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Facilitating the effective production and marketing of processed food products by small-scale producers in Zimbabwe

Output 4.2: Report of producer/processor survey

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1. Introduction

1.1 Background

Small-scale farming in Zimbabwe rarely provides sufficient means of survival in many rural areas. Rural households in Agro-ecological Regions IV and V hardly produce above their subsistence levels owing to poor soils and erratic rainfall patterns. About 55% of farmers in Agro-ecological Region IV and 82% in Agro-ecological Region V reported food shortages in 1993, which was a year of reasonably good harvests (Moyo, 1995). Previous research demonstrates that up to 70% of rural households are living in absolute poverty and between 75% and 90% are below the Government's official poverty lines (Chipika, 1992). Indeed, most rural households depend on a diverse portfolio of activities and income sources. Some households are looking towards activities such as food processing as a means to enhance the livelihood they can achieve from a limited area of land (Simalenga, 1996).

Research suggests that small-scale food processing activities represent a potential source of livelihood for the poorest people in Sub-Saharan Africa. Food processing may increase the value of crops to poor farmers and thus yield higher returns, expand marketing opportunities, improve shelf-life and overcome seasonal and perishability constraints. Adoption of improved and validated processing technologies, good standards of quality and hygiene may assist small-scale horticultural producers overcome some of the problems experienced in the fresh produce market (e.g. lack of market information and market integration, reliance on spot markets, transport constraints and wastage). By processing some or the entire crop, producers have an alternative or additional means of marketing their produce. This is important given that post-harvest losses of horticultural crops range from 30 – 40%, and as a result limit smallholder access to higher value markets in urban areas. Even in circumstances where small-scale producers can access such markets, returns on unprocessed products are typically low. Small-scale agro-processing activities may also contribute to socio-economic development through improved incomes, employment creation, food availability, nutrition and social and cultural well-being (Richter, Basler and Franzen (1996) and McPherson (1991).

However, a recent case study research conducted by the University of Zimbabwe and the University of Reading with small-scale producers/processors of horticultural crops (report output 4:1 of Project R7485-Producer Processor Case Study Research, 2002) has shown that a number of factors affect the ability of small-scale enterprises to effectively manufacture and market processed food products. Major constraints faced were identified in producing or procuring raw materials, storage and processing crops and accessing markets for the finished product(s).

A full-scale producer/ processor survey research, which forms the basis of this report, was subsequently undertaken in order to validate and assess whether the findings in the case study research were generally applicable to small-scale horticultural producers/processors in Zimbabwe.

1.2 Focus of the survey research

In collaboration with the University of Reading, the University of Zimbabwe conducted a widespread survey research in high horticultural production provinces of Zimbabwe. Study areas were selected in such a way that different geophysical characteristics, levels of infra-structural development and social dimensions were covered. The survey examined in greater detail the constraints faced by existing small-scale producers/processors and documented coping with strategies adopted. Focus was put on issues pertaining to procurement of raw materials; appropriate processing technologies, quality control procedures; market information and marketing effort. The impact of food safety and hygiene was also assessed by examining quality control procedures that were applied by the processors.

The survey research involved in-depth interviews with producers/processors using a standard interview questionnaire. The interview questionnaire was developed on the basis of results from the case study research work. A total of 294 small-scale producers/processors of horticultural crops were interviewed throughout the high rainfall areas of Zimbabwe. The producers/processors who participated in the interviews processed at least one product from the three product categories chosen—dried fruits, dried vegetables, and fruit jams/jelly/marmalades. A total of 47 of the processors interviewed processed fruit jam, jelly or marmalade, 78 processed dried fruits and 255 were involved in vegetable drying. In some cases, the processors interviewed also manufactured other products such as dried vegetable soups and powders.

1.3 Objectives of the producer/processor survey

The specific objectives of the survey research were:

1. ***To identify in more detail the necessary requirements for small-scale producers/ processors to effectively manufacture and market processed products based on horticultural and/or fruit crops, and hence access the potential market for processed products***

This was assessed through a field survey that examined the specific requirements of a number of existing small-scale producer/processors in different geographical areas of Zimbabwe. Effectiveness in this context was assessed in terms of, amongst other things, economic returns, food safety and environmental sustainability. The requirements to be considered included sourcing and handling of raw materials, appropriate processing technologies, quality control procedures, product presentation, market information, marketing effort, etc.

2. ***To identify the potential externalities associated with the processing of horticultural products in the study areas***

These included potential impacts on the environment, food safety and hygiene, social and gender impacts, etc. To assess the potential returns to small-scale producers from

manufacturing and marketing processed products based on horticultural and/or fruit crops.

This was based on estimates of current returns to producers from sales of unprocessed products, costs of production and the potential sales price of processed products. This stage of the research provided some indication of the potential benefit to small-scale producers in terms of enhanced livelihood.

3. ***To identify constraints that might prevent small-scale producers of horticultural and/or fruit crops from manufacturing and marketing processed products effectively***

Constraints to be addressed were based on those identified in the case studies that included:

- Technical
- Financial
- Infrastructure
- Institutional
- Social
- Informal

This stage considered whether certain problems identified were gender-related, i.e. if women were more affected by certain constraints than their male counterparts.

4. ***To identify coping strategies implemented by small-scale producers/ processors of horticultural crops in the manufacturing and marketing of processed products.***

1.4 Methodology

A field survey that involved 294 small-scale producers/processors of horticultural crops was conducted in Manicaland, Mashonalnd East and Mashonaland West provinces of Zimbabwe. The survey was preceded by a series of case studies that had been carried out earlier (within the framework of this project) to gain general understanding of the operations of small-scale food processors. The focus of the survey was to consider the specific requirements and understand the dynamic activities of a number of existing small-scale producers/processors of horticultural and/or fruit crops in different areas of Zimbabwe. The survey was carried out in areas with different geophysical characteristics, degrees of infra-structural development and social dimensions, etc.

The survey research involved in-depth interviews with small-scale producers/processors. The interviews were conducted using a standard interview questionnaire, which was developed on the basis of results from the case study research. Field researchers were asked to take extra field notes on any additional information regarding the enterprise that they considered of interest. There was an intention to record interviews and take photographs of the different enterprises and their processing equipment but this was not

possible due to logistical problems. Only the data collected from enterprises that processed products for marketing purposes were statistically analyzed.

1.5 Organisation of the report

The report is divided into eight sections. Section one gives a brief introduction to the survey research. Section two discusses the physical locations of the enterprises and their characteristics. Section three describes the range of end products processed and marketed.

Section four discusses the quality control procedures adopted by small-scale producers/processors in Zimbabwe. Product preservation and presentation are addressed by examining the packaging requirements for both the processed product and raw material. Section five looks more closely at factors related to markets through which small-scale processors channel processed products and their access to consumer and market information. Section six considers the returns to small-scale processing activities on the part of producers, the nature and degree of enterprise growth currently being experienced within the small-scale food processing sector, and the degree of competition and linkages among enterprises. Finally section seven summarises and classifies the main constraints currently being experienced by small-scale enterprises within the horticultural sector, and the short- and long-term coping strategies being adopted to overcome such constraints.

2. Characteristics of the survey enterprises

2.1 Geophysical locations of the enterprises

2.1.1 Geophysical distribution of enterprises

Manicaland, Mashonaland East and Mashonaland West provinces are rated the largest producers of fruits and vegetables in Zimbabwe. A greater percentage of the agricultural area in the three provinces lies between Natural Regions II and IV indicating adequate rainfall and/or water and cool temperatures for horticultural production. Manicaland province stretches across Natural Regions I to IV. The 294 enterprises interviewed were located in Natural Regions I, II, III and IV. The regions, to some extent had some bearing on fruits and vegetables produced and products processed. Table 2.1.1 shows the distribution of vegetable drying/processing, fruit drying and jam producing enterprises by region.

