red Winter Wheat and Hard White Winter Wheat. A Thesis submitted to the University of Georgia.

[10] Stanley P. Cauvin and Linda S. Young (2006): Baked Products: Science, Technology and Practice. Blackwell Publishing Ltd, 9600 Garsington Road, Oxford OX4 2DQ, UK. ISBN-10: 1-4051-2702-3; ISBN 13: 978-1-4051-2072-8.

[11] Yahaya, A. T; Taiwo, O; Shittu, T. R; Yahaya, L.E. and Jayeola, C. O. (2012). Investment in Cashew Kernel Oil Production: Cost and Return Analysis of Three Processing Method. American Journal of Economics 2012 2(3): 45 -49. doi: 10 5923/j.economics 2012020304.

[12] Vicki S(1997) Bromate Analysis, Food Sci Technol. Bull Publications.

[13] ICCO (2004) Annual Report of the International Cocoa Organization 06 BP 1166 Abidjan 06 Côte d'Ivoire

[14] Ding EL, Hutfless SM, Ding X, Girotra S.(2006). Chocolate and prevention of cardiovascular disease: a systematic review. Nutr Metab (Lond). 3;3:2

[15] K. Hollenberg, Norman (2006). Vascular Action of Cocoa Flavanols in Humans: The Roots of the Story. Journal of Cardiovascular Pharmacology: 4 :S99-S102