

# Characterizing the Tanzanian quality beef supply chain; a case of Arusha and Dar-es-Salaam cities

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## Abstract

Niche markets that require quality products and pay premium prices are increasingly dominating the market share of East African livestock products. To serve the niche markets sustainably; a well-coordinated, communicated and integrated chain is a pre requisite. This ensures understanding of competitive challenges, identifying relationship among chain actors, ensuring more efficient product flows along the chain and improving access to markets. This paper characterized the Tanzanian quality beef supply chain by using functional approach. Data were collected by using questionnaires administered to two cattle fattening companies, six beef processors, 11 supermarkets, 34 tourist hotels and one beef importer.

Quality beef accounted for 5% of beef traded in the study areas. This beef targeted high income consumers who were served through tourist hotels and supermarkets. The quality beef were traded through three main retailing outlets: conventional butchers (21.5%), supermarkets and modern butchers (40.4%) and tourist hotels with restaurants (38.1%). The beef traded through supermarkets & tourist hotels encompasses prime cuts of half carcasses processed and tenderized in the processing factories; while non-prime cuts from the processing factories were traded through conventional butchers. Moreover, it was found that 34% of QB traded in the study areas was imported mainly from Kenya; a situation that calls for the attention of beef industry stakeholders in Tanzania.

**Key words:** *consumers, niche markets, supermarkets, tourism*

## Introduction

Niche markets that require livestock quality products and pay premium prices are increasingly dominating the market share of East African countries (Omore and Kaitibie 2007). In Tanzania tourist industry that form the main part (88%) of QB consumers has increased plausibly (Allegretti et al 2016). Statistics show that number of tourist increased six fold from 501 669 in 2000 to 1 093 000 in 2014; while hotels doubled from 205 in 1991 to 469 in 2013 (Ashimogo and Greenhalgh, 2007; TTSR 2011, HAT 2014). On the other hand, middle income clusters who are potential consumers of QB are projected to increase (SAGCOT, 2012). Supermarkets and modern butchers (quality beef retailing outlets) have grown about tenfold from one supermarket in 2007 to more than 10 supermarkets with about 25 branches in 2015, most of them located in Arusha and Dar es salaam cities (Ashimogo and Greenhalgh, 2007; Kamugisha 2011; TTSS 2014).

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Despite having the largest cattle population in Africa after Sudan and Ethiopia with the expansion of quality beef market share, Tanzania has remained a net importer of QB products for the past three decades (FAOSTAT 2013; MLFD 2014). More than 700MT (80%) of QB consumed in the country are imported annually (SAGCOT 2012). Importation of QB contributes to depletion of the nation's meager foreign exchange which stands at an average of \$674 800 p.a and accounts for 17% of total meat imports (Actualistix 2016). Importation of beef is accompanied with underutilization of beef processing factories that is operating at 50% capacity; with only 2% of beef produced being processed country wide while the remaining beef is sold warm and undifferentiated (URT 2015).

Supply of locally produced QB is associated with the potential improvement of livelihoods for 27 million people (50%) in the country who depend on livestock (URT 2015) at one hand and lessening of alarming unemployment level in the country that stands at 21.5% in Dar-es-Salaam and 10.3% countrywise on the other hand (NBS 2016). Reduction of unemployment level would be achieved by adding value to beef produced in the country through fattening of cattle produced, full utilization of meat processing factories and incremental incomes obtained by selling quality beef at premium prices in the niche markets. Sustainable supply of quality beef in the niche markets requires a well-coordinated and integrated chain that ensures understanding of competitive challenges, relationship among chain actors and notices of efficient product flows among chain actors to access the markets. This paper characterized the Tanzanian quality beef supply chain. Specifically the paper described characteristics of quality beef supply chain and assessed the requirements of the markets at successive nodes of the chain to satisfy the end user.