Almost 84% of the enterprises produced dried vegetables, making dried vegetables the most popular products of the three. Dried fruit producers comprised 26% of the enterprises while jam producers made up 15%. Thus, almost 27% of the enterprises belonged to at least two of three categories of producers.

Table 2.1.1 Distribution of Enterprises of Processed Products across Agro-Ecological Regions

	Region I	Region II	Region III	Region IV	Total products
Dried vegetables	55	143	25	32	255
	21.6%	56.1%	9.8%	12.5%	84%
Jam	12	24	8	3	44
	25.5%	51%	17%	6.4%	13.3%
Dried fruit	12	36	12	18	78
	25.5%	51%	17.0%	7.4%	

Table 2.1.1 shows the distribution of enterprises across provincial locations. Manicaland province had the highest number of enterprises interviewed (38,4%) and Mashonaland West had the least (27%). A significant proportion of jam producers was from Manicaland province (42.6%) compared to that from the other two provinces indicating the province's comparative advantage in the production of a wide variety of fruits.

Table 2.1.2 Distribution of Enterprises of Processed Products across Provinces

Province	Dried fruit	Dried vegetables	Fruit jam	Total
Mashonaland East	46	83	12	96
	59.2%	32.9%	25.5%	33.8%
Mashonaland West	15	70	15	79
	19.7%	27.2%	31.9%	27.8%
Manicaland	17	100	20	109
	21.1%	39.8%	42.6%	38.4%
Total	78	254	47	284
	100%	100%	100%	100.0%

2.2 Experience in processing horticultural crops

2.2.1 Dried fruit and dried fruit confectionery

Processors of dried fruit and fruit confectionery alone comprised about 29% processors of dried fruit and confectioners. This showed that in 70% of cases where dried fruit and confectioneries were produced, they were produced together with dried vegetables and or fruit jam. Table 2.2.1 shows the number of years that the different enterprises had been processing dried fruits.

Table 2.2.1 Experience of Enterprises in Production of Dried Fruit and Dried Fruit Confectionery

Producers of:	Less than One	2 – 5 years	6 – 10 years	11 – 15 years	16 – 20 Years	Over 20 years	Total
Dried Fruit Only	4	13	3	1	2	-	23
	17.4%	56.6%	13.0%	4.3%	8.7		100%
Dried Fruit & Dried Vegetables	6	25	10	4	1	1	47
	12.8%	53.2%	21.3%	6.5%	2.1%	2.1%	100
Dried Fruit & Jam	-	1	1	-	1	1	4
		25%	25%		25%	2%5	100
All The Three	-	2	-	-	1	1	4
		50%			25%	25%	100
Aggregate	10	41	14	5	5	3	78
	12.8%	52.6%	17.9%	6.4%	6.4%	3.8%	100

Note: (-) = data not available

Most producers had been producing dried fruits for more than one calendar year, of which half of the producers had been doing for 2 to 5 years. Production of dried fruit was mostly being done in conjunction with dried vegetables.

2.2.2 Fruit jam/jelly/marmalade processing

Of the 47 enterprises producing jam, jelly and/or marmalade, 45 indicated the periods they had been producing the products. Table 2.2.2 shows the number of years the four categories of jam producers had been producing jam, jelly and or marmalade.

Table 2.2.2 Experience of Enterprises in Production of Fruit Jam, Dried Fruit and Dried Vegetables

Producers of:	Less than One	2 – 5 years	6 – 10 years	11 – 15 years	16 – 20 Years	Over 20 years	Total
Fruit Jam	2	7	-	-	1	4	14
	14.3%	50.0%			7.1%	28.6%	100%
Fruit jam & dried Vegetables	1	8	7	1	3	3	23
	4.3%	34.8%	30.4%	4.3%	13.0%	13.0%	100%
Fruit Jam & Dried Fruit	1	-	-	1	-	2	4
	25%			25%		50%	100%
All The Three	-	2	1	-	1	-	4
		50%	25%		25%		100%
Aggregate	4	17	8	2	5	9	45
	8.9%	37.8%	17.8%	4.4%	11.1%	20.0%	100%

More than 90% of the enterprises had been producing jam for more than 2 years with more than 30% producing for at least 16 years. Table 2.2.2 also shows that production of jam was done in conjunction with other products (particularly dried vegetables). In enterprises that produced jam and dried vegetables, production of jam had been occurring for at least two years in more than 95% of the enterprises.

2.2.3 Dried vegetables

Production of dried vegetables had been occurring for at least 2 years in 93% of the enterprises, and for at least 6 years in almost 70% of the enterprises. Table 2.2.3 shows the number of enterprises that had been producing dried vegetables for different periods.

Table 2.2.3 Number of Enterprises with Experience in Production of Dried Vegetables

Production Period	Enterprises
Less Than one year	6.4 %
2 – 5 Years	31.3 %
6 – 10 Years	22.9 %
11 – 15 Years	8.4 %
16 – 20 Years	7.2 %
Over 20 Years	23.7 %

Almost a quarter of the sample had been producing dried vegetables for over twenty years and more than half for 2 to 10 years. Analysis did not take into consideration production of dried vegetables in conjunction with other products on the understanding that of the three categories, dried vegetables was the most common product.

2.3 Background and reasons for participation in processing activities

2.4 Business location and availability of infrastructure

Most enterprises operated from residential homes, as businesses were family oriented. Only 70% operated from other premises separate from owners' homes. Table 3.4.1 shows the premises used for business under the four ownership categories.

Table 2.4.1 Number (%) of Premises Being Used By Businesses Under Different Ownership Categories

	Type of Premises Business Operate From			Total
	Home	Separate Premises (owned)	Separate Premises (rented)	
Family Business	89.9 %	1.4 %	1.4 %	92.7 %
Partnership	0.7 %	0.3 %	-	0.7 %
Cooperative	0.7 %	1.4 %	0.7 %	2.8 %
Processor Organization	1.7 %	-	1.7 %	3.5 %
Total	93.0 %	3.1 %	3.8 %	100 %

Note: (-) = data not available

While the owner's home was the physical address for the business, the household kitchen was in most cases the only structure usually used as the 'factory' for jam-making while drying was done in open spaces. Table 2.4.2 shows the least and most used production facilities in the home.

Table 2.4.2 Facilities Being Used for Processing

Facility	Enterprises using specified facilities
Open Air Structure	14.0 %
Household Kitchen	72.4 %
Purpose Built Facility in the Home	5.2 %
Other Purpose built Facility	5.2 %
Market Street Stall	1 %
Other	2.1 %

Business enterprises operating in the three provinces faced on average similar 'Cost Significant Different Distances' to urban markets given the distance between them and nearest towns or cities. Table 2.4.3 shows the average distance between enterprise and nearest town or city in kilometers. Distances between enterprises and towns or cities in Mashonaland West were shorter than in the other two provinces but the differences were low.

Table 2.4.3 Average Distances to Nearest Towns and Cities for Enterprises by Province

Province	Statistic	Distance to Nearest Town (km)	Distance to Nearest City (km)
Mashonaland East	Mean	36.8	156.1
	Std. Dev	34.4	54
Mashonaland West	Mean	35.1	132.8
	Std. Dev	29.3	47.6
Manicaland	Mean	42.4	153.2
	Std. Dev	33.4	46.2
Total	Mean	38.5	148.7
	Std. Dev	32.7	50.7

The variations (standard deviations) suggest that there was wide variability in the location of enterprises. This indicates vicinity to urban environments was not a very important factor in establishing a business. This could also be a good proxy indicator of road network infrastructure, which makes it easier to access urban markets. It may also mean that urban markets are not very important relative to local markets.

2.5 Training received in processing techniques

2.5.1 Training background for vegetable processing enterprises

Training in food processing techniques (particularly vegetable processing) was the most dominant received by the owners or managers of enterprises (Table 2.5.1). Training in areas associated with machinery repair and maintenance, business management and marketing were the least received by enterprises.

