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ANALYSIS OF WATERMELON *(CITRULLUS LANATUS)* MARKETING IN NNEWI METROPOLIS OF ANAMBRA STATE, NIGERIA

Isibor, A.C. and Ugwumba, C.O.A.
*Department of Agricultural Economics and Extension, Anambra State University, Anambra State, Nigeria
**Department of Agricultural Economics and Extension, Nnamdi Azikiwe University, Awka, Anambra State
E-mail chinweann@yahoo.com.

Abstract: The study examined watermelon marketing in Nnewi metropolis of Anambra State, Nigeria. Purposive and simple random sampling methods were used to select five daily markets and 100 respondents respectively. Primary data were collected using structured questionnaire and analyzed using descriptive statistics, budgetary techniques and multiple regression. Watermelon marketing in the study area was dominated by men (80%) at the whole sale level and women (90%) at the retail level. About 46% level of inefficiency existed in the marketing system operationally, the wholesalers, were more efficient (0.69%) than the retailers (0.75%) in watermelon marketing. Positive net marketing incomes of ₦43,320,000 and ₦3,057,700 for the wholesalers and retailers respectively, proved the enterprise profitable. Net marketing income was statistically and significantly determined by marketing cost, product price and house hold size, high purchase cost, low patronage, high transport cost, high product price and lack of capital hindered watermelon marketing in the area. Local production should be encourage in the state, provision of soft loans, modern storage facilities and cheap mass transport system would mitigate the problems and ensure enterprise sustainability.

Keyword: Watermelon, Profitability, Efficiency, Determinants, Nnewi Metropolis, Nigeria.

INTRODUCTION

Watermelon *(Citrullus lanatus)* is one of the most widely cultivated crops in the world at large and the global production in 2002 reached 89.9 million mega grams (FAO, 2003, Huh *et al,* 2008). China was reported to be the leading country in production of watermelon followed by Turkey, United States, Iran and Republic of Korea (Huh *et al,* 2008; Wehner and Marynard, 2003). Water melon is the most preferred exotic vegetables produced in large quantities and most consumed cucurbit because of its nutritional and health values (Oguntola, 2006, Adeoye *et al,* 2011).

Recent report indicated that exotic vegetable production generates higher profit, provides more employment and income to the farmers than those of indigenous vegetables. Knowledge of availability of aggregated farm level resources and difference in their productivities are essential in order to enhance productive capacity of the small holder farmers (Ajewole and Folayan, 2008).

Produce from the farm reaches the consumers through the marketing system. Ugwumba *et al,* 2011 defined marketing as all processes involved in the movement of products that consumers need form the point of production to the point of purchase. (Adeleye, 2008) defined agricultural marketing as the performance of all business activities involved in the movement of agricultural commodities from the point of production to consumer's yard. These processes ensure that the right product (form utility) is available at the right place (place utility), at the right price (possession utility) and at the right time (time utility) to fully satisfy the consumer (Okoh *et al*, 2008). Marketing system enables producers as well as middle men to earn income with which they purchase other useful goods and services (Ebe, 2007).

Marketing of watermelon is a common business in the study area. It is the source of employment and income generation for many people especially women and adolescents. Since water melon is widely grown in the northern parts of the country where the abundance of cultivable sandy loam and savannah climate favour its production. It is mostly supplied to the study area via the marketing system. Marketing system in Nigeria is faced with perennial problems of inefficiency and ineffectiveness due to inadequate market infrastructural facilities, transports and pricing system (Onyemauma, 2010, Adakaren *et al,* 2012) inefficient floating capital, high cost of transportation, high interest rate and poor sales (Ugwumba, 2010).

Nnewi North Local Government Area (LGA) is at the centre of Nnewi metropolis of Anambra State Nigeria. Nnewi is the second largest city in Anambra State in South Eastern Nigeria. The Local Government Area has approximated land density of 7,000/sqm and a population of about 391,227 (National Population Commission NPC, 2006). The temperature ranges from 20.4 to 33.8 Celsius with average rainfall from 39.0 to 1083.00mm. The area was chosen for the study because of increasing watermelon marketing activities occasioned by soaring population of the area and increasing demand for the commodity due to the influx of companies in the commercial city.

Purposive sampling technique was used to select five markets namely: Nkwo edo, Nwafo Uruagu, Orie-agbo, Eke–amaobi and Amiko. The selection was based on their daily nature and size occasioned by the number of intermediaries observed to be selling water melon in each of the markets. Subsequently, simple random method was used to select 20 intermediaries (10 wholesalers and 10 retailers) from each of the markets to arrive at a total of 100 intermediaries for the study. Data's were collected from the respondents by means of interview schedule. The data sought information on socio-economic characteristics such as market cost, age, gender, and educational level, sources of fund for investment, marital status, product price, household size and marketing experience.

