

Technical Report

Commercialization of Sweetpotato based silage: can women entrepreneurs compete favorably?

Sarah Mayanja and Netsayi Mudege



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Acknowledgements

This report is based on a gender study conducted in two intervention districts of the RTB-ENDURE Sweetpotato sub-project (i.e. Kamuli and Masaka) in December 2016. We would like to thank the male and female silage entrepreneur (both upcoming and existing), sweetpotato farmers and pig farmers who participated in the study. We believe that this report captures their voices, interests and hopes and we hope that the findings will be a significant contribution in commercializing sweetpotato sweetpotato vine production interventions in Uganda.

Notes on contributors

Sarah Mayanja, a holder of an MSc in agroecology, is a research associate with CIP. She has experience in agricultural trade development, agricultural marketing, gender-responsive value chain development and postharvest research.

Netsayi Mudege

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Contents

Acknowledgements	2
Notes on contributors.....	2
Contents	iii
Acronyms	iv
Executive summary	5
1. Introduction	6
1.1. Background	7
1.1. Methodology.....	7
2.1. Prospects of the sweetpotato silage enterprise	8
2.2. Requirements for running the silage enterprise.....	10
2.2.1. Access to and control over business production resources	11
2.3. Market awareness about silage and its utilization	13
2.4. Target clients and marketing	14
2.5. Opportunities and strategies for expanding market outreach	15
2.6. Challenges and proposed solutions	17
2.7. The consumer perspective.....	20
3. Discussion.....	23
3.1 Prospect for women entrepreneur to competitively engage in the SPS business	23
3.3 Overcoming challenges and gender based constraints	23
3.4 Consolidating existing and exploring new markets	23
4. Conclusions	24
References	25

Acronyms

OFSP	orange fleshed sweetpotato
SACCOs	savings and credit cooperative societies
SPS	sweetpotato silage
var.	variety
WFSP	white-fleshed sweetpotato
YFSP	yellow-fleshed sweetpotato

Executive summary

Sweetpotato silage production has been proven to be a viable business, which women and men entrepreneurs can engage in, more so considering that women are already engaged in sweetpotato root production and piggery. Aside from addressing the post-harvest losses incurred from sweetpotato by-products, silage would also address the most economical challenge livestock farmers face, while also generating additional income for entrepreneurs.

While a few women silage entrepreneurs had already been identified, in the RTB-ENDURE project it was not clear whether they could operate effectively and compete with male entrepreneurs successfully. Also, it was not clear whether other prospective women entrepreneurs could take up this business opportunity.

This study sought to establish if there were gender based differences in the set up and operation of silage businesses, and whether these had an effect on the competitiveness of the business for men and women. Further, the study also sought to establish if there was an optimal client base with regards to projected demand and how entrepreneurs could position themselves to address the demand.

The study was conducted in Masaka and Kamuli districts specifically in areas where the RTB-ENDURE project was implemented. A total of 215 individuals were interviewed.

Results indicated that the general perception was that SPS was a viable undertaking amongst men and women and that women entrepreneurs could engage as competitively as men. Women had fair access to productive resource and could also control how these resources were used. However, women faced general and gender specific challenges that could curtail their successful engagement in this business, some of which included unequal access to benefits accruing from the sale of SPS, drudgery and immobility.

This thus calls for concerted efforts to address these challenges in a bid to ensure that women remain viable in this business. This study has shown that though breaking into a male dominated business may be difficult for women entrepreneurs, they never the less can be competitive. However, they will need support to address technical challenges and gender based constraints as identified in Section 2 of this report. Women entrepreneurs that are part of silage groups may have to adopt slightly different strategies to ensure that they are visible in leadership, co-ordination and management of the enterprise. This may require that they undertake capacity development in the highlighted fields in addition to acquiring more technical and business development knowledge.

Women sole entrepreneurs may face a stiffer challenge in operating their businesses, but fortunately they are equipped with business plans and also exhibited a formidable force of innovativeness. Both types of entrepreneurs need to be linked to support agencies such as BDS providers, women development agencies and similar project initiatives to keep this noble business afloat.

1. Introduction

Sweetpotato (*Ipomea batatas*) is an important food and cash crop in people's livelihood in Uganda, especially for the rural based farmers. Uganda currently is the third largest sweetpotato producer in Africa after Tanzania and Nigeria (FAO 2015). The crop plays a key role in provision in rural diets, and is the third most important staple providing 85 kcal (Mwanga and Ssemakula; 2011). The Orange Fleshed Sweetpotato (OFSP) varieties play contain beta carotene-the precursor of Vitamin A; and have been proven to have an ample supply to cater for the needs of children aged five years and below (Low et al.; 2007). Sweetpotato is also predominantly a 'woman's crop'. While this eases its integration into farming systems, it is also partly responsible for its neglect at household, community and national level. In the recent past, sweetpotato was classified as an orphan crop and has thus not received due attention from national research and development initiatives. Yet, as noted by Gibson et al (2010), the crop is known to bridge the hunger gap due to its short maturity period especially in areas that experience long drought seasons.

Aside from food security, sweetpotato residues are increasingly being used by livestock farmers as feed, which has been identified as the most challenging constraint in this sector (Dione et al, 2015). In the piggery sub-sector for example, sweetpotato vines and non-marketable roots are considered to be an important feed resource. However, the vines and roots are highly perishable and farmers can only use but for a short period of time. This becomes a limiting issue to women and children who are responsible for sourcing and feeding animals (Mudege et al, 2016; Kyalo et al, 2014). In periods of acute shortage; women piggery farmers resort to swill and various types of grasses as a source of feed; and at times are forced to reduce their herd size as a way to cope with the dire situation. In such cases, they are forced to greatly compromise on the quantities fed thus leading to poor quality animals; or to sell off their animals hurriedly below the market prices. This leads to a loss in income and investment growth; yet small animals have been identified as an enterprise which women and other vulnerable groups can engage in profitably (Kabirizi et al. 2014).

To address this challenge, post-harvest and value chain research initiatives have been done with an aim of improving utilization of sweetpotato residues through ensiling thus increasing the shelf life while also providing a nutritious animal feed (Lukuyu et al. 2014). Research efforts have also focused on identifying dual purpose varieties which can provide optimal amounts of food and fodder (Andrade et al.; 2015; Kyalo et al.; 2016). In addition, Mutetika et al. (2017) have shown that sweetpotato silage can meet the nutritional needs of growing pigs when supplemented with a maize-soy diet at a rate of 60:40. Building on these results, production of sweetpotato based silage has been actively promoted under the RTB-ENDURE Project (2014-2017) in Masaka and Kamuli districts, two of the highest pig producing areas in Uganda (Ouma et al., 2015).

During the project, 16 pilot farmers actively engaged in production of both dual sweetpotato varieties, silage production and on-farm feeding trials. The farmers realized the benefit of silage and not only promoted the technology amongst neighbouring farmers, but also commenced on its commercialization. A willingness to pay study (Arsindu et al, 2017) further revealed that livestock farmers were willing to pay above the breakeven price. To further propel the commercialization drive, the project supported silage entrepreneurs to develop business plans (basing on four business models) and three silage centers were established. While a few women entrepreneurs had already been identified, it was not clear whether they could operate and compete with male entrepreneurs successfully, and also whether other prospective women entrepreneurs could take up this business opportunity. This study sought to establish if there were gender based differences in the set up and operation of silage businesses, and whether these had an effect on their competitiveness. Further, the study also sought to establish if there was an optimal client base with regards

to projected demand and how entrepreneurs could position themselves to address the demand. This would inform the strategy to support women silage entrepreneurs to effectively compete in the market.

