



ISSN NO. 2320-5407

Journal homepage: <http://www.journalijar.com>

INTERNATIONAL JOURNAL  
OF ADVANCED RESEARCH

RESEARCH ARTICLE

**Analysis of Determinants of Competitive Performance for Kenyan Small and Medium Enterprises (SMEs)**

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**Manuscript Info**

**Manuscript History:**

Received: 12 March 2014  
Final Accepted: 25 April 2014  
Published Online: May 2014

**Key words:**

Determinants of food processing  
SMEs' competitive performance

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**Abstract**

Competitive performance of small and medium enterprises (SMEs) is very critical for Kenya as an agricultural nation. Competitive processing in these enterprises would ensure that they effectively stabilize agricultural production, create jobs and reduce poverty. From reviewed literature it is purported that formal education and training, enterprise training, inter-firm, linkages/collaborations and policy framework could affect competitive performance of SMEs. The discussion in this article is based the results of a descriptive research designed study of 30 SMEs distributed into 11 horticulture; 10 dairy and 9 milling sub-sectors respectively. The study was guided by these research questions:- What are the effects of formal education and training on competitive performance of food processing SMEs; Does enterprise training affect the competitive performance of food processing SMEs; What are the effects of inter-firm linkages and collaborations on the competitive performance of food processing SMEs and Does policy framework affect the competitive performance of Kenyan food processing SMEs? Four corresponding hypotheses were tested to verify if the explored variables were significant determinants of competitive performance of SMEs. Data was collected using a combination of instruments. For qualitative data interview guides were used to obtain information from KII, observation schedules were used to gather observable data from within studied enterprises and focused group discussion guides supplemented qualitative information. Computer supported SPSS was used to analyze the coded data. Descriptive statistics were used to present the results and discussion of the analysis. Multiple regression analysis facilitated the presentation of significant relationships between independent variables and the dependent variable collectively and individually. Estimate results of  $R^2 = 72.7\%$  and adjusted value of  $R^2 = 68.3\%$  indicated that all the independent variables tested were significant determinants of competitive performance of food processing SMEs. The t-test was used to establish the magnitude of relationship between individual independent variables and the dependent variable. The study found that formal education and training; enterprise training; linkages and collaborations and policy framework are all essential for quality production and food processing. Further findings confirmed Kenyan SMEs used imported technologies which lowered the profit margins due to increased unit cost of production. It was found that Kenya lacks SMEs' sector specific policies to address their specific and special needs. It was concluded that since all the investigated independent variables were significant determinants of food processing SMEs competitive performance; Sector specific policies would create an enabling environment for all interventions for strengthening the Kenyan food processing SMEs' sector.

The research recommended that future similar studies should use larger study samples and explore more variables as means of verification of the findings. The special value the study added included establishing that job creation by SMEs should be reinforced by labour laws in order to create salaried jobs as opposed to contractual jobs which are not sustainable and therefore not functional in poverty reduction.

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## 1.1 Background

Kenyan food processing small and medium sized enterprises (SMEs) are important for stabilizing the country's agricultural production (GoK 2003), job creation and poverty reduction (UNDP, 2004). SMEs are perceived as pollinators of economic development (Omari 1998) and job creators (GoK, 2005). Export Processing Council (2005) emphasize that SMEs are essential points of contact and articulation between the past and the future; providing modes of production and consumption. Ikiara (1988) suggests that enabling environment is the basis for SMEs to provide training for entrepreneurs. SMEs reduce poverty and unemployment (Boettke and Coyne 2004). Bwisa (1998) observed that Kenya SMEs are not able to compete globally and their local market share is further threatened by the influx of cheap influx of imported processed foods. It is timely to analyze determinants of competitive performance of food processing SMEs in order to craft appropriate intervention. The study selected milling sub-sector, horticultural sub-sector and dairy sub-sectors respectively because they are directly connected to local livelihoods. Table 1.1 illustrates that food processing has consistently constituted over 40% of the total manufacturing SMEs sector in Kenyan production for over nine consecutive years

### 1.1.1 Food-processing in Kenya

Focus of the study on dairy, milling and the horticulture respectively was motivated by the fact that these could translate easily to agri-based businesses as cradle of Kenyan agricultural economy. Food processing further brings emphasis on large numbers of small to medium players rather than corporations. The Kenyan dairy farming started in 1920 in the European operated White Highlands and the African Smallholdings was initiated in 1950 (DFID, 2001). At first the sub-sector was dominated by Kenya Cooperative Creameries but currently it experiences competition operation challenges from individual fresh milk vendors. As a result of increased in zero-grazing among small farmers vendors of fresh milk pose threat to processors because they are closer to the consumers and they charge lower prices. Other sub-sector threats could come from cyclic fluctuations of milk supply and inadequate milk storage facilities. The Ministry of Agriculture, Research and Development (MoARD, 1996) observed that milk remains the major source of nutritional animal protein to many households in Kenya. This underscores the importance of establishing the determinants of competitive performance of SMEs in the dairy sub-sector so as to enhance their competitive advantage. While technological challenges lead to inadequate milk handling (storage and cooling), Khan (1998) purported that Kenyan SMEs have technological setbacks due to low levels of local innovation and adaptation of imported technologies.

Kenyan Grain milling has grown over the years, concurrently with human settlement and land tilling activities (Ayayo, 2004). Grain milling is important due its linkage to major carbohydrate staples of the local communities. Liberalization of regional grain marketing has stimulated grain movement freely within the domestic and regional markets which reduces stocks. Ethangata (2004) observed that though the sector is dominated by few large firms; grain milling, the small millers are widely dispersed even within residential estates. Job creation in the milling sub-sector is highly unstable due to seasonal fluctuations corresponding with harvest peaks diminish the potential of positive impacts (FAO, 2003).

The importance of horticultural sector of food processing has transformed from the transition of human cave-life to formal settlement. Initially man gathered naturally existing horticultural products mainly fruits as food (Ayayo, 2004). Kenyan horticultural food processing is directly linked to domesticated life of human population as source of vegetables and medicine (Ayayo, 2004). Horticultural farming has evolved due to increased demand of commercial horticultural products that has necessitated bulk cultivation of certain horticultural species (Atieno, 1997). Ethangata (2004) observes that horticulture is the most vibrant sub-sector in Kenyan food-processing; however it has faced challenges associated with liberalization of trade.