Non – parametric statistical tools such as mean, percentages and frequency distributions were used to analyze data generated on socio-economic factors and constraints to watermelon marketing in the study area. Marketing margin and efficiency were determined by the use of percentage marketing margin and efficiency index. Enterprise profitability and operating efficiency of the marketers were realized using enterprise budgeting analysis and shepherd Farrell technique while multiple regression analysis was used to ascertain the determinate of net making of the respondents.

Ugwumba and Uzuegbunam, 2010 budgetary method was adopted in the determination of enterprise profitability is given below.

$$NMI = \sum_{j=1}^{n} P_{rj} Y_j - \left(\sum_{i=1}^{m} P_{xij} X_{ij} + \sum_{j=1}^{r} F_{ij}\right)$$

Where:

NMI/profit	=	Net Marketing Income / Profit
$\sum$	=	Sum
$P_{rj}Y_j$	=	Unit price X quantity of J^{th} respondents sales = Total revenue (TR) for j^{th} respondent.
P_{xiJ}	=	Prices X quantities of jth respondent's variable inputs = Total variable cost (TVC) for j^{th} respondent.

F_{ij} = Depreciation of equipments, annual/rent for store, interest in loan etc. for j[th] respondents = Total fixed cost (TFC) for jth respondent.

TC = Total cost (TVC + TFC)
ROI = Return on investment = TR/TC

When, ROI > I, there is profit, otherwise there is loss

NROI = Net return on investment = NMI/TC

Percentage marketing margin was determined with Onyemauwa (2010) stated as

$$\%MM = \frac{Pr - Pr}{Pr} \times \frac{100}{1}$$

Where;
% MM = Percentage Marketing Margin
Pr = Retail price (consumer price)
Pr = Farm gate price

Marketing efficiency was computed using Olukosi and Isitor (1990) given as

$$\%ME = \frac{Net\ Marketing\ Margin}{Total\ Marketing\ Cost} \times \frac{100}{1}$$

Where;
% ME = Percentage marketing efficiency

Note:
If ME= I marketing is efficient
If ME < I marketing is inefficient
If ME > I, marketing is highly efficient

The multiple regressions was in determining the relationship between net marketing income and socio-economic factors of the respondents and it is implicitly specified as

Y = $f\ (MKC, AGE, GEN, EDU, PDP, HOS, MKE, \boldsymbol{e})$

Where;
NMI = Net Marketing Income (₦)
MKC = Marketing Cost (₦)
AGE = Age (years)
GEN = Gender (dummy; male = 1; female = 0)
EDU = Educational level (number of years of schooling)
PDP = Product Price (₦)
HOS = House Hold Size (number in house hold)
MKE = Marketing Experience (number of years in watermelon marketing.
e = Error term

The equation were fitted with the data and tried in three functional forms of linear, semi-log and double-log. On the basis of economic, statistical and econometric reasons, the estimated equation with the best fit was chosen as the lead equation.

RESULTS AND DISCUSSION

Socio-economics of the respondents is shown in table I majority (72%) of the intermediaries (wholesalers – 80% and retailers – 70%) were in the age range of 41-60years. This implied that watermelon enterprise in the area was dominated by energetic members of the population. The watermelon business was dominated by male intermediaries (80%) at the wholesalers level, while female intermediaries (95%) dominated the business at the retail level, implying that only a few female (20%) could take the risks of long distance trips, theft, transportation stress and others associated with sourcing the product by wholesalers. Further results of analysis of socio-economic variables (Table I) showed that majority (90%) of the respondents were married; 69% had gained 6-10 years experience in the business, and that all the respondents had acquired one form of education or another. The high levels of educational attainment and years of marketing experience acquired by the respondents might have reflected positively on adopted marketing skills, hence marketing income realized by the intermediaries.

Chukwudi (2006) noted that success and stability of any business depends on the skill and experience of the manager, while Ugwumba (2010) and Ijeoma (2012) opined that education and experience are veritable tools for acquiring new ideas and skills that bear positively on scope of enterprising, income and profit. Marketing margin is the difference between farm gate price and consumer price. The farm gate price for an average watermelon fruit was ₦250 and the consumer price average ₦550.

According to Olukosi and Isitor (1990),

$$MM = P_r - P_f \; and \; ME = NMM/TMC$$

Where;

MM = Marketing Margin
P_r = Retail/Consumer Price Per Average Size Watermelon Fruit
ME = Marketing Efficiency
NMM = Net Marketing Margin
TMC = Total Marketing Cost

Then, $MM = ₦550 - ₦250 = ₦300 \; / \; fruit$

$$Percentage\ MM = \frac{550 - 250 \times 100}{550} = \frac{30000}{550} = 54.5\%$$

This implied that for every ₦100 paid by consumers 54.5% or ₦54.5 was spent by the watermelon marketers on marketing cost, while the rest ₦46.5 became the earning / net marketing margin to total marketing cost, that is ME=NMM/TMC but NMM = ₦300 /fruit and TMC = ₦374.8/fruit.