1.1. Background

'Improving the Utilization of Sweetpotato and other Root and Tuber Crops Residues for Pig Feeds' was one of the four sub-projects under the EU/IFAD funded project 'Expanding Utilization of RTB and Reducing Their Postharvest Losses' (RTB-ENDURE). The sweetpotato subcomponent of RTB-ENDURE was implemented by the CIP-led CGIAR Research Program on Roots, Tubers and Bananas (RTB) in collaboration with the International Livestock Research Institute (ILRI), NARO, VEDCO, CHAIN-Uganda, Makerere University, Uganda Martyrs University, Iowa State University and Pig Production and Marketing Ltd (PPM). The sweetpotato sub-project sought to:

- i) Investigate options for sweetpotato silage making and supplementation;
- ii) Identify models for proper organization of value chain actors for production, conservation and marketing of sweetpotato-based feeds;
- iii) Strengthen the existing linkages between pig farmers and sweetpotato traders; and
- iv) Build business capacity for profitable silage making and pig raising.

To improve delivery of the project objectives, a gender strategy was developed following a landscape study. The strategy which was reviewed and validated by the project implementers and beneficiaries aimed to ensure that both women and men benefit from the project interventions. As a result, both women and men were directly targeted and efforts made to ensure that they actively engaged in and benefited from the project activities.

To achieve objective (iv) above, the project devised four silage making business models i.e. (i) individual entrepreneurs producing silage for sale (ii) group based entrepreneurs (iii) institutional based entrepreneurs – evolving into silage centers offering a package of services and (iv) youth entrepreneurs. The models were popularized amongst potential entrepreneurs including pilot farmers and farmer groups which were exposed to the technology. Close to 16 silage entrepreneurs were identified and these were trained and supported to develop business plans. Towards the closure of the project, some entrepreneurs (both group and individual) were showing more promise than others. However, most of these were dominated by men. This prompted the need to understand how the existing women entrepreneurs were faring in the business as compared to men with regards to access to productive inputs, skills-set, technology, machinery & equipment and the potential client base. This would enable understanding of the major constraints which may impede engagement in silage making as a business. Sweetpotato silage production was proven to be a viable business, and considering that women are already engaged in sweetpotato root production and piggery, silage production would be a good integration.

This study was thus undertaken to obtain a better understanding of the performance of women and men silage entrepreneurs with a view identifying the major gender based impediments. The findings would form the basis/recommendations for crafting a gender responsive business strategy aimed at improving women's participation and competitiveness in this new business venture.

1.1. Methodology

A survey was done targeting existing silage entrepreneurs and quantitative data were collected using a semi-structured tool. Four Focus Group Discussions (FGD)s were also

conducted with the men and women silage entrepreneurs. The clients/consumer study adopted the rapid market appraisal (RMA) approach (Bernet et al., 2006), which allows the rapid assessment of a specific market to determine the commercial potential of a new or existing product or service. This approach was considered appropriate for this study because in many areas sweetpotato silage was a new type of feed and had not been fully commercialized. The study was conducted in Masaka and Kamuli districts specifically in areas where the RTB-ENDURE project was implemented. A total of 215 individuals were interviewed, as detailed in Table 1.

Table 1: Study participants in Kamuli and Masaka districts in December 2016

Participant category	Men	Women	Total
Entrepreneurs	14	5	19
Potential Consumers	52	124	176
FGDs	12	8	20
Total			215

Two quantitative tools were designed and used to collect data from traders and consumers. A checklist type of a tool with question guides was used for the key informant interviews.

Sweetpotato silage entrepreneurs study participants were recruited purposively using project implementers and who assisted in identifying them. Most of the consumer interviewees were recruited with the assistance of community leaders in a randomized manner. All the interviewees were informed that participation in the study was voluntary and that declining to participate would not result in any penalty.

Data were analyzed using Stata version 13.

2. Results

2.1. Prospects of the sweetpotato silage enterprise

Male and female entrepreneurs revealed that the sweetpotato silage enterprise is likely to be a viable enterprise basing on their projections in their recently developed business plans. In addition, male farmers in Masaka shared that many farmers in the district rear pigs as a commercial enterprise. However, the greatest challenge they face is accessing feed, as elaborated below:

The price of bran fluctuates a lot yet it is what most farmers depend on to feed their pigs. At times, it is so high and becomes unfordable. Also, the farmers find it hard to access feeds for the animals in drought. We (as farmers) have also tried feeding the animals with brewers' waste but it was very expensive because it comes from far. Participants, Men FGD Masaka

I know that we as Ugandans are mostly livestock farmers however we face challenges of sourcing animal feeds especially in the dry season. We also lose our vines during the dry season. Yet when we feed raw vines to young piglets they get diarrhoea. So, silage is our viable business (Participant, Women FGD Kamuli)

Entrepreneurs were thus positive that sweetpotato silage will have a market, because not only is it easy to make, it is also easy to pack and easy to sell because it is a cheaper option which the farmers need. They further shared the raw materials are easy to get though they are seasonal – so in times of plenty one can make silage, store and sell in dry periods. A male participant shared that he was excited when he sold some of the silage he initially made (with an intention to feed it to his own animals), which proved to him that there is a market. Additionally, they noted that the price of SPS was fairly stable as compared to that of bran.

Many peri-urban pig farmers bought their feeds from the market with a high number depending on maize bran. An entrepreneur who was based in a peri-urban area had this to share:

My business is based in a peri-urban area where many livestock farmers are also based. However, they find it hard to access feeds, so this is an opportunity to bring services closer to the people because they all buy feeds. (Participant, Male FGD Masaka).

Another reason advanced was the fact that pork consumption was on the increase in the area, given the scarcity of fish and beef, as elaborated below:

There has been a change in the type of sauce we eat. We used to eat fish or beef but these are now not available. So now the most common sauce is pork. That is why most people are into pig farming and they need the feed since most of them are peri-urban farmers. The high demand for pork will drive the demand for silage. Investing in SPS is a sure business because many farmers will buy the silage. (Participant, Male FGD Masaka).

In addition to the above, women entrepreneurs from Masaka were of the view that SPS was more nutritious than maize bran, hence a better option than bran. They further share that animals get stunted due to a lack of feeds. Women from Kamuli also noted though some farmers had been sensitized about silage making, very few had the time to make their own silage and preferred to buy. Hence silage is better option because it is safe, cheaper and convenient to access.

Another woman participant in Kamuli noted that she will obtain more additional income from the sale of sweetpotato roots as a result of expanding the area under sweetpotato production to obtain vines for making SPS. However, a male participant from Kamuli sounded some caution on the business: he noted that though vines were currently easy to get and sometimes free, this was likely to change in the future as farmers realized their value.

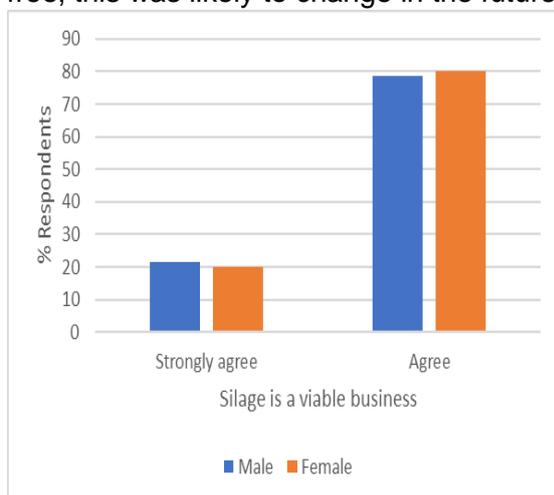


Fig 1: Perception on viability of SPS business

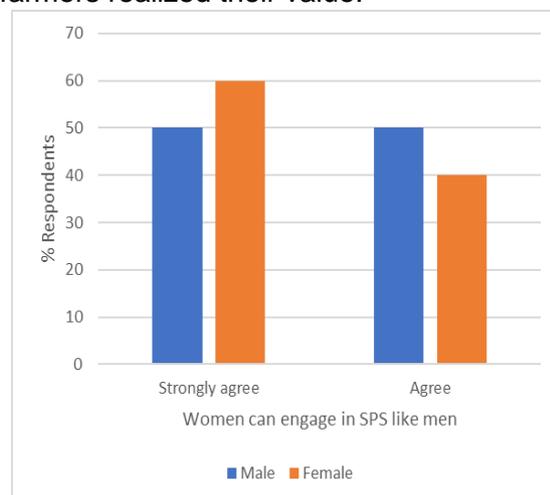


Fig 2: Women ability to engage competitively

Thus, though the general perception was that SPS was a viable undertaking amongst men and women (Fig 1) and that women entrepreneurs could engage as competitively as men (Fig 2), there were subtle differences in the reasons advanced for this proposition. Women highlighted opportunities in the market which are likely to address women farmer's constraints to sourcing animal feeds such as ease of access (convenience) and stunting. They also identified an opportunity in increased root sales. Men on the other hand identified opportunities related to change in food consumption practices. The male entrepreneurial 'eye'

