Sustainable Agriculture Research; Vol. 5, No. 2; 2016
ISSN 1927-050X E-ISSN 1927-0518
Published by Canadian Center of Science and Education

Drivers of Dry Common Beans Trade in Lusaka, Zambia: A Trader's Perspective

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Received:January 30, 2016 Accepted: February 24, 2016 Online Published: April 5, 2016

doi:10.5539/sar.v5n2p15 URL: http://dx.doi.org/10.5539/sar.v5n2p15

Abstract

This study was designed to analyze drivers of dry common beans trade in Lusaka, Zambia. Specifically, the study analyzed the effect of common bean grain characteristics on bean market price. Data was collected using structured questionnaires from 225 traders stationed in three markets namely: Soweto, Chilenje and Mtendere.

Using hedonic pricing, the findings reveal that medium sized grain was an important characteristic which significantly affected the pricing of common bean. For instance, it was observed that medium grain size fetched ZMW1.266 per kilogram (kg) and ZMW 1.042 per kg more than grains of smaller size in the pooled and Soweto market sample, respectively. It was further revealed that yellow, yellow and white color significantly affected the bean price received by traders. Other factors which significantly affected the pricing of beans included age of the trader, being a retail trader and trading at Chilenje market. Given these findings, common bean breeders need to include traders and consumers as important actors whose knowledge can make resourceful impact in varietal development. Furthermore, interventions by policy makers that respond to the social economic needs of traders is recommended to improve bean trade.

Keywords: trader, hedonic, characteristics, market, factors

1. Introduction

1.1 Bean Production and Economic Importance

Grain legumes such as common beans (*Phaseolus vulgaris* L.) have a significant role as rich and yet inexpensive source of protein. They have been found to offer health benefits because of their high concentration of soluble fibers (Hichaambwa et al., 2009; Stone et al., 2011). Thus the food crop is important to a wide array of consumers including infants, adults, pregnant women and to both rich and poor households.

Common bean has its origin in Central and South America (Directorate Agricultural Information Services [DAIS], 2002). It is the most important food legume worldwide, and a major staple in Southern and Eastern Africa (Akibode, 2011; Birachi et al., 2011). Africa accounts for about 25 percent of the total global production of the crop. World production of beans is estimated to be around 12 million tons (Fenta, 2012). In the case of Zambia, approximately 23,000 metric tons of beans per annum is produced (Zambia Agriculture Sector Profile, 2011). This production is under an estimated area of 71,544 hectares (CSO, 2011), which is an improvement from 42,475 hectares in 2003/04 agricultural season (CSO, 2005). Northern province is the largest producer of beans with 62 percent of the total national production, followed by North Western province with 8 percent of the total produced (Pulse Value Chain Initiative, 2011; CSO, 2011).

Over the past decades, there has generally been a surge in the production of the crop across African countries and this could be attributed to the realization of the potential benefits that the crop offers at both household and national level. For instance, the crop is slowly but steadily undergoing transformation from being a traditional subsistence crop to being market-oriented (Buruchara et al., 2011). Approximately 40 percent of production is marketed at a market value of over US$ 452 million annually (Katungi et al., 2009; Buruchara et al., 2011; Michael et al., 2011). In the case of Zambia, the demand for beans is expected to significantly increase in tandem with increasing population and expanding cities (Sitko et al., 2011). This offers income generating opportunities to both farmers and traders in view of the prospective surge in demand. For instance, producers could realize

improved revenue as the crop has the highest gross margin of U$ 465.8 per hectare over six widely grown food crops in Zambia, it is only third in line to tobacco and cotton in terms of returns per unit of land (Tembo & Sitko, 2013).