Considerable studies on meat supply chain in Tanzania have been documented (MMA 2008; Pica-Ciamarra et al 2011; Mlote et al 2012; Kadigi et al 2013; Wilson 2015ab). MMA (2008) revealed little on QB when exploring 'Tanzanian red meat for local and export markets' since they aggregated different types of meat, hence the study was not deepened to focus on the quality beef industry. Pica-Ciamarra et al (2011) when assessing the Linkage of Smallholders to Livestock market; inclined their study towards upstream actors by assessing major systems of livestock data collection and dissemination. Mlote et al (2012) evaluated 'Value addition of beef cattle fattening in the Lake zone in Tanzania' where she compared benefits and opportunities of cattle fattening versus cattle sold unfinished in the upstream chain actors. Kadigi et al (2013) examined the market access, linkages and opportunities of cattle and beef products among upstream traditional chain actors in Mwanza region. Wilson (2015a) mapped the red meat value chain in the Southern highlands of Tanzania by using value chain approach. Finally, Wilson (2015b) examined white meat value chain in the Southern highlands of Tanzania by using the value chain approach too. Scant information on the quality beef supply chain exists (Mapunda 2007). Mapunda (2007) examined the relative efficiency of the existing beef marketing system and exploration of potential market opportunities for quality beef in Arusha and Dar-es-Salaam cities leaving out the upstream chain actors. To the knowledge of authors, there is no study in Tanzania that has characterized entire quality beef supply chain despite its imperative contribution to household income and unemployment reduction.

## **Methodology**

### **Sampling strategy**

Arusha, Dar-es-Salaam and Manyara regions were purposely selected as case study locations. The Arusha and Dar-es-Salaam regions were chosen due to the presence of meat processing factories, tourist hotels and supermarkets in the regions. Moreover, Arusha was included in the sample since the cattle population (1 699 541 heads) ranks second after Shinyanga in the country (NSCA 2012). Manyara region was sampled to explore cattle fattening since the region was the only one dealing with commercial cattle fattening during data collection exercise in the northern zone.

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## Data collection

Data were collected from two cattle fattening companies, six beef processors, 11 supermarkets, 34 tourist hotels and one beef importer by using three sets of structured questionnaires during February 2012 – June 2012. The first and second questionnaires were designed to capture data from tourist hotels and supermarkets. The third questionnaire was designed for QB cattle producers. Finally, a checklist was made for soliciting data from beef importers.

Various techniques were executed in primary data collection (Table 1). Key informant interviews involved downstream beef supply chain actors that included cattle slaughtering and meat processors. Structured questionnaires were used to collect data from tourist hotels, supermarket operators, and cattle fatteners. Appointments were made two days before the date of interview through district livestock extension staff and wards executive officers. Interviews were conducted at respondents' offices. The interviews were conducted in Kiswahili and English languages. Kiswahili language was used during interviews with Tanzanian respondents while English was used during interviews with non-Kiswahili speaking respondents in Modern butchers, supermarkets and beef importing companies.

**Table 1.** Techniques used for primary data collection from sampled actors

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| <b>Id.</b> | <b>Actor's name</b>                     | <b>Data collection technique</b> |
|------------|---|----------------------------------|
| 1          | Fatteners                               | Structured interviews            |
| 2          | Cattle slaughtering and Beef Processors | Key informant interviews         |
| 3          | Supermarkets                            | Structured interviews            |
| 4          | Tourist hotels                          | Structured interviews            |

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## Data analysis

Descriptive statistics were performed whereby frequency tables, percentages and charts were used to map relationships among chain actors.

## Results

Quality beef accounted for 5% of all beef traded in the study area that amounted to 3 803 863 kg per annum. The beef was traded through three major retailing outlets: conventional butchers, supermarkets and modern butchers; and tourist hotels and restaurants that accounted for 21.5%,

40.4% and 38.1% respectively (Figure 1). The quality beef traded through supermarkets with modern butchers; and tourist hotels with restaurants encompassed the prime cuts from half carcass processed and tenderized in the processing factories and or imported from other countries. On the other hand quality beef traded through conventional butchers were composed of non-prime cuts of carcasses from the processing factories produced locally in the country. A significant portion of quality beef (23%) traded through supermarkets and modern butchers; and tourist hotels with restaurants were imported mainly from Kenya. The importation of substantial portion of quality beef in the country calls for the attention of beef industry stakeholders in Tanzania.