### **Inter-dependence of Agriculture and Food Processing and job creation 1.1.2**

FAO (2003) observed that millions around the world directly or indirectly depend on agriculture for their livelihood. Barr (1995) observed that because food processing SMEs are dependent on agriculture for raw material, their competitive performance is highly influenced by factors that affect agricultural production. Food processing is important for stabilizing agricultural produce through preservation (Atieno & McCormick 1997). Market competition on the other hand requires conforming to formalized quality standards. This presents new strategic processing philosophies to Kenyan food processing SMEs.

While there is a growing trend that registration with ISO 9000 is rapidly becoming a must for any company that wants to trade competitively globally, it is not clear if Kenyan SMEs are ISO registered. Kenya food processors either use imported technologies or low levels of local technological innovation and which pose competitive challenges to adaptation of Kenyan SMEs. Boettke and Coyne (2004) reported that food processing SMEs boost economic and social development by creating jobs and enhancing livelihoods. GOK (2005) reported that SMEs employ over 74.2% of the working population. McCormick and Atieno (1997) found that horticultural sector alone created 2,000,000 jobs in the informal sector compared to 500,000 in the formal sector since 1995. Kenyan food processing SMEs must perform competitively to fulfil their expected mandates as a prime sector of economic development. Establishing their competitive performance must be established and be actively incorporated in national development plans.

Despite the large numbers of small processors, growth dynamics of SMEs into bigger sizes is problematic. USAID/GEMINI (1993) survey of employment dynamics in the informal sector found that only 38% of small businesses had grown since they were started and that 47% were single operations; a major constraint was lack of entrepreneurship knowledge. On the hand, the informality of management styles within SMEs should enhance their competitive advantage based on Deming (1950) approach of "Plan-Do-Check-Act Management loop". Until very recent times, the government of Kenya was dominant in many business spheres through licensing and controls or through obliging farmers to sell at prices set by statutory marketing boards (Bwisa, 1998). This shows that Kenyan SMEs are still operating in a hostile policy environment. As a response to global events of production, Kenyan government established the Jua Kali that is widely discussed in Sessional paper No2 of 1992.

### **Problem Statement 1.2**

Kenyan food processing SMEs are important because they add value to agricultural produce through stabilization, storage and market distribution (Kenya National Development Plan, 1989-1993). According to Gichira (1999), SMEs could resolve unemployment problems and reduce poverty; but the government has not provided sufficient direct support to the sector. Cheap imports which flood Kenya Super-market chains imply that local SMEs face strong rivalry from these imports. According to Boettke and Coyne (2004), food processing SMEs boost economic and social development by creating jobs and enhancing livelihoods. GoK (2005) reported that SMEs employ over 74.2% of the working population. McCormick and Atieno (1997) found that horticultural sector alone created 2,000,000 jobs in the informal sector compared to 500,000 in the formal sector since 1995. It is not clear as to the actual factors which determinants the competitive performance of such a prime sector of Kenya's economy. Establishment of such factors would instrumentally support the National Gross Product (GDP) when such factors are translated into values actively incorporated in processing and marketing activities of food processing SMEs.

It is purported that formal education and training, enterprise training, inter-firm trade and production linkages and policy framework determine the competitive performance of Kenya SMEs (Hoekmann and Javorcik, 2006; IFC Survey, 2004). It is not established if they really determine competitive performance of food processing SMEs and to what extent they do this. It is not clear if the policy framework governing the business environment are enabling for the competitive performance of the food processing. On the other hand, Miatta (2006) found that Kenya government maintains an impressive record of macroeconomic legacy supported on foreign aid with limited attention to the SMEs. It is not clear if the existing development policies fit establishment of dynamic and flexible, informal sector SMEs (Bwisa 1998). The low export participation of 10% by Kenyan food processing SMEs reported in EPC (2000) contradicts the vast unexploited regional export market potentials reported in EPC (2006). Pack (2005) emphasizes that meaningful industrial take-off largely depend on the country's ability to be creative and innovative. The level of innovation and creativity within Kenyan food processing SMEs can only be assessed and strengthened if the determinants of their competitive performance are established.

### 1.3 Research Questions

The study posed the following research questions:

- (i) What is the effect of formal education and training on competitive performance of food processing SMEs?
- (ii) Does enterprise training affect the competitive performance of food processing SMEs?
- (iii) What are the effects of inter-firm linkages and collaborations on the competitive performance of food processing SMEs?
- (iv) How does policy framework affect a competitive performance of food processing SMEs?

. From the four research questions for null hypotheses were formulated thus:-

- H<sub>0</sub>1** Formal education and training does not affect the competitive performance of food processing SMEs.
- H<sub>0</sub>2** Enterprise training does not affect the competitive performance of food processing SMEs.
- H<sub>0</sub>3** Linkages and collaborations do not affect the competitive performance of SMEs.
- H<sub>0</sub>4** Policy framework has no influence on the competitive performance of food processing SMEs.

## 2.0 Literature Review

### 2.1 Overview of Studied SMEs' sub-sectors

Literature was reviewed on each of the studied sub-sectors to underscore similarities as well as differences of the studied subsectors. This would provide information on challenges and opportunities each has consistent with Kenyan vision 2030.

#### 2.1.1 Dairy Sub-Sector

The Kenyan Dairy processing originated from European operated white highlands in 1920 and the African smallholdings started in 1950 (DFID 2001). Dairy sub-sector in Kenya was dominated by Kenya Cooperative Creameries; had received massive operation challenges of competition especially from fresh milk individual vendors. According to Mwaniki et al (1997), the sub-sector threats come from cyclical fluctuations, poor storage facilities leading to poor milk management at smallholder farm level limits increased milk production and supply from the dairy industry. Lack of proper milk handling (storage/ cooling); processing and marketing channels / facilities worsens the situation. On the other hand, the demand for processed milk and milk products is so great that it cannot be ignored. The informal milk marketing through hawking and milk bars as part of liberalization of milk marketing in 1992 was a major challenge to the sustainability of milk processing SMEs ((MoARD 1996). Staal et al (2001) reported a rapid intensification of dairy production mainly in central part of Kenya as a result of shrinking land holdings however even this intensification suffers from challenges of poor infrastructure to the outlying rural areas where many resource-poor farmers are found.