Common bean is one of the most consumed pulse (Note 1) crop in sub-Saharan Africa (Katungi et al., 2009). However, common bean consumption in Zambia is low, 10 kg per capita per year (Hichaambwa et al., 2009; Government of the Republic of Zambia, 2013). This is in contrast to 40-60 kg per capita of bean consumption in Eastern and Central Africa (Ugen et al., 2012). Maize dominates caloric intake among Zambians, accounting for 57 percent of daily caloric consumption (Sitko et al., 2011), and an estimated annual per capita consumption of 150kg (Rapsomanikis, 2009).

1.2 The Role of Traders in Product Marketing

Despite the important role that traders play in both local and global food systems, there is currently limited public information about traders and bean marketing. Whilst it is understood that the consumers are the beginning of the food value chain, it is the traders who perpetuate market expansion (Akoten & Otsuka, 2007). Thus the role of traders in market development cannot be down played. Traders are the link between the consumers and the producers. This connection is important because the traders need to constantly keep up with the changing tastes of the consumers. For instance, consumer preferences change in response to changes in income levels, lifestyle decisions, food safety concerns among other things (Lohr, 2001). Thus traders can help convey this information regarding changes in consumer demand to the producers. Furthermore, the activities of the traders could affect commodity prices, access to scarce resources such as land and water, food security etc. Thus traders have the potential of influencing the food system. However, the thrust of traders in marketing goes beyond influencing food systems. For example, a number of studies have shown that producers who engage with traders are more likely to stay in business and prosper than those who do not (Watson, 2006; Akoten & Otsuka, 2007). Furthermore, a study in Kenya revealed that industrial clusters, which involved traders were more likely to reduce transaction costs and enhance enterprise growth especially where markets were not well developed (Akoten & Otsuka, 2007).

1.3 Factors Affecting Bean Marketing in Sub-Saharan Africa

Unlike Zambia, there is a lot of documented literature on bean marketing across much of sub-Saharan Africa. However, the aim of this section is not to exhaust all the factors but to point out some of the key elements. This is because beans marketing is confronted by a myriad of factors.

Most consumer studies have acknowledged the importance of consumer preferences and the role they play in the bean value chain (Mishili et al., 2009; Chirwa, 2007; Magreta & Jambo, 2012). Magreta and Jambo (2012) noted that production costs and consumer demand are the most critical factors which affect the pricing of a product. Thus markets and especially traders are a central node in the bean value chain. This is because it is through the market that what sells is known.

For example, grain attributes have been found to be a major factor in influencing bean marketing. Mishili et al. (2009) found that color contributed to the discount rate that traders received for their bean in Dar es Salam and Morogoro regions of Tanzania. Magreta and Jambo (2012) further revealed that color is ranked highly as an important characteristic that consumers sought. This is because the color of the grain affects its desirability by different consumers. For instance, dark red bean in Southern Malawi is preferred because it is believed to increase red blood cell levels in the human body (Chirwa, 2007; Magreta & Jambo, 2012).

Quaye et al. (2011) on the other hand, observed that the size of the grain is also an important factor which influences the desirability of the grain. For instance, Hella et al. (2013) notes that legume grain size is a key factor in determining consumer demand. Mishili et al. (2009) reports that larger bean grains are preferred in Morogoro region of Tanzania. This is an important attribute because it may also affect the way bean is prepared for consumption. For example, the cooking time for the grain could be affected, larger beans might take longer to cook than beans of smaller size (University of Alaska Fairbanks [UAF], 2009).

The amount of damage on the grain can also contribute towards the price discount. Mishili et al. (2009) observes that bean with bruchid (weevil) damage has a significant effect on the percentage of discount that consumers receive. This implies that consumers are particular with the quality of bean they purchase. Therefore, the amount of damage, caused by either insects or post-harvest handling, is a cardinal quality characteristic that deserves attention when assessing consumer demand.

Seasonality of the grain supply has also been found to be a factor in the marketing of grain legumes (Mishili et al., 2009; Quaye et al., 2011). This is because it affects the freshness of the grain, and this could also affect the desirability of the grain by consumers. Thus, seasonality might influence the price that the grain legume fetches.

