

Yukon Food System Design and Planning Project:

Report on Agri-Food Industry Engagement



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The Institute for Sustainable Food Systems at Kwantlen Polytechnic University (ISFS) is based on Kwantlen's Richmond campus and operates in conjunction with the Sustainable Agriculture program. The Institute's applied research, extension, and outreach programming focuses on regional-scale, human intensive, ecologically sound food systems as foundational to sustainable community. Our past and current work falls under two categories: MESA projects and Bio-Region Food Systems projects.

Through our MESA ("Municipally Enabled Sustainable Agriculture") projects, we work with municipalities in south-west BC to investigate the direct economic, environmental, and social benefits that could result if municipalities supported small scale agriculture in their communities through policy (such as bylaws allowing urban farming and farm gate sales) and programs (such as education programs and demonstrations). Our work has demonstrated significant potential for increased food security, a reduction of farmland loss to urban sprawl, job creation, and wealth generation.

In our Bio-Region Food Systems projects, we are working to evaluate the potential for a food system sector organized and operating at the eco-region scale and comprised of low input, human intensive, and ecologically sound supply chain components. This eco-regional scale food sector complements the current food system, to improve food self-reliance, minimize environmental impact, improve economic viability of farms and ancillary businesses, contribute to the local economy, create opportunity for the development of small and medium sized businesses and strengthen communities.

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Background on the Yukon Food System Design and Planning Project

Food security is increasingly a concern of all contemporary societies and communities. Rising costs for fuel, production inputs, processing, storage, transportation and marketing have resulted in increasing household food costs. For Canadians, in 2008, when general inflation was 1.3%, overall food cost inflation was 7.3%. Cereal grains products' cost increased 12.4% and the cost of fruits and vegetables a whopping 26.9%. Canada's northern communities experience increased cost of food acutely. The vulnerability of the Yukon was highlighted in July 2012, when the Alaska Highway washed out and Whitehorse grocery stores were emptied of perishable foods within forty-eight hours. Factor in climate change and economic volatility, and no longer can we rely on the global system to provide cheap food.

While the Yukon has a growing agriculture sector, still only about 2% of food consumed in the Yukon is produced in the Yukon. Interestingly, this figure is not unique to the Yukon but much like the majority of North American jurisdictions. We have all become largely dependent upon a global food system and as such vulnerable to food system perturbation. In other words, most communities and jurisdictions have put all their eggs in one food system basket. As communities and jurisdictions begin to examine alternatives, it is realized that significant economic and community development and small and medium sized business creation potentials exist in the substantive re-regionalization of our food systems. Understanding those potentials and how to achieve them is what the Yukon Food System Design and Planning project is all about.

The Yukon Food System Design and Planning project was conceptualized in August, 2010 when leaders of the Yukon - Canadian Agricultural Adaption Program (CAAP), Yukon Agriculture Association (YAA) and Kwantlen Polytechnic University Institute for Sustainable Food System (ISFS) staff met in Hay River, NWT while attending the Territorial Farmers Association Annual Conference. There, they discussed nascent Yukon agriculture, the significant potential for an expanded Yukon food system sector, and the ability/desire to advance Yukon food self-reliance. They discussed a project to bring forth necessary information and a compelling, data-based argument for public and private sector commitment to and support for concerted development of Yukon's agri-food sector.

Subsequently, IFSF worked with YAA, CAAP, Yukon Agriculture Branch and Agriculture and Agri-food Canada for two years to conceptualize, develop and garner funds for the project. IFSF assembled a project team based in British Columbia and the Yukon. Each project team member has been involved in a research and/or community engagement capacity. The majority of research team members are BC-based while most of the community engagement team members are based in the Yukon.

85% of cash funding for the first phase of the project was garnered from Agriculture and Agri-food Canada's Growing Forward program (locally overseen by the Yukon-CAAP Council). The YAA, as Industry Proponent, contributed the remaining 15% of cash funding. KPU contributed in-kind funding (staff salary and overhead) commensurate with funding from the YAA. The purpose of the federal Growing Forward funding program was to facilitate the ability of agriculture and the agri-based products sector to seize opportunities, respond to new and emerging issues, and pilot solutions to new and ongoing issues in order to adapt and remain competitive.

Through research and community engagement it is the objective of the Yukon Food System Design and Planning Project to build on previous work and existing Yukon expertise to develop:

- A realistic design for a future Yukon food system that improves Territorial and community food security and food self-reliance while fostering economic growth and community development, and
- A plan for its implementation and sustainability.

The outcomes of this project are intended to demonstrate how the Yukon can increase food self-sufficiency through local agriculture and food related business, harvesting of traditional food species, enhance economic, job creation, and business and economic opportunities in the food and agriculture sector, and build increased capacity for community health and environmental stewardship.

It is planned that this project be executed in two overlapping phases. The first encompassing baseline assessment and preliminary system design, and the second to produce a comprehensive Yukon Food System Design and implementation action plan in substantial consultation with the Yukon agriculture and food sector, government and community leadership. At the time of this report's publication, Phase II of the project has not been funded. All Phase I reports are available for download from www.kpu.ca/isfs. They include:

- The State of the Yukon Food System in 2011 (released in January 2015)
- Report on Agri-Food Industry Engagement (released in January 2015)
- Foundational Yukon Food System Design (released in January 2015)
- Our Food Security Today and Tomorrow in Carcross-Tagish First Nation (released in January 2015)
- Food Security in Tr'ondëk Hwëch'in Nation (forthcoming)
- Report on Yukon Community Food Security Engagement (forthcoming)

Acknowledgements

Many people have contributed to this ambitious project, from conceptualization to execution. We of the Institute for Sustainable Food Systems at Kwantlen Polytechnic feel very fortunate to have connected with and learned so much from so many in the Yukon. We are truly grateful.

Rick Tone (retired Yukon Agricultural Association Executive Director) and Len Walchuck (former Canadian Agriculture Adaption Program Chair) first worked with us to conceive of and plan the project, as well as secure funding. The insight and openness to diverse thinking they exhibited is rare. Once the project began, Len Walchuck's ongoing engagement and guidance was also instrumental. Valarie Whelan (Agriculture and Agri-food Canada), Tony Hill (Yukon Government Agriculture Branch Director), Matt Ball (Yukon Government Agriculture Branch Agrologist), and Bradley Barton (Yukon Government Agriculture Branch Agriculture Research Technician) provided critical guidance and input throughout the duration of the project. Sylvia Gibson (former Yukon Agricultural Association Executive Director) also provided valuable support during the early implementation of the project.

The Yukon Food System Design and Plan project benefited immensely from ongoing review and feedback from Monitoring Committee members: Chief Danny Cresswell (Carcross/Tagish First Nation), Dr. Ansylie Ogden (Yukon Government Senior Science Advisor), Len Walchuck (Canadian Agriculture Adaptation Program), Sylvia Gibson (Yukon Agricultural Association), Alan Stannard (Yukon Agricultural Association), and Bev Buckway (Yukon Agricultural Association).

Similarly we greatly value the willingness of our project Advisory Committee members formed to provide insight and guidance going into the second phase of this project. They are: John Lenart (Dawson area farmer), Joan Norberg (Whitehorse area farmer), Kim Melton (Growers of Organic Food Yukon), Dr. Chris Hawkens (Vice President Research and Community Engagement, Yukon College), and Tony Hill (Yukon Government Agriculture Branch Director). We look forward to their substantial contribution going into phase II.

Technical information and support was graciously provided by Kam Davies (Yukon Government Agriculture Branch Agricultural Lands Technician), Kevin Bowers (Yukon Government Agriculture Branch, Agriculture Development Officer and Supervisor, Meat Inspection), Gary Brown (Yukon Bureau of Statistics), and Sebastien Markley (Yukon Bureau of Statistics).

Community engagement has been and will continue to be a critical element and focus of this project; after all, regional food systems (like all elements of the human economy) should be about and for the people and their communities in that region. We feel extremely fortunate to have partnered with the Arctic Institute of Community Based Research (AICBR) in Whitehorse. This organization is dedicated to facilitating and promoting community-based, Northern-led health research activities aimed at improving the health of Yukon First Nations and non-First Nations residents. Norma Kassi (AICBR Director of Indigenous Collaboration) and Jody Butler Walker (AICBR Executive Director) guided and facilitated our engagement with communities and First Nations in the Yukon. Norma Kassi did a lot of heavy lifting in this regard and taught all of us many important lessons about the Yukon, its peoples and cultures. Katelyn Friendship (AICBR Research Officer) was also very helpful. Lynn Rear and Michelle Parsons

skillfully served as our community coordinators in Dawson and Carcross and Tagish respectfully, setting up interviews. We are very grateful to the many Indigenous and non-indigenous interview participants in Carcross, Tagish, and Dawson.

We very much want to thank the many Yukon farmers who participated in personal interviews and completed the Farmer Survey. Similarly we are grateful to the processors and suppliers who we interviewed in person and by telephone. It is important to acknowledge that Growers of Organic Food Yukon (GoOFY) was instrumental in recruiting farmers for survey participation. Tom Rudge, long time Yukon farmer and food system advocate and GoOFY leader was hugely supportive and provided much valuable guidance.

Additionally we would like to recognize the exceptional leadership of and support received from Chief Danny Cresswell of the Carcross/Tagish First Nation. Chief Cresswell contributed significantly to the early dynamic thinking around this project, its implementation, and its effective, on-going execution.

We express our great gratitude to the First Nations that graciously and enthusiastically agreed to work with us on this project, including Tr'ondëk Hwëch'in First Nation, Na-Cho Nyak Dun First Nation, Carcross/Tagish First Nation and Kluane First Nation.

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Industry Engagement Report Overview

Baseline data on the economic characteristics and dimensions of Yukon food production, processing and retail are critical to developing a Yukon food system design and plan as well as for assessing outcomes of design and plan implementation. Equally important is the engagement and participation of members of the Yukon agri-food sector: farmers, food processors, input suppliers, food retailers and others. This report describes our Phase I Industry Engagement which included a Yukon Farmer Survey and interviews with other Yukon food system business owners and operators. We present pertinent findings from these engagement activities, including opportunities and challenges for expansion of food production in the Yukon. Table 1 presents the Industry Engagement activities undertaken in Phase I and identifies engagement activities planned for Phase II.