#### 2.1.2 Milling Sub-Sector



extension contracts and other forms of various short term training. The F-test results showed that over 86% of the variations in agricultural output were due to the managers' education, networks and policy framework. The study concluded that when augmented with basic factors of production, schooling had a positive and significant allocative effect with good primary education. Education was found to be important in influencing producers to observe, diagnose and correct common processing problems, compared to processors with little or no formal education and training (Onyuma et al, 2006).

#### **2.4 Enterprise Training and technological innovation**

Enterprise training is production oriented training. This is comparable to field day training for agricultural small holders highlighted in Onyuma et al (2006) and is inclusive of the technologies used and their applications. In this study, enterprise training is explored from process perspective to understand how workers in food processing SMEs actually gain skills and competencies in food processing SMEs. The sources of food processing technologies and technical applications were explored in order to understand their cost implications on overall competitive performance of SMEs. Pack (2006) observed due to low technological innovation among Kenyan SMEs the production tends to be generic and of low quality. According to (Castells 1996; UNDP 2004), new technology forms driving force in transformation of firms and economic environment. Atieno (1997) found that obsolete technologies and inefficient use of machinery in Kenya dairy sector threaten processing efficiency. Gichira (1999) found that Kenyan domestic engineers have had little success in adapting technology to domestic environment; yet new information and transportation technologies are critical in simplifying the complexity of enterprise allies and competitors in the global markets. Ngugi (1999) criticized the relevance of Kenyan technological training and suggested that Kenya should either privatize business training or make it autonomous instead of keeping it under the ambit of the government. Collier and Gunning (1998) stated that there is a limited investment in technology deepening in Kenyan informal sector processing activities.

#### **2.5 SMEs' Linkages and Collaborations**

According to Central Bank of Kenya June (1999) and World Bank (2003) inter-firm linkages enhance SMEs opportunities to exploit economies of scales in bloc production. Kenya Economic Review (1999) further identified benefits of enterprises merger and trading bloc formation as effective competitive strategies. According to (International Competition network 2005), integration of SMEs into trading blocs broadens the markets for the larger scale production of large companies. According to Schmitz (1990) and Rasmussen (1992), network enterprises have opportunities to revolutionize labour relationships and increase network firms' competitiveness. Export Promotion Council (2006) recommended short market chains for the products' value to remain competitive. Howard (1992) found that lack of sufficient integration between firms lowers total factor productivity and the level of industrial and management skills. Lederman and Maloney (2006) stated that inter-firm linkages improved linking firms' management and marketing techniques. According to EPC (2000) Kenya has failed to exploit its strategic geographical position to exploit the Middle East, Eastern Africa, the Far East, America and Europe. Bwisa (1998) found that both public and private sector enterprises in Kenya have failed to carry out effective marketing in these regions due to limited establishment of international trade linkages.

#### **2.5 Policy Framework**

The government is perceived as the chief facilitator SMEs' competitive performance. The government controls production and marketing environments of all business through policies and trade regulations. Enabling policy environment comprise of targeted sector specific support that is missing in the case of Kenyan SMEs' sector (Gichira 1999). Addressing general enterprise development issues, (Teal 1998) observed that 1970s-80s witnessed phenomenal growth of enterprise operation in many countries of the world as they exploited opportunities created by technology. Pedersen (1996) perceived industrialization as technology transfer from industrialized countries. On the other hand, Pack (2006) pointed out that no country can industrialize fully without home grown technological competency. Both technological innovation and adaptation require policy directive (MacGaffey 1998). Gichira (1999) argues that the macro policy instruments used in Kenya have tended to encourage investment in highly protected, but efficient, capital intensive and large-scale industries.

#### **2.6 Gap of knowledge**

Theoretical and empirical reviews established that food processing is important for Kenya's industrialization process, because Kenya is an agricultural economy. However the fact that the local market is flooded with cheap imported processed food was an indication that the factors that affect their competitive performance was not yet fully understood. While different studies cited formal education and training, enterprise training, inter-firm linkages and collaboration and policy framework to have effect, they did not specify the extent of these effects **3.0**

## **Methodology**

### **3.1 Introduction**

Chapter three presented the methods and procedures used to collect, analyze and present the data. It also highlights the ethical observations that were taken into account during the research.

### **3.2 Research Design**

This study used cross sectional survey design. According to King'oriah (2004) qualitative research describes a situation, behavior, attitudes of individuals and community. Survey design was used because it is useful in gaining insights into general picture of a situation without utilizing the entire population (Edward and Clarke, 1982). The structured relationships of individuals governed by norms of sanctions of the society are best explored through qualitative and quantitative designs that treat each subject as a special case and relate it to other cases (Onen, 2007). The quantitative approaches were used to establish the extent to which assumed determinants are significantly related to a dependent variable for competitive performance of SMEs Kothari (2008). The multiple regression analysis was used because it was the most suitable method for combining measurements, classification comparison and interpretation of collected data (Onen, 2007) to establish coefficient of determination.

### **Study Location 3.3**

Research was conducted in Nairobi Province targeting food processing SMEs. This is because Nairobi Province is home to Kenya's capital city of Nairobi that hosts 7.5 percent of Kenya's population. Nairobi Province has a 52.2 percent absolute poverty which is quite high; with the greatest incidents occurring between 1994 and 1997 among the 20 percent of Nairobi wage-earner residents. Also the location was chosen because of the importance attached to Nairobi as the capital of Kenya with the highest concentration of consumer population. Beside, Nairobi Province has a heterogeneous composition of consumers who purchase a wider variety of processed foods from both local and import markets.

### **Target Population 3.4**

The target population was based on (IFC, 2004) survey of 10,000 food processing SMEs in Nairobi Province. These became the accessible population of food processing SMEs for the study and therefore they provided the sampling frame from which the study sample was selected.

### **Sample Size and Sampling Procedure 3.5**

The study used a combination of sampling techniques to obtain the study sample of 30 food processing SMEs.