Price is also another key factor in the marketing of bean as it affects how much of the product is purchased, according to the law of demand. Thus preferences of consumers in the market for a particular good can be assumed to be solely determined by corresponding characteristics (Langyintuo et al., 2004; Mishili et al., 2009).

Furthermore, market location has also been shown to be a factor in the marketing of bean. Different markets might experience variable prices (Akoten & Otsuka, 2007; Mishili et al., 2009). This could be due to differences in transportation costs incurred by traders stationed in different markets, and also the differences in levels of demand by the communities (Akoten & Otsuka, 2007). It is, therefore, important to weigh in location of the bean trader when analyzing bean trade. Other than product characteristics, trader characteristics have also been found to play a key role in influencing the commodity prices received by traders (Bett et al., 2011).

The literature reviewed has demonstrated that various characteristics variables can significantly influence bean pricing. Despite this evidence, which is mostly based on cases in African countries, there is not much empirical literature on the drivers of bean trade in Zambia. For instance, a number of studies have been done on dry common bean with a focus on productivity (Amanor-Boadu et al., 2013), and breeding efforts so far attained (Makunde, 2007; Shimabale, 2011; Katungi et al., 2011; Magreta & Jambo 2012). However, stressing on the adoption of beans, market participation of the producers and developing new varieties, without cogent market information emanating from either consumers or traders, might not achieve the intended results. Therefore, there was need to draw lessons from traders on what characteristics of bean were preferred, and the influence these characteristics had on the pricing of beans. Furthermore, there was inadequate empirical evidence on the bean grain characteristics most preferred on the Zambian market. However, due to limited data availability, the study focused on Lusaka province only. As such inferences drawn from this study cannot be generalized at national level.

1.4 Study Objectives and Research Questions

This study sought to identify and analyze factors influencing the demand for dry common bean in Lusaka, Zambia. The specific objective was to analyze the effects of common bean grain characteristics on market price;

1.5 Hypotheses

1) Bean attributes do not significantly affect the price of beans (H_0).
2) Trader characteristics do not have a significant influence over the price of bean received by traders (H_0).

The remainder of the paper is organized as follows. The next section presents the methodology. This will be followed by a section on data analysis, which will provide a description of the variables used in the study. Section three provides results and discussions along with conclusions and policy implications.

2. Methodology

This section presents the methodology used in the study. It sets out by presenting a conceptual and then a theoretical framework for modelling decision choices before highlighting the sampling procedures and the data collection methods.

2.1 Conceptual Framework

Beans marketing remains a challenge as most of the beans is sold through informal channels (Sitko et al., 2011). Thus, there is limited information documented on common beans marketing in Zambia. Nevertheless, drivers of bean trade hinge on consumer choices which are influenced by a number of interrelated factors, which also affect the trader demand. For instance, the choices made among food options in turn influences the food production systems through trader demand. The study adapted Shepherd's framework (Figure 1) in analyzing factors which affect individuals' decisions in making choices regarding food purchases.