Hence

ME = ₦300 / ₦374.8 = 0.8003

% ME = NMM/TM*100 = 0.8003*100 = 80.03%

A marketing system is efficient if the calculated marketing efficiency value is equal to one or 100%. Based on this deduction, watermelon marketing in the study area recorded a value of 0.8003 or 80.03% which was less than the efficiency bench mark of 1 or 100% implying that about 20% inefficiency still existed in the marketing of watermelon in the study area.

The budgetary techniques, net return on investment and operational efficiency of the watermelon marketers (shepherd-Ferrell, 1982) were also used to assess the profitability of watermelon marketing in the area. Results of the computations are shown in Table 2. The results indicated that the wholesalers and retailers respectively spent 87.88% and 94.90% of their total cost of marketing on purchasing the watermelon fruits. The least marketing cost variables for the wholesalers and retailers of watermelon in the area were local government charges (₦23,000 or 0.02%) and interest in loan (₦14,400 or 0.16%) respectively on profitability of the enterprise, profit above total variable cost (gross margin) was ₦43,418,000 for the wholesalers and ₦ 3,112,700 for the retailers; net marketing income, mean net marketing income and return on investment were ₦43,320,000; ₦433,200 and 1.44 for the wholesalers and ₦3,057.700, ₦30,577 and 1.34 for the retailers respectively. The positive values of net marketing income, mean net marketing and return on investment for both the wholesalers and retail confirmed that marketing in the area by either the wholesalers or the retailers was profitability enterprise

Also, operational marketing efficiency computations using shepherd–Farrell method yielded marketing efficiency indices of 0.69 and 0.75 (Table 2) for wholesalers and retailers respectively. This implied that the wholesalers though realized higher mean net marketing income proportionately spent more (31%of their sales revenue) on marketing cost than the 25% spent by the retailers on the same cost. By this result the retailers were operationally more efficient in the business than the wholesalers. This result corroborates Ugwumba (2009) which reported that retailers of fresh maize were more efficient (54.08%) in the business than the wholesalers (61.32%). The influence of socio-economic characteristic of the marketers namely marketing cost represented by (MKC, age (AGE), gender (GEN) educational level (EDU), product price (PDP), household size (HOS) and marketing experience (MKE) (independent variable) on net marketing income(NMI as dependent variable) was assessed using the multiple regression analysis.

Out of the six retained independent variables, three (marketing cost, product price and house hold size) exerted statistical and significant influences on net marketing income earned by the respondents and the remaining three independent variables (age, gender and marketing experience) exerted weak but positive effects on net marketing income. The coefficient of marketing cost was negative and statistically significant at 5% level. This implied a negative relationship between marketing cost and net marketing income, so that marketers who increased their marketing cost earned lower net marketing income ceteris paribus. This development is in line with a prior expectation of negative relationship between marketing cost and net marketing income. The result is at variance with Onyeweaku (2010) which reported a positive and significant relationship between marketing cost and marketing margin. Product price also determined net marketing income realized by watermelon marketers in the area. This was because the coefficient of product price was positive and statistically significant ($P < 0.05$), implying that increase in product price would lead to increase in net marketing income and vice versa. The coefficient of household size was negative and statistically significant at 5%

level. Meaning that respondents who had smaller household size consumed less and marketed most of the purchased quantities, hence earned higher income. On the other hand, intermediaries who had large household size and marketed smaller quantity of the product in order to satisfy family watermelon demand, earned lower net marketing income.

Finally, the regression was a good fit and all the independent variables together statistically and significantly influenced net marketing income at 5% level of probability as indicated by the significant value (23.14) of the F-statistic; more so, about 79.8% of variation in net marketing income was due to variations in the six independent variables, while the rest 20.2% variation in net marketing income was attributed to statistical noise. The significant value of the Durbin–Watson statistic confirmed the absence of auto correlation among observations of the independent variables. Constraints to watermelon marketing in the area Table (4) were high purchase cost, high product price, lack of capital, low patronage by consumers, losses incurred due to product deterioration and high loading, off loading, security and local government charges. The most pressing of the problems was high cost of product. Purchases (96%). This was followed by low patronage from consumers (84%), high transport cost (82%), high product price and lack of capital (80% each), losses to product deterioration due to poor storage facilities (40%) and the weakest set back to efficient watermelon marketing was high security, local government and storage charges (30%).

CONCLSION AND RECOMMENDATIONS

Watermelon marketing in Nnewi metropolis was controlled by men at the wholesale level and women at the retail level. This agrees with Ugwumba *et al* (2012) which states that marketing of watermelon on Port Harcourt metropolis is being control by men wholesalers and women at retail level. The business is profitable at both levels as indicated by the positive value of marketing margin, net marketing income and return on investment. The level of profitability will improve if adequate measures are taken to mitigate marketing problems as identified to be responsible for high marketing costs and the existence of inefficiencies. It is recommended that local production should be encourage in the state to improve local supply and reduce huge transportation costs incurred by the wholesalers who source the product from distant states. Provision of soft loans and modern storage facilities will improve the capital base of the marketers and reduce losses due to product deterioration in storage; government should provide cheap mass transport system so as to reduce inter-state transport fares and other marketing costs.

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