Equation  $n = z^2 (pq)/d^2$ . -----3.1

Thus  $n = (1.96)^2 (0.5 \times 0.5) / 0.5 \times 0.5 = 3.8416 \times 0.25 = 384.16 / 0.0025 = 384$ . Table 3.1 summarizes the subsequent steps that were employed in obtaining the 30 sample SMEs.

### **Data Collection 3.6**

Data collection employed multiple approaches in order to facilitate triangulation of information. Primary data was collected using three different instruments. Questionnaires were used to collect quantitative information, interviews were used to elicit key informants' information and observation schedules were used to gather on-the spot data within the organization. Secondary data was gathered through document review from books, working papers, journals as well as policy documents relevant to the variables explored in the study. Borg et al (1993) suggests that multiple sources of data authenticate information obtained.

### 3.7 Data Analysis

Qualitative data was analyzed in thematic setting while descriptive analysis with quantitative information was analyzed using SPSS computer aided program displayed in tables and percentages. Multiple regression analysis facilitated the determination of significant relationships between the X values and Y. The researcher used conceptual and elaboration analysis to describe concepts and their relationships. Conceptual analysis clarifies assumptions, concepts and conclusions while elaboration analysis explains concepts more clearly by adding assumptions to specify and clarify conditions under which events and processes are more likely to occur (Selltiz et al (1976). Elaboration analysis was used to facilitate grouping of themes and clauses that were interactively obtained from respondents during data collection. The report was written using descriptive statistics. Descriptive statistics allowed the researcher to generalize about data, and to give account of structure or characteristic of the population as presented by the sample.

Multiple regression analysis facilitated establishment of relationships between the variables were based on estimation of determinants (predictors and prediction). Multiple regression facilitated opportunity to learn more about the relationship between independent variables and the dependent variable. The coefficient of determination was particularly important for expressing significance of the extent to which individual independent variables affected the SMEs' competitive performance and establish the extent of generalizations possible from the findings (Tarus et al., 2006).

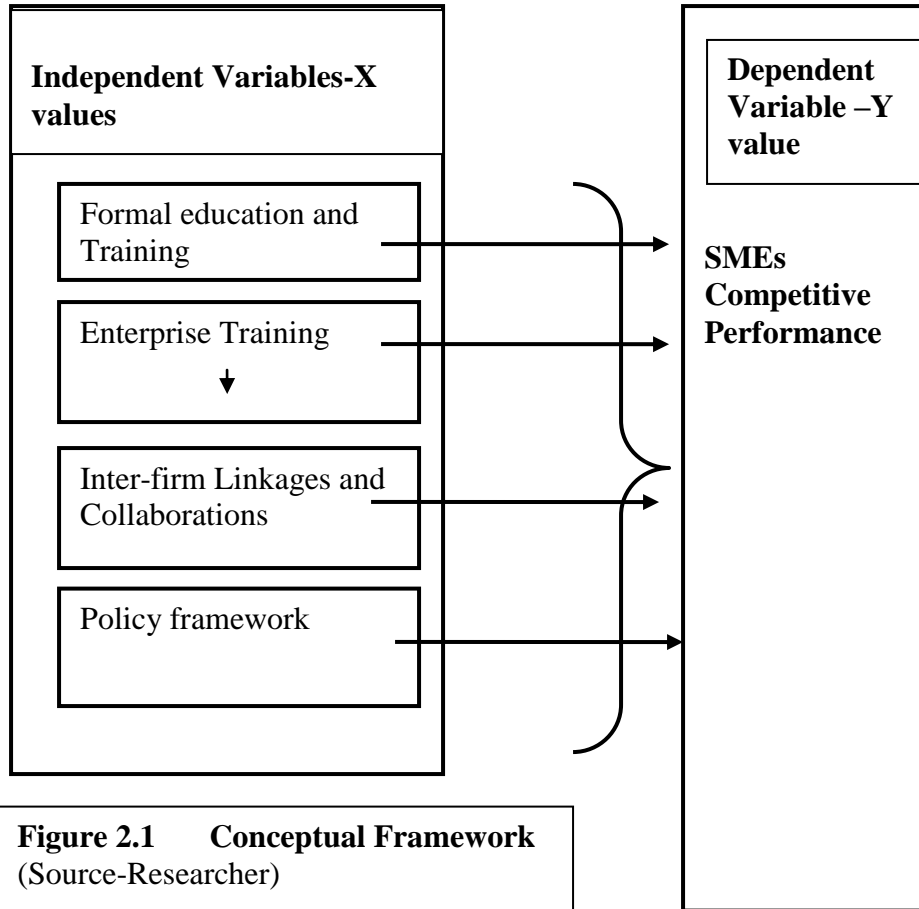
## Chapter- 4

### 4.0 Results and Discussion

**Kenyan Manufacturing sector (1987-1996) Table 1.1**

Industry	1987	1988	1989	1990	1991	1992	1994	1995	1996
Food and beverages	44.2	44.0	42.4	42.2	45.8	45.8	46.52	46.3	46.2
Clothing and Textiles	7.3	6.8	6.3	5.6	3.3	5.4	4.0	4.1	4.03
Wood and furniture	1.8	1.4	1.3	1.3	2.3	1.2	1.3	1.3	1.28
Paper and Printing	3.6	3.3	2.9	2.8	3.0	3.2	3.0	2.8	3.9
Chemical, rubber and petroleum	22.5	22.5	27.0	27.2	25.2	24.7	27.5	27.5	27.5
Plastic glass and non metallic minerals	3.6	4.3	3.9	5.3	5.1	4.3	5.1	5.4	5.43
Metal products	7.0	6.6	6.0	4.9	4.5	6.3	4.4	4.3	4.3

Source: Economic Survey, 1997



**Figure 2.1 Conceptual Framework**  
(Source-Researcher)

**Table 3.1 Sample selection technique (n=30)**

Study Sample	Population	Sample	Sampling technique
Production Managers	164	11	1. Quota (representativeness) 2. Simple random
Managing Directors	106	9	1. Quota (representativeness) 2. Simple random (objectivity)
Marketing Managers	74	5	1. Quota (representativeness) 2. Simple random(objectivity)
Factory Supervisors	38	3	1. Quota (representativeness) 2. Simple random(objectivity)
Chairpersons	18	2	1. Quota (representativeness)

			2. Simple random (objectivity)
Totals	384	30	1. Computed statistically based on confidence interval of 1.96/ 95%). 2.Key informants targeted (Purposive)

