

Original Research Article

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## Marketing Analysis of Cereal BY-Products used as Livestock Feed in Kano State, Nigeria

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### ABSTRACT

The study focused on the profitability analysis of marketing of cereals by-products used as livestock feed in Kano State. Multistage sampling technique was used for the study and data was collected using structured questionnaire supplemented with key informant interview. A total of one hundred and seventy-eight (178) cereals by-product marketers were sampled. The analytical tools employed included descriptive statistics, net marketing margin analysis and marketing efficiency. The result of the socio economic characteristics showed that 12% of the cereals by-products marketers were adult belonging to the age group of 43-52 years, 51% of them had household size of 1-6 members, 43.8% of the cereals by-products marketers had 14-22 years of marketing experience, 94.9% married with 88.6% males, the result of educational background of legumes by-products marketers in the study area shows that 44.9% had Qur'anic education. The result of the profitability analysis revealed that cereals by-products marketing were profitable as the marketing margin for sorghum bran and maize bran were ₦323.34 and ₦470 respectively. The total revenue realized for the marketing were ₦1796.67 and ₦2083.33 for sorghum bran and maize bran respectively. The result further revealed Gross Margin (GR) of 0.01 and 0.01 for sorghum bran and maize bran traded in the study area while return per naira invested was found to be 1.09 and 1.16 accrued from every ₦1.00 invested for legumes by-products marketing. The result also revealed that marketing of legumes by-products was efficient with 254.17% and 306.16% for sorghum bran and maize bran respectively indicating that marketing of these by-products was profitable and efficient in the study area. The study recommended that since cereals by-product marketing is a profitable enterprise more youth should be encouraged to venture into the enterprises this will go a long way in reducing unemployment in the study area.

#### Keywords

Cereals by-products, Sorghum bran and Maize bran

#### Article Info

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## **Introduction**

Feeds are natural substances which are most commonly organic matter with little components of inorganic matter (Umar, 2002). Livestock feeds are both organic and inorganic substances taken in by animals to provide nutrients such as energy, proteins, minerals and vitamins, metabolized in the body to maintain and produce body tissues, fluids and by-products such as meat, milk and eggs. The feed industry is one of the most competitive businesses in the agricultural sector and is by far the largest purchaser of U.S. corn, feed grains and soybean meal (FAO, 2001).

Studies in various part of Nigeria revealed that about 31% of the Nigerian land area is cropped and different ranges of livestock feeds are produced (Abubakar, 1998). Livestock feeds are of two types those from cereal (millet bran, sorghum bran and maize bran) and those from legume (cowpea vines, groundnut hay and soybean) (Benerjee, 2005). Marketing provides the mechanism whereby producers exchange their commodity for cash. The cash is used for acquiring goods and services which they do not produce themselves, in order to satisfy a variety of needs ranging from food items, clothing, shelter, medication and schooling to the purchase of breeding stock and other production inputs and supplies (Solomon and Nagussie, 2002). Agricultural marketing from micro view point is the performance of all business activities which direct the forward flow of goods and services to consumers in order to accomplish producer's objectives (Olukosi *et al.*, 2007).

Livestock feed markets suffered from neglect in marketing services in spite of their importance to household welfare and national economy as a whole simply because their full potential is fairly realized. The marketing of industrial and agricultural by-products in

Nigeria is faced with a number of constraints including relatively unorganized market and inadequate feed markets (Powell 1984).

## **Materials and Methods**

The study was carried out in Kano State, Nigeria. The state lies on latitudes  $10^{\circ} 33^1\text{N}$  to  $12^{\circ} 37^1\text{N}$  and Longitude  $7^{\circ} 40^1\text{E}$  to  $9^{\circ} 29^1\text{E}$ . It is within sudan savannah zone; the total land area of the state is 20,760 square kilometers. The mean daily maximum and minimum temperature are  $91.6^{\circ}\text{F}$  ( $33.1^{\circ}$ ) and  $60.6^{\circ}\text{F}$  ( $15.85^{\circ}\text{C}$ ) respectively. Kano state is bordered to the north and northwest by Katsina state, to the east and northeast by Jigawa state, to the south by Bauchi state and to the southwest by Kaduna state. According to the official gazette of Federal Republic of Nigeria (2007), the state had a [population of nine million three hundred and eighty-three thousand six hundred and eighty-two (9,383,682) inhabitants, with an annual growth rate of 3.3%, who are mainly Hausa and Fulani by tribe (NPC, 2006).