Table 2.5.1 Training Received by Enterprise Owners/Managers in Vegetable Drying

Training	Owners/Managers Trained
Jam/Marmalade processing	38.8 %
Fruit processing	30.9 %
Dried vegetable processing	60.0 %
Food processing techniques	21.3 %
Other vegetable fruit and techniques	23.8 %
Use processing techniques	9.2 %
Business management	14.0 %
Bookkeeping	11.5 %
Marketing	14.0 %
Quality control	11.0 %
Maintenance and repair of machinery	3.6 %
Other area	6.3 %

2.5.2 Training background for enterprises producing dried fruits and dried fruits confectioneries

Higher proportions of dried fruit confectioneries had at least received some training in food processing techniques as compared to those involved in drying of vegetables (Table 2.5.2). This partly explains why more than 60% of them were also involved in vegetable drying and production of jam.

Table 2.5.2 Training Received by Enterprise Owners/Managers in Fruit Drying

Training	Owners/Managers Trained
Jam / Marmalade processing	36.7 %
Dried fruit processing techniques	71.0 %
Other fruit and vegetable processing techniques	48.4 %
Dried vegetable processing techniques	77.4 %
Food processing techniques	36.7 %
Use of processing technology	9.7 %
Business management	16.1 %
Bookkeeping	16.1 %
Marketing	12.9 %
Quality control	16.1 %
Maintenance & repair of machinery	6.5 %
Other area	0 %

2.5.3 Training back ground for enterprises producing fruit jam, jelly and marmalade

Enterprise involved in jam production had higher chances of having received training in quality control, bookkeeping and marketing than others (Table 2.5.3).

Table 2.5.3 Training Received By Owners/Managers in Jam Producing Enterprises

Training	Owners/Managers Trained
Jam /Marmalade processing	57.6 %
Dried fruit processing techniques	27.3 %
Dried vegetables processing	54.6 %
Fruit and vegetable processing	30.3 %
Food processing	27.3 %
Use of processing technology	18.2 %
Business management	18.2 %
Bookkeeping	20.6 %
Marketing	26.5 %
Quality control	33.5 %
Maintenance and repair area	8.8 %
Other area	9.1 %

2.5.4 Sources of training

The most common source of training received by producers/processors was through friends and relatives (55,1%), government organizations (51.4%) and Non-Government Organizations (36.7%). Other sources of training included training institutes and other small-scale processors.

2.6 Business Registration and Start-Up Business Registration

Formal registration of small-scale horticultural producers/processors was uncommon. Only 5.7% of all the interviewed enterprises operated as formally registered businesses. The rest operated as unregistered entities. Table 2.6.1 shows the proportion of enterprises that were registered in the different categories of enterprise.

Table 2.6.1 Proportion of Businesses Operating as Registered Operations

Category of Processors	Registered
Dried vegetables	1.2 %
Dried fruit	9.1 %
Fruit jam	7.1 %
Dried vegetables and dried fruit	19.6 %
Dried vegetables and jam	8.3 %
Dried fruit and jam	0 %
All	0 %
Aggregate	5.7 %

The main reason behind operating as unregistered businesses was the size of the business, which in most cases were thought to be too small to warrant registration. Table 2.6.2 shows other reasons cited by some of the enterprises for not registering their businesses apart from the size of the enterprise.

Table 2.6.2 Number (%) of Unregistered Enterprises and the Reasons Given

Category of Processors	Business Too Small	Would be Taxable	Not Advantageous	Registration Process Complicated
Dried vegetables	80.6%	2.4%	12.7%	4.2%
Dried fruit	100%			
Fruit jam	92.3%	7.7%		
Dried vegetables & Dried fruit	86.5%	2.7%	10.8%	
Dried vegetables & jam	86.4%		4.5%	9.1%
Dried fruit & jam	100%			
All	75%		25%	
Aggregate	84.2%	2.3%	10.2%	3.4%

2.6.1 Payment of Taxes and Other Levies

Payment of taxes by the small-scale enterprises was rare. Only 4.4% paid taxes to central government, 4.1% paid some license fee and 28.9% paid local council (local government) fees. Thus, council fees were the most popularly paid levies mainly because local authorities are likely to be located to the enterprises hence know their income generating ventures than central government tax department officials.

3. Processing techniques, technology and end-products

3.1 Product range and markets

It is interesting to note that the more developed formal food processing enterprises or processor organisations have made significant attempts to broaden the range of fruits and vegetables targeted for processing. However, in contrary, small–scale producers/processors of horticultural crops in Zimbabwe that are largely informal tend to target a limited number of fruits and vegetables for processing. There were very few cases where individual enterprises processed both fruits and vegetables whereas the three studied provinces have got a rich endowment of broad range of fruits and vegetables suitable for processing into various products. For example, small-scale processors in Manicaland Province tend to concentrate on jam-making and vegetable drying and there is evidence of in-depth knowledge in these aspects. Their exposure to or knowledge of drying techniques for fruits in the province is limited. Processors in Mashonaland East and West provinces are largely involved in vegetable drying and have had exposure to or knowledge of fruit drying. In contrast to what was found in the case studies, the producer/processor survey revealed that a substantial number of enterprises have the knowledge and practice fruit drying in the Mashonaland provinces. Processing of fruit

jam, though highly dominant in the Nyanga District of Manicaland Province, is limited despite high levels of fruit production in the small-scale sector.

3.1.1 Jam/jelly/marmalade products

Of the 294 producers/processors interviewed, 47 were involved in fruit jam/jelly/marmalade processing with 52% taking jam making as an income generating activity. The majority of fruits processed were exotic varieties as shown in Table 3.1.1. The most popularly processed fruit was the lemon. The only indigenous fruit jam products recorded were from hacha, hute, marula and matamba. Fruit preserves that were noted in the case studies such as lemon curd, brandied peaches, apple jelly and peach preserve were not identified in the survey indicating that they were only popularly processed by a few well-up individuals.

Table 3.1.1 Types of fruits processed by small-scale enterprises for sale

Fruits processed	*Number of enterprises processing and selling*	*Primary end-product*
Apricot	1	Apricot jam
Gooseberry	1	Gooseberry jam
Guava	2	Guava jam
Hacha	1	Hacha jam
Hute	1	Hute jam
Lemon	8	Lemon jam /marmalade
Mango	2	Mango jam
Marula	1	Marula jam
Masawu	1	Masawu jam
Matamba	1	Matamba jam
Orange	2	Orange marmalade
Peache	1	Peach jam
Pineapple	3	Pineapple jam
Plum	3	Plum jam
Strawberry	1	Strawberry jam
Tomato	1	Tomato jam
Youngberry	1	Youngberry jam

3.1.2 Dried fruit products

A total of 78 processors/enterprises interviewed produced dried fruit products. However, a very limited number of processors have tried selling dried fruit products. The Murehwa Food Processors Association as identified in the case study continues to export small volumes of dried mango and papaya fruit, but has yet to establish firm contracts in the export markets. The solar-based dryers that are currently being promoted by some organisations have been well-adopted for vegetable drying but have been tried more on fruits. Fruit drying is still a novel activity among the small-scale food processors. Mrs Gabaza in Chipinge (identified in the case studies), is one of the few leading pioneers

currently involved in the activity for household consumption purposes, and has interest in adopting the activity for income-generation.

The types of dried fruits being processed and marketed by the processors/enterprises interviewed are shown in Table 3.1.2. It is interesting to note that unlike in jam processing, there are more indigenous fruits involved in the drying activities. A number of processors have experimented with drying different fruit varieties than jam-making.