Table 1: Industry engagement activities

PHASE I	
Activity	Date
Community Gardens Workshop Gather information on community visions for community gardens; existing community assets and needs	March 2014
Survey of Yukon Farmers	August 2013 - February 2014
Supplier, Processor and Retailer Interviews Feed and Seed Suppliers Meat Processors Mobile Abattior Operators Food Cooperative Food Retailers	January 2013; February 2014
North of 60 Conference Presentation and feedback on Food System Objectives and Indicators	November 2013
PHASE II	
Planned Activity	Planned Date
Interviews: Farmers Gather additional data on production methods, yields, and marketing from business-oriented farmers	April 2014
Interviews: Food Related Businesses Food Retailers Restaurants and Food Services Institutions Distributions Other Manufacturers	May - June 2014

This report presents the following highlights from industry engagement activities:

- Highlight 1: North of 60° Agriculture Conference and Banquet
- Highlight 2: General Farm Information
- Highlight 3: Product Types and Production Practices
- Highlight 4: Farm Cash Income
- Highlight 5: Food Production, Quantity and Price
- Highlight 6: Estimated Sales of Yukon Crop and Livestock Production
- Highlight 7: Feed, Seed and Compost
- Highlight 8: Processing
- Highlight 9: Marketing
- Highlight 10: Collaboration Amongst Farm Businesses
- Highlight 11: Challenges

Industry Engagement Methods

Yukon Farmer Survey

The Yukon Farmer Survey was developed by the ISFS research team. It was reviewed by the ISFS Agriculture-Industry Liaison and Yukon Government Agriculture Branch staff. The survey was pre-tested with three Yukon farmers. The survey gathered information on 2012 Yukon farm production. The farms included in the survey are a subset of farms presented in the 2011 Census of Agriculture as the survey focused on farms that produce crops and livestock for food (therefore, the equine, floriculture and nursery sectors were excluded). Additionally, the Yukon Farmer Survey was designed to gather key information that is not covered by the Census of Agriculture such as the quantity of food produced on Yukon farms as well as prices, marketing channels, sourcing of local inputs, and production methods.

Farmers' contact information was retrieved from the Yukon Agriculture Association's Yukon Farm Products and Services 2013 Guide as well as through personal communication regarding additional farmers not listed in the Guide. The YAA and the Growers of Organic Food Yukon (GoOFY) also solicited farmer participation through their contact lists. Farmers had the opportunity to complete the survey online, over the phone, by hardcopy via mail, or in person. The survey process began in August 2013 and was completed in February 2014. The survey questions can be found in Appendix I: Yukon Farmer Survey Questionnaire at the end of this report.

Table 2 (page 12) summarizes survey participation. A total of 74 farms were contacted to take the survey. Fifty-one farmers completed the survey (68.92% rate of completion), 10 farmers chose not to participate, two farmers started but did not complete the survey, and 11 farmers did not respond. Among the 51 respondents, two started their farm operations in 2013 and one operated an aquaculture farm so their responses were not included in this report. As a result, the total number of respondents for this survey was 48. Not all respondents answered every question; therefore the total number of responses (denoted by "n") varies between questions. Additionally, due to confidentiality, data is suppressed in cases where it could be used to ascertain the identity of the survey respondents.

All respondents who completed the survey were offered a \$50 gift certificate to a supply store in Whitehorse or Dawson area.

Table 2: Survey participation statistics

	Number of Farms
Complete surveys	51
Incomplete surveys	2
Decline to participate	10
Did not respond to survey invitation	11
Total	74

Interviews with Yukon Input Suppliers, Food Processors and Retailers

In January 2013 and February 2014 members of the Project team conducted interviews with Yukon input suppliers (feed, seed, and compost), food processors (butchers, mobile abattoir operators) and food retailers. A total of nine interviews were carried out in person, by phone and through email. The purpose of the interviews was to gather industry information, identify barriers and challenges to food production and the sale of local farm products, and to solicit views on the prospects for a future Yukon food system. The interviews consisted of closed and open ended questions that were tailored to each type of business. The closed questions allow for comparison of answers among respondents of each business type; the open ended questions allowed the interviewers to pursue details on challenges and opportunities identified by interviewees.

North of 60° Agriculture Conference and Banquet

In November of 2013 two team members presented the draft Food System Objectives developed by the research team and received comments from conference participants from the Yukon agriculture sector. A summary of these comments is presented in Table 3, page 10. Institute for Sustainable Food Systems (ISFS) staff facilitated a panel discussion of the future of Yukon's food system.

Working Together to Grow More Workshop

In March of 2014 two team members attended the Working Together to Grow More workshop which was a Yukon community gardening gathering. The team members learned about the state of community gardening in the Yukon and discussed what the role of community gardens could be in community food security and how Yukon community gardens can produce more food in the future. Additional information on community gardens can be found in the Yukon Food System Design and Planning Project: Report on Community Engagement (available for download at www.kpu.ca/isfs).

YFSDP Project Advisory Committee

An Advisory Committee to the YFSDP Project was established to respond to general and specific requests from the ISFS research team for guidance and advice as they work towards completion of the Yukon Food System Design and Planning Project. Advisory Committee members consisted of members from Yukon's agriculture industry and related fields. Specific duties of the Committee included:

- Provide technical advice
- Provide insight into Yukon's agriculture, food system, and communities
- Help ISFS researchers connect with relevant organizational, industry, and individual stakeholders in Yukon's food system
- Represent the Yukon Food System Design and Planning Project to the public at large

The first meeting of the YFSDP Project Advisory Committee was in January 2014. Meetings were intended to continue in Phase II of the Project.

Industry Engagement Result Highlights

Highlight 1: North of 60° Agriculture Conference and Banquet

The Yukon Food System Design and Planning Project is structured around measuring the status of a series of Food System Objectives and Indicators and describing the Territorial policy and planning environment in which a local food system is emerging.

“Food System Objectives” describe what a future food system should be and should achieve. They are broad statements that describe desired conditions to be achieved as a result of activities taking place in the food system. Draft Food System Objectives (presented in Table 3) have been selected by the research team based on an extensive literature review and are in keeping with a broader objective to develop a food system design that moves towards ecological, economic and social sustainability. Further detail about the Food System Objectives can be found in the Yukon Food System Design and Planning Project: State of the Yukon’s Food System Report (available for download at www.kpu.ca/isfs).

During the North of 60 Agriculture Conference in Nov. 2013, the draft Yukon Food System Objectives were presented and conference participants, most of whom were farmers or representatives from food system businesses or organizations, were given opportunity to comment on them. The summary of these comments is presented in Table 3.

Table 3: North of 60 participants' comments on project objectives

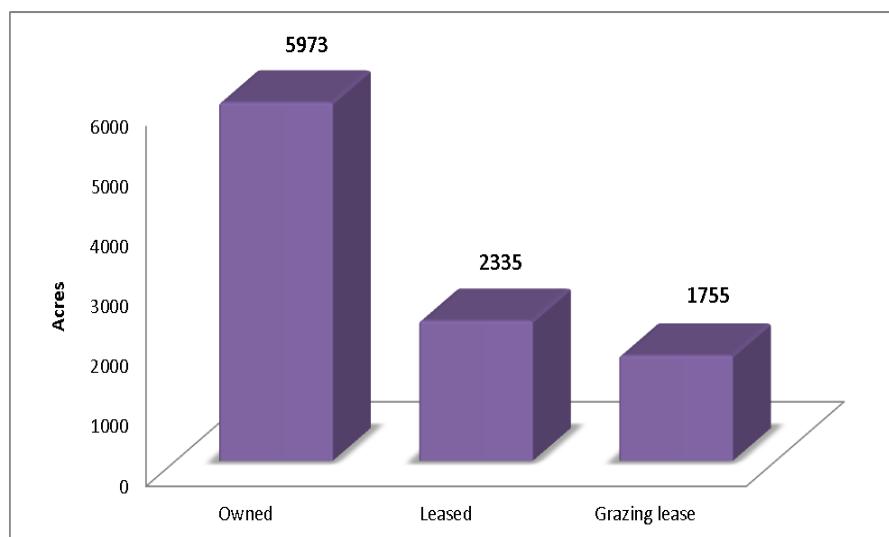
Objective	Number of respondents who commented on the Objective	Summary of Comments
Increase Territorial self-reliance in agricultural foods	7	All respondents endorsed this objective. Several suggested that it should be pursued through incremental, increasing targets for self-reliance. One respondent cautioned that significant infrastructure will be required.
Sustain Traditional food harvest	5	All respondents endorsed this objective.
Increase biodiversity	7	All respondents endorsed this objective although one suggested it may be too 'broad' and not focused enough on agriculture. Respondents commented that: 1) interface of management strategies is required, for example, among Yukon government departments; 2) important to examine livestock-wildlife interactions; 3) knowledgeable urban and small space gardeners can enhance biodiversity.
Minimize non-renewable energy inputs and optimize energy efficiency	4	All respondents endorsed the objective. One suggested it should be expressed as two separate objectives: 1) minimize non-renewable energy inputs and 2) optimize energy efficiency. Other comments: municipal and government support are required thorough bylaws and enabling legislation; organic methods can contribute significantly to this objective.
Reduce greenhouse gas emissions	4	One respondent endorsed the objective providing it does not negatively affect production quantities. Two others questioned whether increasing agricultural production and reducing greenhouse gas emissions are compatible objectives.
Contribute to the local economy	5	All respondents endorsed this objective.
Improve economic viability of farms and agri-food businesses	6	All respondents endorsed this objective. This objective was identified by one respondent as the biggest challenge for small farmers. Another respondent identified establishment of value chain connections as a critical component to achieving this objective.
Create jobs	7	Five respondents endorsed the objective; two expressed doubt the objective could be achieved. One respondent suggested there may be excellent summer employment opportunities for local youth.
What other objectives would you like to see?	5	Sustainability policy at various levels of government Government policy and action to support Yukon food system infrastructure Protection measures for sector for example, "GMO Free Yukon" labels. Develop Yukon grown brand Food safety and inspection of local production

Highlight 2: General Farm Information

To gain an overall perspective of the local farming sector, this highlight focuses on general characteristics of farms and farmers. This includes farmland acreage and tenure, the channels through which land was acquired and the amount of farmland currently in production. This section also includes the characteristics of workers in the agriculture labour force including farm operators, employees and volunteers. In addition, we look at their age, farming experience, work hours and wage rates.

Figure 1 shows the amount of farm land in acres by land tenure. Forty-six farms out of 48 (96%) had land that was privately owned. Of these, ten (22%) leased additional parcels of land or held grazing leases. Only two (4%) farms did not own their land. The land area owned varied from 1 acre to 1000 acres.

Figure 1: Amount of farm land in acres by land tenure (n=48)



Overall average farm size was 124 acres while median size was 90 acres. Only 6 farms were larger than 300 acres. Land area leased from a private owner ranged from 1 acre to 1700 acres; while land accessed through a grazing lease ranged from 160 acres to 1,000 acres.

