Effects of Value Addition on the Profitability of Irish Potato Production in Bomet County, Kenya

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In Bomet County farmers produce Irish potatoes for household consumption and income generation. The farmers have been urged to adopt value addition practices to increase their profits and household income. But since value addition comes with a cost, it raises a question of whether value addition increases farm profitability or not. The study used single cross-sectional data from 200 randomly selected farmers to determine the effect of value addition on the profitability of Irish potato production. The data were collected using a structured and unstructured questionnaire. Gross Margin Analysis was used in determining the profitability of various forms of value addition. Statistical packages for social scientists was used in data analysis. The study found that the most common form of value addition practiced by the farmers was sorting while grading, chipping and frying were practiced by few farmers. The study found that value adders earned more profits than non-value adders. The study further established that sorting was more profitable to farmers while frying, grading and chipping led to losses. Therefore, there is a need to identify cost-cutting technologies for grading, chipping and frying as these forms of value addition are not profitable to the farmers.

Keywords: Farmers, Irish potatoes, Kenya, Profitability, Value addition

INTRODUCTION

Irish potato is an important crop species in Kenya whose volumes comes second after maize. It remains the mainstay for most rural farmers in cooler regions where the crop is widely grown. Previous studies have shown that farmers who can play with factors that affect price, that is, demand and supply can be able to fetch good prices at all times for their products making the production of potatoes a lucrative affair. The studies further noted that by embracing value addition, the farmers would reduce post-harvest losses of about 40-50% through proper handling and storage (Ministry of Agriculture, Annual Report 2013). A study by Ferris et al. (2012) noted that the bulk of the Irish potatoes are sold as ware potatoes and eaten as a boiled vegetable. In Kenya, urban residents are the country’s main consumers and the reason for the soaring demand for ware potatoes and processed products, such as chips and crisps in restaurants and bars (Kirumba et al., 2004 and Tesfaye et al., 2010). On the other hand, fresh consumption is common in rural areas where Irish potatoes are produced. In general, Kenya has an expanding food processing industry, driven by its growing urban population, changing population structure, new eating habits, and increased tourism.

According to GoK (2014), at least 20% to 32% of households grow potatoes in Bomet County. Production and value addition in potatoes are essential livelihood strategies for millions of poor smallholder farmers (Devaux, et al., 2011). A study by Pravakar et al. (2010)

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further noted that value addition in agricultural marketing is key in increasing farmers’ incomes and in poverty reduction. Lundy et al. (2002), postulated that to take advantage of value addition potential, the resultant activities must be competitive, sustainable and involve low-income rural populations. The participation of low-income rural populations is critical to achieving poverty reduction. According to Culas and Mahendrarajah (2005), farmers should attain income levels similar to the industry workers (and others) They also pointed out that the ability to attain the same income level should be based on the assumption of effective labor use and other factors of production, all of which are possible through farm diversification and value addition. Furthermore, the Northern Ireland Business (2010) pointed out that by diversifying farms into rural enterprises, farmers are likely to grasp a range of benefits that they don’t often find in traditional farms. Ramirez (2001) found that value-adding activities accounted for a 350 % increase in household incomes and said value-adding could prove useful as a poverty reduction tool if it leads to an increase in ‘on and off’ farm rural employment and income. Golleti et al. (1999) also highlighted the poverty reduction potential of post-harvest and value-added activities and emphasized gains in rural income and employment are complemented by reductions in food prices for urban dwellers and improvements in processing and market chains.

According to Quaye and Kanda (2004), analysis of marketing margin is crucial in identifying the effects of market actors on prices received by consumers and producers of agricultural products. To date, enormous studies have been conducted globally to determine the effects of the production and marketing of Irish potatoes on profitability and farmer’s income. For instance, a study by Sebatta et al. (2015) used break-even analysis to determine the effect of potato value addition on farmer’s income in Uganda. The study found that farmers who did value addition earned more income than those who did not do value addition. That is, those who did value addition earned income 40% above the amount earned by non-value adders. The study further established that prices of value-added seed potatoes were 30% more than the prices on non-value-added potatoes. On the other hand, the value-added ware potato had the highest maximum price at UGX.1,200 per kilogram while non-valued added potato products had the lowest price of UGX.150.00. The study concluded that value addition in potato farming is a profitable venture that can increase farmer’s incomes. Omari (2015) used descriptive statistics and the Multiple Linear Regression model to analyze the production and marketing of Irish potatoes in Tanzania. The study found that farmers and food sellers made the highest marketing margin of 63%.

In Kenya, limited studies have been conducted to determine the profitability of Irish potatoes in the face of value addition practices. For instance, Muthoni and Nyamongo (2009) reviewed the constraints affecting ware Irish potatoes in Kenya. The study found that lack of on-farm storage facilities (which is a form of value addition) reduced farmer’s earnings or income. Kaguongo et al. (2008) also concur that the majority of farmers in Kenya do not store Irish potatoes due to a lack of storage facilities. Instead, they sell directly after harvested and end up receiving low prices and thus incomes. Kirumba et al. (2004) noted that the production and marketing of Irish potatoes are very challenging for farmers. The study noted that during the season of high supply farmers receive low farm-gate and wholesale prices and vice versa during the season of high demand due to seasonality in production coupled by lack of storage facilities. That is, farmers receive farm-gate prices and wholesale prices that range between KES 400-500/Bag and KES 900-1100/Bag respectively. During the season of high demand, the farmer receives farm-gate and wholesale prices that range between KES 1000-2000/Bag and KES 1600-2000/Bag respectively.