Source: survey data

#### 4.1 Formal Education and Training and Competitive Performance of SMEs

Objective one of the study explored the effects of formal education and training on SMEs competitive performance. Table 4.1 presents the finding of the descriptive analysis

**Table 4.1 Cumulative Years of Education within the Sample SMEs (n=30)**

Sub-sectors	Distribution	Cumulative yrs	Frequency	%
Horticulture	000	554	6	56
	1-2000	297	3	26
	1-3000	232	2	18
		1083	11	100
Milling	000	534	6	67
	1-2000	329	3	33
	1-3000	-	0	0
		863	9	100
Dairy	000	316	4	40
	1-2000	367	4	40
	1-3000	273	2	20
		956	10	100
<b>Cumulative total</b>		<b>2952</b>	<b>30</b>	

Source: survey data

As shown in table Table 4.1, it was established that the majority of SMEs employees had relatively low level of education. This concurs with Yambo (1991) and McGrath et al. (1995) who purported that the SMEs create, low paying jobs which attract people with low formal education and training. It was noted that higher cumulative investment of years on education and training resulted into better decision-making, better organization of production and market systems and the kind of technologies that are used for production and information management. This concurs with the findings in Onyuma et al (2006) that education and training at whatever level enhances workman competency and adaptability to new changes.

The second research question explored the influence of enterprise training on the competitive performance on the sampled SMEs. Table 4.2 presents the findings.

**Table 4.2 Forms of Enterprise Training n=30**

Form of Training	Sector of SMEs			Frequency	Percentage
	Dairy	Horticulture	Processing		
Vocational Training					
Workshops and Seminars					
In-house / on-the job					
External Management					
External Marketing					
External technical					
<b>Totals</b>					

Source: Survey data.

Table 4.2 showed that SMEs training came from vast sources that are not standardized and hence the effectiveness of enterprise training was not easy to establish. This concurs with Yambo (1991) who claimed that most of the Kenyan processing SMEs use in-house and on-the job training to save costs. On the other hand 21(20%) of responses confirmed that some of their workforce had attended vocational training prior to being employed. McGrath (1998) argued that that generic vocational training may not be relevant in real production. The finding confirmed that 11(37%) SMEs used short external technical management training but most of SMEs managers learned on the job. The respondents from both horticulture and dairy sectors confirmed that they benefited from short exposure trainings and trade fares and but mostly they got technological training which facilitated their ability to understanding and adapt to the technologies they were using in processing.

#### 4.2.3 Inter-firm Linkages & Collaborations and SMEs Competitive Performance

##### 4.3 Linkages and SMEs Production Efficiency

The third research question explored the effect of inter-firm linkages on competitive performance of the SMEs. Production, market, professional associations were seen as potential sources of added efficiency. Multiple responses were encouraged. Table 4.3 summarizes these.

**Table 4.3 SMEs Production Efficiency SMEs Linkages (n=30)**

Types of Linkage	SMEs sub-sectors			Frequency	Percentage
	Dairy	Horticulture	Processing		
Modern Technology Association					
Manufacturers Associations					
Professions Associations					
Marketing Associations					
Trade Shows and Exhibitions					
Local Business Corporation Structures					
<b>Total</b>					

Source: Survey data

As shown in table 4.3, 10(9%) SMEs had association membership with Modern technology association. The ten SMEs distributed as indicated across the sub-sectors had computerized their information systems and they explained that modern technology eased the controls of the internal systems and overall management process. This finding was consistent with Stalk (1998) who asserted that modern technology had transformed contemporary business environment and has become the cutting edge in the market. On the other hand, one medium-sized SME that was

processing both dairy and horticultural products praised association linkage between producers and consumers. The respondent narrated how their firm obtained its production information from its main corporate customer. The corporate customer for this SME was Nairobi Air Services (NAS) that provided information about products' specification and quantities. This firm attributed upto 25% of their profit margins to adherence to close consultation they had with this strategic customer. This finding concurs views by Pedersen (1996) that networks of small enterprises often have important quality improvement elements for processors and consumers. This was supported by Boettke and Coyne (2004) that industrial organization paradigms should recognize that buyers and sellers can cooperate in matters ranging from pricing to research development.

Practitioner linkage was also found to be a strong support for SMEs however some of the samples SMEs were not registered with Kenya Association of Manufacturers (KAM); 22 enterprise were members of KAM and they recognized that it was good for joint bargain and was instrumental in ensuring that SMEs maintained sub-sector standards of production. This was consistent with Carr and Alter (2002) who observed that competitive firms always bench-marked their production for quality assurance. It was however found that SMEs least practiced market linkages which would enable them explore economies of scales. Few of the respondents saw value of collaborating with competitors of linking with larger firms in their respective sub-sectors

**4.2.4 Policy Framework and SMEs Competitive Performance**

**4.2.5 4.4 Policy Framework**

The study objective no 4 explored the effects of policy framework on the competitive performance of the studied SMEs. Table 4.4 presents the respondents rating of policy support for their competitive performance in terms of inputs and table 4.5 shows rating in terms of coordination and facilitation.

**Table 4.4 SMEs' Rating of Policy Framework Support-Inputs**

Support Expected	Es Sub-sectors			Frequencies		
	ing	griculture	ry			
levant Skills	(o)	No)	0)			
levant Technologies	o)	es); 5(No)	es			
nsored workshops	o)	es); 3(No)	es			
nsorship to production courses	o)	es)	No)			
ket support	(o)	es), 7(No)	No			
hnology Adaptations training	o)	No)	No			
y input support/stock	(o)	No)	No			
rastructure	o)	No)	No			
	o)					
						%

Source: Survey data

As shown in Table 4.4, the respondents rated the government support in all the core areas very low ; a negative rating of 84%. This concurs with Hoffman (1999) that stated that Kenyan trade policies have failed to translate the growth theories for SMEs into practical implementable training models for adaptation by entrepreneurs.

**4.5.4.2 Policy Framework Coordination**

Table 4.5 provides responses to how SMEs owners rated in terms of coordination and provision of enabling competitive environment. Multiple responses were encouraged.