Table 3.1.2. Types of fruits dried/processed by small-scale enterprises and end-products

Vegetables processed	*Frequency (n) of enterprises involved in production of products*	*Frequency (%) of enterprises involved in production of products*	*Dried primary end-product*
Apple	6	30.0	Dried apple
Banana	7	35.0	Dried banana
Guava	4	20.0	Dried guava
Hacha	7	35.0	Dried hacha
Lemon	4	20.0	Dried lemon
Mango	9	45.0	Dried mango
Masawu	13	65.0	Dried masawu
Matamba	2	10.0	Dried matamba
Matowe	1	5.0	Dried matowe
Mawuyu	4	20.0	Dried mawuyu
Mazhanje	1	5.0	Dried mazhanje
Orange	4	20.0	Dried orange
Pawpaw	6	30.0	Dried paw-paw
Pineapple	4	20.0	Dried pineapple
Tsubvu	2	10.0	Dried tsubvu

3.1.3 Dried vegetables

Quite a wide variety of vegetables were being produced by the processors/enterprises interviewed (a total of 255 of the 294 cases), the majority involving indigenous varieties. Choumoellier, tumeric ginger, cassava leaves, sweet potato leaves, Chinese cabbage, black jack (guku), shallots, spinach, cauliflower, green beans, chillies, green pepper, onion, peas, carrots and cowpea leaves were being dried by a few processors. Examples of indigenous varieties being processed included cowpea leaves (munyemba), pumpkin leaves (muboora and mutikiti), nyevhe (or runi, a traditional plant called 'wild cats'), mushroom, sweet potato leaves,tsongora, okra (nyandanda), derere (resembles okra), cassava leaves, musakupuka, gumanai and ngaka. Table 3.1.3 below shows the list of the dried vegetables and their end products. For a large number of processors however, such foodstuffs were essentially processed for household consumption requirements. Some marketed small quantities of the surpluses. In most cases, processors depended on their immediate local area for sales—typically during the dry season when fresh vegetables were scarce in the local area.

A few processors were involved in manufacturing other vegetables such as mushroom, cassava and carrot powder soups. Such products were identified in the retail shops especially in the tourist zones, of which the Halfway House is a typical example.

Table 3.1.3 Types of dried vegetables processed by small-scale enterprises

Vegetables processed	*Frequency (n) of enterprises involved in production of products*	*Frequency (%) of enterprises involved in production of products*	*Dried primary end-product*	*Secondary end-product*
Beans	41	13.9	Beans (13.9%)	Powder soup (0.3%)
Black jack	4	1.3	Black jack (1.3%)	
Butter nut	2	0.7	Butter-nut (0.7%)	
Cabbage	110	37.4	Cabbage (37.4 %)	
Carrot	5	1.7	Carrot slices (1.4 %)	Carrot powder (0.3 %)
Cauliflower	2	0.7	Cauliflower (0.7%)	
Cassava leaves	1	0.3	Cassava leaves (0.3%)	Cassava leaf powder (0.3%)
Chillies	4	1.4	Chillies (1.4%)	Chillie powder (0.3%)
Chinese Cabbage	1	0.3	Cabbage (0.3%)	
Choumoellier	1	0.3	Choumoellier (0.3%)	
Covo	95	32.3	Covo (32.3%)	
Cowpea leaves	6	1.9	Cowpea leaves (1.9%)	
Green beans	5	1.7	Beans (1.0%)	Beans powder (0.7%)
Green pepper	4	1.4	Green pepper (1.4%)	Green pepper powder (0.7%)
Mushroom	23	7.8	Mushroom (7.8%)	Mushroom soup (0.7%)
Nyevhe	45	15.5	Nyevhe (15.5%)	
Okra	55	18.7	Okra slices (18.7%)	Okra powder (4.1%)
Onion	9	3.1	Onion slices (3.1%)	Onion powder (0.3%)
Peas	3	1.0	Peas (1.0%)	
Pumpkin leaves	72	24.5	Pumpkin leaves (24.5%)	Pumpkin powder (0.7%)
Rape	99	33.7	Rape (33.7%)	
Rugare	44	15.0	Rugare (15.0%)	
Shallots	2	0.7	Shallots (0.7%)	
Spinach	2	0.7	Spinach (0.7%)	
Sweet potato leaves	1	0.3	Sweet potato leaves (0.3%)	
Tomatoes	33	11.1	Tomato slices (11.1%)	Tomato soup powder (5.4%)
Tsunga	59	20.0	Tsunga (20.0%)	
Tumeric ginger	1	0.3	Tumeric ginger (0.3%)	Tumeric ginger powder (0.3%)

3.2 By-products and wastage

The processors/enterprises interviewed suggested that jam processing and drying of fruits and vegetables involved little wastage. It however seems that not much attention had been given to the waste products since they are considered to be of no commercial value. The kind of waste handled included water, fruit and vegetable peelings, fruit pulp, fruit juices and seed. The processors displayed limited environmental consciousness as they at times disposed the waste products by burning and/or dumping into the rivers and other natural waterways. Other methods of waste disposal included feeding livestock; enrich the soil and collecting seed for planting. Table 3.2.1 shows the types of waste and the methods of disposal practised by the processors. The survey did not come across any situation where waste products were developed into useful by-products as a result of the processing activity carried out.

Table 3.2.1 Types of waste products and methods of disposal

Waste product	*Source of product*	*Method of disposal (% of cases)*
Waste water	Jam making, vegetable drying	Put into river or other water sources (11.7)
Fruit peelings	Jam making	Put in rubbish pit (79.1), used as animal feed (48.6), used as fertiliser (37.6), burn (3.1), collected by others (7.0), making compost (2.2)
Vegetable peelings	Vegetable drying	Place in open air (10.7),
Fruit pulp	Jam making	Put into river or other water sources (5.7)
Vegetable pulp	Vegetable drying	Put into river or other water sources
Fruit juice	Jam making	Into river or other water sources
Vegetable juice	Vegetable drying	Into river or other water sources
Fruit seed	Jam making	Selling (1.3)

4. Product characteristics and requirements

4.1 Packaging material in use at storage (Dried Vegetables).

The survey identified a wide variety of packaging materials in use within the vegetable drying sector. The most frequently used packaging material (by approximately 60% of the surveyed processors) were newspapers, glass bottles, plastic jars, regular and sealed plastic bags. The remaining 40% of the processors that did not use packaging material regularly suggests that there is a fairly high level of processing for domestic consumption.

Table 4.1.1 summarises the frequencies of using various packaging materials for storage of dried vegetables. Newspapers were not commonly used as packaging material for storage of dried vegetables as only 23% of the processors indicated using them. Glass and plastic jars were also not common packaging materials as about 83% of the respondents using glass jars infrequently and only 9% used plastic jars frequently. About 44% of the processors utilised regular plastic packaging frequently. Use of sealed plastic bags was also popular among about 36% respondents. About 89% of respondents used other

packaging options that included metal tins, buckets, transparent empty sacks, jute bags, jute sacks and other plastic packs (data not shown).

Table 4.1.1 Packaging material for dried vegetable storage purposes

	Frequency of use of packaging materials				
	Very infrequent	Infrequent	Neither frequent nor infrequent	Frequently	Very frequently
Newspaper	41.4 %	22.8 %	13 %	19.8 %	3.1 %
Regular plastic	27.1 %	19.3 %	7.2 %	28.3 %	18.1 %
Glass bottle	66.7 %	17 %	10.7 %	4.4 %	1.3 %
Plastic jar	68.3 %	14.9 %	8.1 %	6.2 %	2.5 %
Sealed plastic	33.1 %	19.4 %	11.9 %	19.4 %	16.3 %

4.2 Packaging Material used when marketing dried vegetables

Table 4.2.1 summarises use of different packaging options for marketing. Glass and plastic bottles were infrequently used as packaging materials for marketing dried vegetables. Plastic trays covered in cellophane were rarely used as well. Newspapers, that are normally associated with informal marketing of small-scale processed food products, were used by about 33% of the surveyed processors in marketing dried vegetables. This distribution may explain the observation made in the case studies reported to the effect that a large part of the trade is informal. The informal traders use cups and small plates to measure out produce when selling. The client provides the packaging. Use of regular plastic bags to market produce was frequently practiced by 48% of the respondents. The use of sealed plastic bags as an option was also very popular with about 40% claiming regular use.