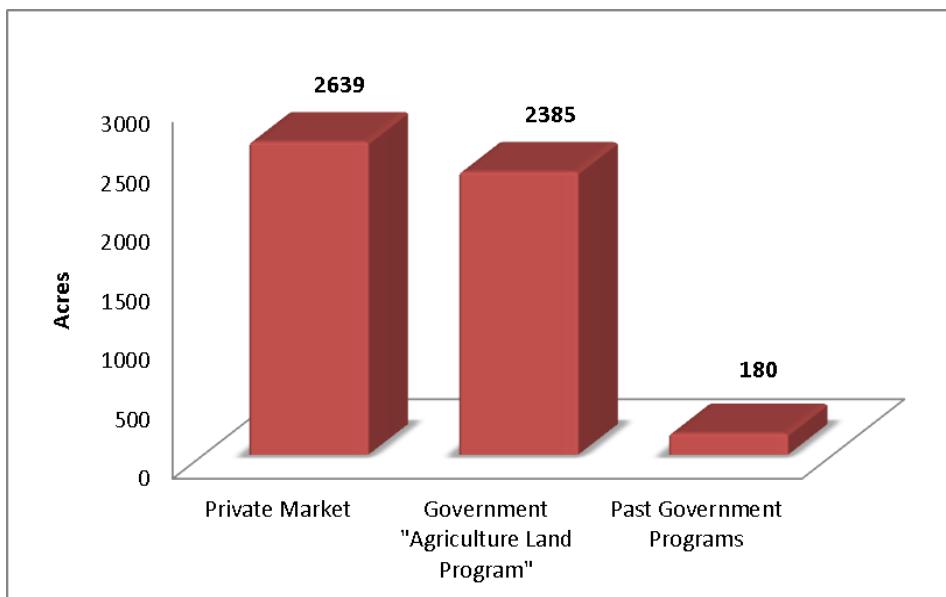
No farm utilized 100% of their land area. The majority of farms (28, 58%) used less than half of their farm land. The main reasons were: natural areas and lack of resources to clear and prepare the land for agriculture. Nonetheless, 30 farmers indicated that within the next five to 10 years, they intended to expand production onto currently unutilized arable land.

When asked about the willingness to let others farm on their unused land, almost 60% of respondents prefer not to let others farm on their land. About 20% stated that they would allow others to rent their land while another 20% said "maybe". The main reason for not wanting to rent out unused land was because of the possibility of farm expansion within the next five to 10 years. Thirty farmers stated that they intended to expand their production onto currently unutilized arable land. Another reason given for not putting farmland into cultivation was to preserve the woodlands and tree areas (presumably for ecological services, recreational or aesthetic purposes).

Figure 2 (page 16) shows the amount of owned farmland that was purchased through three different mechanisms. The total amount of land bought through the private market and through the Agriculture

Land Program is similar, with a difference of about 300 acres. However, the number of farms purchased through private sale, 25 farms (48%), is almost twice the number purchased through the Yukon Government's Agriculture Land Program, 14 farms (27%). Two farms (0.4%) purchased their land through past government programs¹.

Figure 2: Amount of owned farmland in acres by land acquisition (n=40)

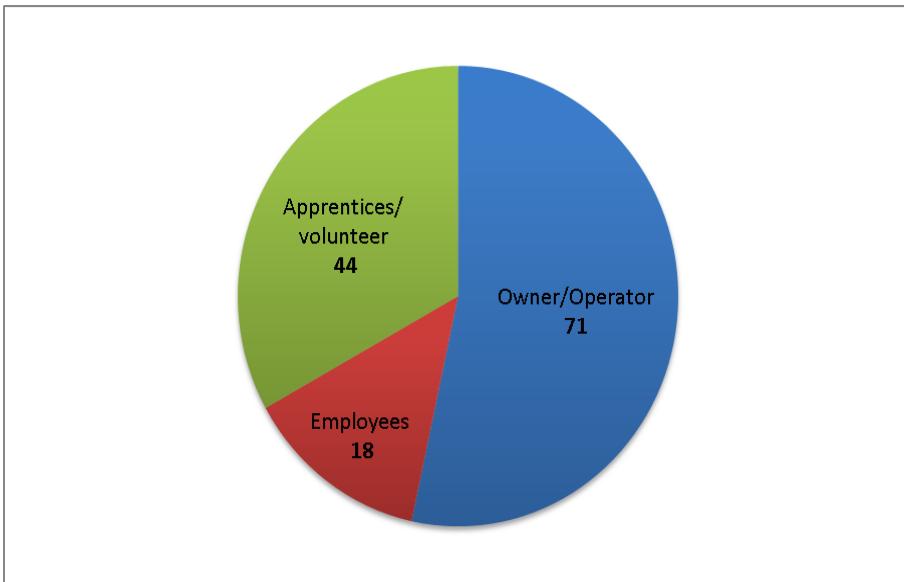


Among the 48 farmer respondents, the oldest farm began operating commercially 60 years ago while 14 farms (29%) have begun operation in the past five years. The average age of a farm was about 16 years. Even though almost one-third of the farms began operation only in the past five years, the majority (70%) of farmer respondents have more than 10 years of farming experience. The remaining farmers have been farming between three to 10 years.

Figure 3 shows the total number of farm workers. All respondents, save one, who completed the survey were owner/operators or co-owner/operators of their farms. Of the 48 farms represented in the survey, only seven farms (14%) hired employees. This implies that farm businesses in Yukon are not a significant source of employment. However, farming business did report offering several opportunities for volunteers and apprentices.

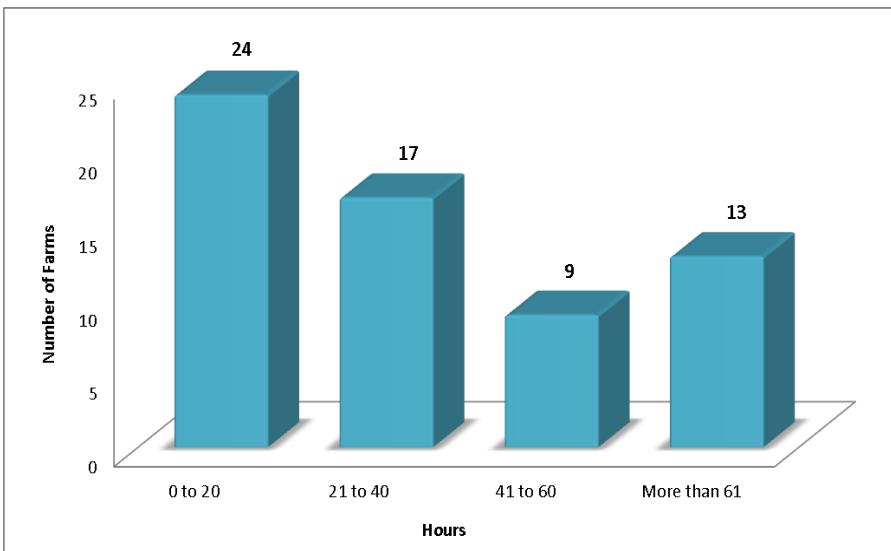
¹ Note that the amount of land released through the Agriculture Land Program (ALP) of 2,385 acres was reported by 14 farms who responded to the survey. The total amount of land released through the ALP is approximately 34,000 acres.

Figure 3: Total number of farm workers (n=48)



When asked about the hours of work for each farm owner/operator, respondents' reported work hours varied from 2 hours to 98 hours per week. Figure 4 shows the number of owner/operators by hours worked per week. On average owner/operators worked approximately 40 hours per week on farm. A number of farmers worked more than 60 hours. Note that the majority of farmers stated that they did not pay themselves wages or salary.

Figure 4: Number of owner/operators by hours worked per week (n=46)

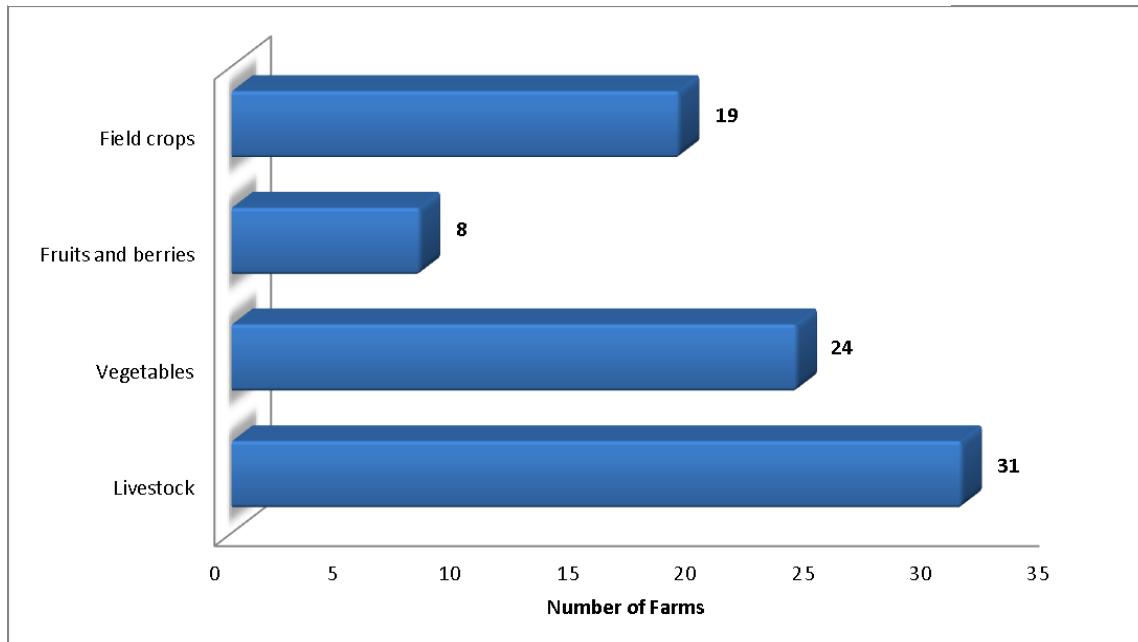


Highlight 3: Product Types and Production Practices

This section presents information on different production practices undertaken by the farms represented in the survey. This includes product types, production methods, irrigation systems, water sourcing, and pest occurrences.

There are four products types discussed in this report: vegetable, fruit and berry, forage/hay and livestock. There were 48 survey responses, yet many farms produce more than one type of farm product. Therefore the total number of farms in Figure 5 (showing the number of farms by product type) does not sum to 48. Twenty-one farms (44%) produce only one product type. The remaining 27 farms (56%) produced at least two or more product types. Only one farm produced all four types of products. The majority producing only one product type was livestock farms. The full list of products produced by 48

Figure 5: Number of farms by product type (n=48)

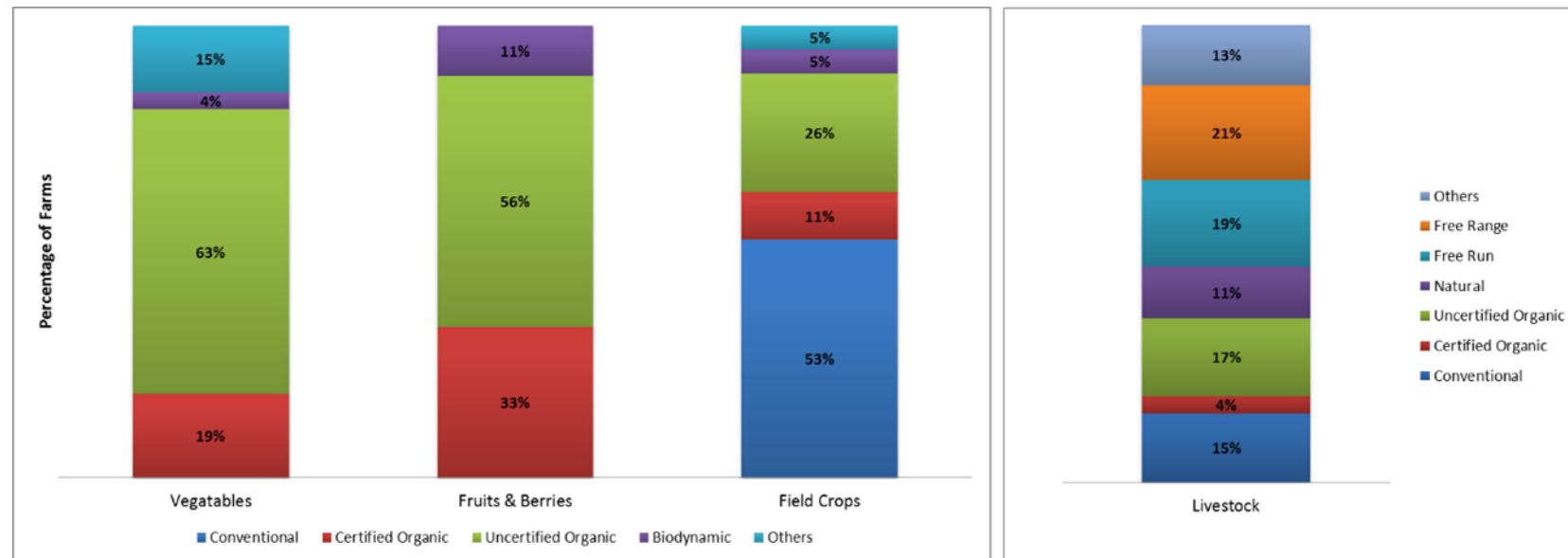


farms can be viewed in Highlight 5: Food Production, Quantity and Price, page 25.