**Table 4.5 Policy Regulation and Coordination for SMEs competitive Performance**

Policy area of application	SMEs Sub-sectors			Frequencies			
	Manufacturing	Agriculture	Services	Number	Percentage	Number	Percentage
Coordination	24	10	10	44	80%	10	19%
Security	10	10	10	30	55%	24	45%
Registration and licensing	10	10	10	30	55%	24	45%
Technology and innovation	10	10	10	30	55%	24	45%
Generalization and Price Control	10	10	10	30	55%	24	45%
Financial Provision	10	10	10	30	55%	24	45%
Tax Revenue Collection	10	10	10	30	55%	24	45%
Coordination	10	10	10	30	55%	24	45%
Financial Stability	10	10	10	30	55%	24	45%
Customs Regulations	10	10	10	30	55%	24	45%
Environmental security	10	10	10	30	55%	24	45%
				<b>330</b>		<b>100</b>	

Source: Survey Data

As shown on Table 4.5, the majority (24 (80%) of the responses rated policy coordination and regulation as poor. This finding concurs with the views by MacGaffey (1998) poor coordination of technological support to SMEs in a developing nation forces the SMEs manufacturers to rely on imported technological inputs.

**Estimation Results 4.3**

To determine levels of relationships and extent to which the explored variables affected the competitive performance of the SMES multiple regression analysis was used. The four independent variables on the conceptual framework posed the four research questions. For the purpose of multiple regression, two main hypotheses were stated:

1. None of the independent variables (formal education and training, enterprise training, linkages and collaborations and policy framework) is a significant predictor of food processing SMEs competitive performance.
2. One or more of the independent variables are not significant predictors of SMEs competitive performance. The general multiple regression equation adopted is given under methodology.

The individual effects of the independent variables (formal education and training, enterprise training, inter-firm linkages and collaborations and policy framework) on dependent variable were described in section 4.5 of this

report. All the four independent variables were assumed to be related to competitive performance of food processing SMEs. The results of multiple regression analysis are summarized in tables (4.1-4.4).

**4.3.1 Presentation of Estimation Results**

For the purpose of this study, the general equation was converted into aspects of equation thus:  $Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + e$ . -----4.1

The values in appendix C were run through SPSS and results displayed in tables 4.19-4.23 obtained.

**Table 4.1 Descriptive Statistics**

	Mean	Std. Deviation	N
Competitive Performance	58.8667	15.00283	30
Formal education training	2.10	.759	30
Enterprise training	1.87	.860	30
Linkages and collaboration	1.87	.860	30
Policy framework	2.07	.828	30

Table 4.1 presents the results of descriptive statistics of the types of variables that were explored and analyzed through multiple regressions.

**Table 4.2 Correlations**

		Fml	Ent	Lkg	Plcy	
Pearson Correlation	Competitive Performance	1.000	-.397	-.625	-.459	-.339
	Formal education training	-.397	1.000	.074	.074	-.011
	Enterprise training	-.625	.074	1.000	.161	.158
	Linkages and collaboration	-.459	.074	.161	1.000	-.132
Sig. (1-tailed)	Policy framework	-.339	-.011	.158	-.132	1.000
	Competitive Performance	.	.015	.000	.005	.033
	Formal education training	.015	.	.349	.349	.477
	Enterprise training	.000	.349	.	.197	.202
	Linkages and collaboration	.005	.349	.197	.	.243
N	Policy framework	.033	.477	.202	.243	.
	Competitive Performance	30	30	30	30	30
	Formal education training	30	30	30	30	30
	Enterprise training	30	30	30	30	30
	Linkages and collaboration	30	30	30	30	30
	Policy framework	30	30	30	30	30

Table 4. 2 shows the correlation among variables

**Table 4.3 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change statistics				
					R Square Change	F change	Df1	Df2	Sig. F. change
	.852 (a)	.727	.683	8.45033	.727	16.603	4	25	.000

a Predictors: (Constant), Policy, Formal education training, Linkages and Enterprise training

Table 4.3 presents the model summaries (R<sup>2</sup> and adjusted R<sup>2</sup>).

**Table 4.4 ANOVA**

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	4742.267	4	1185.567	16.603	.000(a)
	Residual	1785.200	25	71.408		
	Total	6527.467	29			

a Predictors: (Constant), Policy, Formal education training, Linkages, enterprise training

b Dependent Variable: competitive Performance

Table 4.4 resents the ANOVA results and provides the overall significance of the regression. The value of F is significant ( $F_o=16.603 > F_c = 2.76$ ;  $\alpha < 0.05$ ) implying that at least one of the predictors is significant.

**Table 4.23 Coefficients (a)**

Model		Unstandardized Coefficients		Standardized coefficients	T	Sig.
	(Constant)	B	Std error	Beta		
	Formal education training	113.444	7.330		7.330	.000
	Enterprise training	-6.622	2.078	-.335	2.078	.004
	Linkages and collaborations	-8.468	1.884	-.486	1.884	.000
	Policy framework	-6.931	1.876	-.397	1.876	.001
		-5.770	1.946	-.318	1.946	.007

a Dependent Variable: Competitive Performance

**Table 4.6 indicates the regression coefficients and the t-values**

#### 4.3.2 Interpretation of the Results

Two hypotheses were tested under the multiple regression analyses. The hypothesis of no effect and the hypothesis of no significant predictors. First the study tested the hypothesis that none of the independent variables (formal education and training, enterprise, inter-firm linkages and collaboration and policy framework) are significant predictors of competitive performance of SMEs. From the analysis of variance in Table 4.2, there is a strong evidence ( $F_o=16.603 > F_c=276$ ;  $\alpha < 0.05$ ) against the null hypothesis that all bs are not equal to zero. Therefore the hypothesis that the investigated independent variables determine the competitive performance of SMEs was acceptable. The study thus concluded that one or more of the independent variables are significant predictors of competitive performance of SMEs. This finding led the researcher to get to the second hypothesis under multiple regression to determine the actual significant predictors and to establish which of the independent variables (formal education and training, enterprise training, inter-firm linkages and collaborations and policy framework) are not significant predictors of competitive performance of food processing SMEs. From Table 4.3, the t-test values indicate that all the independent variables (formal education and training, enterprise training, inter-firm linkages and collaborations and policy framework) are significant predictors of competitive performance of food processing SMEs since each has a magnitude of greater than 2. This finding is also valid because for each predictor,  $t_c(0.05,25)=1.708$ . The critical t ( $t_c$ ) is smaller than all the calculated t-values indicating that all the independent variables are significant predictors. Further, for all the predictors,  $\alpha < 0.05$ : this also indicates significance. Hence the study established that all the independent variables (formal education and training, enterprise training, inter-firm linkages and collaborations and policy framework) are significant predictors of competitive performance of food processing SMEs in Nairobi province.