was also able to quickly to identify potential future impediments to vine sourcing which all entrepreneurs would need to factor in their planning. Entrepreneurs also note that they were their own first customers for the SPS – especially women (60%) since most of them revealed the main purpose of making SPS was to feed own animals (Fig 3). Hence the target clients were both internal and external.

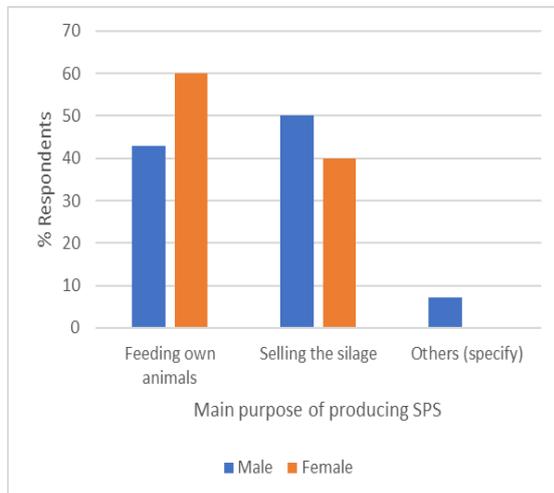


Figure 3 Main purpose of producing SPS

2.2. Requirements for running the silage enterprise

From the FGDs, the requirements for running a business were classified into two (i) entrepreneurial skills and (ii) physical tools, equipment and other assets. With regards to entrepreneurial skills, male participants from Kamuli considered trusted and transparent leadership as a key requirement, especially for enterprises run by a group. Participants also considered marketing skills (e.g. promotion) as well as technical skills i.e. ability to make good quality silage which produces a lot of foliage but with minimal soft stems; poly bags, forage choppers, transportation (bicycles), weighing scale and storage facilities. Other inputs included a group garden – large enough to produce vines and roots for sale as well as capital; which could be sourced from members; loans from banks or Village Savings and Lending Associations (VSLA’s).

Women in Kamuli also mentioned similar inputs, but in addition, mentioned the need to invest in capacity building so that they can offer trainings (at a fee) and also in other side income generating businesses (e.g. piggery and sweetpotato production) so as to generate the investment capital required for the SPS business. They also identified knowledge on innovative ways to improve silage making as another important requirement.

In Masaka, women indicated the need to package in smaller volumes as an important strategy to capture the market:

As women, we need to think of smaller volumes because it is not easy to ensile and package heavy bags – so we want to think of 50kg as the biggest bag but also plan for smaller bags. Also, the clients are not likely to buy a lot of silage at a go. So if you make silage in a big bag it is likely to get spoilt quickly. (Women participants, Maska FGD).

However, they women also realized that they needed to advise farmers on the minimum silage that is fed to a pig to make a difference. They noted that if women farmers buy only

10kg (for example) they will not see a difference in their herd performance. The women further shared that they would not opt to hiring a marketing outlet in the beginning, but would rather sell from their homes since silage is quite bulky.

Though there were many similarities amongst the resources identified as being necessary for running the business, women were quick to note the need for alternative income generating streams to raise the additional capital required for running the silage business. Women also noted the need to position themselves to meet demand from low volume buyers but also to sensitize them on the need for optimal feed volumes. Again, these issues would enable them meet market demands of smallholder and resource constrained farmers.

2.2.1. Access to and control over business production resources

With regards to productive responses, all men respondents owned mobile phones while 80% women did - and also revealed that they had control over the phones. 60% of the women respondents solely owned radios while 40% jointly owned the radio with the husband, but also felt they had control over the radio's disposal. Thus, women had fairly good access to and control over communication resource. This is similar for storage facilities where 92% of the men owned stores while all the women owned the store where they stored silage. Land is still a major resource for SPS entrepreneurs since a fairly large proportion of the men and women respondents claimed that they source from own farms and from neighbors (Fig 5). Thus, it was important to understand ownership, access and control over this resource. Fig 3 and 4 indicate that while the household head owns the land, 55% of the men perceived that both husband and wife manage the land jointly, while 60% of the women perceived that women solely manage the land. Results on who has the final say on disposal of the land were similar to management of the land. This could imply that women entrepreneurs have fair access to this resource.

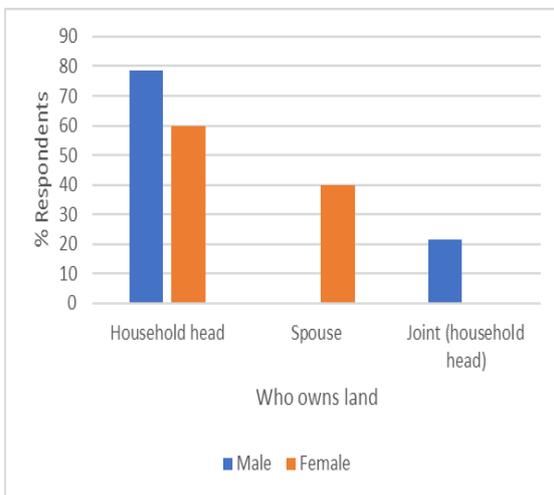


Figure 4 Land ownership

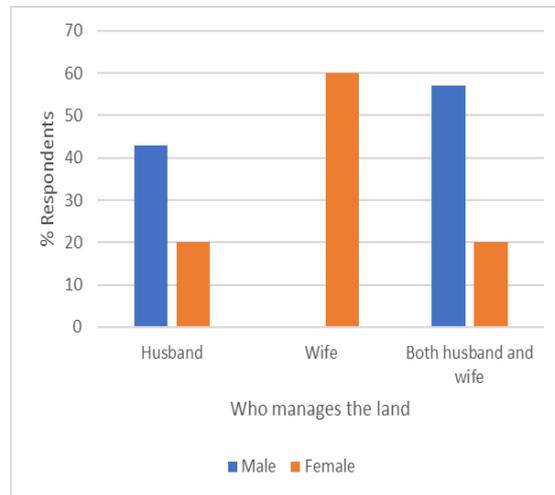


Figure 5 Land management

Transport is an important accessory in production and marketing , especially for a bulky commodity like SPS. The study sought to find out if there were any differences in access to and control over the commonest transport means – in this case the bicycle. Results revealed that 80% of the men owned the bicycles (Fig 6) and also had greater control over their disposal (Fig 7). This is an agreement with results obtained from the FGD in both locations where women revealed that one of the reason they sold from home was not only

due to the bulky nature of SPS, but also challenges in accessing transport. Women also indicated that the volumes of the SPS produced were determined by their ability to deliver vines home, which at times was done by carrying them on their heads. In addition, transporting the forage chopper to their sites was highlighted as an encumbrance for both men and women, but more so to women (section 2.6).