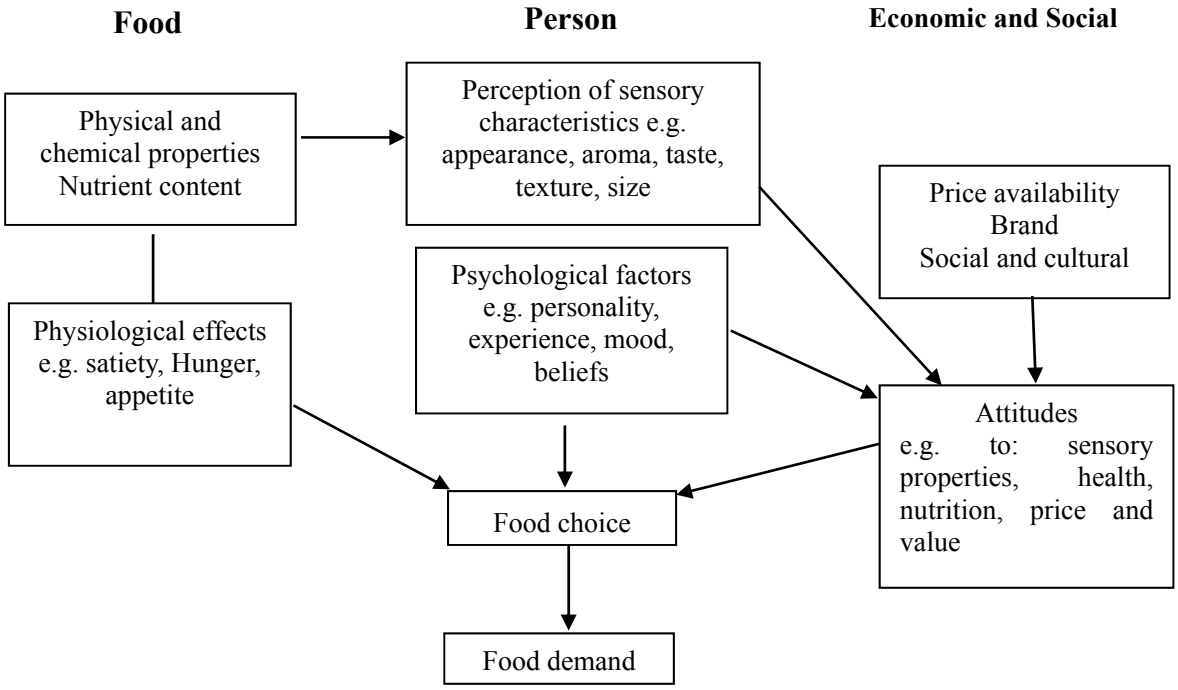

Figure 1. Some factors affecting food choice (Adapted from Shepherd, 1999)

Consumer preferences and tastes are key factors affecting consumer purchase decisions regarding legumes. For instance, price and the perceived worth of food, dominates food choices (Furst et al., 1996). Socio-economic, cultural and external factors can also affect market participation of various actors. For example, the knowledge and values shared by a society can have a significant effect on choice over food products, cultural values may dictate what is desirable (Bobroff, 2012). This may partly be the reason why the production of beans is highly concentrated in Northern Province of Zambia. Quaye et al. (2011) also denotes the important role legumes play in fighting malnutrition and poverty. For instance, they provide an alternative source of proteins for the poor who cannot afford livestock products. Furthermore, product characteristics also play a significant role in helping individuals to make choices over food options (Lohr, 2001). For example, grain legumes might appeal to different consumers owing to the grain color and size (Hella et al., 2013). This might also influence the demand for beans as traders would focus more on bean variants most marketable. Physical properties of the grain such as size and weight influence further the pulse cooking quality; this is important for consumer acceptance (UAF, 2009).

2.2 Theoretical Framework

This study used Lancaster's theory of consumer choice which decomposes utility for a good into utility derived from the good's attributes (Lancaster, 1966) and random utility theory which provides a profound theoretical basis for many forms of preference induction procedures in understanding behavior with regard to choices (McFadden & Train, 2000; Louviere, 2003). Thus random utility theory was utilized in identifying factors which influence the price received by traders with regard to grain legumes. Following Langyintuo et al. (2004) and Terfa et al. (2013) the price of a good can be shown to be a linear summation of the implicit value of its attributes. It can be assumed that there is a functional relationship between the good's price, p_i , and characteristic vector X_{ij} in the form of equation $p = f(X)$. This functional relationship specifies the hedonic regression typical for a good in the market as

$$P_i = \sum X_{ij}\beta_{ij} + \varepsilon \tag{1}$$

where p_i is the fixed price of the i th product, which in this case is bean price per kilogram, and ε is the random error term. The dependent variable p_i will vary for the different common bean characteristics. The independent variables, X_{ij} , explains variance in price per kilogram of beans as it is the quantity of the j th

characteristic provided by one unit of product i. The parameter estimates, B_{ij}, gives the implicit values of the product's characteristics.