**Figure 1.** Beef supply chain actors and functions in Arusha and Dar-es-Salaam cities

### Cattle production

Arusha's quality beef cattle production was still at an infant stage during the period of data collection. There were no individual cattle fatteners. Only two companies (i.e. Manyara Ranching Company (Monduli district) and Ormoti Tukutta Co. Ltd (Simanjiro district) were engaged in production of cattle for QB in the study area. In this system, animals were grazed in natural pastures during the day on private owned land in paddocks and supplemented with concentrates in the evening. The Manyara ranching company reared a minimum of 1 500 cattle heads with 100 heads as fattening stock at any point in time (Table 2). The company owns 45 000 acres of land which are divided into 52 paddocks. During dry season, cattle were grazed in respective paddocks but they were supplemented with hay and concentrates. Moreover the ranch had a breeding program to produce breeder cows for the surrounding community. Breeder cows were sold at half price, that stood at 400 000 Tsh/breeder cow instead of the prevailing market price of 800 000 Tsh/cow as part of meeting Corporate Social Responsibility.

**Table 2.** Herd structure of Manyara ranch

| Cattle type | Fattening stock | Cows | Bulls | Steers | Heifers | Weaner heifers | Weaner bulls |
|-------------|-----------------|------|-------|--------|---------|----------------|--------------|
| Number      | 100             | 472  | 97    | 82     | 128     | 127            | 28           |

The fattened stock consisted of steers aged 2 – 5 years and culled cows aged 3 – 8 years. The concentrates used in fattening process were maize bran, sunflower seed cake, cotton seed cake, minerals, common salts, urea and molasses. The estimated amounts and costs of concentrates used per day for 100 cattle are presented in Table 3. Cattle in this farm were fattened for a period of about 90 days.

**Table 3.** Estimation of costs of concentrates for 100 cattle per day

| <b>Concentrate name</b> | <b>Concentrate price (Tsh/kg)</b> | <b>consumption of concentrate /cattle/day</b> | <b>Concentrate cost /cattle/day (Tsh)</b> |
|-------------------------|-----------------------------------|---|---|
| Maize bran              | 200                               | 1 kg  | 200                                       |
| Hay                     | 200                               | 3 kg  | 600                                       |
| Molasses                | 200                               | 4 ltr   | 800                                       |
| Minerals                | 400                               | 75 gm   | 30  |
| Salt                    | 150                               | 50 gm   | 8   |
| Cotton seed cake        | 250                               | 2 kg  | 500                                       |
| Sunflower seed cake     | 200                               | 2 kg  | 400                                       |
| <b>Grand total</b>      |                                   |   |   |

On the other hand, Ormoti Tukutta Conservation Ltd had three programmes: fattening, dairy production and breeding. The ranching program was for dairy and provision of improved breeds to the surrounding community while fattening was for beef production. Cattle fattening was of medium size with the herd of about 250 cattle at any point in time. Ormoti prefers fattening cross breeds of Sahwal-Zebu and Boran-Zebu. These cross breeds were said to have rapid weight gain during fattening and produced relatively tender meat that was preferred by consumers.

The company fattened three grades of cattle bought from cattle farmers in conventional beef supply channel. These grades were A, B and B<sup>-</sup> based on the weight of the animal (Table 4). The herd was composed of 12% Grade A animals, 25% Grade B animals and 63% Grade B<sup>-</sup> animals.