The researcher further determined the proportion of the total variance in competitive performance ( $R^2$ ) that was due to independent variables, by dividing the sum of squares of regression by total sums of squares. From Table 4.2,  $R^2 = 0.727$  or 72.7%, implying that 72.7% of the variability in the competitive performance of SMEs can be explained

from formal education and training, enterprise training, linkages and collaborations and policy framework. The remaining 27.3% are due to other extraneous factors that were not measured in this study.

The researcher is aware that  $R^2$  always increases if more predictors are added to the model and that multiple  $R^2$  from a sample tends to produce a biased estimate of the true population value, hence the researcher determined the adjusted  $R^2$  to obtain a better approximation of the population multiple  $R^2$ . From Table 4.6, the  $R^2$  adjusted is 0.683, this means that 68.3% of variability in competitive performance of SMEs is explained by formal education and training, enterprise training, linkages and collaborations and policy framework and the rest 31.7% are explained by other factors.

From the multiple regression analysis, the following were deduced:

1. All the independent variables (formal education and training, enterprise training, linkages and collaborations and policy framework) are significant predictors of competitive performance of food processing SMEs in the sample.
2. The total effect of all independent variables on competitive performance accounts for up to 68.3% of the variability.
3. The regression equation for competitive performance was

$Y^1 = 113.444 - 6.622X_1 - 8.468X_2 - 6.931X_3 - 5.770X_4 - \dots - 4.2$  where  $Y^1$  is the predicted competitive performance and  $X_1$ , is formal education and training,  $X_2$  is enterprise training,  $X_3$ , is linkages and collaborations and  $X_4$  policy framework.

It was noted that the b coefficient associated with strength of affiliation (-1.138) is negative, indicating an inverse relationship in which higher numeric value for strength of affiliation are associated with lower numeric value level of competitive performance. Hence the independent variables are less strongly affiliated with competitive performance of the food processing SMEs. Using the unstandardized coefficients, the order of which the independent variables is most associated with low performance of the SMEs was such that : Enterprise training is more associated with low competitive performance than linkages which is more associated than formal education and training which is also more associated with competitive performance than policy.

The multiple regression analysis and subsequent interpretation of results indicates that formal education and training, enterprise training, linkages and collaboration as well as policy framework interact to determine the competitive performance of SMEs and that they account for 68.3% of competitive performance of the SMEs. Only 31.7% of competitive performance is explained by other factors. But this relationship is inverse; the four independent variables do not contribute in equal magnitude to the competitive performance of SMEs. The effect of enterprise training is highest and the effect of policy framework is lowest. Hence for SMEs to perform competitively there should be a suitable and friendly policy framework as a priority.

## 5.0 Summary of Findings.

Four research questions and four null hypotheses were posed by the study. The hypotheses were:

- |                       |  |
|-----------------------|--|
| <b>H<sub>0</sub>1</b> | Formal education and training does not affect the competitive performance of food processing SMEs. |
| <b>H<sub>0</sub>2</b> | Enterprise training does not affect the competitive performance of food processing SMEs.           |
| <b>H<sub>0</sub>3</b> | Linkages and collaborations do not affect the competitive performance of SMEs.                     |
| <b>H<sub>0</sub>4</b> | Policy framework has no influence on the competitive performance of food processing SMEs.          |

The major findings of the study were that all independent variables (formal education and training, enterprise training, linkages and collaborations and policy framework) collectively and interactively determined up to 68.3% of competitive performance of food processing SMEs. The regression equation formulated for competitive performance  $Y=113.444-6.622X_1-8.468X_2-6.931X_3-5.770X_4$  support significant relationship between independent and dependent variables. Thus both statistical descriptive results and regression findings reinforce the conclusion that independent variables significantly determine competitive performance of food processing SMEs. Widely cited operation challenges included technological inputs, low local innovation and adaptation skills, and availability of raw agricultural materials. The study found policy gaps in commitment to support SMEs competitive performance compared to the significance the government attaches to a sector as confirmed in (Namusonge 1998; Gichira 1999; Bwisa 1998) and Goldsmith 1996).

### **5.1.1 Formal Education and training**

Both primary and secondary data analyzed showed that formal education and training were significant determinants of competitive performance of food processing SMEs. This implies that formal education and training facilitate acquisition of basic skills and competencies of graduates at different levels to be self employed. It was found that higher levels of formal education and training enhanced opportunities in placement in management positions within SMEs and this influenced competitive performance through strategic decision-making on the kind of technologies and marketing. Multiple regression analysis interpretation showed that formal education and training and policy regressionally yields high competitive performance within the studied Kenya food processing SMEs.

### **5.1.2 Enterprise Training**

Generally it is believed that enterprise training is production oriented. Using the model summary of regression analysis and  $R^2$  adjusted values, enterprise training with the other three independent variables cumulatively accounted for 68.3% competitive performance of the SMEs that was significant. The coefficient b-values in Table 23 further provide inverse relationship of enterprises with high numerical value that still reinforce the significance of enterprise training at  $b=-8.468$  and coefficient t-test of  $-4.495$  is  $.004$ ;  $\alpha < 0.05$  constant significance. This further confirmed that enterprise training was a significant determinant of competitive performance of SMEs through improvement of processing skills. It was further found that it failed to effectively fulfill this because of over-supply of training providers due to uncoordinated liberalization.

### **5.1.3 Inter-Firm-Linkages and Collaborations**

It was found that inter-firm linkages and collaborations were significant determinants of the competitive performance of Nairobi based food processing SMEs. In Anova, the F statistic  $.000(a)$  established a strong relationship between inter-firm linkages and collaborations and competitive performance of SMEs. The coefficient values of b and t-test provide inverse relationships that indicated the significance of linkages and collaborations ( $b=-6.931$  and  $t=-3.693$ ;  $\alpha < 0.05$ ). Descriptive analysis found that integrated market linkages enhanced market expansion and increased sales turnover.