2.3 Sampling

The survey was conducted in Lusaka district. Three markets were purposively selected: Soweto, Chilenje and Mtendere. Soweto market was selected because it represented the largest beans trader market. Being the single largest market in Zambia, Soweto market has stores and stands numbering well over 7,200. Chilenje and Mtendere markets were selected to act as representatives of small level markets for beans trading in Zambia. This in effect allowed for any kinds of comparisons across these markets.

The sampling was done in two – stages, and a sample of 225 beans traders was obtained. The first stage involved purposively selecting the markets. The markets were picked to represent different trading environments of the traders. Stage two involved sampling of all the retailers in the market. In Chilenje and Mtendere market, all the identified 24 and 28 beans traders were interviewed, respectively. Thus in the two small markets a census was conducted. In Soweto market, 173 beans traders were randomly selected and interviewed, using simple random sampling. Therefore, the total sample of beans traders captured was 225 from all the three markets within Lusaka district.

2.4 Data Collection

Data was collected from Lusaka district using structured pretested questionnaires. The data collected included traders' demographics, income generating activities traders are involved in other than selling beans, beans varieties and prices, importance of different beans characteristics, perceptions of trading environment, trading barriers, information on assets owned and sources where they procured beans.

2.5 Data Analysis

2.5.1 Analytical Framework for the Effect of Grain Characteristics on Bean Market Price

A hedonic pricing model was used. The estimated parameters of the model provided information about the relative contribution (significance and magnitude of effect) of the given common bean feature. In this study, the hedonic pricing model took the general form as shown by equation (1). The explanatory variables included: color, grain size, grain damage, bean source, month of sale, age of trader, education, gender, trader type and area of operation.

Following Meenakshi et al. (2012) color embodies important sensory attributes which include aroma, taste and texture. Therefore, it was included and was expected to have either a positive or negative effect on the price, the variable entered the equation as a dummy. The size of the grain was also included. This is commonly measured, by breeders, by weighing 100 randomly selected grains. It was included as a dummy variable. Another key factor was grain damage. It is generally understood that consumers prefer grain legumes with less damage (Langyintuo et al., 2004, Mishili et al., 2009). Furthermore, bean source and seasonality were included to find out if they had any effect on the pricing of common bean. Bean source was an important characteristic to consider as different bean sources might affect the flavor of beans were as seasonality was important to account for the seasonal variation in bean prices.

According to Oczkowski (1994), the price of the product excludes the attributes of the buyers and sellers implying differentiation of products and not their markets, buyers or sellers in the competitive markets. On the contrary, other studies have found that the product prices are also related to the attributes of buyers or sellers (Bett et al., 2011; Terfa et al., 2013), consequently reflecting that the markets are non-competitive. Therefore, this study included trader attributes such as age, gender, trader type and location of the trader.

3. Results and Discussions

This section presents the study results. The section starts by giving an overview of the sample characteristics using descriptive statistics displayed as tables. Empirical results from regression models are then presented and discussed.

3.1 Descriptive Analysis

Table 1 showcases variables used to analyze the hedonic pricing model. The prevailing retail price of dry bean per kilogram was used as the dependent variable. The average price was found to be ZMW 3.627. This was the price traders received from consumers. Grain size was included as one of the key factors influencing bean pricing and had three (3) levels: small, medium and large size. This variable was garnered from all bean variants.