**Table 4.** Ormoti Tukutta Co. Ltd fattening herd structure

| <b>Weight range<br/>kg</b> | <b>Herd<br/>composition<br/>%</b> | <b>Fattening period<br/>weeks</b> |
|----------------------------|-----------------------------------|-----------------------------------|
|----------------------------|-----------------------------------|-----------------------------------|

|                      |           |    |       |
|----------------------|-----------|----|-------|
| Grade A              | 300 – 350 | 12 | 2     |
| Grade B              | 280 – 300 | 25 | 3 – 6 |
| Grade B <sup>-</sup> | 250 – 280 | 63 | 5 - 8 |

The time span for cattle to stay in feedlots depended on the quality attributes of the cattle bought that ranged from two to eight weeks (Table 4). During the rainy season, cattle were fed on fresh grass and concentrates such as cotton seed cake, red sorghum, maize bran and wheat bran; while during the dry season cattle were fed on hay, sorghum or silages during the day time and supplemented with concentrates in the evening. The fattening period was relatively shorter (14 -60 days) compared to 90 days at Manyara ranching Co. Ltd as well as individual traders who fattened cattle in the Lake zone (Mlote et al 2012). Plate 1 shows cattle under fattening in a feedlot at Ormoti Co. Ltd in Simanjiro district.

**Photo 1. Cattle fattened at Ormoti Fattening Company**

**Live cattle trade**

***The Ormoti Co. Ltd model***

During data collection period, there was no QB cattle auctioning. The Ormoti Co. Ltd purchased cattle for fattening directly from cattle farmers' homesteads while Manyara Ranching Company raised its own cattle for fattening. When purchasing cattle the Ormoti company considered the following attributes: (i) Minimum live weight of at least 250 kg and a cross of Tanzania short horned zebu (TSHZ) with Sahwal or Boran. The minimum weight of 250kg reduced the cost of fattening animals in feedlot as it took less time to attain the slaughter weight of at least 350kg. Moreover, crosses of (TSHZ) with Sahwal or Boran were more preferred due to their relatively bigger size and more weight than pure (TSHZ) (ii) The age of cattle of between 3 and 5 years because fattening cattle of much older age was reported to add little value in terms of meat quality. The fattening of older aged cattle was claimed to yield meat that is loaded with more fat than the meat of young cattle; and (iii) Castrated steers and bulls which are known for their tender and marbled meat which is highly demanded.

The company paid 1 400Tshs/kg live weight as a farm gate price. In most cases, bulls and steers weighed more than cows and heifers such that they fetched higher prices than cows and heifers. Once after fattening, Ormoti Co. Ltd sold fattened cattle to Orpul Company Ltd which is a sister company at a price of 1 700 Tsh/kg live weight. Orpul Co. Ltd has specialized in slaughtering cattle and processing beef into different beef cuts. It was estimated that Ormoti Co. Ltd sold about 100 cattle heads per week. The model of paying cattle farmers based on weight was different from other studies in the country whereby cattle prices are based on accepted morphological status from the buyers' visual assessment (Mlote et al 2012; Kadigi et al 2013)

***The Manyara Raching Company model***

The Manyara Ranching Company produced calves and reared them for sale to different customers. The ranch's customers were categorized into three groups: cattle traders, meat processing companies and butcher men around the ranch who accounted for 80%, 13% and 7% of the cattle sold by the ranch respectively.

It was estimated that the Ranch sold about 40 cattle heads monthly at 1,700 Tsh/kg live weight. The ranch management reported that the cattle supply could not fulfil the requirements of its customers during dry season (October – December) when there is low supply of cattle from pastoralists due to inadequate pastures and water. This finding is similar to Mafuru et al (2006) who found that cattle transactions are influenced by availability of pasture in the traditional livestock sector.

### ***Cattle slaughtering and beef processing***

Slaughtering facilities in quality beef supply channel was relatively advanced compared to those found in conventional beef channel. Modern slaughtering facilities in the QB channel allowed humanly slaughtering of cattle that produced tender beef. Moreover, beef traded through this channel was chilled before being sold to customers so as to improve its tenderness. Table 5 shows the distribution of abattoirs and meat processing factories along the quality beef channel in the study area.