We asked farmers to indicate how much of their food crop production is sold, given away, kept for self-consumption and wasted. The survey revealed that almost all the farmers would keep a portion of their food for themselves (from all four categories: vegetables, fruits and berries, field crops, and livestock). Farm owners/operators do not pay themselves wages or salaries; hence, the food they keep is their income in-kind. For vegetable farms, on average, 53% of their production was sold and 36% was kept for self-consumption. For livestock farms, about 72% was sold and 19% kept for self-consumption. For fruits and berries, 61% was sold with 25% kept for self-consumption. Lastly, 61% of the field crop production was sold on average and 37% was kept for self-consumption. The remaining portions were either given away or discarded as waste.

Figure 6 shows the percentage of crop and livestock farms by production method. There were a small number of certified organic vegetables and fruits/berries farms. Nonetheless, all the other respondents indicated that they followed either organic or biodynamic² production practices. The majority of vegetable and fruit farms declared themselves as “uncertified organic” farms. For field crops, production method is divided between conventional and organic practices. The majority follows conventional practices. This could be because there are only a small number of certified organic livestock farms.

Figure 6: Percentage of crop farms by production method, n= 48



² Biodynamic production is a “holistic understanding to agriculture processes” which consist of a “spiritual-ethical-ecological approach” to food production and nutrition.

Table 4 indicates the irrigation systems utilized by vegetable, fruit and berry, and field crop farms. The irrigation systems included under “others” were a fire hose and a stationary hand move. In terms of how much of the productive land for each of these crops was irrigated, land dedicated to growing vegetables was the highest. Among all respondents growing vegetables, 50% of the land is irrigated, whereas for fruits and berries it was 15% and for field crops, 13%.

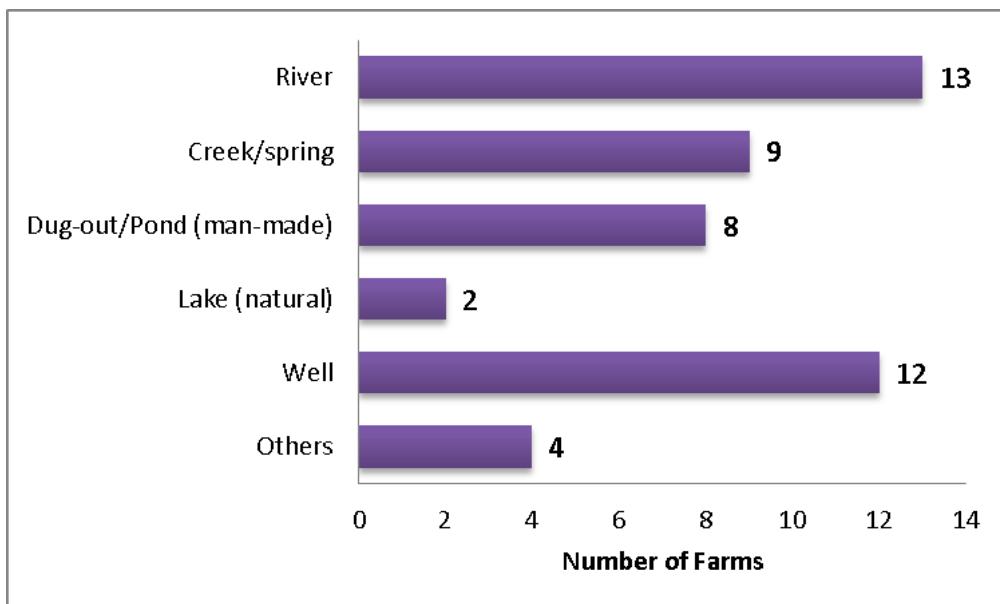
Table 4: Irrigation systems utilized by vegetable, fruit and berry, and field crop farms

Crop Type	Central Pivot	Hand Move	Wheel Move	Drip	Manual (hose/sprinkler)	Manual (watering can/bucket)	Others
Vegetables (n=24)	0	3	0	9	17	10	2
Fruits and Berries (n=8)	0	2	0	4	6	2	1
Field Crops (n=19)	1	1	1	0	1	1	1

Note that one farm can utilize more than one irrigation system, so the numbers of farms will not sum to “n”

Figure 7 conveys the sources from which farms obtained water. The majority of farms sourced their water for irrigation from a river (27%) or through wells (25%). Nineteen percent of the farm respondents sourced from a creek or spring, and 17% used a constructed water retention pond. The few who indicated other sources include a domestic water line and a natural water body.

Figure 7: Sources of water



Of the 24 farms that grew vegetables, 19 stated that they used some form of protected culture for their crops. The types of protected culture used most widely were cold frames, row covers, high and low tunnels, heated and un-heated greenhouses, hoop houses and hot beds. For fruits and berries, only two of the eight farms used greenhouses, cold frames and netting. Given the climate in Yukon, soil was covered by snow for more than half of the year, approximately four months of the year was covered by crop canopy and the remaining two months were covered by crop residues on the soil surface.

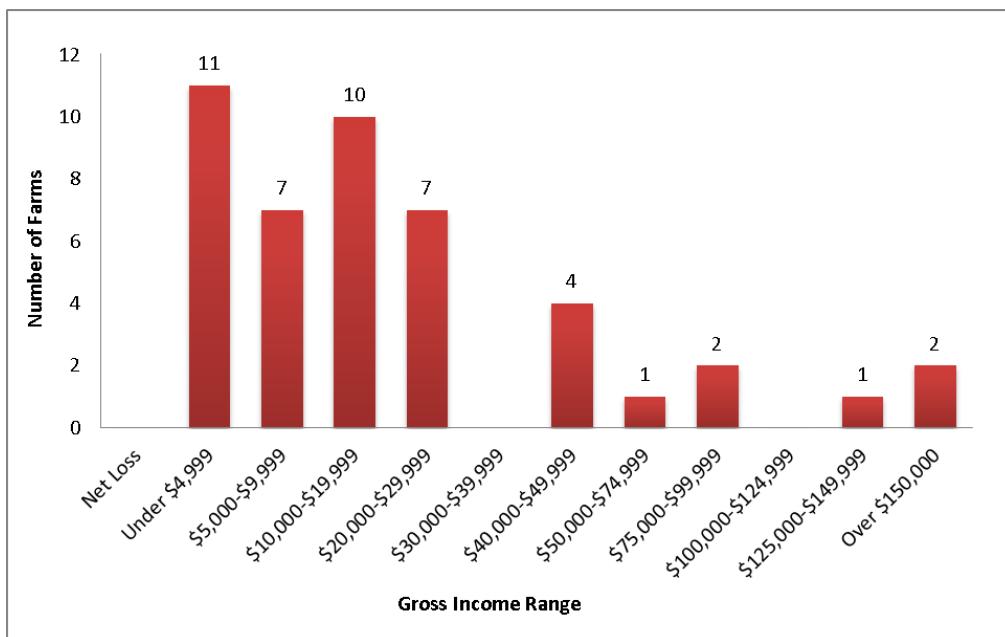
In terms of pests, most farms encountered insects, wildlife, weeds and invasive plants on an annual basis. The attraction of insects and wildlife is highly dependent on several factors such as location, weather, season, crop type and production practice; so, a few respondents from the survey did indicate that they rarely or had never encountered problems with insect or wildlife pests. Diseases were rarely or had never been encountered by the majority of farm respondents.

Highlight 4: Farm Cash Income

This section highlights the economic viability and profitability of the farming sector surveyed to ascertain whether the farm business has broken-even, and whether it is sustainably profitable. Knowing that many farmers have off-farm work to support the family, this section presents data on household income proportions by farm and off-farm income.

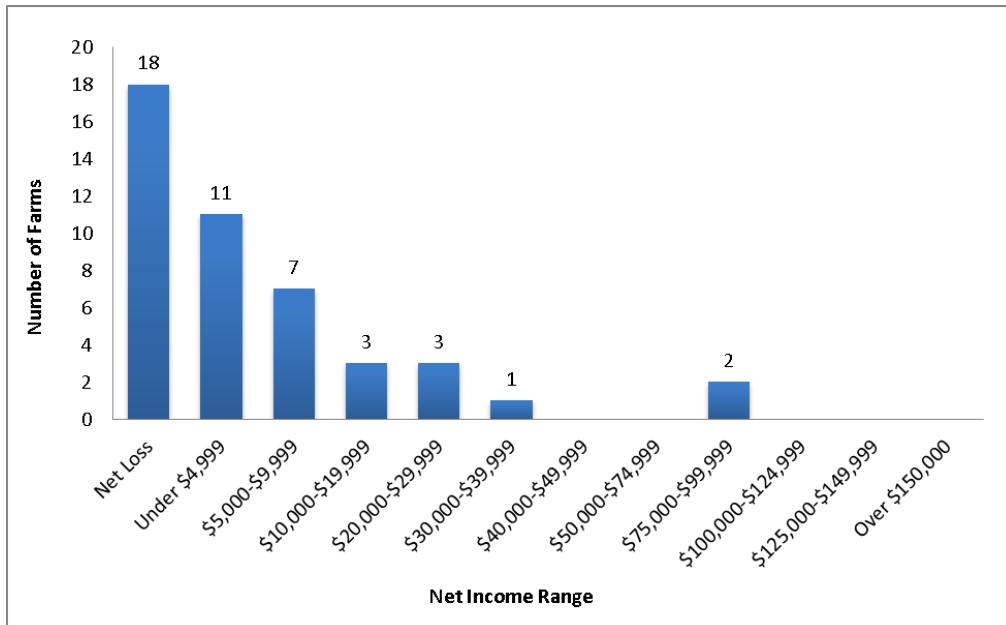
The following presents an analysis of the financial status of farm businesses in the Yukon. Income is separated into two types: gross income and net income. Gross income is the total sales of agricultural products. Net income is total sales less operational expenses and indicates the net profitability of a farm business. Figure 8 and Figure 9 show the number of farms in gross and net income ranges.