The general assumption was that a huge potential for Irish potato processing exists and that households who decide to exploit this potential were well-off in terms of welfare. It was also assumed that the decision to engage in value addition was premised on higher expected utility by the producers. Interaction of these two decisions was expected to be reflected in the welfare status of farmers in terms of the increase in household incomes through an increase in the profitability of value-added Irish potato products. That is, an Irish potato farmer was expected to choose to engage in value addition practices to increase food security and household income. The value addition of Irish potatoes was expected to increase farm income hence enabling the household to improve their welfare. It was thus assumed that Irish potato farmers who will adopt value addition practices will have their profits increased and subsequently increase in household income and welfare. Despite the high prices of potatoes farmers receive, production and value addition activities are characterized by high costs thus raising the question of whether value addition is a profitable activity on not. To verify this, this study determined the effect of value addition practices on the profitability of Irish potatoes in Bomet County.

METHODOLOGY

Description of the study area

The study was conducted in Bomet County (Figure 1). The County lies between latitudes 0º 29’ and 1º 03’ south and between longitudes 35º 05’ and 35º 35’ east. It is bordered by four counties; Nakuru to the east, Kericho to the North-East, Nyamira to the south and Narok to the West. Bomet covers an area of 2037.4 km2. The County lies up to 2,300m above sea level. Major crops produced in the County include; tea, Irish potatoes, maize, pyrethrum and a bit of coffee. Dairy/milk production, especially in Sotik
Sub-county, is also a major economic activity. The County population was estimated to be 782,531 in 2012 and was projected to reach 846,012 in 2015. The Irish potato annual production for the year 2013 was 25,517 Tonnes with a value of Kshs 965,918,182 (Bomet County Development Profile, 2013).

Data and data analysis

Primary data was used in the study. A structured and non-structured questionnaire was used in the collection of data. Data on physical quantities and prices of various value addition activities in Irish potato were captured. The data was obtained from Sub-County agricultural offices, Agricultural Sector Development Support Programme (ASDSP), Kenya National Potato Farmers Association (KENAPOFA) and Kenya National Farmers Federation (KENAFF). SPSS computer program was used in the data analysis and results presented in the form of tables.

Sampling procedure

The study adopted a multistage sampling procedure. Within the County, five Irish potato producing Sub-Counties were also purposively selected. In each of the five Sub-Counties, the simple random sampling method was used to select 4 wards to give a total of 20 wards. In each of the selected wards, a list of Irish potato farmers was generated in the 20 wards with the help of County and Sub-County Agricultural Officers. A total sample size of 200 smallholder Irish potato farmers was then selected using a systematic sampling technique.

Sample size

Since the population of Irish potato farmers in Bomet County is unknown, the infinite formula for determining sample size was used. The study adopted the formula specified by Kothari (2004). Mathematically, this is given as:
\[
\frac{z^2pq}{n} = \epsilon^2
\]

(1)

Where \( n \) = sample size, \( p = \) proportion of the population doing value addition, \( q = 1 - p \), \( z = \) the standard variate at a given confidence level (\( a = 0.05 \)), \( \epsilon = \) the acceptable error (precision). Using \( p = 0.6 \) assuming a conservative sample, \( z = 1.96 \), \( q = 0.4 \) and an acceptable error of 6.78\% (e). \( q = \) the weighting variable and is computed as 1-P.

The sample size, computed using the above formula was thus 200 respondents.

The sample was determined as:

\[
n = \frac{1.96^2 \times 0.6 \times 0.4}{0.0678^2} = 200
\]

(2)

**Profitability estimation**

To evaluate profitability, Gross Margin Analysis (GMA) was used. GMA included Total Revenues (TR), Total Variable Costs (TVC) and excluded Total Fixed Costs (TFC). Mathematically, GMA formula is given as:

\[
GMA_{ij} = TR_{ij} - TVC_{ij}
\]

(3)

Where \( GMA_{ij} \) denotes GMA for raw potato sold (i) and GMA for value-added potato products (j). \( TR_i \) denotes TR

**Characterization of profitability of potatoes and household income by value addition practices category**

Table 2 below shows that sorting was found to be very profitable to farmers earning them a profit of Kshs 27,106.92. Grading, grading and chipping led to losses of Kshs 55,900, Kshs 55,889.20 and Kshs 30,000 respectively. This means that Irish potato farmers should focus more on the sorting of Irish potatoes and find new cost-effective technologies to carry out grading, chipping and frying of which they are comparatively disadvantaged to carry out profitably. It is also noted that despite the value addition of Irish potatoes profitable in Bomet County, there was no significant effect on household income. The reason could be due to low production levels/subsistence farming which translates to low incomes. Contrary results are reported in Golleti et al. (1999), Pravakar et al. (2010) and Sebatta et al. (2015) who found that value addition in agricultural marketing increases farmer’s incomes. Ramirez (2001) also found that value-adding activities increase household incomes by 350%. Studies by Kaguongo et al. (2008), Muthoni and Nyamongo (2009), Maganga et al. (2012) and Omari (2015) concur that that value addition through access to adequate on-farm storage facilities eventually increases farmer’s earnings or income.
CONCLUSION, RECOMMENDATIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

Conclusion

The study was conducted to determine the effect of the adoption of value addition practices on the profitability of Irish potato production in Bomet County. The study found that the most common form of value addition practiced by the farmers was sorting. The study found a significant difference between the gross margin of value adders and non-value adders. Value adders earned more profit. The study further established that sorting was more profitable to farmers than frying, grading, and chipping.

Recommendations

There is a need for government and other stakeholders to identify cost-cutting technologies for grading, chipping and frying as these forms of value addition is not profitable to the farmers. The study focused only on the effects of uptake of value addition practices on the profitability of Irish potato production in Bomet County. Though the study found a positive relationship between value addition and profitability, there is a need to carry out further research to determine if an increase in farmers’ incomes reduces household poverty or not.

REFERENCES