**Table 5.** Abattoirs and meat processing factories along quality beef supply channel in Arusha and Dar – es - Salaam

| Processing plant / abattoir               | Region/ location | Full capacity/ day |       |
|---|------------------|--------------------|-------|
|   |                  | Cattle             | Shoat |
| <b>Both slaughtering &amp; processing</b> |                  |                    |       |
| Arusha abattoir                           | Arusha           | 200                | 300   |
| Orpul Co. Ltd                             | Manyara          | 80                 | 40    |
| <b>Beef processing</b>                    |                  |                    |       |
| Meat King                                 | Arusha           | Unknown            |       |
| Happy Sausage                             | Arusha           | Unknown            |       |

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Jabe Investment

Arusha

Unknown

TANMEAT Co. Ltd

Dar-es-Salaam

Unknown

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Cattle slaughtering and processing of QB were not well developed in both cities. However, the situation was more advanced in Arusha than it was in Dar-es-Salaam. While there was only one meat processing factory in Dar-es-Salaam, there were three meat processing factories and two modern abattoirs in Arusha (Table 5). The only beef processing factory in Dar-es-Salaam was Tanzania Meat Products 2002 Ltd (TANMEAT). The factory sourced half carcasses for processing from wholesale meat traders. Then, the factory apportioned carcasses into desired cuts and processed some into other beef products such as beef cuts, beef sausages, chilly bites and burgers.

In Arusha city, there were four beef processing factories namely; Happy sausage, Meat King, Jabe Investment and Arusha Meat company. The factories were involved in the preparation of prime meat cuts and beef products. With the exception of Arusha Meat Company, the remaining three factories depend on orders from meat wholesalers who slaughter their cattle at Arusha abattoir and supplied prime portion of the carcass to beef processing factories. Apart from providing cattle slaughtering services to butcher men, Arusha Meat Company was involved in apportioning of carcasses into different prime beef cuts and process some into beef products mainly sausages. The company was estimated to be slaughtering and processing carcasses equivalent to five cattle heads per week.

In addition to the aforementioned meat processing factories, there was a modern beef processing plant in Simanjiro district owned by Orpul Co. Ltd. The plant had a modern slaughter house (Plates 2, 3, 4, 5 and 6). The plant obtained fattened cattle for slaughtering and beef processing from the sister company 'Ormoti Tukutta Co. Ltd'. The slaughter house had a capacity of slaughtering 80 cattle heads per day in two shifts. However, the Company was operating below its slaughtering capacity slaughtering an average of 25 -30 cattle heads per day. The capacity under utilization was due to lack of customers who could afford to buy QB.

**Photo 2.** Half carcasses being chilled in the Orpul cold rooms

**Photo 3.** An officer of Orpul Beef explaining the functioning of t

**Photo 4.** the solistification of quality beef in the processing plant

**Photo 5.** Packed meat c for sale at Orpul Co.

Orpul beef processing plant supplied QB to customers in Arusha and Dar-es-Salaam cities. It received cattle from Ormoti Co. Ltd cattle fattening farm. It then slaughtered animals in hygienic and recommended standards. Thereafter, the carcasses were aged and chilled in chilling rooms (Plate 2). After chilling, the beef was apportioned into desired cuts (Plate 4), packed into appropriate packages (Plate 3 and 5) and transported to customers by using refrigerated trucks.

The company supplied an average of 984 tones of beef cuts annually that accounted for 26% of the QB consumed in the surveyed area. The company's major customers were: Gold mines in the Lake zone (50%), supermarkets (15%) in Arusha municipality, Orkonerei Maasai Social Initiative (OMASI)

(5%) and tourist hotels in Arusha and Dar es Salaam (30%). During the time of field survey, the gold mines which were buying beef from Orpul Co. Ltd were Tulawaka, North Mara and Barric Gold mines. These mines had contractual agreements with the processing company. Contract specifications included time interval of beef product supply, quantity supplied, quality attributes and prices of the products supplied to the mines. In Arusha municipality, the company supplied carcasses to Meat King and Happy Sausage factories in half carcasses for further processing.