### **5.1.4 Policy Framework Influences**

The researcher found that policy framework had an overall SMEs competitive performance facilitation and regulation roles. Through the model summary of the regression analysis conducted, the value of  $R^2$  the coefficient of determination value of 72.7% and the adjusted  $R^2$  value of 68.3% established that (formal education and training, enterprise training, inter-firm linkages and collaborations and policy framework) are significant predictors of SMEs competitive performance. The policy coefficient ( $b=-5.770$  and  $t=-3.69-2.965$ ;  $\alpha < 0.05$ ) presented inverse relationship that is significant in support of rejection of policy and accept the alternative version hypothesis. As a matter of fact policy was found to be more associated with competitive performance of food processing SMEs. In fact the researcher observes that even the extraneous independent variables not included in the study have ties to policy framework.

## **5.2 Conclusions**

### **5.2.1 Formal Education and training**

The study concludes that in order to improve technology uptake and limited technology innovation there is need to improve formal education and training to address the special needs of SMEs. There is need to re-focus on the

substance of formal education and training in order to make it more directed toward enhancing SMEs propensity to creativity and innovation and growth to larger sized forms.

### **5.2.2 Enterprise Training**

It was further found that undirected enterprise training sources reduced the competitive performance of SMEs by overwhelming them with vast choices. It was concluded that generic vocational and technology colleges did not adequately address the changing needs of competitive performance of SMEs in a globalizing business environment. The study concluded that generic vocational and technology colleges did not adequately address the changing needs of competitive performance of SMEs in a globalizing business environment.

### **5.2.3 Inter-Firm-Linkages and Collaborations**

The study concluded that weak production; marketing and processing linkages reduced the sales volumes and weakened the competitive performance of sample SMEs. The study further concluded that limited marketing linkages concentrate the SMEs sales activities to local market and limit their participation in export markets and poor integration into global competition.

### **5.2.4 Policy Framework**

The study concluded that Kenyan SMEs require policy protection. It recommended that the government intervention to Kenyan food processing SMEs should include production incentives and tax breaks to enhance their competitive performance. This would strengthen trade networks and encourage collaborations between different firm-sizes to initiate subcontracting networks.

## **5.3 Policy Recommendations.**

It is recommended that government establish policy that synchronizes enterprise training activities and programmes to improve their quality and relevance for the food processing SMEs sub-sector. It is further recommended that introduction of a systems approach by Kenyan food processing SMEs would bring other SMEs stakeholders on board, to formulate and craft more tailored and cost effective support to enhance enterprise development.

## **5.4 Sub-sector focus**

There are a few specific observations that were found in milling, dairy and horticulture sub-sector and highlighted as follows.

### **5.4.1 Milling Sub-Sector**

It is recommended that small millers should form sub-sector associations and develop milling blocs to enable them exploit the economies of scale. They could reach out to larger millers for subcontracting arrangements so that they upgrade their technologies to expand their production for enhanced profit margins. The study further recommends that state intervention for the milling sub-sector employers to reinforce job security through labour laws to serve dual purpose of improving production quality and making casual workers transform job status from casual to contractual. This would encourage continuous improvement of products and enhance sales turnover and hence improve competitive performance.

### **5.4.2 Dairy Sub-Sector**

The study concluded that the sector's survival depends directly on state intervention to streamline raw milk collection for bulk processing against the vendor competition. The study recommends that dairy processors should strengthen collaborative associations to facilitate larger firms' support to SMEs for information and modern ways of processing. Formation of strategic partnership between the government, the dairy processors and donors would resolve the problems of milk collection and storage technologies. This would expand collection areas and production volumes and reinforce and control quality of milk internally. Further it is recommended that policy framework should encourage dairy processing SMEs to form "Regional Marketing Corporations" for the purpose of exploiting regional liberalization of trade. The government should strengthen the sub-sector by setting out a stage for capacity building for all milk producers to meet acceptable hygienic standards. Training vendors in hygienic methods would improve government's revenue collection from all the dairy sub-sector SMEs and expand sustainable production base for improved overall turnover.

### **5.4.3 Horticulture Sub-Sector**

As compared to dairy and milling, horticulture was found to be more sensitive to weather conditions. It was concluded that horticultural sub-sector requires policy coordinated functional linkages. This would facilitate sustainable SMEs' linkages for enhanced inter-regional trade between developing countries, for fast technology transfers. It would further reduce reliance on rich countries for export markets and diversify export opportunities away from primary commodities.

### 5.5 Contribution to Knowledge on Performance Gaps

The study found that Kenya has not adequately integrated the determinants of competitive performance of SMEs in her development plans to support entrepreneurship development adequately. This study identified and addressed this gap. The study found little evidence to confirm that leading training institutions are formulating consultative curricula with food processing industry. The study recommends an integrated approach by SMEs stakeholders to build synergies for enhancing SMEs competitive performance.

It is recommended that SMEs should form strategic alliances for processing skills and technology upgrade and marketing to improve the performance of individual firms in blocs. Strategic linkages between different sized firms would upgrade technologies used within the SMEs. The study recommends that in order to be relevant, lead institutions which offer courses related to food processing including universities and middle level colleges should realign their programmes in consultation with the food processing industries in order to address SMEs requirements adequately. The study recommends establishment of business policy liaison with entrepreneurship as a new paradigm for promoting SMEs growth and diversification.

### 5.6 Suggestions for Further Research

Since the study explored the determinants of food processing SMEs focusing only on 30 SMEs using only four predictor or independent variables, generalization of the findings are restricted to the local area where the sample originated; it is recommended that similar future research should use bigger sample size to address wider coverage of the country to support generalizability. The study further recommends that more research in the area of education and training to establish the kind of education and training values that should be incorporated in an integrated approach to SMEs support for enhanced competitive performance. Again further research could address the streamlining of food processing SMEs training needs so that trainers could focus on specified required competencies. More future research should explore synergic approaches to address the entrepreneurial topological gap in Kenya. Finally the study recommends that further SMEs performance research on enterprise development policies should focus on enabling/ disabling policies as interface for food processing SMEs.

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