Table 4.2.1 Usage levels of packaging options for marketing of dried vegetables

Packaging option	Frequency of use				
	Very infrequent	Infrequent	Neither frequent nor infrequent	Frequently	Very frequently
Newspapers	37 %	18.2 %	12.3 %	31.2 %	1.3 %
Glass bottle	53.2 %	21.7 %	9.2 %	3.9 %	2 %
Plastic bottle	69.5 %	16.5 %	7.9 %	4.6 %	1.3 %
Plastic tray covered with cellophane	65.8 %	19.1 %	7.9 %	5.3 %	2 %
Sealed plastic bag	33.6 %	12.1 %	14.1 %	19.5 %	20.1 %
Regular plastic bag	23.9 %	22.6 %	5.8 %	29.7 %	18.1 %

A range of other non-conventional packaging options was in use within this sector. These included bowls, cups, empty sacks and plates. Trade in dried vegetables is still largely informal which may explain limited use of conventional packaging and continued application of the non-conventional forms of packaging.

4.3 Quality Control in processing vegetables

Grade of vegetable

The first quality control stage applied by processors is that of selecting vegetables for processing. About 84% of those surveyed claimed they use grade 1 vegetables for processing. Grade 2 vegetables are used by at least 82% of the respondents. Only 33 % of the processors used grade 3 vegetables. These figures suggest that processors associate good vegetables with good end product quality. Table 4.3.1 gives a summary of frequency of using different vegetable grades.

Table 4.3.1 Frequency of using different grades of vegetables

Grade of vegetables	Very infrequent	Infrequent	Neither frequent nor infrequent	Frequently	Very frequently
1	4.2 %	1.6 %	9.9 %	34 %	50.3 %
2	2.7 %	3.8 %	11.4 %	69.6 %	12.5 %
3	26.8 %	16.6 %	23.6 %	27.4 %	5.7 %

Fresh vegetable examination

From the survey, an overwhelming 99% of the respondents examined their fresh produce physically prior to processing. However, about 92% of the processors did not carry out any further examination of the vegetables during and after processing. Physical examination is obviously the most reliable method in controlling the product quality.

Case studies conducted prior to the survey indicated that a large number of processors out-sourced their fresh vegetables. The survey indicates that about 89% of processors did not rely on the examination done by their suppliers.

About 36% of the respondents agreed that the use of recommended varieties of vegetables would enhance the quality of the end product. A small number, equivalent to about 4% of the respondents used other methods to examine the quality of fresh vegetables.

At least 81% of those surveyed believed their quality control methods were adequate suggesting that the level of training was satisfactory in this particular area. There was a general realization however that the quality of fresh vegetables had a bearing on the dried product quality. Of the respondents, about 64% also believed that the quality of other inputs had an impact on the final product quality (Table 4.3.2).

Table 4.3.2 Importance of quality of other inputs used for quality of end-product

Very unimportant	Unimportant	Neither important nor unimportant	Important	Very important
6.2 %	13 %	17.1 %	43.5 %	20.3 %

Almost 90% of those surveyed considered the processing method to be important in determining end product quality. However, a small number (3%) disagreed with this assertion.

Processing equipment

The respondents generally agreed that the quality and maintenance of processing equipment significantly affected end product quality. Of the respondents, about 60% believed that equipment quality was important whereas about 53% agreed that maintenance of equipment had a bearing on product quality.

Storage methods

The storage methods for dried vegetables, cleanliness of processing facility surroundings, and type of packaging were all considered important by at least 85% of those surveyed. Table 4.3.3 summarises the results. Cleanliness of packaging was also considered important.

Table 4.3.3 Perception rating by enterprises (%) of the importance of selected parameters in the processing and handling of fruit and vegetables

	Very unimportant	Unimportant	Neither important nor unimportant	Important	Very important
Importance of storage method	0.5%	1.1%	5.6%	31.6%	52.9%
Importance of cleanliness of surroundings	1%	2.6%	3.6%	41.7%	51%
Importance of type of packaging	1.1%	2.1%	11.2%	50.5%	35.1%
Importance of cleanliness of packaging	1.1%	0.5%	4.9%	43.7%	49.7%

It is important to note that most respondents had realized that producing a quality product is not by coincidence. The fact that most identified each and every activity in the processing chain as important in achieving end-product quality was in itself an achievement.

4.4 Control methods used to ensure quality in jam making

Grades of fruit

The first issue discussed with surveyed processors was the grade of fruit used to process jam. Of the respondents, about 80% used grade 1 fruit in jam-making, while 40% used grades 2 and 3. Of the fruit processors, about 53 % surveyed believed they had adequate control over the quality of fresh fruit used for jam making. About 47% of the respondents were satisfied with the methods of quality control. About 94% of the respondents

emphasised the importance of the quality of fresh fruit used in jam-making to produce good end-products. The quality of inputs was also rated important by 88 % of the respondents. The three sets of results under discussion suggest a high level of awareness among processors of the importance of using high quality inputs in jam making.

Processing equipment

The importance of the method of processing was recognized as important by 94 % of the processors. Quality of processing equipment as well as its maintenance were rated important by 76 and 70 % of the respondents respectively (Table 4.4.1). Again jam processors appeared to have a high level of awareness of issues that affect product quality.

Table 4.4.1 Perception rating by enterprises (%) of the importance of the cleanliness of equipment used in the processing of fruit and vegetables

	Very unimportant	Unimportant	Neither important nor unimportant	Important	Very important
Importance of method of processing			5.9%	64.7%	29.4%
Importance of quality of equipment		5.9%	17.6%	58.8%	17.6%
Importance of maintenance of equipment	17.6%	5.9%	5.9%	41.2%	29.4%

Storage of processed fruits

All respondents surveyed believed that the storage methods for dried fruit as well as cleanliness of the surrounding of the processing sites were important to achieve good quality products.

Packaging material

The type of packaging employed on jam products was deemed to have an effect on product quality. All respondents in the survey also indicated the importance of the cleanliness of packaging as critical.

Jam processors appeared to have a higher level of appreciation of the factors that influenced end-product quality in the processing chain than vegetable processors. The responses on issues/factors, which influenced end-product quality, were higher amongst jam processors.

4.5 Types of packaging used for storage for jam

Types of packaging material used for storage of jam
A high number (85%) of those surveyed used some form packaging to store jam. This compares well with about 23% for vegetable processors. None of the respondents used newspapers to store jam. Use of regular and sealed plastic jars for jam packaging was also very infrequent. A surprising feature from the survey was the 23% who claimed to use trays covered with cellophane to store jam. The case studies did not observe this practice. The survey suggests that 91% used 375 ml bottles to store jam. A smaller number (4%) used metal can jars for jam storage.

4.6 Types of packaging material for marketing fruit jam

Limited use of regular plastic bags (9%) was recorded for packaging of jam for marketing. Another surprising feature was the number of respondents who claimed to market jam wrapped in newspapers! Just how that is possible is open to debate. A high figure of 87% of those surveyed marketed jam in 375 ml bottles.

5. Marketing of the products

5.1 Marketing of Processed Horticultural Crops

In addition to traditional processing activities whose main objective is to process horticultural products for consumption purposes, more and more enterprises are being set up where a marketing component now features prominently. About 86% of producers/processors specializing in the processing of a single horticultural product also market the product. On the other hand, comparatively less producers/processors who are more diversified in their processing enterprises tended to market their products (Table 5.1.1).