As indicated above, one third of customers for Orpul factory were tourist hotels in Arusha municipality and Dar es Salaam city. This proportion is significantly lower than the one reported by Ashimogo and Greenhalgh (2007) who observed that Tanzanian meat processing factories derive about 85% of their revenues from the sales of meat to tourist hotels and restaurants. The difference in the findings between the two studies is attributed to the category of respondents captured during the two surveys. While this study involved only tourist hotels in the sample, Ashimogo and Greenhalgh (2007) included tourist hotels and restaurants in their sample. Moreover, this study found that substantial proportion of beef (5%) traded in the surveyed area was processed; and accessed niche markets. The proportion of beef processed in the study area is different from the one reported by SAGCOT (2012) and Kurwijila et al (2011) who revealed that only 0.06% of the beef produced in country in 2010 was processed and sold to niche markets to secure premium prices. The relatively high proportion of beef processed in this study might be due to the fact that the study was executed in the major cities of the country where most investments targeting high income earners are found as opposed to the rest of the country. Furthermore, the study findings are more or less similar to the findings reported by Mishili et al (2009) who found that Tanzania's livestock sector performed relatively well than its counterpart in the neighbouring countries of Burundi, Uganda, Kenya, Mozambique, Malawi and DR Congo in terms of production; but the sector in Tanzania lags behind in livestock value addition which results in the export of live cattle rather than livestock processed products.

### **Beef and beef products retailing**

Retail outlets for quality beef and its products include modern butchers and supermarkets for raw beef products. During the field survey, there were 27 supermarkets and 5 modern butcher shops in Dar es Salaam city. In Arusha municipality, there were 18 supermarkets and two modern butchers selling raw quality beef cuts and beef products. In general, supermarkets in Dar-es-Salaam city were bigger than supermarkets in Arusha municipality. Most (93.7%) of the supermarkets sold both imported and locally produced quality beef while the remaining supermarkets sold only imported beef. The imported beef was mainly from Kenya through Bright Choice Co. Ltd. On the other hand, the locally produced QB was obtained from processing factories and specialized beef wholesalers. Supermarkets used to chill beef and apportion it into desired cuts as per consumers' preferences. These beef cuts and beef products were displayed in cold shelves for sale (Plate 6).

### **Photo 6. Beef parked and displayed in cold room for retailing in supermarkets**

Beef wholesalers dominated supplies of beef to tourist hotels as it accounted for 44.12% of the supply among interviewed tourist hotels (Table 6). The reason behind domination of beef supplies by butcher men in tourist hotels is associated with limited supplies of QB from local meat processing factories. Inadequacy of quality beef supply and non availability of QB were mentioned by 27.27% and 13.04% of the interviewed tourist hotels and supermarkets respectively (Tables 7 and 8).

**Table 6.** Sources of beef and beef products sold in supermarkets and tourist hotels

| Source/supplier                                | Supermarkets (%) | Tourist hotels (%) |
|--|------------------|--------------------|
| Local meat processing industries               | 9.1              | 29.4               |
| Importers                                      | 18.2             | 17.7               |
| Importers and local meat processing industries | 63.6             | 11.8               |
| Butcher men                                    | 9.1              | 44.1               |
| Total  | 100.0            | 100.0              |

Generally, supermarkets and tourist hotels were supplied with beef from three main sources: (i) Beef wholesalers in the form of half carcasses. These carcasses were processed into prime meat cuts and packed according to the requirements of their customers. (ii) Meat importers and (iii) Local meat processing factories. The findings on sourcing of beef from different dealers observed in this study is different from the findings reported by Farmer and Mbwika (2012) who found that Kenyan major supermarkets are supplied with fresh meat from abattoirs that source their cattle mainly from fattening farms.