Table 1. Descriptive statistics of variables in the hedonic pricing model

Variable	Mean	Standard Deviation	Minimum	Maximum
Price (ZMW (Note 2) per Kg)	3.627	1.550	0.554	7.937
Small sized grain	0.867	0.341	0	1
Medium sized grain	0.978	0.148	0	1
Large sized grain	0.142	0.053	0	1
Seed damage	0.452	0.284	0	1
Mottled bean color	0.996	0.067	0	1
Yellow bean color	0.431	0.249	0	1
Brown bean color	0.446	0.271	0	1
White and Yellow	0.867	0.341	0	1
May	0.929	0.258	0	1
June	0.911	0.285	0	1
July	0.916	0.279	0	1
August	0.898	0.304	0	1
September	0.916	0.279	0	1
October	0.911	0.285	0	1
November	0.920	0.272	0	1
December	0.920	0.272	0	1
January	0.920	0.272	0	1
February	0.889	0.315	0	1
March	0.947	0.225	0	1
April	0.969	0.174	0	1
Serenje	0.250	0.067	0	1
Lundazi	0.161	0.027	0	1
Lusaka	0.333	0.241	0	1
Kasama	0.084	0.028	0	1
Luwingu	0.058	0.023	0	1
Mbala	0.462	0.429	0	1
Mporokoso	0.132	0.032	0	1
Mwinilunga	0.022	0.015	0	1
Solwezi	0.090	0.094	0	1
Age of the trader(years)	37.200	8.503	17.000	62.000
Education (years)	8.409	4.107	0.000	16.000
Gender(1=yes; base=Male)	0.316	0.147	0	1
Wholesale trader	0.240	0.143	0	1
Retail trader	0.613	0.489	0	1
Wholesaler and Retailer	0.150	0.089	0	1
Chilenje	0.107	0.039	0	1
Mtendere	0.124	0.038	0	1
Soweto	0.769	0.422	0	1

Source: 2012 Pulse Value Chain Initiative Data (Note 3) - Zambia.

About 86.7 percent of the traders had considered small grain size to be important. On the other hand, about 14.2 percent of the traders had considered large grain size to be important. About 45.2 percent of the bean traders had indicated that grain damage was an important factor. Bean color was broken down into four (4) levels; mottled, yellow, yellow and white and brown. Mottled bean meant grain with blotches of color on them i.e. Kabulangeti. Almost all the traders had sold mottled grain, that is, 99.6 percent of the traders sold mottled beans. This denotes the popularity of mottled beans amongst consumers. Seasonality was also included to explain the variability in the pricing of the grain. Twelve (12) dummy variables for months were thus generated. About 93 percent of the traders had sold beans in May, it is around this period that low prices of beans are experienced (Birachi, 2012). Source of beans was also included to explain bean flavor. Mbala was found to be the major source of bean as 46.2 percent of the traders affirmed. This is partly because Northern Province is the major producer of bean.

The average age of traders was 37 years. It was also learnt that bean trade in Lusaka was dominated by males, one-third were female traders. A look at the number of years spent in formal education by the beans traders reveal that the average number of years spent in formal education by a trader was 8 years.

3.2 Empirical Results and Discussions

Empirical results for the hedonic regression analysis are presented in Table 2. The dependent variable was the prevailing price of beans. The columns for all markets (pooled sample) and Soweto market gives parameter estimates from the hedonic regression and associated robust standard errors, respectively. In explaining the coefficients for a particular covariate, the *ceteris paribus* condition is assumed for all other variables.

The study found medium sized grain to be a significant determinant of dry common bean pricing. For instance, medium sized grain increases the pricing of beans by ZMW 1.266 and ZMW 1.042 more than smaller bean grain for the aggregate sample and Soweto market, respectively. This is similar to findings by Quaye et al. (2011) and Mishili et al. (2009) that larger grain size positively affects the pricing of legumes.

Grain damage was also found to have a significant but negative effect on the salability of bean. A damaged seed grain was likely to be priced lower by ZMW0.383 and ZMW0.393 than undamaged grain for the aggregate sample and Soweto market, respectively. This conforms to findings by Mishili et al. (2009) who found that grain damage had a negative effect on the pricing of common beans in Tanzania.