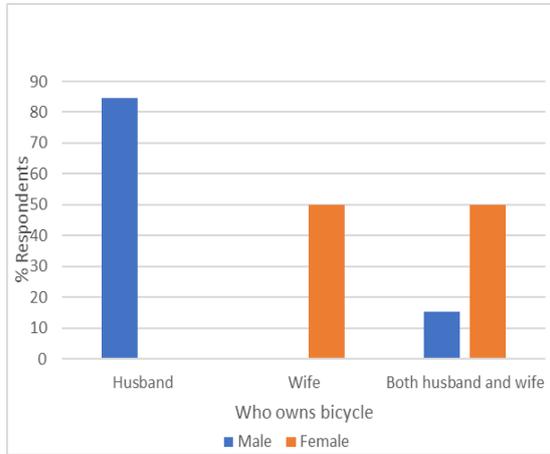


Figure 6 Ownership of bicycle

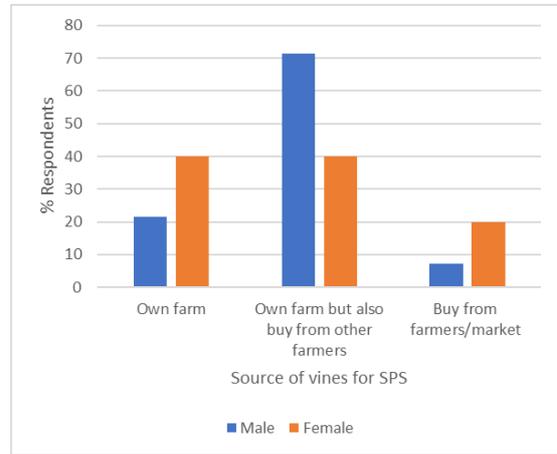


Figure 7 Decision to dispose of the bicycle

40% women revealed that they mostly sourced vines for making silage from their own gardens 40% from other farmers and 20% bought the vines (Fig 7). On the other hand, 70% of the men depended on other farmers for the vines. The fact that men heavily depended on other farmers for vines could be linked to their mobility, and could also imply that they had better access to vines than women did. Ultimately, this could have a bearing on the amount of SPS women could produce for sale.

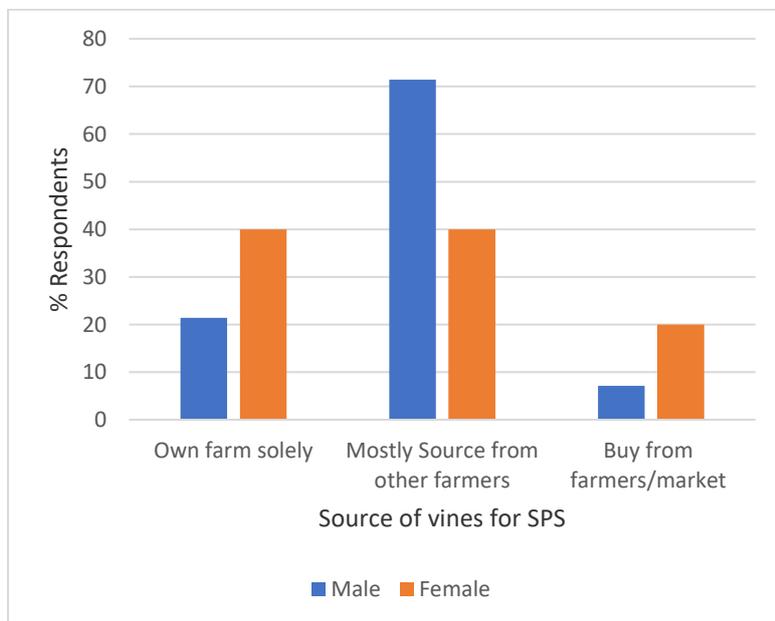


Figure 8 Source of vines for SPS production

2.3. Market awareness about silage and its utilization

In Kamuli, women entrepreneurs perceived that a good proportion of silage farmers were aware about silage: at least 50% in Bugulumbya and at least in Butansi 70%. This was attributed to the trainings and farmer open days which served to popularize silage. Both men and women entrepreneurs further revealed that increasingly people were calling to enquire if there was any silage available for sale.

In Masaka, however; men entrepreneurs revealed that some farmers were not aware of silage – a few who have had heard about it perceived it to be a wholesome feed, and when they learnt that one had to supplement, they did not buy silage again. The entrepreneurs thus noted that lack of awareness can thwart the market, as elaborated below.

It is necessary to have a good background of the farmer's practices before you decide to sell otherwise they will kill your market. Some farmers who have tried it out had poor management practices and even when they used the silage there was no change in animal welfare. (Men participants, Masaka FGD).

In addition, it was noted that farmers who had been exposed to silage did not know how to handle it once it matured and experienced losses. Women entrepreneurs from Masaka estimated that 30% livestock farmers know about silage; thus the need for promotion to widen awareness and create the market. Women livestock farmers were noted to be more aware of silage because they were the ones who reared animals more than the men.

Generally, both men and women entrepreneurs noted that there was limited awareness on (i) how to feed the animals (diets) and (ii) how to utilize silage; and therefore, many livestock farmers needed to be trained. The entrepreneurs revealed that training could be costly, and the best strategy was to train clients and potential clients especially women; as elaborated below:

It is important to train the person in the household who is responsible for feeding the animals. As they come to buy we also train or sensitize on how to feed silage.

Women livestock farmers need to be trained more because they rarely come for training. Women are also in charge of feeding the animals and so need to be exposed to this. Only 2 out of 10 men take time to feed animals. (Women participants, Kamuli FGD)

These days; women shoulder a lot of responsibility more than men. So they have to be innovative and search for income generating ideas since they have a lot of responsibilities than men. Many of them keep one or two pigs and would be interested in silage. But they need to be trained. (Women participants, Masaka FGD).

Training and other promotion activities were thus deemed important if SPS were to succeed as an income generating activity. The men entrepreneurs noted that there was need for behavioral/practice change amongst target clients. Farmers needed to know that silage was not a replacement for maize bran – hence the need for after sales service. Therefore, silage entrepreneurs needed to be in close touch with the buyer e.g. entice him/her with linkages to piggery market. The promotion messages would need to be phased in nature – especially where the animal herd needs to be rehabilitated.

2.4. Target clients and marketing

All men and 60% of the women entrepreneurs sold their silage at the farm gate level. Similarly, all the men and 60% women entrepreneurs sold all their silage to individual livestock farmers. 40% women had sold to institutional buyers. Women entrepreneurs from Kamuli revealed that their clients came from as far as Jinja, and reared mostly pigs and a few had cattle. Such farmers were not able to make silage on their own, as explained below:

How do you define farmers who can't make own silage?

Response: *They don't have time, they don't have vines, they don't know how to make the silage and do not produce own vines. (Women participants, Kamuli FGD)*

Entrepreneurs were asked to estimate and characterize the potential clients (Table 2). The potential clients were seen to be livestock farmers in the entrepreneur's local area of operation, and these were likely to be pig farmers - especially those who habitually buy feed. In all areas, it was noted that men were most likely to buy silage because they have larger herd sizes and have greater purchasing power than women. Men thus dominated the commercial and medium category of the livestock farmers and 8 out of 10 buyers were thus likely to be men. In Kamuli, it was noted that although it was the women who looked after the pigs, they did so on behalf of their husbands who own them. Further, men in Kamuli wouldn't allow their wives to go looking for silage because they feared that other men will take them. With regards to projection of market size, all respondents except men from Masaka considered the category of beginners/micro farmers to command 20% of the market. This projection was based on the fact that such clients rarely buy feed, and would need a lot of sensitization to do so. Men in Masaka however had a different perspective: they realized that though such clients bought in small volumes, they were repeat buyers and thus would cumulatively command a larger market share. Medium size clients (with 4-10 animals) were considered to be a good target; mainly because they considered piggery as a business. Women entrepreneurs in both areas projected this market at 40% - which projection lied between Masaka men (25%) and Kamuli men (60%). All respondents noted that the commercial client category would not form more than 10% of their market, mainly because such clients mixed their own feed.