Supermarkets and tourist hotels that import beef and beef products accounted for 81.82% and 68% of the whole sample respectively. The major portion (91.67%) of the QB imported in Tanzanian niche markets came from Kenya. Revival of the East African Community that harmonizes business environment among member countries might have contributed to the dominance of the imports of beef and beef products from Kenya vis-à-vis from other countries outside the East African Community (Table 7). Proximity to Tanzania is another added advantage that Kenya has over other countries. This is accompanied by cheaper means of transport (trucks as opposed to airplanes) all of which might lead to competitive advantage for Kenya's beef products as opposed to those of other countries where tourist hotels and supermarkets import beef and beef products from.

Table 7 presents reasons for importing beef as stated by supermarkets. Customer preference was ranked as an important aspect by 45.45% of the sampled supermarkets. Supermarket operators were of the opinion that; requirements of customers determine what to sell. Imported beef and beef products were considered to be of higher quality than similar products produced within the country.

The high cost of locally produced QB was stated by 36.36% of the sampled supermarkets as a very important aspect behind importation of beef (Table 7). The costs referred to here are those incurred by supermarkets in marketing quality beef, and these include the costs of transport and the cost of

fixing cold chain facilities in their shopping halls which are required to keep QB cold when selling the beef stocks. The Farmers' Choice Co.

Ltd which is the main supplier of beef and beef products in Tanzanian niche markets, incurred costs on transport and on fixing cold chain facilities on identified supermarkets to allow efficient and effective marketing of their products. In this case, supermarkets in Tanzania acted like agents of the Farmers' Choice Co. Ltd.

**Table 7.** Reasons behind importation of quality beef among supermarkets

| Reason                          | n  | Very important % | Important % | Unimportant % |
|---------------------------------|----|------------------|-------------|---------------|
| Customer preference             | 11 | 45.5             | 54.5        | 0.0           |
| Lack of traceability            | 11 | 0.0              | 36.4        | 63.6          |
| Inadequate supply               | 11 | 27.3             | 27.3        | 45.5          |
| Quality inconsistency           | 11 | 18.2             | 45.5        | 36.4          |
| Local quality beef is expensive | 11 | 36.4             | 18.2        | 45.5          |

Inadequate supply was reported by 27.3% of the sampled supermarkets as the reason behind importation of beef and beef products (Table 7). Supermarkets which reported inadequate supply of QB produced were ready to purchase locally produced beef if sufficient stocks were available. This suggests that there is an opportunity for investors wishing to produce quality beef in Tanzania to be competitive in this aspect.

On the other hand, reasons behind importation of QB among tourist hotels are presented in Table 8. It was revealed that inconsistent supply was a very important aspect reported by 54.6% of the sampled tourist hotels. Customer preference ranked as the second most important reason indicated by 40.9% of the sampled tourist hotels. Inconsistent supply can be explained by the demand for huge capital needed in the production of QB as was the case of Orpul Co. Ltd whose initial capital investment was 30 billion Tsh, with a break even period of five years. This amount of money is huge for any company to operate effectively and have consistent supply of QB to the downstream chain actors like tourist hotels, supermarkets and export markets. About 40.9% of tourist hotels rated customer preference attribute as a very important attribute linked to the importation of quality beef (Table 8). Customer preference stated by tourist hotels as a reason behind beef importation can be attributed to customers' skepticism on the QB produced locally.

**Table 8.** Reasons behind importation of beef and beef products in tourist hotels

| Reasons                 | n  | Very important<br>% | Important<br>% | Unimportant<br>% |
|-------------------------|----|---------------------|----------------|------------------|
| Customer preference     | 22 | 40.9                | 45.5           | 13.6             |
| Lack of traceability    | 22 | 18.2                | 31.8           | 50.0             |
| Inadequate quality beef | 23 | 13.0                | 56.5           | 26.1             |
| Inconsistent supply     | 22 | 54.6                | 36.4           | 9.1              |

On average, larger volume (1 248 kg) of imported beef was sold by one supermarket per month compared to 1 086 kg of locally produced QB sold by one supermarket per month in the surveyed supermarkets (Table 9). Large volumes of imported beef sold in supermarkets can be associated with high demand of QB that cannot be met through local production. Inadequate supply of locally produced QB is one of the major reasons given by sampled supermarkets and tourist hotels for importing beef to supplement local supply. According to SAGCOT (2011), 83% of the country's quality beef demand in 2010 was met through importation.