Major crops grown in the state includes millet, sorghum, maize, rice, wheat, cotton, gum Arabic and groundnut etc. Their by-products are significant source of food to livestock while rearing of animal like cattle, horses, goats and sheep were more pronounced (RIM, 1992). The state has quite large number of markets. These include rural and urban markets where agricultural commodities are assembled including livestock and their feeds. Most of the market operates weekly or twice a week with the exception of urban markets which operate daily. Kano state is currently made up of forty-four Local Governments Area (LGAs) and the state is agriculturally classified into three (3) zones by the Kano State Agricultural and Rural Development Authority (KNARDA, 1995). Legumes by-products marketers are found in all the three ADPs zones of Kano state (KNARDA, 2001).

**Sampling method**

A multistage sampling technique was used for data collection in the study area. For this study all the three (3) Zones was considered. The first stage involved purposive selection of two local government areas from each zone based on relative abundance and high intensity of feed marketers. On that basis, Rano and Kura local government areas were chosen from zone I, Danbatta and Shanono local government areas were chosen from zone II and Wudil and Tarauni local government areas were chosen from zone III. The second stage, involved purposive selection of one market from each of the selected local government based on the size, location and high involvement in feed marketing. On that basis, Rano and Kura markets were selected from zone I, Danbatta and Shanono markets were selected from zone II and Wudil and Unguwauku Yan awaki markets were selected from zone III. The third stage, involved random selection of respondents from the six selected markets. A pre-survey was conducted and a total of 595 marketers were identified from all the markets out of which 30% was considered from each of the selected markets. In the last stage, a total of 178 respondents were randomly selected using flip papers in the study. In each market, the marketers were first identified and a list was prepared, a ballot box method was applied in selecting the marketers.

**Analytical tools**

The tools of analysis used for this study are: Descriptive statistics, Marketing margin analysis and Marketing Efficiency.

**Marketing margin analysis**

It is the difference in prices of a commodity at different stages of time, place, form and possession as it moves from producer to the

ultimate consumer (Olukosi *et al.*, 2007). The model is specified as follows:

$$\text{Net Marketing Margin (NM)} = \text{TR} - \text{TMC} \text{---(i)}$$

Where:

$$\begin{aligned} \text{NMM} &= \text{Net Marketing margin} \\ \text{TMC} &= \text{Total Marketing Cost} \\ &= (C_1 + C_2 + C_3 + C_4 + C_5) \end{aligned}$$

Where: C<sub>1</sub> = Cost of Transportation (N), C<sub>2</sub> = Cost of labor (N), C<sub>3</sub> = Marketing charges (N), C<sub>4</sub> = Storage (N) and C<sub>5</sub> = Commission Fee (N)

**Gross ratio**

It is a ratio that measures the overall financial success of a business. A less than 1 ratio is desirable for any business, the lower the ratio the higher the profit (Olukosi and Erhabor, 2008). It is stated as:

$$\text{GR} = \frac{\text{TMC}}{\text{TR}} \text{-----(ii)}$$

Where,

$$\begin{aligned} \text{GR} &= \text{Gross Ratio} \\ \text{TMC} &= \text{Total Marketing Cost} \\ \text{TR} &= \text{Total Revenue} \end{aligned}$$

**Operating ratio**

It measures the solvency of a business. A ratio less than 1 is desirable because it indicates that the business is making profit. A ratio of 1 implies break-even and a ratio greater than 1 implies a loss (Olukosi and Erhabor, 2008). According to Musa *et al.*, (2006), the lower the ratio (<1) the higher the profitability of the business. It is given as:

$$\text{OR} = \frac{\text{TVC}}{\text{TR}} \text{-----(iii)}$$

Where,

OR = Operating Ratio  
TMC = Total Variable Cost  
TR = Total Revenue

### **Return on capital invested**

Return on capital invested is defined as total income or revenue divided by total marketing cost (Olukosi *et al.*, 2005). It is given as:

$$\text{RNI} = \frac{\text{TR}}{\text{TMC}} \text{----- (iv)}$$

Where,

RNI = Return on Capital Invested  
TR = Total Revenue  
TMC = Total Marketing Cost

### **Marketing efficiency**

Marketing efficiency measures the ratio of output to input i.e. the maximization of the ratio of output to input marketing (Olukosi *et al.*, 2007). The higher the ratio, the higher was the marketing efficiency and vice versa. The formula is specified as:

$$\text{M.E} = \frac{\text{Value added by marketing}}{\text{Cost of marketing services}} \times 100 \text{----(vi)}$$