Table 2. Potential client categories and characteristics

Client Category	Kamuli Women	Kamuli men	Masaka Women	Masaka Men
Beginners/micro				
Herd size	1-3	3-1, and 5-1	1-3	1-3
Housing	Tethering	Tethering (3-1). Housed (5 -1)	Tethering, a few house them	Tethering
Feeding practices	source feeds locally like food left overs (swill), peels, grass. Rarely buy bran. Sell off piglets as soon as they are born because they destroy farmers crops; and are likely to be killed	Tethered: Vines, small roots, grass, yam shoots. maize by products. Rarely buy feeds Housed: swill, amaranthus, buy limited feeds in drought	Source locally, rarely buy in times of crisis	May buy 30-60 kg silage per month. But mostly depend on local sources
Estimated size of market	70 % in Bugulumbya & 80% in Butansi and are mostly women.	Tethered mostly women. Estimate: 10%	Total 50%, mostly women but target only	Mostly women and constitute 70%. They are

	<i>But can only target 20%</i>	<i>Housed: Both men & women Estimate: 20%</i>	<i>20% of this market</i>	<i>important repeat buyers</i>
<i>Promotion strategies</i>	<i>Require a lot of sensitization</i>	<i>Men are most likely to buy so will target them</i>	<i>Most are ignorant and need a lot sensitization</i>	<i>Through training to interest them</i>
Medium/small scale				
<i>Herd size</i>	<i>4-10</i>	<i>6-10</i>	<i>4-10</i>	<i>4-10</i>
<i>Housing</i>	<i>Housed</i>	<i>Housed</i>	<i>Housed</i>	<i>Housed</i>
<i>Feeding practices</i>	<i>Maize bran and swill</i>	<i>Swill, vines, Amaranthus, buy bran in drought</i>	<i>Maize bran and swill. Also mix own feeds</i>	<i>Bran and other local feeds</i>
<i>Estimated size of the market</i>	<i>40%. Both men and women but women take care of animals even when they belong to husband</i>	<i>Mostly men and are the focal market. Piggery is a business for them. 60%</i>	<i>40% both men and women. Usually animals belong to husband but wife manages them</i>	<i>May purchase up to 500 kg a month. Constitute 25% of the market. Most are men</i>
<i>Promotion strategies</i>	<i>Main target. Easy to convince</i>	<i>Focal market segment. sensitization</i>	<i>A good target and easy to sensitize</i>	<i>Sensitization</i>
Commercial/Top				
<i>Herd size</i>	<i>10+</i>	<i>10+</i>	<i>11+</i>	<i>11 - 1000</i>
<i>Housing</i>	<i>Must be housed</i>	<i>Housed (semi permanent)</i>	<i>Housing is a must</i>	<i>Well structured housing</i>
<i>Feeding practices</i>	<i>Make own feeds</i>	<i>Bran and swill. Categorize animals by sex and age</i>	<i>Mostly depend on own feeds (mixed)</i>	<i>Commercial feeds</i>
<i>Estimated sized of the market</i>	<i>10% and are mostly men but their wives manage the herd</i>	<i>Nearly all are men. Estimate: <10%</i>	<i>10% mostly men but women manage the herd</i>	<i>5% mostly men, few women supported by husband (feeds)</i>
<i>Promotion strategies</i>	<i>A potential market, easy to sell to</i>	<i>They are mobile and can be reached</i>	<i>High potential market, easy to market to</i>	<i>Sensitization</i>

All women and 90% men had access to credit in the event they wanted to do so to invest in SPS business, but very few had actually accessed credit. Only one man obtained credit to procure a forage cutter. All respondents had good access to Market Information related to SPS, and mostly received it from fellow farmers. They also had fairly good access (90%) to SPS related extension and BDS services (80%).

2.5. Opportunities and strategies for expanding market outreach

The entrepreneurs reviewed and highlighted potential opportunities to grow their SPS businesses. Women from Kamuli in particular noted that they produced own vines and these could form a basis for expanding the business. They further noted that they had access to a chopper that had been procured during the RTB-ENDURE project chopper and could use this but would have to plan to buy another chopper in the future. Other inputs readily available to them were tarpaulins, maize bran (from own crop) as well as the ability to borrow money from their women's groups. They also noted that many livestock farmers were close to them so it would be easy to start selling SPS to them. Men had similar perspectives, but in addition considered a good road network and ownership of bicycles as opportunities that could enable them reach wider markets. They also considered ease of access to molasses, free space for

SPS operations, land (in Butansi) and the fact that SPS is competitive given the high price of maize bran.

From Masaka, the women entrepreneurs noted that two of them had business plans which they could use to guide their businesses but also to source for business loans. One woman entrepreneur had land of her own, while the others revealed that they would access the family land. One entrepreneur indicated that she would have to depend on purchasing vines, but these were likely to be cheap during the wet season and she would target to ensile during this season. Proximity to the male entrepreneur who had procured a chopper that was fairly easy to transport was seen as an opportunity by one entrepreneur who was located at a distance from the silage center; while the rest could access chopper services from the center. The women also noted that though SPS had a potential market, it was likely to be short-term because the livestock farmers were bound to start making silage for themselves. But they noted that they can prepare feed supplements and sell this alongside SPS since they produced maize and soybean. Men had very similar views to the women, but were quick to point out that most had managed to sell silage which was encouraging (Fig 9).

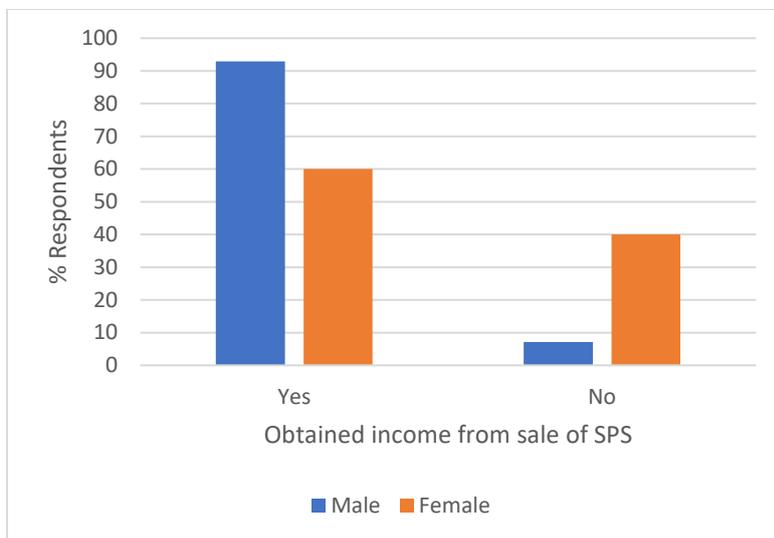


Figure 9 SPS silage sales

When asked about the factors they considered before they make SPS for sale (in light of the opportunities discussed), indeed the men revealed that a ready market is a driver for them (Fig 9) while the women's vote was equally spread amongst ready market, labour availability, storage space and impressive prices. While the latter may be combined with ready market, it is important to note that for women labour is an important factor that drives their ability to engage in SPS as a business.