**Table 9.** Major beef products sold in supermarkets

| Products sold per month        | n | Minimum | Maximum | Mean    |
|--------------------------------|---|---------|---------|---------|
| Beef produced locally (kg)     | 7 | 250     | 5 000   | 1 086.3 |
| Sausages produced locally (kg) | 7 | 32      | 157     | 85.5    |
| Imported beef (kg)             | 7 | 207     | 3 200   | 1 248.6 |
| Imported sausage (kg)          | 7 | 48      | 377     | 149.4   |

Prices of beef cuts and sausages produced locally were generally lower than the prices of imported beef cuts and sausages (Table 10). The lower prices of beef produced locally can be explained by short distance between the source (Arusha) and supermarkets in Arusha and Dar-es-Salaam; compared to the distance between the source of imported beef cuts and sausages say from Kenya and the supermarkets located in Arusha and Dar-es-Salaam.

**Table 10.** Prices of beef cuts and sausages sold in supermarkets

| <b>Purchasing price (wholesale price)</b> | <b>n</b> | <b>Minimum</b> | <b>Maximum</b> | <b>M</b> |
|---|----------|----------------|----------------|----------|
| Beef cuts produced locally (Tsh/kg)       | 11       | 6 500          | 12 500         | 7 300    |
| Sausage produced locally (Tsh/kg)         | 11       | 4 500          | 5 200          | 4 800    |
| Imported beef (Tsh/kg)                    | 11       | 13 500         | 15 200         | 14 200   |
| Imported sausages (Tsh/kg)                | 11       | 5 500          | 9 500          | 6 900    |
| <b>Selling price (retailing price)</b>    |          |                |                |          |
| Beef cuts produced locally (Tsh/kg)       | 11       | 7 900          | 12 500         | 10 500   |
| Sausage produced locally (Tsh/kg)         | 11       | 6 800          | 8 200          | 7 500    |
| Imported beef (Tsh/kg)                    | 11       | 15 900         | 34 000         | 28 800   |
| Imported sausages (Tsh/kg)                | 11       | 12 550         | 15 900         | 14 500   |

## Conclusions

- Quality beef traded in the study areas were mainly produced locally (77%) and passed through three main retailing outlets: conventional butchers, supermarkets with modern butchers; and tourist hotels with restaurants. Chain actors were identified to include quality beef farmers (fatteners), cattle slaughtering and beef processors; supermarkets and modern

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butchers; and tourist hotels with restaurants. The cattle fattening venture were still infant in the study area since only two companies were engaged in cattle fattening (Manyara Ranching Company Ltd and Ormoti Tukutta Co. Ltd. The Cattle fatteners preferred cattle with the following attributes: minimum live weight of at least 250kg, crosses of TSHZ with Sahwal and/or Boran aged between 3 – 5 years. The beef processing factories were of two types: the factories that were involved only in beef processing and those which were engaged in cattle slaughtering and beef processing. Those engaged with cattle slaughtering sourced cattle from cattle fatteners, slaughtered the animals and processed beef into the desired cuts as per customer preference. Beef that were involved in the beef processing alone sourced beef in half carcasses from meat processing factories and some prime cuts from meat wholesalers in the traditional sector. Both beef processing factories were bound with informal contractual agreements specifying the prices of cattle and/or beef produced while depending on phone calls in times of need for the stock.

- The beef processing factories supplied quality beef to gold mines, supermarkets, modern butchers and supermarkets. These were bound with informal contractual agreements specifying the time interval of delivery, types of beef (beef cuts) supplied, prices of beef and beef products supplied. Moreover, it was revealed that the quality beef retailers traded imported beef (23%) due to inadequate supply of the beef locally. The fact that huge amounts of QB is imported and retailers face inadequate supply signifies the opportunity for beef stakeholders to venture in the quality beef production and supply for value addition and employment creation in the country.

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