Table 5.1.1 Proportion of producers/processors who market their products

Types of Processed Product	No. of Processors	No. of Marketers	Proportion
Fruit Jam	14	12	85.7 %
Dried Fruit	23	20	87.0 %
Dried Vegetables	178	162	91.0 %
Fruit Jam & Other Products	47	24	51.1 %
Dried Fruit & Other Products	78	59	75.6 %
Dried Vegetables & Other Products	255	225	88.2 %

The number of producers/processors that were involved in both processing and the marketing of the processed horticultural crops tended to follow a normal curve when classified according to years of experience in both the processing and the marketing of processed horticultural crop products. A few producers/processors had less than a year's

experience; between 11 – 15 years of experience, while the majority of producers/processors fell within the classifications of between 2 – 5 years and 6 – 10 years of experience. For those who did not market processed horticultural products, the reasons given ranged from the belief that markets for processed horticultural products were non-existent (67%), having difficulties finding a market for their products (33%), poor market prices (33%), long distance from the market (20%), insufficient volumes thereby rendering marketing as a non-economic activity (70%), and the failure to process products to the required standards (40%).

There were some variations in the quantities of the raw materials used and quantities of products marketed. These observations were not surprising. However, the discrepancies between the quantities of raw materials used and the final output offered to the market were disproportionately high. There were no clear explanations supporting such wastages. Reasonable assumptions suggest that the producers/processors were probably not aware of the level of wastages involved. Large wastages can be attributed to use of poor quality raw materials, resulting in low outputs. Table 5.1.2 shows typical quantities that were processed versus quantities that were actually marketed, using the example of dried vegetables.

Table 5.1.2 Average quantities of dried vegetables processed and marketed in a typical season

Unit of Measurement	Statistic	Quantities Processed	Quantities Sold
Kg	n	37	36
	Mean	375.6	340.5
	Std. Dev.	356.7	357.7
20 Litre Volume	n	74	72
	Mean	29.4	27.8
	Std. Dev.	39.1	38.3
50 Kg Volume	n	78	76
	Mean	714.2	591.5
	Std. Dev.	1706.3	1364.6

The large disparities in both the quantities that were processed and the quantities that were actually marketed was an indication of the heterogeneity among a seemingly homogenous group of small-scale producers/processors. The large standard deviations thus illustrate the large differences in the actual quantities that were processed and marketed between different producers and/or processors.

5.2 Marketing Channels

Results from the producer/processor formal survey confirmed earlier findings from the case studies that suggested that producers/processors used several channels to market their products; including both direct sales to consumers and sales through intermediaries such as retailers.

The majority of dried vegetable processors relied on sales within their local community, particularly to friends and neighbours. Some processors marketed dried vegetables in nearby high-density areas, from market stalls that they rented for a daily fee. In some cases sales were made to intermediaries, mainly other vendors. Jam processors also marketed their products through networks of friends, work colleagues, members of women's clubs or local community or church groups. A few jam processors made direct sales to consumers from kiosks attached to their small-scale commercial fruit orchards. A reasonable number of producers/processors, however, also made sales to institutional consumers, including boarding schools, orphanage homes, hospitals and hotels (Table 5.2.1).

Table 5.2.1 Marketing channels currently used by producers/processors

Type of Processed Product	Local Rural Area	Regional Town
Fruit Jam	78.6 %	28.6 %
Dried Fruit	73.9 %	26.1 %
Dried Vegetables	81.5 %	18.5 %
Dried Fruit & Jam	25.0 %	0.0 %
Dried Vegetables & Jam	87.5 %	33.3 %
Dried Vegetables & Fruit	72.3 %	29.8 %

The other marketing channels used by producers/processors included markets and residential areas within the city of Mutare (used by a paltry 3% of the producers/processors), markets and residential areas within the city of Harare (5%), Bulawayo and Gweru (1%), and South Africa and Botswana (0.6%). Data in Table 5.2.2 on marketing channels show similar trends.

Table 5.2.2 Marketing channels utilised by producers/processors about 5 years ago

Type of Processed Product	Local Rural Area	Regional Town
Fruit Jam	85.7 %	28.6 %
Dried Fruit	87.0 %	26.1 %
Dried Vegetables	87.6 %	19.7 %
Dried Fruit & Jam	-	0.0 %
Dried Vegetables & Jam	83.3 %	33.3 %
Dried Vegetables & Fruit	78.7 %	27.7 %

The data further show that other marketing channels used by producers/processors about 5 years ago included markets and residential areas within the city of Mutare (used by a paltry 2.0% of the producers/processors). Markets and residential areas within the city of Harare (6.1%), Bulawayo and Gweru (0.0%), and South Africa (0.3%) were also used.

5.3 Role of wholesalers and distributors in the marketing channels

The majority of the more market-oriented producers/processors relied on commission-based sales through intermediaries; largely established retail outlets, including supermarkets, kiosks and specialist shops. In most cases, retailers did not purchase the product wholesale, but charged a commission for sales made through their outlet. This helped in increasing the marketing channels accessible to producers/processors and keep marketing costs down. Furthermore, it enabled producers/processors to make their product more accessible to a wider group of consumers than would have been possible through personal networks (Table 5.3.1).

Table 5.3.1 Types of marketing channels utilised by producers/processors

Marketing Channel	Fruit Jam	Dried Fruit	Dried Vegetables	Dried Fruit and Jam	Dried Vegetables and Jam	Dried Vegetables and Dried Fruit
Direct to consumers	92	100	95	100	85	96
Local market	58	68	84	100	80	91
Hotel/Guesthouse	0	0	6	0	0	0
Street trader	33	15	15	0	15	7
Middlemen/Wholesalers/Distributors	0	5	4	0	15	7
Farm kiosk	17	0	3	3	5	4
Tuck shop	25	0	6	6	5	4
Supermarket	0	0	1	1	0	2
Grocer/general store	25	0	4	0	5	7
Speciality/tourist shop	8	0	1	0	5	2
Schools/colleges	17	10	6	6	5	9
Other outlets	9	0	4	4	0	0

However, direct sales to consumers remained the single largest marketing channel used by producers/processors. Again, there appeared to be no significant difference in the numbers and proportions of producers/processors who utilised various marketing channels about 5 years ago or when producers/processors embarked on their enterprises. These findings were also confirmed by data on the share of product that is being marketed through various channels (Table 5.3.2).

Table 5.3.2 Share of product currently marketed through various channels

Marketing Channel	<20%	21-40 %	41-60 %	61-80 %	81-100%
Direct to consumers	17.4	10.8	12.9	23.7	35.3
Local market	37.6	19.5	21.4	17.6	0.5
Hotel/Guesthouse	7.7	7.7	10.5	0.0	0.0
Street trader	45.3	28.1	21.4	3.1	7.8
*Middlemen	35.1	8.1	5.4	2.7	13.5
Farm kiosk	46.7	33.3	0.0	0.0	0.0
Tuck shop	18.0	14.0	2.0	0.0	0.0
Supermarket	6.7	13.3	6.7	0.0	0.0
Grocer/general store	15.8	68.4	0.0	0.0	0.0
Speciality/tourist shop	7.7	7.7	0.0	0.0	0.0
Schools/colleges	14.3	21.4	21.4	17.9	0.0
Other outlets	21.1	10.5	5.3	5.3	0.0

*Includes wholesalers, Distribution

5.4 Market information: consumers, demand and prices

According to the formal survey results, processed horticultural products are targeted at and purchased by consumers in different social status groups *viz*: the low-, middle- and high-income groups. Table 5.4.1 shows the percentages of consumers in different income groups who frequently purchase various processed horticultural products.

Table 5.4.1 Consumption demand patterns of processed horticultural products between different income groups (%)

Processed Product	n	Low-Income	Middle-Income	High-Income
Fruit Jam	10	70.0	90.0	30.0
Dried Fruit	14	76.6	92.9	35.7
Dried Vegetables	133	81.2	90.2	32.3
Dried Fruit & Jam	2	100.0	100.0	50.0
Dried Vegetables & Jam	19	89.5	89.5	31.6
Dried Vegetables & Fruit	37	83.8	91.9	40.5

The results presented above tend to be consistent with the results of the consumer survey which showed that low-income groups tend to consume the more traditional forms of processed food products, whilst higher-income groups tend to consumer more of the exotic processed food products. The relatively low numbers for the high-income group are also consistent with earlier findings, which established that the bulk of processed products are sold locally, while low quantities of products are sold in the cities to consumers with more purchasing power.