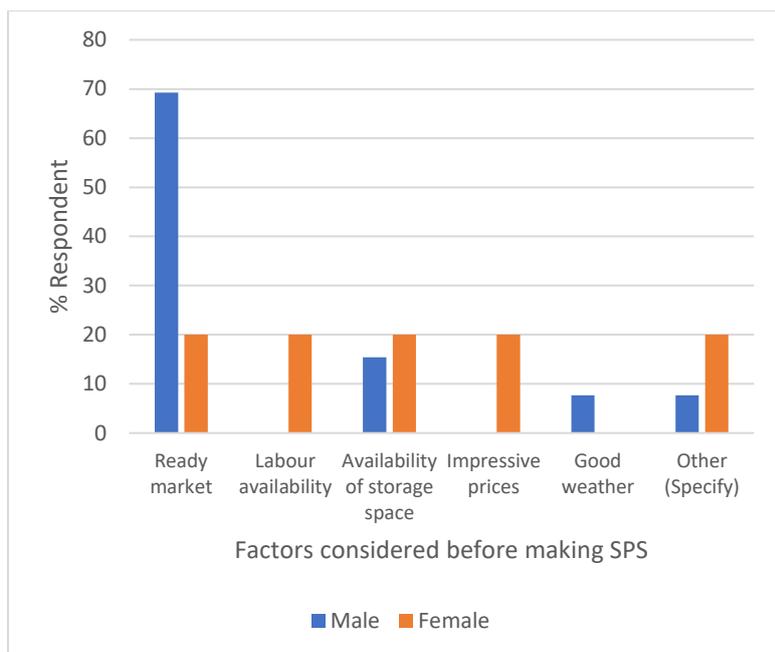


Figure 10 Factors considered before making SPS for business

Entrepreneurs were also requested to think about potential strategies to expand their market outreach, more so given the fact that SPS was a fairly new undertaking. Amongst the common strategies mentioned by both men and women included use local radios for promotion, training and sensitization activities and sign posts to advertise their businesses.

Men further mentioned market research to identify potential markets, designing and promoting a feed package i.e. silage with supplementary feed, and leading by example through exhibiting good practices as trained so that their animals are exemplary – and is so doing creating demand for their SPS. Other strategies included distribution of samples to many areas.

Women on the other hand mentioned the need to think of producing smaller volumes because it would not be easy for them to ensile and package heavy bags. They thus discussed and agreed that a 50kg bag would be the largest bag they would go for. Women also revealed that their potential clients were not likely to buy a lot of silage at a go. So, if one made silage in a big bag it was likely to get spoilt quickly. As part of their strategy to improve sales, women noted that they would need to advise farmers on the minimum silage that has to be fed to a pig to make a difference in its growth and performance. If women farmers for example bought only 10kg they will not see a difference. Lastly, they planned to first sell from home because silage is quite bulky, yet they lacked means of transport.

From the above, it was clear that women and men differed in some of the strategies they outlined. For the women, the focus was on starting small and reaching out to other smaller clients (especially women) while the men projected to distant areas and possibly larger buyers.

2.6. Challenges and proposed solutions

In the discussion about existing and anticipated challenges that could curtail growth of the SPS business, the entrepreneurs shared a range of issues related to the client responsiveness, access to inputs, governance issues (for group enterprises) and gender based constraints; among others. These challenges are discussed using these themes below:

Limited access markets

Women entrepreneurs from Kamuli mentioned the lack of market which was attributed to farmers who were trained discouraging other livestock farmers to buy from the entrepreneurs. Such farmers were encouraging potential clients to use the communal chopper to ensile for themselves. Another reason advanced for a low client base was poor quality silage, especially when it is not prepared and stored appropriately. From Masaka, the women entrepreneurs noted that the market needs to be developed because it is not big enough to absorb all the silage that will be made by the entrepreneurs.

Disease and weather changes

Women and men entrepreneurs mentioned animal diseases (such as swine fever) as potential threats to the enterprise: if people lose their animals they can't buy silage. Extended drought periods (attributed to changes in weather) were also noted by the men entrepreneurs to be a challenge curtailing access to vines.

Limited access to start-up capital

Start-up capital was also highlighted as a challenge by all women entrepreneurs. While there were possibilities of accessing loans, entrepreneurs noted that these may be difficult to services especially where one fails to get customers to buy the silage. In the discussion, the women entrepreneurs mentioned selling on credit as a mitigation measure but noted that the customer may also fail to pay on time yet the loan would have to be paid. Thus, access to inputs for making SPS was deemed as the first major challenge by women (Fig 11).

Gender related constraints

Women revealed that they needed to get permission from their husband to engage in SPS as a business. They also shared that some husbands forcefully take a woman's income made from sale of silage (and other commodities), while other men borrow from their wives and never pay back. Women also mentioned that some husbands assume that because the silage is made in their homes, they rightly have a share to the proceeds. When asked to expound on whether this was a major occurrence, respondents from Kamuli revealed that 8 out of 10 men did so.

Women entrepreneurs from Masaka shared that men have changed and no longer provide for the family like they used to do in the past e.g. provide health care. This increased the burden of providing for the general welfare to women, and hence the need for them to be more entrepreneurial in nature. Women further shared that men hardly support the operations related to their enterprises; yet they expect to benefit from them. One woman had this to share:

My husband is a coffee farmer and is not interested in livestock. However, since we have joint resources; after the sales are made sometimes you don't get to know how all the income was spent. When you ask about the money; he will point to the children and will say: how do you think they will go to school? (Woman Participant, Masaka FGD)

Another woman entrepreneur from Masaka also shared that though she was very interested in the business and would have wished to run it on her own, she was forced to start up with her husband because she did not have the resources. When asked which resources were most constraining, she mentioned a bicycle to transport the vines, and also lack of technical skills to make good quality vines. She also shared that her first attempt to make silage were not successful as the quality was not good, yet she found the process very labour intensive.

Women also revealed that without the help of men or hired labour, silage making especially where one did not have access to a chopper was a drudgery (Fig 12).

Governance and good business practices

Entrepreneurs operating in groups revealed that lack of transparency especially in declaring proceeds from the sale of silage to the group members is a potential challenge that could easily break up the group. Another issue noted was lack of customer care which could discourage potential clients from buying; especially those that needed assistance in proper utilization of silage. The entrepreneurs revealed that they are still weak in record keeping; especially when they realize they are making losses; they get discouraged and stop keeping records. This challenge applied both to group and individual men and women entrepreneurs.

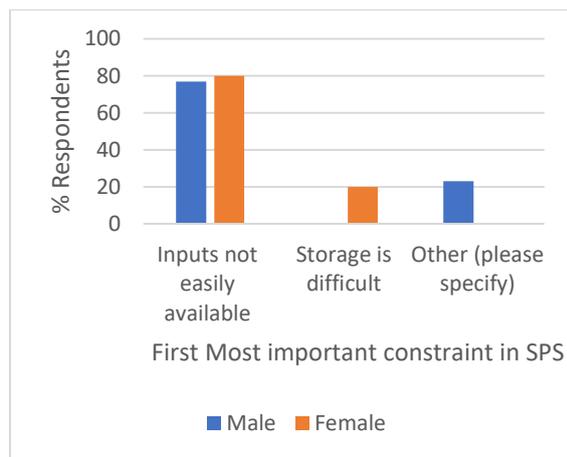


Figure 11 Most important constraint in SPS business

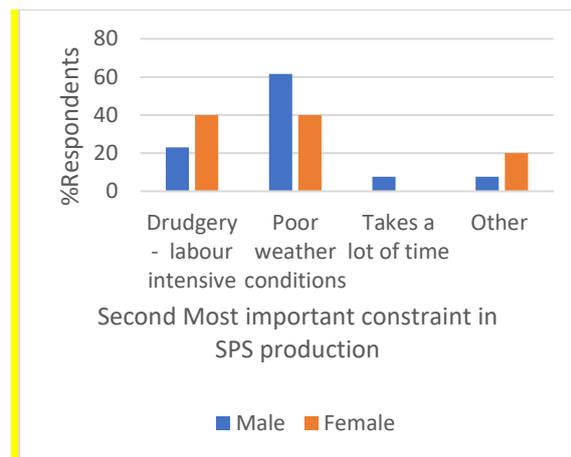


Figure 12 Second most important constraint in SPS business

Proposed solutions:

Limited access markets

All the entrepreneurs realized the need to advertise, promote and sensitize potential clients especially outside the districts of operation so as to increase sales and market outreach. Further, they noted that silage must be of high quality hence the need by all entrepreneurs to strive to uphold quality but also to sensitize buyers on how to maintain the quality once a bag is opened. Transparency with the buyers was also considered to be a good strategy especially in explaining the shortcomings of silage so that buyers are well informed. A woman entrepreneur from Masaka shared that she planned to try feeding silage to kroilers – and in case the trial was successful, this would form an alternative market since many farmers are now rearing kroilers. She however noted that the concentration of bran had to be increased to improve chances of acceptance. ne member shared that she uses medical plaster to seal holes and keep the silage to be more airtight, which was a good practice aimed at preserving the quality of the silage.