Figure 8: Number of farms by gross income range (n=45)



Thirty-nine of 45 farmer respondents (87%) reported net income in 2012 to be lower than \$20,000. Eighteen farms (40%) reported losses during the 2012 production year. If the source of household income came solely from farming, more than 80% of farm business owner/operators would be earning below the 2011 low-income cut-offs for a family of 2 (Statistics Canada, 2013). This is not to imply that the income generated and food produced from such farms is insignificant.

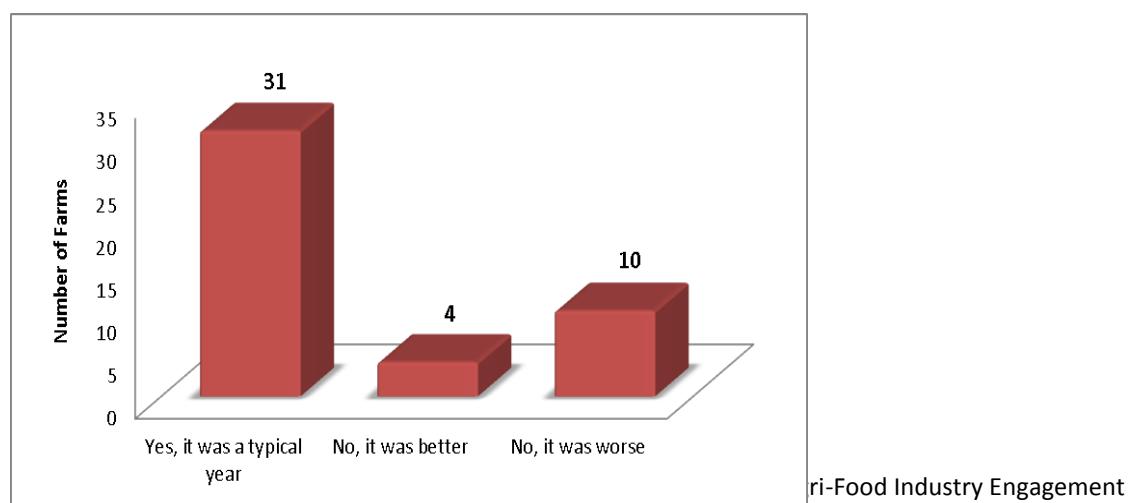
Figure 9: Number of farms by net income range (n=45)



To gain a better understanding of farm business financial characteristics two additional questions were asked. First, respondents were asked whether their 2012 farm cash income represented income for a typical year of operation. Second, respondents were asked whether their farm business has broken-even.

Figure 10 presents the respondents' answer to whether 2012 was a typical year of operation. Thirty-one farms (70%) stated that 2012 was a typical year while 10 farms (22%) indicated that cash income was lower than usual. Of the 18 farms that lost money during 2012, half of the farmer respondents indicated that it was a typical year. However, it is important to keep in mind that for some farms losses could be attributed to business start-up and preparation costs: survey results showed that 11 farms began operation after 2010.

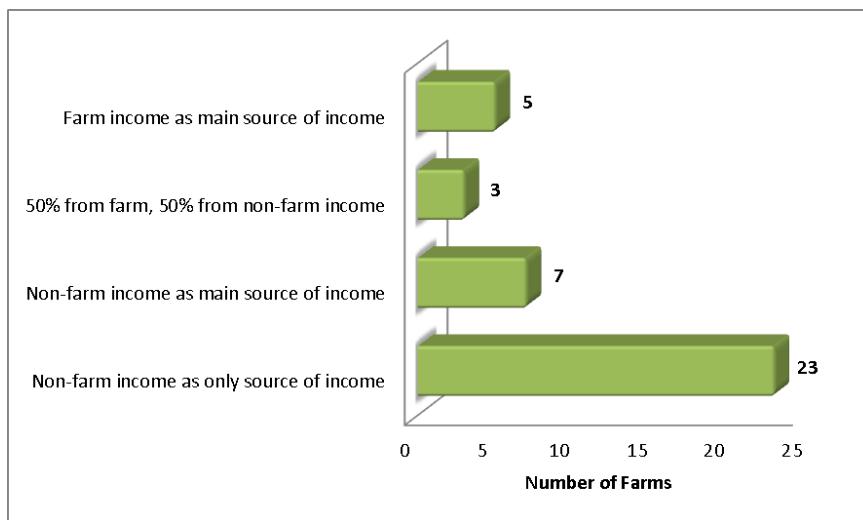
Figure 10: Respondents' answers to whether 2012 was a typical year of operation (n=45)



Slightly less than 50% (14) of respondents indicated that their farms had broken even. On average, respondents estimated it took a farm 14 years to break even. Eighteen farms stated that their farms had yet to break even. Of these, 11 farms only began their operations in 2010, and thus could be considered as still in the start-up phase. Note that many farmers had difficulty answering this question as they never viewed their farms as a business but a lifestyle and the farms were considered their homes. Collectively, these findings suggest a need for farm business management education programming.

Survey results indicate that farm income was small, likely insufficient to sustain a family. This is not unique to the Yukon. Therefore, it is not surprising to find that many farmers received income from other sources such as off-farm work, government grants, and donations. Again, not unique to the Yukon. Figure 11 presents the number of farms by household income sources. Nearly 80% of respondents indicated that non-farm income was their main source of household income. The percentage of farm income as part of the total household income ranged from less than one percent to 95%.

Figure 11: Number of farms by household income sources (n=38)



Highlight 5: Food Production, Quantity and Price

This section conveys survey findings regarding production and price of farm products in 2012. This includes the quantity and price of crop and livestock products produced and sold by survey respondents. Note that not every farm in Yukon participated in the survey. As such the total quantities presented in this report do not reflect total Yukon production. However, it provides an estimate of the production quantity based on the farms that completed the survey, implying a minimum production capacity of Yukon farms in 2012.

Total Production of Crops and Livestock Produced by 48 Farmer Respondents in 2012

Table 5 and Table 6 show the total quantity of all crops and livestock produced and sold in 2012 per 48 farmer respondents. The total quantities presented in these tables do not reflect that of the total production of Yukon agriculture sector. Despite that, the intention of this table is to provide an indication of Yukon farms' production capacity. (Additional information on the estimated total production capacity in Yukon for grass hay, beets, carrots, potatoes, raspberries, Saskatoon berries, beef cattle, broiler chickens and pigs can be viewed in Table 7 page 27)

Table 5: Total quantity of vegetables produced and sold by 24 farms in 2012

	# of Farms Reported	Quantity (lbs)
Bean	6	200
Beet	12	1,969 *
Broccoli	13	1,428
Brussel Sprouts	2	10
Cabbage	14	2,912
Carrot	18	11,090 *
Cauliflower	5	366
Cucumber	7	539
Eggplant	1	20
Kale & Collard	15	1,260
Leek	2	25
Lettuce & Salad Greens	13	2,645
Onion	10	1,410
Parsnip	4	52
Pea	12	1,032
Pepper	3	35
Potato	15	14,392 *
Radish	10	829
Rutabaga & Turnip	8	363
Spinach	13	553
Squash & Pumpkin	2	--
Swiss Chard	12	476
Tomato	11	4,051
Zucchini & Summer Squash	10	1,060

* additional information on estimated quantity of production is provided in the next section

-- missing information due to lack of responses

Table 6: Total quantity of fruits and berries (by 8 farms), field crops (by 19 farms) and livestock (by 21 farms) produced and sold in 2012

	#of Farms Reported	Quantity (lbs)
Haskaps, blue honeysuckle	3	37
Raspberries	4	136 *
Rhubarb	4	188
Saskatoon Berries	2	9 *
Strawberries	3	244
Others (grapes and apples)	2	215

	# of Farms Reported	Quantity	Unit
Alfalfa, alfalfa mix hay	2	1000 * bales	
Other Grass Hay	15	1,196 * metric tons	
		3,910 * bales	
Oats (seed, grain for livestock, green feed)	3	695,380 lbs	
Other Field Crops (barley, wheat)	2	850 lbs	

	# of Farms Reported	# of Animals on Farms	Quantity Sold	Unit
Bees	2	6 (colonies)	275	lbs of honey
Cattle - Beef	4	36	6,430 * lb/meat, bone-in	
Cattle - Dairy	1	x	x	litres of milk
Chickens - broilers	13	6,925	12,617 * lb/meat, bone-in	
Chickens - laying hens	13	741	9,139 dozens	
Goats (meat)	x	27	200	lb/meat, bone-in
			4	per animal
Goats (milk)	1	x	x	litres of milk
Pigs	8	80	11,414 * lb/meat, bone-in	
Sheep	2	42	450	lb/meat, bone-in
Turkey	8	3,087	4,749	lb/meat, bone-in
Other Livestock (bison, elk, and rabbit)	2	35	2,060	lb/meat, bone-in

* additional information on estimated quantity of production is provided in the next section

x data suppressed due to confidentiality

Estimation of Total Production of Selected Products

The production quantities grass hay, beet, carrot, potato, raspberry, Saskatoon berry, beef cattle, broiler chicken and swine³ presented in Table 5 and Table 6 does not represent a good estimate of the production capacity of Yukon farms because 1) several larger producers declined participation in the survey and 2) some respondents elected not to provide yield information. In order to present a better estimate of production quantity of these products, additional information on production quantity was gathered through secondary sources including local news articles, interviews with farmers, and representatives from the Yukon Government Agriculture branch. By combining the survey results and additional secondary data, we are able to offer a better estimate of Yukon's production level for these products as shown in Table 7. Note that the quantity of livestock presented in the table refers to the quantity of meat sold and not the total quantity of all animals on farms.

Table 7: Estimation of total production of selected products, 2012

Livestock	# on farm	quantity	unit
Chickens - broilers	10,125	27,017	lb of meat, bone-in
Pigs	110	17,532	lb of meat, bone-in
Beef Cattle	98	55,070	lb of meat, bone-in
		quantity	unit
Field Crop			
Hay		12,000	tons
Vegetable			
Beets		25,117	lbs
Carrots		176,437	lbs
Potatoes		896,241	lbs
Fruit and Berry			
Raspberries		2,136	lbs
Saskatoon Berries		8,009	lbs

Notes:

1. For grass hay, the total acreage in production is approximately 6,000 acres, of which 1,500 acres are under irrigation. Yield differs between irrigated and dry land production. Irrigated land averages about 3.5 tons/acre and dry land averages about 1.5 tons/acre. In total, the estimated Yukon grass hay production is 12,000 tons annually.
2. For livestock production, the following assumptions were applied in the calculation of total production:
 - The average cold-trimmed weight was used for beef cattle at slaughtering age.
 - General Canadian conversion rates from Statistics Canada were used to convert 'acres to pounds' and 'number of head to pounds'.
 - The total number of animals (for beef cattle, pigs and chicken broilers) on the farms was slaughtered for meat consumption. Therefore, not taking into account the possibility of farmers saving a portion of the herd for the following year.