Different pricing mechanisms have been adopted by different producers/processors. Such pricing mechanisms include the selling of processed products at the same price as their competitors, selling products at prices that are below competitors' prices, and using the "mark-up" strategy where a factored percentage is added to production costs (Table 5.4.2).

Table 5.4.2 Proportions (%) of producers/processors using different pricing strategies

Type of Processed Product	% Processors same as competitors	Selling at Prices Below Competitors	Add % to Production Costs	% Total
Fruit Jam	28.6	57.1	14.3	100.0
Dried Fruit	40.0	60.0	0.0	100.0
Dried Vegetables	50.5	43.0	6.5	100.0
Dried Fruit & Jam	0.0	100.0	0.0	100.0
Dried Vegetables & Jam	31.3	50.0	18.7	100.0
Dried Vegetables & Fruit	57.7	30.8	11.5	100.0

Based on the results in Table 5.4.2, the majority of producers/processors use the strategy of selling their own products at prices below those of their competitors.

5.5 Knowledge of consumer requirements and factors influencing consumer demand

Despite the complexities and barriers to the flow of information, particularly in areas where the majority of small-scale producers/processors operate, a commendable proportion of the producers/processors were either well-informed or very-well informed about their own market niches. About 70% of the producers/processors who specialised in dried vegetables were either well-informed or very-well informed about consumer requirements. The statistics are 81.3% for dried fruits and 70.0% for fruit jam. Customers, extension agents, and friends and relatives were largely ranked as either important or very important sources of information on the market of products processed by small-scale producers/processors. On the other hand, the radio, television, newspapers, other businesses, suppliers, wholesalers, and retail outlets and shops are perceived as playing a less important role in disseminating market information on products processed by small-scale producers/processors.

The information on market requirements has enabled small-scale producers/processors to be knowledgeable about the relative importance of various factors in influencing and ultimately determining consumer demand for particular processed food products. Determinant factors that were considered included the issue of prices, shelf life, the consistency of product quality, safety of the product, quality of packaging material used, labelling of product, the overall appearance of the product, value for money, the ability to buy product in varying quantities, availability of product throughout the year, nutritional value, and whether or not the product exhibited the Standards Association of Zimbabwe (SAZ) mark. On the other hand, classifications were based on whether factors were very unimportant, unimportant, neither important nor unimportant, important, and very important (Table 5.5.1).

As indicated in the Table 5.5.1, issues relating to the prices, the consistency of product quality, safety of the product, quality of packaging material used, the overall appearance of the product, the ability to purchase product in varying quantities, and the availability of product throughout the year were rated very important. On the other hand, issues related to shelf life and nutritional value were classified as being relatively important, while labelling of the product, value for money and whether or not the product exhibited the SAZ stamp were considered as being of very little importance in their influence of consumer demand.

According to survey results, about 17% of the producers/processors are of the opinion that the consumer demand for products have not changed compared to the situation 5 years ago or since they embarked on their processing enterprises, about 70 % believe there has been an increase in the demand for their products, while the remaining about 14% said they have witnessed a decline in the demand for their products (n = 223).

Table 5.5.1 Responses from respondents to relative importance of various determinants/factors of consumer demand

Factor	% Very Unimportant	% Unimportant	% Neither Important nor Unimportant	% Important	%Very important
Price	0.5	1.8	1.8	24.3	71.6
Shelf life	13.6	9.0	20.8	40.3	16.3
Consistent product quality	3.2	9.5	3.2	67.9	16.3
Safety of product	3.2	0.0	17.4	30.7	48.6
Quality of packaging	4.6	19.7	4.1	52.8	18.8
Labelling of product	23.4	32.6	5.0	20.6	18.3
Overall appearance of product	9.8	5.4	12.1	42.9	29.9
Value for money	18.1	15.7	27.5	27.9	10.8
Ability to buy in varying quantities	0.5	1.8	12.7	76.5	8.6
Available throughout the year	2.7	6.3	15.4	47.5	28.1
Nutritional value	3.6	1.8	31.2	49.3	14.0
Exhibits the SAZ Mark	43.0	13.1	6.3	32.1	5.4

Factors that were identified and rated as either important or very important in resulted in an increase of consumer demand for processed food products include increased rural and urban populations as well as a change in consumer incomes. Another factor was that some consumers were now switching to lower priced products due to economic hardships and the improvement in the quality of processed products that has occurred over the years. On the other hand, factors such as an increase in the level of competition and an increase in the price of complementary products (e.g. in the case of bread and fruit jam) have been strongly attributed to the decline in consumer demand.

6. Estimation of Potential Returns and Characteristics of Enterprise Growth

6.1 Returns to small-scale horticultural processing

The "returns" *per se* were not an issue of focus in the producer/processor formal survey given the general focus of formal surveys. This section, therefore, highlights the findings from the case studies. The case studies established that returns to small-scale horticultural processing differed significantly by product (e.g. dried vegetables, dried fruit or jam), relative resource endowment and entrepreneurial skills of the processor involved, the marketing strategy was adopted, and furthermore by the socio-economic context in which the processor operated. In order to give some indication of the potential importance of value-added processing for improved income generation among small-scale horticultural farmers, this section highlights the returns to processing among a few of the processors/enterprises visited.

Dried vegetables were normally sold on a per cash basis. The profit margins ranged from 5.9% for dried cabbage to 36.7% for dried cowpea leaves. In another case, a producer/processor specialised in drying field vegetables for export to Botswana[1]. Profit margins in this case ranged from a loss of 13% for dried vegetables purchased in Bulawayo for resale in Botswana, and a profit of 4% for dried vegetables sold from own production. Profit margins from fruit processing enterprises portrayed a somewhat similar differential scale depending on the sources of the raw materials, processing mix and the commercial orientation of the producer/processor. Profit margins in fruit processing ranged from a net loss of less than 1% (for Rusitu Jam Processors) to a profit of about 71% (for Mrs. Masaya's enterprises).

6.2 Enterprise Growth and Performance

A number of enterprises have witnessed various developments which also entails that there has been a number of changes since their inception. Highlighted changes included changes in the types/varieties of crops processed, the range of processed products, the use of different processing techniques, the use of different processing technologies, marketing through different marketing channels, and targeting different groups of consumers. Table 6.2.1 specifies the results for different processed products.

Table 6.2.1 Number (%) of enterprises that have undergone changes in respect of different processed products

Identified Changes	Fruit jam	Dried fruit	Dried vegetables	Dried fruit & jam	Dried vegetables and jam	Dried vegetables and fruit
Types/varieties of crops	30.8 %	28.6 %	33.5 %	25.0 %	33.3 %	22.0 %
Range of processed products	30.8 %	28.6 %	35.9 %	50.0 %	38.1 %	34.1 %
Change in processing techniques	23.1 %	19.0 %	24.6 %	50.0 %	14.3 %	29.3 %
Change in processing technologies	30.8 %	38.1 %	32.3 %	75.0 %	19.0 %	34.1 %
Change in marketing channels	15.4 %	0.0 %	10.2 %	0.0 %	4.8 %	19.5 %
Change in targeted consumers	23.1 %	23.8 %	15.6 %	50.0 %	23.8 %	17.1 %

The results in Table 6.2.1 suggest that the majority of enterprises that recorded changes were dried fruit and jam processing enterprises (proportionately) and dried vegetable processing enterprises (based on the number of enterprises were changes where

[1] Garden vegetables refer to those vegetables that have to be planted annually by the producer. On the other hand, field vegetables grow freely in the fields, but are not wild *per se*. Although some field vegetables might be planted in the initial year, these plants germinate and grow naturally in subsequent seasons.

recorded). A number of factors were identified as having been instrumental in bringing about these positive developments. Identified factors included the abundance of fresh produce on the market, depressed market prices for fresh produce, product losses due to market failure; the availability of processing knowledge, the availability of processing technology and an increase in the demand for processed products that is coupled by an improved consumer awareness of processed products.