Table 2. Hedonic pricing model results

Variable	All Markets		Soweto market	
	Coef	Robust standard error	Coef	Robust standard error
Grain size(1=yes; base=small)				
Medium grain	1.266***	0.288	1.042*	0.534
Large grain	0.016	0.311	-0.206	0.387
Seed damage, 1=yes	-0.383**	0.187	-0.393*	0.217
Grain color(1=yes; mottled)				
Yellow	1.28***	0.241	1.081***	0.260
White and Yellow	1.580***	0.214	1.788***	0.248
Brown	0.357	0.266	0.581	0.284
Month of Sale (1=yes; base=May)				
June	0.072	0.642	0.050	0.770
July	-0.265	0.513	0.043	0.755
August	-0.001	0.692	0.189	0.822
September	0.380	0.519	0.123	0.469
October	0.260	0.602	0.066	0.529
November	0.788	0.486	0.634	0.711
December	-0.357	0.757	0.349	0.757

January	-0.998	0.779	-1.232**	0.572
February	0.015	0.318	-0.267	0.393
March	0.299	0.510	0.369	0.515
April	0.776	0.716	-0.150	0.459
Source of beans, 1=yes; base=Lusaka				
Serenje	-0.953***	0.351	-0.341	0. 418
Lundazi	0.199	0.517	-0.016	0.512
Kasama	-0.247	0.313	-0.152	0.401
Luwingu	0.067	0.428	0.127	0. 492
Mbala	0.008	0.174	0.056	0.198
Mporokoso	-0.349	0.243	-0.373	0.288
Mwinilunga	0.090	0.426	0.428	0.378
Solwezi	-1.348***	0.295	-0.727**	0.340
Age of the trader	0.029***	0.009	0.023**	0.010
Education (years)	0.01	0.022	0.034	0.028
Gender(1=female)	0.206	0.212	0.343	0.253
Type of Trader(1=yes; base=Wholesale)				
Retail	0.477**	0.234	0.546**	0.247
Whole and Retail	0.119	0.242	0.129	0.239
Area of operation (1=yes; base=Mtendere)				
Soweto	-0.096	0.214		
Chilenje	0.478*	0.247		
Constant	-1.862**	0.834		
F statistic	12.49***		12.08***	
R-squared	0.51		0.50	
Adjusted R-squared	0.43		0.39	
Observations	225		173	

Statistical Significance (*** = 1%; ** = 5%; * = 10%).

The study further reveal that yellow color would significantly fetch a higher price by ZMW1.28 and ZMW1.081 in the aggregate sample and Soweto market, respectively, than mottled grain. Similarly, white and yellow color was also found to significantly affect the price for beans; white and yellow color increases the pricing of common beans by ZMW1.58 and ZMW1.788 more than mottled beans for the pooled and Soweto sample respectively. Sambo and Tembo (2013) obtained similar findings on bean varieties with white and yellow color. This suggests that despite the popularity of mottled bean among traders, yellow and white colored bean fetched a higher price than mottled bean. Although literature on yellow and white beans is limited, some studies in Africa have found white and yellow beans to be most preferred in some parts of Ethiopia and Uganda, respectively (Katungi et al., 2009; Kilimo, 2012). This further affirms the importance of color in influencing the pricing of bean.

The study also revealed that seasonality affected only Soweto market as opposed to the aggregate sample. This could be attributed to the fact that Soweto market has a larger population of traders who might exhibit such a trend as it is much busier than smaller markets vis-à-vis Mtendere and Chilenje.

The month of January was found to negatively affect the pricing of bean compared to the month of May. The month of January was found to fetch lower prices of the grain than May, ZMW1.232 lower at 5 percent level of significance. This is supported by findings by Birachi (2012) who observed that lower prices for beans in Zambia are experienced around January.