³ We focus on these products as recommended by a representative from Yukon Government Agriculture Branch

Price Variation of Crops and Livestock Produced by 48 Farmer Respondents in 2012

Next is a more in-depth look at the production details of specific vegetable, livestock and field crop types across farms. In the survey, each farm was asked to report the quantity and price of each crop produced from their farm. Figure 12, Figure 13, Table 8 and Table 9 summarize a range of quantity produced and price sold by reporting farms. In Figure 12, the light blue line denotes the amount of production reported by a farm that produced the least amount in that particular crop group while the red line denotes the maximum amount of production reported by a farm that reported producing the most of that crop. Similarly, in Figure 13, the light blue and red lines report the minimum and maximum prices received by reporting farms in each crop group. The green dot (in both Figure 12 and Figure 13) denotes the median value for production and price. A median quantity (or price) implies that half of the reporting farms produced (or set price) less than this amount and the other half produces (or set price) greater than this amount. While not shown in the figures, the average production and price are a mid-point between the light blue and red lines. Lastly, the numbers in parentheses indicate the number of farms who reported to produce those crops.

For example, there were 14 farms out of 48 responses that reported producing cabbage in 2012 (Figure 12). The largest farm produced close to 800 pounds while the smallest farm produced slightly less than 50 pounds. The median quantity of cabbage production was approximately 100 pounds. The largest variation of quantities is especially apparent in carrot and potato, tomato, and lettuce and salad greens. Note however that the median quantities reported for these crops were very small compared to the average values (the green dot is below the mid-point) meaning that the production amount by most of the farmer respondents was actually lower than the average values. This implies that most farms in the Yukon have small production scale and a few greater scales.

Figure 13 presents the prices at which all the farmers sold their vegetable crops. Price structure is affected by many factors such as distance to market, production method, quantity and the market avenue. Except for one farm, the production method of the 23 vegetable farms (96%) was reported to be either certified organic or uncertified organic. (The term uncertified organic was used to describe a farming practice that followed organic production methods but did not receive organic certification.) The survey results were inconclusive as to whether certified organic vegetable products consistently sold at prices higher than uncertified organic vegetables.

This is illustrated by the following. Certified organic pea pricing ranged from \$9 to \$18, while uncertified organic peas ranged from \$1 to \$10. Likewise for spinach, certified organic ranged from \$8 to \$10, while uncertified organic ranged from \$1 to \$5. On the other hand, the price for certified organic potatoes ranged from \$1.5 to \$2 while the price for uncertified organic potatoes ranged from \$1 to \$2. Similarly, the price range for certified organic carrot was \$3 to \$8 while the price range for uncertified organic carrot was \$2 to \$8.

Figure 12: Quantity variation in vegetable production

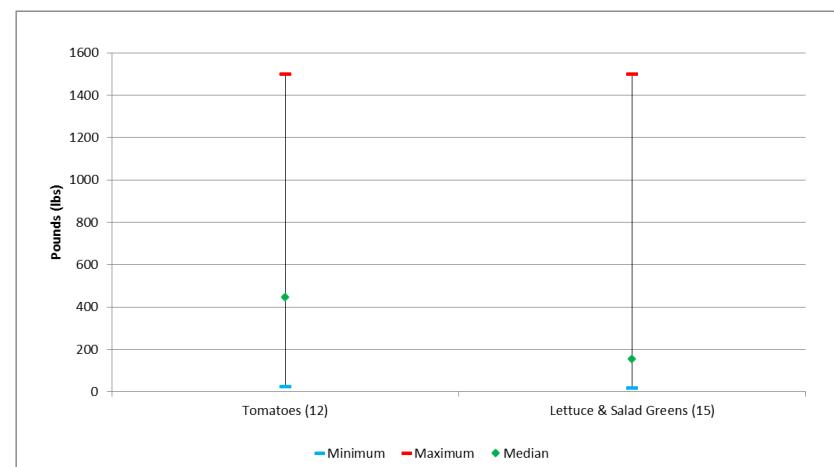
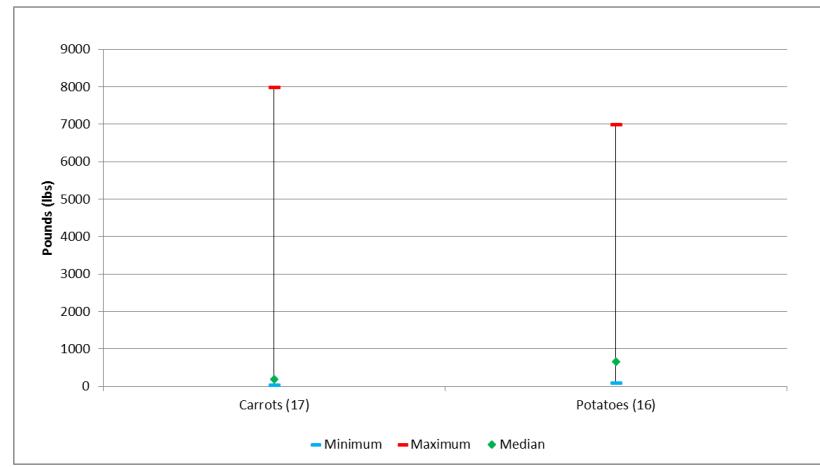
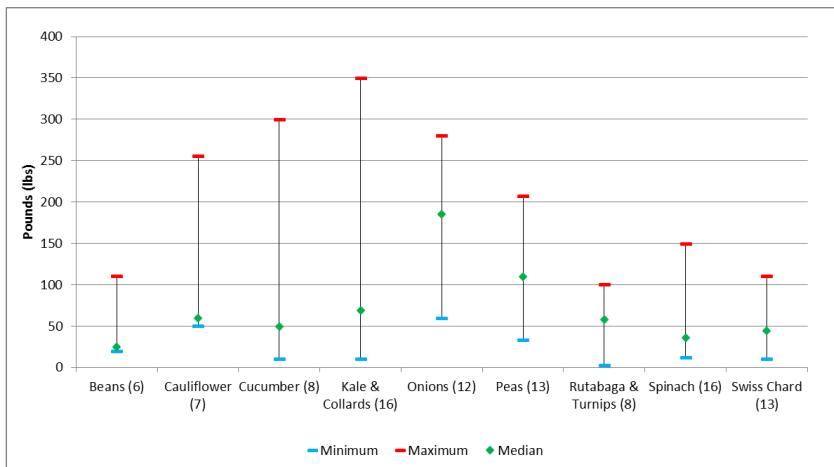
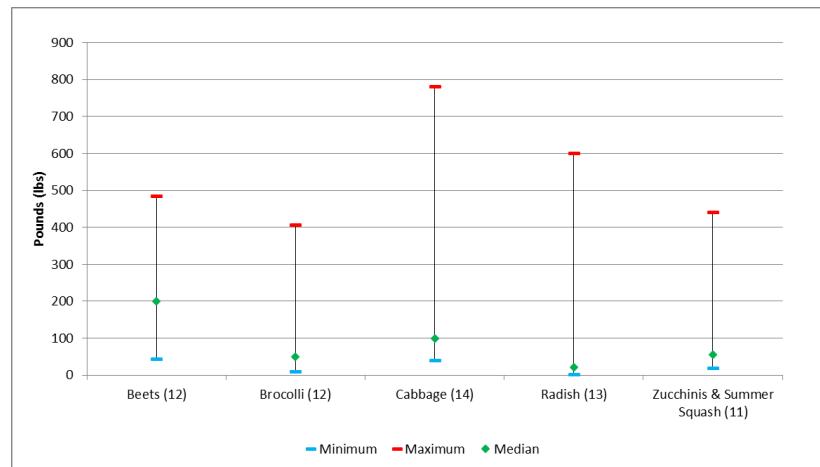


Figure 13: Price variation in vegetable production

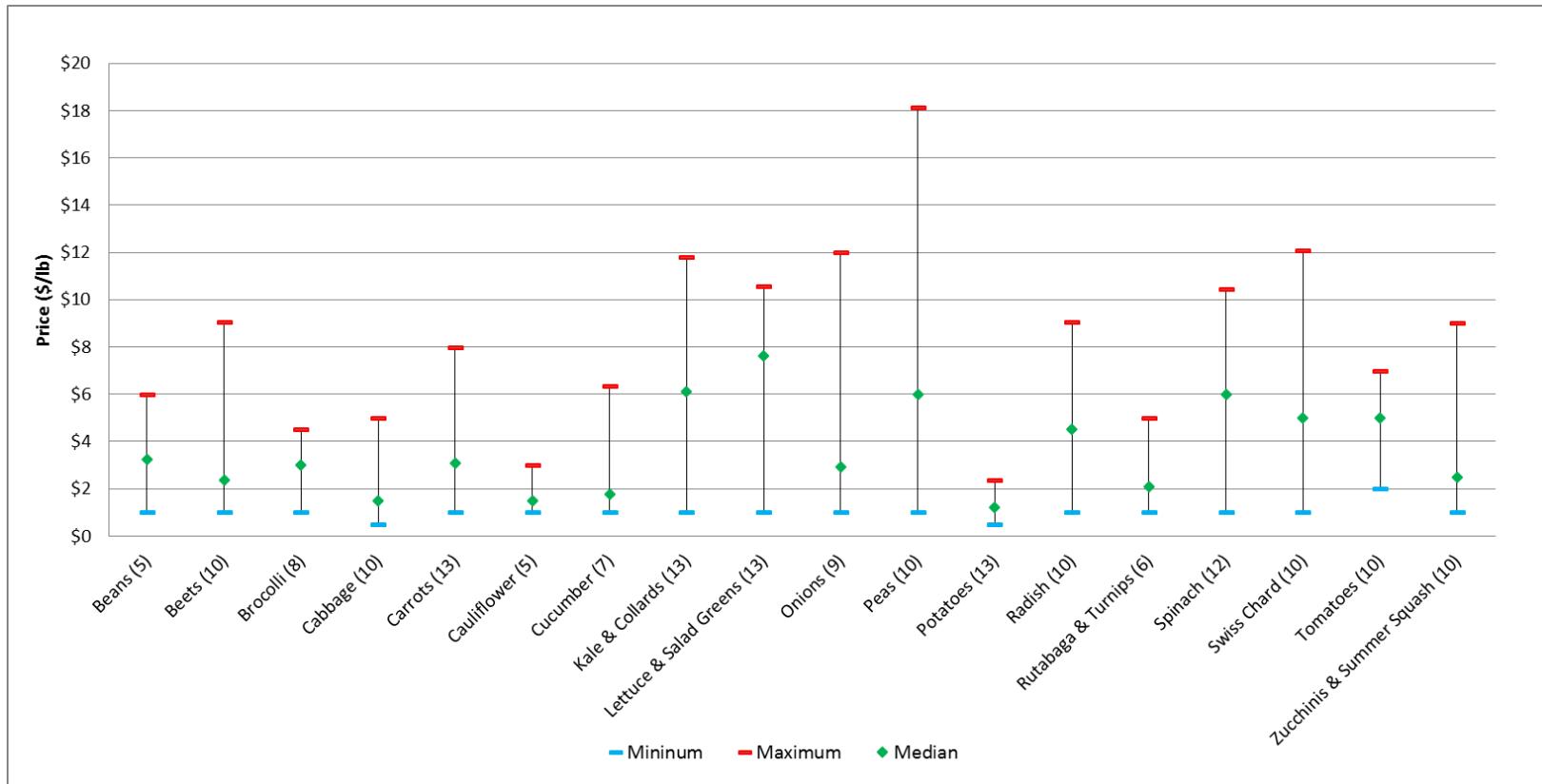


Table 8: Quantity and price variation in livestock production

QUANTITY	# of Farms Reported	Minimum	Maximum	Median	Unit
Chicken - Laying Hens	14	100	2,890	300	dozen
Chicken - Broilers	14	196	3,000	611	lb of meat, bone-in
Turkey	8	84	2,600	400	lb of meat, bone-in
Sheep	2	150	300	225	lb of meat, bone-in
Pigs/Hogs	9	250	3,750	1,225	lb of meat, bone-in
Beef Cattle	4	3,200	3,230	3,215	lb of meat, bone-in