Thus:

$$\text{Value Added by marketing (VA)} = \text{Sp} - \text{Pp}$$

Where:

Sp = Selling price of the commodity (in naira)  
Pp = Purchase price of the commodity (in naira)

## **Results and Discussion**

### **Socio economic characteristic of respondents**

The study examined the socio-economic characteristics of the respondents' such as age, sex, marital status, household size, educational

status, reason for livestock feed marketing, nature of business, years of experience in livestock feed marketing and benefits derived from association. The results are presented in Table 1a shows that the ages of the respondents' ranges from 23-32 years with an average of 44years. The results further revealed that adult of age group of 43–52 years were the highest with 43.1%, while least percentage of 2.3% goes to age group of 63-72 years. The implication of this finding is that, middle aged take part more in livestock feed marketing than old aged and younger ones in the study area. This tally with the finding force work of Osotimehin (2006) that trader's age affects their efficiency in performing managerial decisions. Household size is one of the socio economic variables that may influence the level of participation in legumes by-product marketing. The result in Table 1a revealed that majority of the livestock feed marketers 51% had household size of 1– 6 members and 8.5% goes to household size of 13-30 members. Thus, majority of the respondents in the study area are having less household size because the business is more of middle aged who have less family size than the old ones. Marketing experience is the number of years that the marketers spent in livestock feed business. The longer the experience in the business, the better the performance in livestock feed marketing. The result indicated that most of the respondents 43.75% had a marketing experience of 14-22 years while 6.25% of the respondents had marketing experience of 32-49 years. This implies that livestock marketers can manage risk and make sound decision in managing cereal and legume by products used as livestock feed to enhance better performance.

Gender is an important socio-economic parameter which gives the proportion of respondents according either male or female (Ekong, 2003). The study revealed that both male and female were involved in livestock

feed marketing with male having 88.6% while female constitute 11.4% as presented in Table 1b. The few size of female traders participating in livestock feed marketing may be due to religious and cultural barrier in the study area.

It was observed that men generally participate more in production and marketing aspect of agriculture than women who participate more in agro-processing (Ekong, 2003). This agrees with finding of (Ewa and Ago, 1998) who said “economic status and contribution of women is less in developing countries due to continuous dependent on their male counterparts and the social setting of their

society. Education is very important in every aspect of life and it plays a fundamental role towards agricultural development, it enhances easy assimilation, awareness and receptivity to innovations of agricultural practices. Thus, education gives a better awareness, persuasion and adoption of innovation hence better improvement in production and marketing (Adams, 1992). The result in Table 1b indicated that 44.9% of legume by-products marketers had Qur’anic education while 1.1% had tertiary education having the least percentage. This may be due to the nature of the enterprise which is dominated by people from rural areas.

**Table.1a** Socio Economic characteristics of cereal by-products marketers

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>	
<b>Age</b>			
<b>23-32</b>	3	1.7	
<b>33-42</b>	60	34.7	
<b>43-52</b>	77	43.1	
<b>53-62</b>	32	18.2	
<b>63-72</b>	4	2.3	
<b>Total</b>	<b>176</b>	<b>100</b>	
<b>Mean 44.35</b>	Min 23	Max 68	SD 7.793
<b>Household size</b>			
<b>1-6</b>	89	50.6	
<b>7-12</b>	72	40.9	
<b>13-18</b>	12	6.8	
<b>19-24</b>	2	1.13	
<b>25-30</b>	1	0.57	
<b>Total</b>	<b>176</b>	<b>100</b>	
<b>Mean 7.3</b>	Min 1	Max 29	SD 4.112
<b>Marketing experience</b>			
<b>5-13</b>	69	39.20	
<b>14-22</b>	77	43.75	
<b>23-31</b>	19	10.8	
<b>32-40</b>	9	5.11	
<b>41-49</b>	2	1.14	
<b>Total</b>	<b>176</b>	<b>100</b>	
<b>Mean 17.64</b>	Min 5	Max 45	SD 7.62