Disease and weather changes

To address the above captioned challenges, entrepreneurs emphasized the need to sensitize livestock farmers about optimal hygiene standards and always ensure that the biosecurity measures introduced during the RTB-ENDURE project are adhered to. Both men and women entrepreneurs noted that swill was a potential contaminant hence had to advise their clients to use it with caution. Clients would also be cautioned not to allow the male pig (boar) to service female pigs. With regards to weather changes, entrepreneurs mentioned that they

would identify valley bottoms or areas near wet bodies to plant sweetpotato during extended dry periods.

Limited access to start-up capital

Women entrepreneur revealed that it was important to identify an alternate income generating activity which would be used to serve loans obtained to start the SPS business. Such activities should have quick turn-over (e.g. handcrafts, snack etc). Men entrepreneurs suggested building good customer relations and ensure that all sales are documented in a bid to address the challenge of non-payment. To overcome the transportation problem, women revealed that they would hire motorcycles in the beginning since they are faster and carry a bigger load. Women also mentioned ensiling smaller amounts and packing silage in smaller bags which they could easily manage to make but also to transport.

Gender related constraints

'As a woman it is good if you are the one who handles the proceeds because men will always divert the money' – this was the perception of Masaka participant. Women entrepreneurs realized however that this may not always be possible, and so suggested that it would be important to discuss together with the husband and convince him to take some of the money but not all. They also mentioned that they will strive to learn how to handle their husbands 'nicely' with love so that they agree to be given a smaller portion of the sales; by proposing a sharing modality that is agreeable to both parties. This was seen as an amicable solution that would spur healthy relationships amongst the spouses, which was seen as an important issue for sustainable businesses; as elaborated below

As married women, whatever the problem is, we should persevere and not leave our homes otherwise our businesses will collapse. (Woman Participant, Masaka FGD)

To address the issue of drudgery, women mentioned that they will use hired labour to assist in ensiling. The men entrepreneurs suggested that the chopper will be taken to the source of vines (gardens) to reduce the bulk and ease transport. The women mentioned that in future it was important to network with entrepreneurs located close to them to market their silage and expand sales beyond the farmgate.

Governance and good business practices

Entrepreneurs based in groups revealed the importance of transparency in the group. They suggested open communication with the buyers so that all members get to know how much the group will have been paid for the silage. All entrepreneurs suggested training in business record keeping and continuous sensitization on good business practices as a measure to address poor record keeping, as well as peer to peer support amongst the entrepreneurs. Another suggestion was to devise a standard measure for silage and sensitize clients on how much to feed various animal categories. Further, the men entrepreneurs discussed the possibility of selling animal feed (supplements – which each entrepreneur would mix according to an agreed formula) alongside SPS. Clients would be trained on how to supplement silage for a balanced diet; thus ensuring healthy animals, happy and repeat clients.

2.7. The consumer perspective

Though quite an appreciable proportion of the potential SPS clients had prior knowledge of silage, only 14% had bought it before – 80% being women. Amongst these clients, close to 90% had bought the silage to feed to pigs. The most frequent unit of purchase was by weight

(78%), while the most popular point of purchase was the farmgate (mentioned by 78% of the respondents). There was a marked difference in purchasing patterns between men and women clients. Women made more frequent (and maybe smaller) purchases, while most men bought silage on a monthly basis (Fig 13).

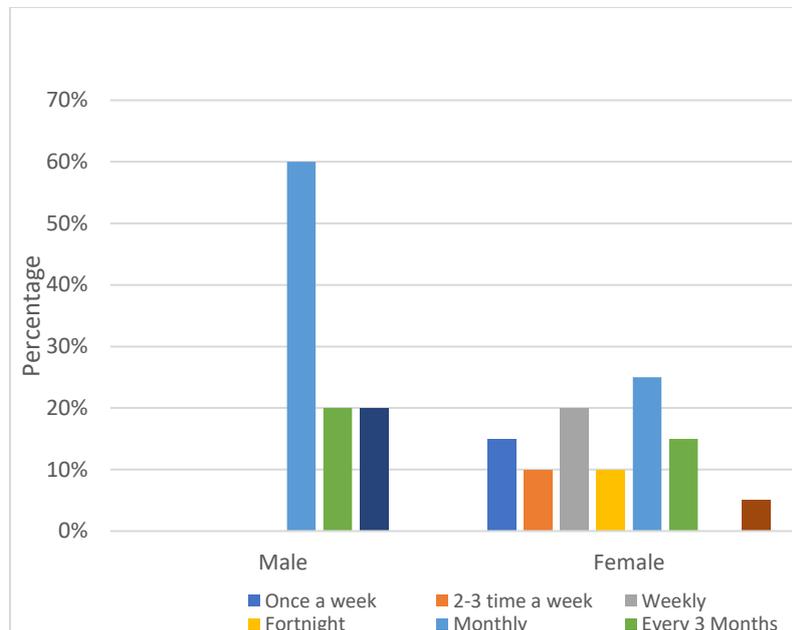


Figure 13 Frequency of purchase of SPS

Most of the respondents (87%) had bought commercial animal feeds before. The most mentioned frequency of purchase was weekly, but this time more women (42%) than men (32%) fell in this category (Fig 14). Other feeds purchased included supplements (23%) swill and sweetpotato vines, but these were mentioned by less than 10% of the clients.

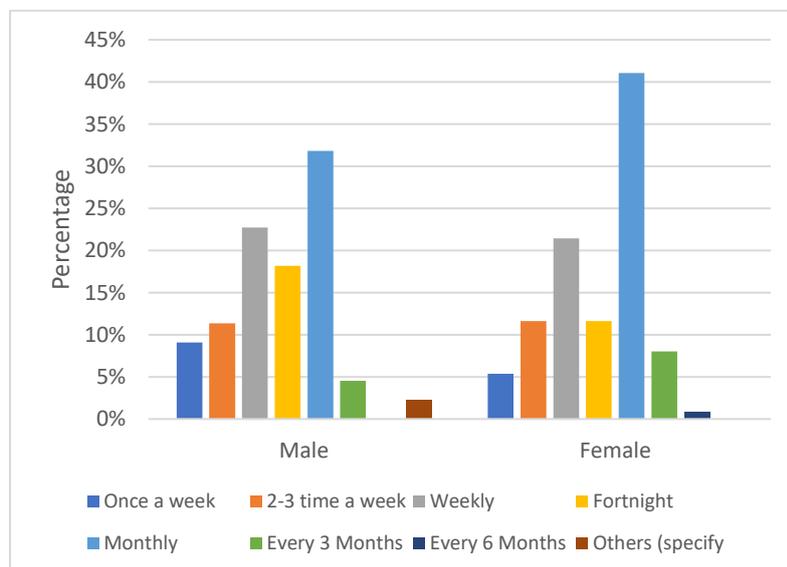


Figure 14 Frequency of purchase of commercial feeds

The most important driver for future purchase of SPS was its nutritive value as mentioned by 47% women and 60% men (Fig 15). 35% women mentioned 'other' attributes which included ease of access and convenience. When asked to mention the most important advantage of silage, 25% men mentioned cost effectiveness followed by 21% who considered distance

from the supplier. Women also mentioned the same advantages but ranked distance from the supplier highest (25%) closely followed by cost-effectiveness (24%).