PRICE	# of Farms Reported	Minimum	Maximum	Median	Unit
Chicken - Laying Hens	13	\$4.50	\$7.00	\$6.00	\$/dozen
Chicken - Broilers	14	\$2.50	\$5.50	\$5.00	\$/lb of meat, bone-in
Turkey	8	\$2.20	\$7.00	\$4.75	\$/lb of meat, bone-in
Sheep	2	\$5.00	\$7.00	\$6.00	\$/lb of meat, bone-in
Pigs/Hogs	9	\$3.45	\$5.50	\$3.75	\$/lb of meat, bone-in
Beef Cattle	4	\$4.50	\$5.00	\$4.75	\$/lb of meat, bone-in

Note: Data for elk, bison, dairy cattle, rabbit and bees are suppressed due to confidentiality

Table 8 shows the quantity and price variation in livestock production. Note that price variation for livestock products was much smaller than that of vegetable products. Possibly this was due to the fact that almost all livestock products were sold at the farm gate (because of stricter regulations regarding selling at retail stores) resulting in prices that were more consistent. In contrast, vegetables were sold through many different channels such as at farm gates, at farmers' markets, restaurants and retail stores which could possibly account for the more substantial price variation for vegetables.

Table 9: Quantity and price variation for grass hay

Unit	Quantity			Price (\$)		
	Minimum	Maximum	Median	Minimum	Maximum	Median
Metric Tons	10	400	133	\$180	\$380	\$289
Bales	150	1,500	782	\$7	\$12	\$10

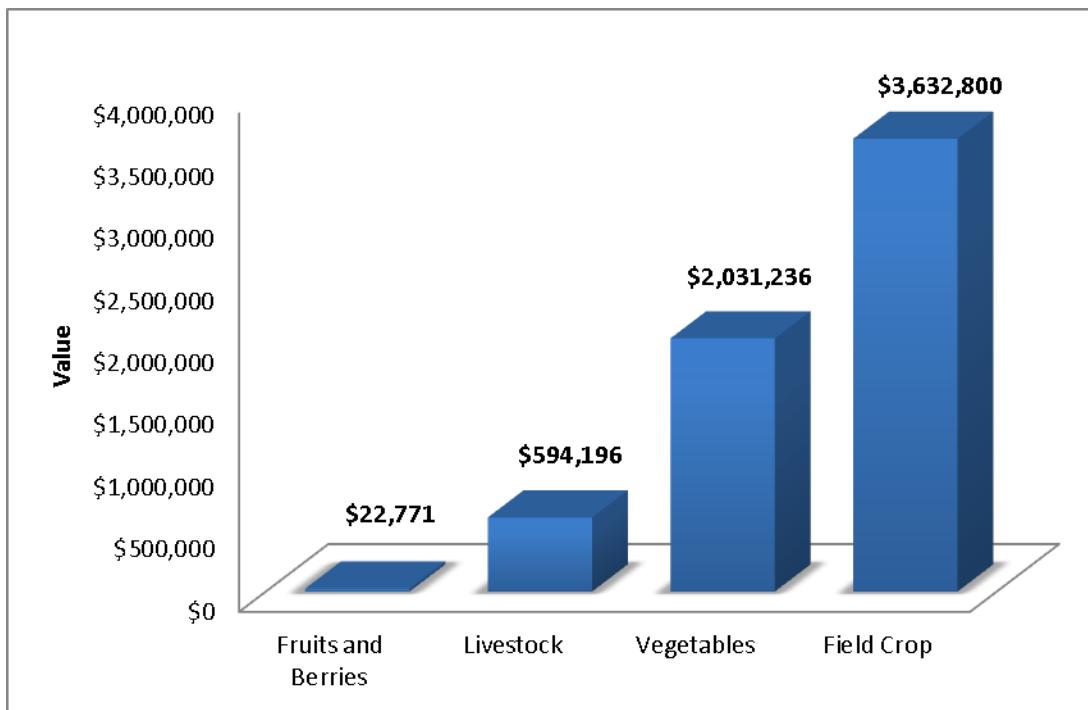
There were only a few farmer respondents that produced agronomic (field) crops: barley, oats, rye, wheat, alfalfa and alfalfa mix hay and other grass hay. There were 15 farms that produced grass hay, mainly Smooth Brome. Table 9 shows the quantities and price in metric tons or bales because these were the units farmers reported in the survey. In that the weight per bale hay is dependent on so many factors, conversion was not made to avoid misrepresentation of data; therefore, both are presented. The summation of grass hay production in metric tons and bales is the total amount of grass hay produced.

Highlight 6: Estimated Sales of Yukon Crop and Livestock Production

This section presents the estimated sales of crop and livestock productions in the Yukon in 2012 based on 48 farmer respondents and additional secondary data sources. These values represent the contribution of the crop and livestock sector to the local economy. The value of sales for each product was calculated using the quantity of production and price reported by each farmer respondents. The median price for a particular product was used in cases where: 1) farmer respondents did not report their sale price and 2) quantity of production of a product was gathered from secondary sources.

The total estimated values of sales of crop and livestock in 2012 was **\$6,281,002** (excluding equine, floriculture and nursery). Figure 14 presents the values of sales generated by fruit, livestock, vegetable and field crop industries. The field crop sector generated the highest sales, accounting for 58% of all crop and livestock sales, followed by the vegetable sector (32%) and the livestock sector (9%). The smallest sector in term of sales was the fruit and berry sector.

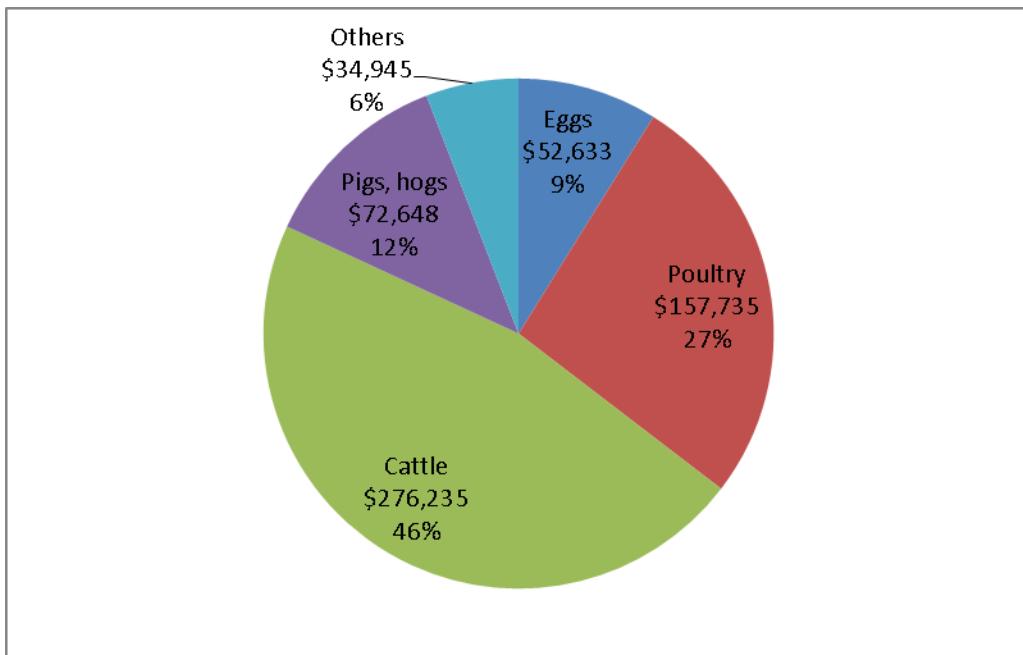
Figure 14: Total sales generated by fruit and berry, livestock, vegetable and field crop industries in 2012



Crop production generated a total of \$5,868,806 in 2012 (90% of the total value of the crop and livestock sector). Production of alfalfa and grass hay was the largest contributor in the field crop sector. (Note that even though the analysis excludes equine industry, it was not possible to exclude hay production for horse fodder.) The major sales generated in the vegetable sector came from potato and carrot. Within the fruit and berry sector, Saskatoon Berry generated the highest sales in 2012 compared to any other type of fruit.

Figure 15 illustrates total sales by livestock types in the livestock sector. Cattle production (beef and dairy) generated the highest gross sale of \$276,235 accounting for 46% of the total value of livestock. Poultry (chicken broilers and turkey), pigs and eggs (laying hens) accounted for 27%, 12% and 9% respectively. Other livestock including bee/honey, rabbit, sheep, goat and elk production generated \$34,945 or 6% of the total livestock industry in 2012.

Figure 15: Total sales in livestock industry by livestock types, 2012



Highlight 7: Feed, Seed and Compost

This section highlights production practice pertaining specifically to the type and source of feed, seed and compost used on farms. This highlight sheds light on the competition between sourcing resources locally and from outside of the Territory.

Out of 27 farms that reported their stock feeding regime, about 55% indicated that they produced a certain amount of feed on their own farm (either hay or grain). Those who did not produce their own feed would trade or buy from local farms, purchase from local businesses or order directly from businesses outside the Territory. Note however that local businesses do not carry feed produced from Yukon farms. Feed sold at local businesses is ordered and shipped from either Alberta or British Columbia weekly. This is because commercial feed has been standardized and certified (e.g. natural or organic) while Yukon feed stocks are believed by some farmers to vary in nutritional quality and consistency (personal communication, Feb 17-18, 2014). Not every respondent reported the amount of feed used in their livestock production operation. Table 10 shows the amount of hay and grain (local and non-local) used in the 2012 production year by survey respondents.