Source: field survey, 2013

**Table.1b** Socio economic characteristics of cereal by-products marketers

Variables	Frequency	Percentage
<b>Gender</b>		
Male	156	88.6
Female	20	11.4
<b>Total</b>	<b>176</b>	<b>100</b>
<b>Level of education</b>		
Primary	32	18.2
Secondary	60	34.1
Quranic	79	44.9
Adult	3	1.7
Tertiary	2	1.1
<b>Total</b>	<b>176</b>	<b>100</b>
<b>Marital status</b>		
Married	166	94.9
Single	3	1.7
Divorced	3	1.7
Widow	3	1.7
<b>Total</b>	<b>176</b>	<b>100</b>
<b>Association Membership</b>		
Member	33	18.8
None member	143	81.2
<b>Total</b>	<b>176</b>	<b>100</b>
<b>Benefits from association</b>		
Helping one another	14	45.2
Source of information	10	32.3
Source of credit	7	22.6
<b>Total</b>	<b>31</b>	<b>100</b>

Source: field survey, 2013

**Table.2** Profitability analysis per 114kg of sorghum bran and 116kg of maize bran used as livestock feed

	Sorghum bran		Maize bran	
Parameters	Value (₦ /kg)	% TMC	Value (₦ /kg)	% TMC
<b>Marketing Cost (MC)</b>				
<b>Purchase price</b>	3683.33	93.05	1613.33	89.46
<b>Transportation cost</b>	125	3.16	50	2.77
<b>Storage cost</b>	50	1.26	30	1.66
<b>Cost of labour</b>	80	2.02	90	4.99
<b>Marketing charges</b>	20	0.51	20	1.11
<b>Total Marketing Cost</b>	3958.33	100	190	100
<b>Total Revenue</b>	4375		2083.33	
<b>Gross Ratio</b>	0.01		0.01	
<b>Operating Ratio</b>	0.90		0.87	
<b>Marketing Margin</b>	416.67		280	
<b>Net Marketing Margin</b>			1893.33	
<b>RNI</b>	1.10		1.16	
<b>Marketing Efficiency (%)</b>	168.61		306.16	

Source: Field Survey, 2013

The finding of this study tally with (Bivan, 1995) who reported that education attendant is paramount in respondent's decision making. The result in Table 1b further revealed that majority of the livestock feed marketers 81.2% were membership to an association while 18.8% of the traders were no having membership to an association. The result also reveals that 45.2% of the members benefited from the association in helping one another, 32.3% benefited with source of information while 22.6% benefited with credit. Imodu and Afolabi (2002) posited that the market structure for agricultural products in Nigeria is not perfectly competitive due to the collusive tendencies of sellers by forming associations for particular products.

### **Profitability of marketing cereal by-products used as livestock feed**

The profitability measures such as the marketing margin, net marketing margin (NMM), marketing revenue and return to naira invested (RNI), gross ratio (GR) and operating ratio (OR) were determined and presented in Table 2. The results revealed that the total sales per year of Sorghum brand and Maize brand were ₦332,383.98 and ₦385,416.08 respectively. The return to naira investments of 1.09 and 1.16 for Sorghum brand and Maize brand implies that a profit of ₦0.09 and ₦1.16 would return to the invested respectively. The result further revealed gross ratio (GR) of 0.01 and 0.02 for Sorghum brand and Maize brand traded. The ratios were all less than unity. A less than 1 ratio is

preferable for any farm business, Olukosi and Erhabor, (2008) posited that the lower the ratio the higher the profit impliedly, Sorghum brand and Maize brand were profitable in the study area. In similar vein, the operating ratio (OR) of Sorghum brand and Maize brand were obtained as 0.91 and 0.87 respectively. Operating ratio of both commodities was lower than unity. Olukosi and Erhabor, (2008) also reported that a ratio less than one indicates that the marketers are making profit.

The results in Table 2 show the marketing efficiencies of Sorghum brand and Maize brand used as livestock feed was found to be 254.17% and 306.16% respectively. The result further revealed that Maize brand has the highest marketing efficiency as compared to Sorghum brand in the marketing of cereals by-products in the study area. The higher the ratio the higher the marketing efficiency and vice versa (Olukosi, *et. al.*, 2007).

In conclusion, the prospect of cereal by-products marketing in Kano state were found to be full time occupation providing employment for a large number of individuals. This could be attributed to the amount of profits realized in both activities. The socio economic characteristics that enhance higher marketing of cereal by-products marketers were age, household size, years of experience and level of income.

### **Recommendation**

Based on the findings of the study the following recommendations were made:

- i. Cereal by-products marketers should form strong and viable corporative groups which will make them have access to institutional support.
- ii. Since cereal by-products marketing is a profitable enterprise more youth should be

encouraged to venture in to the enterprises this will go a long way in reducing unemployment in the study area.

- iii. There is need for government and its development partners to encourage people to go into farming so that there will be an increase in the quantity of cereals which subsequently lead to an increase in the availability of livestock feeds.

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