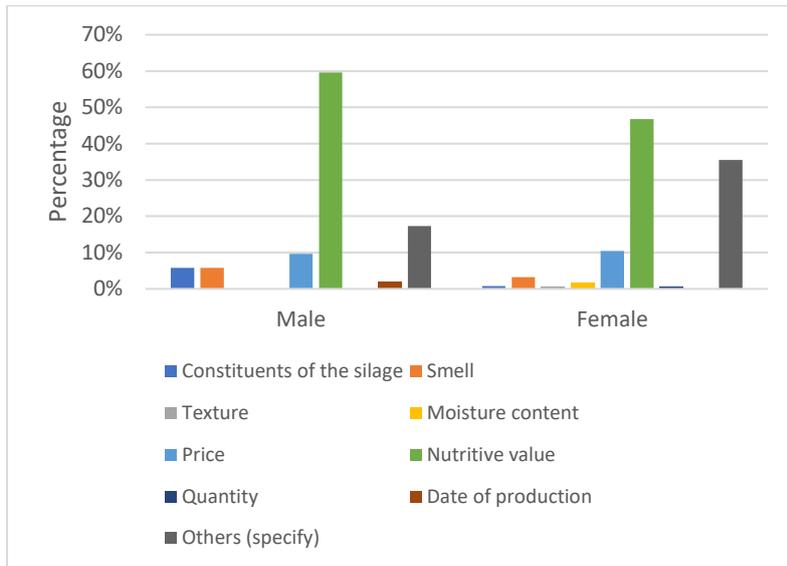


Figure 15 Factors considered when buying SPS

Amongst the limitations of SPS mentioned, women ranked unavailability (i.e. it is not there when you need it) highest (28%) followed by 'it is expensive' (22%), while men ranked 'you need to be trained to use it' highest (27%) followed by 'it is expensive' (22%) next (Fig 16).

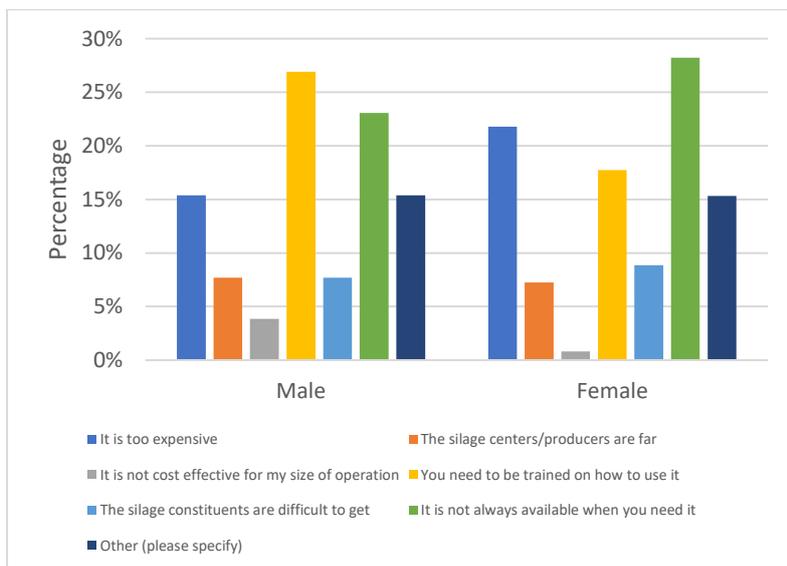


Figure 16 Most important shortcoming of SPS

61% of the male respondents preferred to procure SPS from male entrepreneurs, while 51% of the female respondents preferred to procure from female entrepreneurs, and the reason advanced was the same: they were considered to be knowledgeable.

This data thus shows that though SPS clients are still low, there is a potential for them to increase given their positive perception about the product. Silage entrepreneurs have to ensure they have a consistent supply of silage, set a fair price but also ensure they provide training to potential clients.

3. Discussion

3.1 Prospect for women entrepreneur to competitively engage in the SPS business

As perceived by male entrepreneurs and prospective female clients, women entrepreneurs can ably participate in the SPS business. However, their capacity to operate the business was subtly highlighted both entrepreneurs and potential clients; and also referred to several times by the women entrepreneurs. One major area of consideration was their technical capacity to produce and market quality SPS. This could present a major setback given the fact they would not only have to own but also learn to operate the forage chopper, supervise ensiling and ensure adequate storage. Yabi et al. (2014) found that women adoption of mechanized technologies is dependent on education levels, access to extension services and market access. These findings are pertinent to this case, but in addition to strengthening the aforementioned areas, women entrepreneurs would also have to provide quasi-extension services in a bid to improve markets for their SPS. This implies that women have to consistently seek knowledge on silage production and utilization, and devise means to extend this knowledge to their clientele.

Most women entrepreneurs belonged to silage groups, and a few claimed they run the business with their husbands. This implied that they did not have exclusive rights and in some cases leadership positions to enable them determine how the business would be run; and would thus need training in governance and business management to enable them contribute to and benefit from the SPS. On the other hand, while women owned businesses is a positive indicator of empowerment, a study conducted by Fairlie and Robb (2009) showed that women owned businesses have a lower chance of survival than men owned businesses due to limitations in access to startup capital, human capital and experience. Nonetheless, women entrepreneurs have an edge given that sweetpotato is majorly a woman's business as is small scale piggery. Women have also recognized these challenges and if they are factored in their business plans, this would present a better chance for survival.

3.3 Overcoming challenges and gender based constraints

Most of the gender based constraints were seen to affect women, especially in relation to access to and control of benefits accrued from the SPS, drudgery and limited mobility. While women were positive that they could slowly overcome these challenges, they need to realize that strategies related to behavior change of their husbands might take time. Elsewhere, studies have shown that men need repeated sensitization and men focused strategies before change in behavior can be effected (Mudege et al. 2014, 2016). Women may also benefit from strategies identified by men such as reducing drudgery by chopping vines at the vine production site. In such instances, women would have to employ hired labor (as already identified) but would have to ensure they are practically engaged in the activities. Women were also quick to note that they do not keep proper records of their businesses. While this could be a challenge related to low literacy levels, registering for Functional Adult Literacy (FAL) classes could help mitigate this challenge.

3.4 Consolidating existing and exploring new markets

The strategy to focus on small scale piggery farmers (who are also mostly women) and packaging silage to meet their focal clients' needs is commendable. However, they would

need to address the concerns raised by the clients: lack of silage when it is needed by ensuring a consistent and cost-effective supply. Women also noted that the SPS demand is higher during drought – and hence would have to invest in producing more volumes of SPS during the rainy season, good storage and mobility to address this market. Women entrepreneurs may face challenges in trying to reach new markets, but would benefit from social networks to do so. McCracken et. al (2015) have noted that social networks can enhance women’s participation in wider markets especially where complementary commodities can be sold (e.g. sweetpotato roots, pigs and SPS).

4. Conclusions

This study has shown that though breaking into a male dominated business may be difficult for women entrepreneurs, they never the less can be competitive. However, they will need support to address technical challenges and gender based constraints as identified in Section 2 of this report. Women entrepreneurs that are part of silage groups may have to adopt slightly different strategies to ensure that they are visible in leadership, co-ordination and management of the enterprise. This may require that they undertake capacity development in the highlighted fields in addition to acquiring more technical and business development knowledge.

Women sole entrepreneurs may face a stiffer challenge in operating their businesses, but fortunately they are equipped with business plans and also exhibited a formidable force of innovativeness. Both types of entrepreneurs need to be linked to support agencies such as BDS providers, women development agencies and similar project initiatives to keep this noble business afloat.

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