Small-scale producers/processors were also asked to self-evaluate their own enterprises in order to determine the performance of these enterprises relative to selected criteria. Table 6.2.2 presents the results of the self-evaluations, highlighting the percentage of producers/processors who were satisfied with recommended standards.

Table 6.2.2 Enterprises meeting recommended standards

Recommended Standards	% of Enterprises
Achieving set shelf-life for processed products	52.0
Zero chemical application in fruit/vegetable production	40.5
Achieving specified quality and consistency	36.8
Use of specified packaging material	29.7
Meeting labelling requirements	26.0
Use of specified facilities and technologies	23.8
Achieving specified food safety (SAZ) requirements	21.9

6.3 Competition and Linkages

Compared to about 5 years ago or when most producers/processors embarked on their processing enterprises, 54.5% of the producers/processors were of the opinion that there had been no change in the level of competition, 39.7% believed there had been an increase in the level of competition, while the remaining (5.7%) had witnessed a decline in the level of competition (n = 127). Factors that were considered as determinants of the level of competition in the sector included the availability of inputs, availability of alternative sources of income, level of demand for products, and the availability of appropriate processing technology. Again, the classifications were based on whether factors were very unimportant through to very important (Table 6.3.1).

Table 6.3.1 Relative importance of various determinants of increase/decrease in the level of competition in the sector

Factors	% Very Unimportant	% Unimportant	%Neither Important nor Unimportant	% Important	%Very important
Availability of inputs	0.0	3.8	0.0	57.7	38.5
Alternative sources of income	1.0	19.2	8.7		63.5
Level of demand for products	7.7	1.0	3.8	54.8	32.7
Appropriate processing technology	8.7	20.4	18.4	37.9	14.6

As shown in Table 6.3.1, the availability of inputs and the level of demand for products were rated as being overall very important. On the other hand, the availability of alternative sources of income was classified as being relatively important, while the availability of appropriate processing technology was considered as being of little importance in determining the level of competition in the sector. Processing businesses of a similar size were identified as the main competitors by about 88% of the producers/processors, while large-scale businesses were identified as the main competitors by the remaining producers/processors (12 %). In response to increased competition, about 99% of the producers had improved the quality of their products, about 59% had diversified by increasing the range of processed products, about 31% established new markets for their products, and about 21% had lowered product prices.

Formal and informal business linkages were important for the growth and development of an enterprise. A total of 108 producers/processors out of 167 of the informants who responded to the question (representing about 64%) had established links with other small-scale processors of the same product. These links were established for various reasons (Table 6.3.2).

Table 6.3.2 Reasons and purpose of established links

Reasons and Purpose	% of Producers/ Processors
Sharing ideas and information	96.6%
Joint marketing of products	31.7%
Joint purchase of inputs	27.4%
Sharing transport	21.2%
Operating a savings scheme	20.2%
Sharing machinery/tools	12.0%
Joint purchasing of packaging material	7.2%

Further probing revealed that about 76% of the producers/processors were involved in informal linkages, about 44% had formal associations, and under 2% of the producers/processors had contracts with other small-scale processors of the same product. Reported links included links with farmers, traders, supermarkets, and institutions (e.g. hotels, schools and colleges). No co-operative links were identified by the study within the small-scale horticultural processing sector.

6.4 Credit and Capital

A variety of sources were used in coming up with seed capital for the establishment of the processing enterprises. However, the majority of these small-scale processing enterprises were set up using individual producers/processors' own personal savings (Table 6.4.1).

Table 6.4.1 Sources of seed capital

Sources of 'Seed' (Initial) Capital	% of Producers/ Processors
Use of personal savings	87.6
Financial support from NGO or other programmes	22.3
Borrowed capital from friend/relative	6.9
Financed from previous job	1.8
Sold own assets	0.4

Commercial banks, other formal financial institutions and credit facilities were surprisingly not mentioned as sources of start-up capital. A total of 38 producers/processors out of 170 informants who responded to the question (representing about 26%) had attempted to get loans from such formal sources of credit. Of these, about 69% claimed that they failed to get loans because of ignorance on sources of credit; about 41% cited the prohibitively high interest rates as an obstacle to them getting a loan; about 36% failed in their attempts at acquiring credit due to lack of collateral security; while about 29% failed to obtain credit because there were no credit institutions nearby. Only 43% of the producers/processors reported a healthy status *vis à vis* of their own financial resources, while the remaining 57% reported that they had just enough to cover their basic requirements or had inadequate financial resources. It is therefore evident that there is need to develop policy framework for access to credit facilities.

7. Constraints and Coping Strategies

7.1 Summary of Constraints Faced by Small-Scale Producers/Processors

One of the major objectives of the formal producer/processor questionnaire survey was to determine and assess the constraints to the effective production and marketing of processed horticultural products. Various constraints were identified by small-scale producers/processors and rated according to the severity of the problem. Table 7.1.1 shows the proportion of producers/processors who perceived different input-related constraints as either significant or very significant.

Table 7.1.1 The severity of input-related constraints as rated by producers/processors

Identified Constraint	% of Producers/ Processors
Unavailability of sufficient inputs	48.3
Prohibitively high costs of inputs	38.5
Inadequate water supplies	37.5
Difficulties in transporting inputs	29.9
Failure to receive inputs on time	18.5
Poor quality of inputs	16.3
Large minimum orders requested by packaging material suppliers	11.9

The study also solicited for various responses that are used as coping strategies by the producers/processors. As coping strategies, the producers/processors applied organic material/manure or other locally available inputs; borrowed inputs from friends and relatives; borrowed from neighbours; purchased inputs in groups; purchased inputs from other producers/processors; purchased inputs from friends and relatives; used retained seed, acquired inputs in time; produced own seed using seed gardens, reduced the acreage; and used savings clubs.

Table 7.1.2 Coping strategies used by producers/processors

Coping Strategies	% of Producers/ Processors
Apply organic material or use of locally available inputs	24.1
Borrow inputs from friends and relatives	17.2
Purchase inputs in groups	5.2
Purchase inputs from other producers/processors	13.8
Use retained seed	1.7
Getting inputs in time	6.9
Produce own seed using seed gardens	13.8
Reducing the hectarage	1.7
Use of savings clubs	5.2
Other coping strategies	10.3

A number of other constraints were also identified through the use of complementary research activities. Identified constraints include:-

i. Lack of primary resources (land and water resources), and capital inputs.
ii. Inadequate support from public departments and other organisations in terms of training (e.g. farm operation/production, processing, handling and marketing).
iii. Unavailability and use of 'inappropriate' technology: processing techniques, handling of raw materials.
iv. Lack of appropriate storage facilities, e.g. cold storage for raw materials, semi-processed products and processed products.
v. Access to suitable packaging materials (e.g. glass bottles, plastic bottles, polythene bags, etc.) and packaging sizes (small, medium, large), and/or use of recycled packaging material (e.g. glass jars and plastics).
vi. Problems of hygiene and cleaning of recycled packaging materials.
vii. Lack of access to credit facilities.
viii. Declining tourism industry (domestic and foreign tourists) and the impact of declining tourism industry and deteriorating economy on product sales.
ix. Lack of available knowledge of food products produced by small-scale producers.
x. Lack of information about small-scale food processors.
xi. Inability to provide varying quantities of products and inconsistent supply of products throughout the year.
xii. Poor shelf life of products.
xiii. Inability to comply with food safety standards and regulations.
xiv. Limited access to viable marketing channels.
xv. Inability to use acceptable food labelling

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