In terms of beans source, beans coming from Serenje were found to be statistically significant in influencing the price of beans, and this was found to fetch ZMW0.953 less than Lusaka bean. However, this was only significant for the pooled sample. On the other hand, beans coming from Solwezi would receive ZMW1.348 and ZMW0.727 less than beans from Lusaka for the pooled sample and Soweto market, respectively. Although literature on bean flavor preference is limited, this result might imply preference of the Solwezi bean flavor over the Lusaka bean.

Age of the trader was found to positively and significantly affect the selling price of common beans. A one year increase in the age of the trader would increase the market price by ZMW0.029 and ZMW0.023 for the pooled and Soweto market sample, respectively. This can be related to the finding by Bett et al. (2011) who found a positive correlation between the prevailing market price of indigenous chicken and the age of trader.

Being a Retail trader was also found to positively and significantly affect the pricing of common beans. For instance, a retail trader would receive ZMW0.477 and ZMW0.546 more for beans than a wholesaler for the pooled and Soweto market sample, respectively. This could be attributed to the fact that retailers deal mostly with individual consumers, and have much leverage to bargain for higher prices for their beans than wholesalers who mostly sale in bulk.

Furthermore, area of operation was also found to be a significant factor at 10 percent level of significance for Chilenje market. A trader operating at Chilenje market would command ZMW0.478 more than a trader operating at Mtendere market. This could imply that traders from Chilenje market might order from the bigger markets and then resell at a higher price in Chilenje. This could be attributed to the affluence of the residents in Chilenje.

3.3 Conclusions and Policy Implications

The study used a sample of 225 bean traders from three purposively selected markets in Lusaka district to identify and analyze factors influencing the demand for dry common bean.

A number of lessons can be delineated from the study. For instance, it has been established, using hedonic pricing analysis, that medium sized grain is an important characteristic which affects the pricing of common bean. This affects the price of bean by ZMW1.266 and ZMW1.042 more than smaller grains for the pooled and Soweto market sample, respectively. It was also learnt from the study that bean color such as yellow and white was significant in influencing bean pricing. Thus color plays a critical role in the pricing of the bean grain. It was further revealed that grain damage would lead to a reduction in the price that bean grain fetches. For instance, damaged grain would fetch ZMW0.383 and ZMW0.393 less than the prevailing bean price in the pooled and Soweto market sample, respectively. It was also found that seasonality affected only the Soweto market traders. For instance, beans sold in January would cost less by ZMW1.232 than beans procured in May. Bean was also observed to be affected by the region from which it was procured and this was used as a proxy for flavor. The pricing for beans procured from Serenje was found to be ZMW0.953 less than the beans procured from within Lusaka in the pooled sample. It was also learnt from the study that other factors other than beans characteristics significantly affected bean price such as age, being a retail trader, and area in which the trader operated. Therefore hedonic pricing analysis results suggest that efforts to improve bean markets in Zambia should target grain size, color, level of grain damage, seasonality, bean source, and trader characteristics. Thus the study rejects the null hypothesis that bean attributes do not significantly affect the price of beans. The study further rejects the hypothesis that trader characteristics do not have a significant influence over the price of bean received by traders.

The findings from this study suggest that common bean breeders need to include traders and consumers as important actors whose knowledge can make resourceful impact in varietal development. For instance, grain size and color affected the pricing of bean. It is, therefore, imperative to take these characteristics into consideration by organizations engaged in breeding programs as they affect the demand for the commodity. This also includes the issue of seed damage, as one of the important bean characteristic in the consumer's choice. This can be taken care of if varieties with high storability and less susceptibility to insect damage are selected during breeding. Postharvest handling also needs to be looked at in order to maximize consumer acceptability.

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Notes

Note 1. These are annual leguminous crops which include chickpeas, cowpeas, soybeans, dry beans etc.

Note 2. Zambian kwacha is the currency for Zambia, and the exchange rate was estimated at ZMW11.3 per US$ (http://www.boz.zm/).

Note 3. Data on bean prices collected included: retail, farm gate and wholesale price.