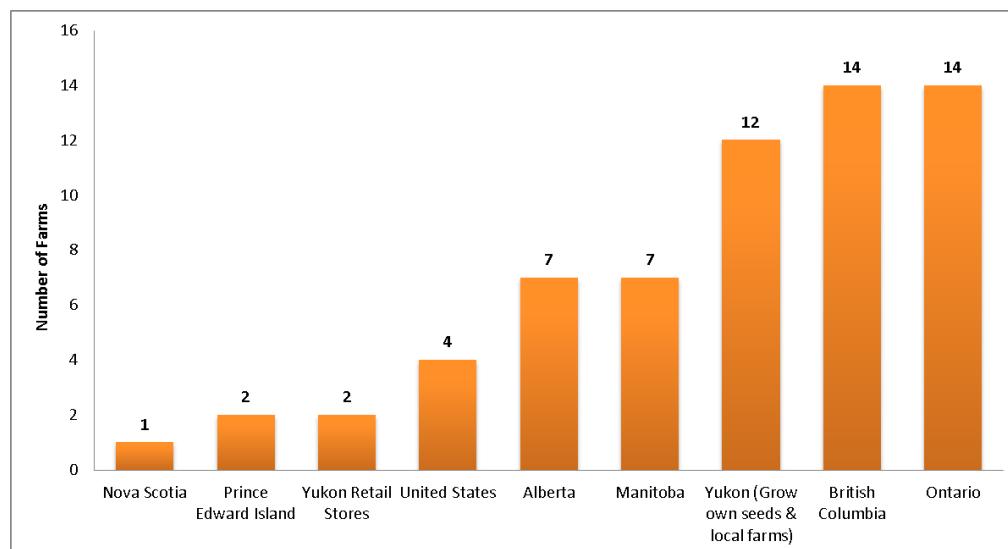
Table 10: Total feed required by a group of farmer respondents in 2012

	Quantity (tons)	Number of Farms Reported
Hay	240	16
Grain	51	17

*Feed required by the equine industry is not included.

Within the Yukon, farmers reported growing their own seed, buying from local farms, purchasing from local businesses, and/or importing from businesses outside of the Territory. Eight farmers reported having grown and saved their own seed. In general, farmers purchase seed from a variety of sources. Figure 16 shows the sources of seeds acquired for farm use. Seed companies from British Columbia and Ontario were among the most common sources from which Yukon farmers ordered seed. Note that local businesses only carry imported seeds from companies in Alberta and British Columbia. The order is placed only once a year in preparation for spring planting (personal communication, Feb 17-18, 2014).

Figure 16: Sources of seeds acquired for farm use



We have no indication of the ratio between Yukon produced seed and imported seed used but think it reasonable to suppose that the vast majority is imported. Local seed companies/farm, identified by farmer respondents, included C&D Feeds and The Feed Store/Pet Junction and Yukon Grain Farm located in Whitehorse. Other seed companies (from out of the Territory) from which farmer respondents bought seeds were:

Boundary Garlic (BC)	Peace River Farms (AB)
Champion Feeds (AB)	PrairierTech Propagation (AB)
Dominion Seed House (ON)	Pumpkin Moon (NS)
Denali Seeds (AK, USA)	Richter's Herbs (ON)
Dynamic Seeds Ltd. (AB)	Salt Springs Stellar Seeds (BC)
Foster's Seed and Feed in Beaver Lodge (AB)	Stokes Seeds (ON)
Full Circle Seeds (BC)	Stellar Seeds (BC)
Gourmet Seeds International (NM, USA)	The Cottage Gardener (ON)
Heritage Harvest Seeds (MB)	Thompson and Morgan (ON)
High Mowing Organic Seeds (VT, USA)	T&T Seeds (MB)
Johnny Selected Seeds (ME, USA)	Vesey's (PEI)
JVK Seeds (BC)	West Coast Seeds (BC)
McFayden (MB)	William Dam Seeds (ON)

While survey respondents indicated that much of the feed and seed were sourced from outside of Yukon, compost and manure needs were sourced locally. The major sources of compost and manure came from on-farm, neighbouring farms, local bakery, and a local compost business (located in Whitehorse). Among the 32 farms reporting compost use, 22 farms reported that a total of 880 tons of compost was used in 2012.

In terms of manure storage, almost two-thirds of the farms (64%) left manure in a compost pile. The rest either stored it in the pen or left it on the pasture. Very few farms stored manure in a contained storage or retention structure. The main use of manure was as a soil nutrient/ organic matter amendment spread on cropped fields or pasture. In addition to the storage and usage of manure, we were interested in knowing whether manure was a good source for satisfying nitrogen (N) needs. According to survey respondents, manure was able to satisfy some to all of the Nitrogen needed in cropping systems. In some cases, N needs were satisfied using other materials in addition to manure, but manure remained the main N source.

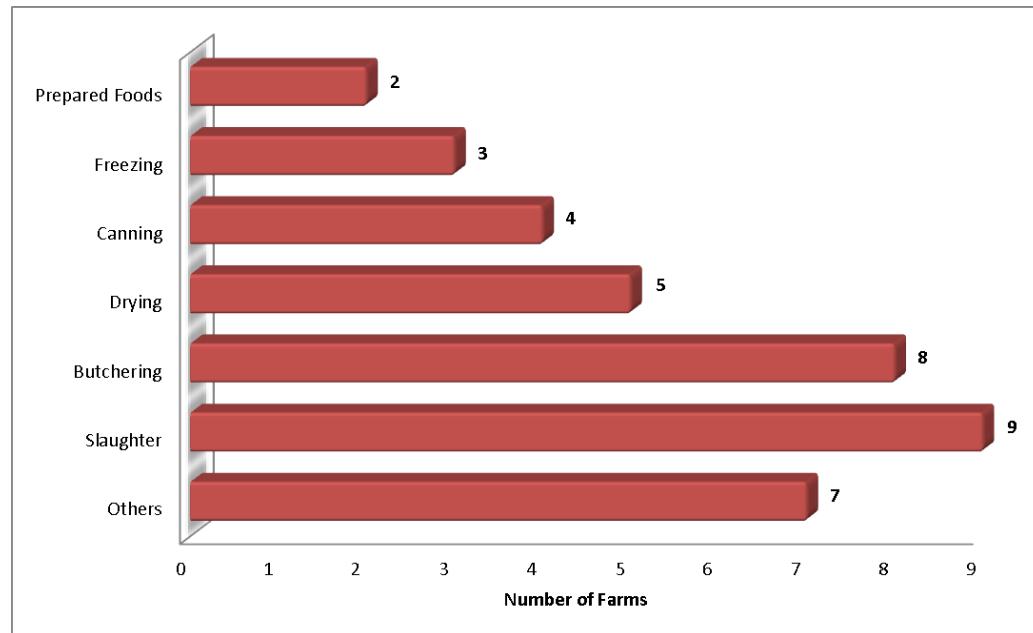
Highlight 8: Processing

This highlight presents the type of post-production and value-added processing activities in which Yukon farmers are engaged, as well as the capacity of processing facilities. In addition to information gathered from the survey, we described the market opportunities for retailing red meat in the Territory based on the interviews with industry partners.

Of the 49 respondents, about one-third (17 farms) engaged in some form of value added processing of their farm product(s) including butchering, slaughtering, canning, freezing, drying, and preparing foods. Other forms of processing included washing and bagging of vegetables, wool and knitted garment production, tea production, crafts, cheese production, and honey extraction. Figure 17 presents the types of value-added processing activities. On average, farms that did value-added processing stated that 51% of their income came from sales of processed products. Since most processing constituted a small-scale on-farm activity, farms did not hire additional employees for this aspect of farm business.

Farm businesses often had processing equipment on farm such as freezing, canning, and dehydration equipment, a home or commercial kitchen, chicken plucker, shearing tools, wool picker, small abattoir and on-farm butcher shop. Among those who did not engage in value-added processing of their farm products, approximately 70% stated that they would like to. Presumably because they perceived market potential and value-added as a way to capture consumer food expenditure and generate greater farm operation revenue. However, the main constraint indicated was the lack of requisite resource including time, money, facility, tools and knowledge.

Figure 17: Types of value-added processing activities



According to Yukon regulations, meat sold at the retail level must be inspected and certified at three stages: 1) slaughtering, 2) transportation and 3) butchering. For red meat producers who lack their own slaughtering and butchering facilities, there is an option of utilizing the mobile meat abattoir. The mobile meat abattoir is owned by the Yukon government and slaughter/butcher services are rendered by an

abattoir operator who obtains an annual operation contract from the Yukon government. The abattoir is an inspected and certified facility, thus giving farmers the opportunity to sell their meat products at the retail level. Per our personal interviews with Yukon farmers, the abattoir service is under-utilized at the moment and there are only a few farmers who sell meat at the retail level. The majority of meat farmers sell at the farm-gate. Additional discussion on this topic will be presented later in Highlight 11: Challenges.

A mobile poultry abattoir also offers poultry slaughtering services (The poultry abattoir ownership and operation will be discussed later in

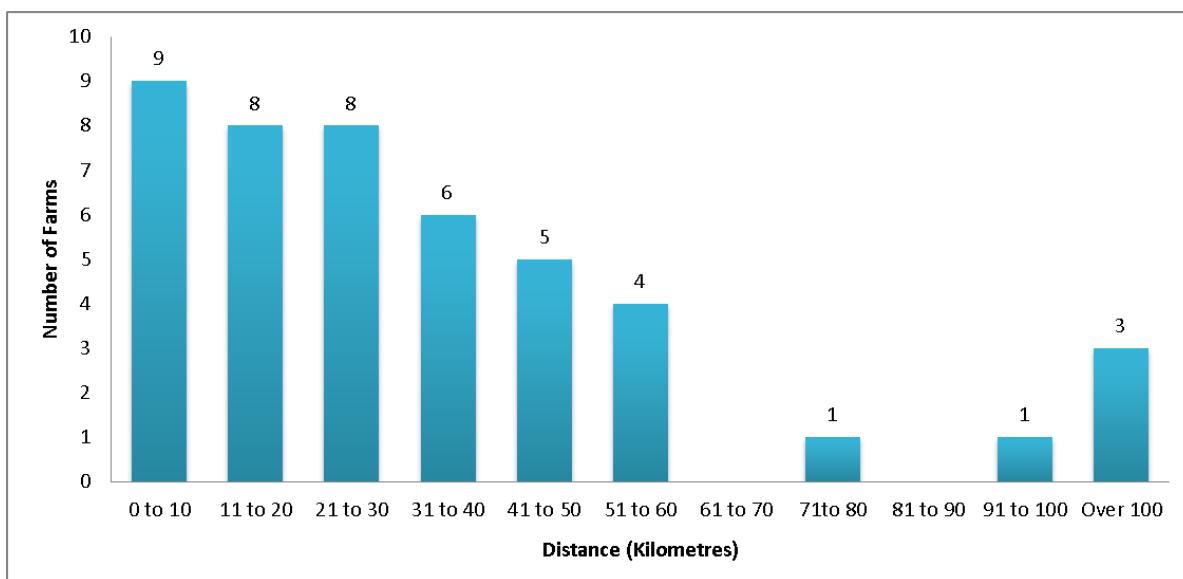
Highlight 10: Collaboration Amongst Farm Businesses). Unlike the mobile red meat abattoir, the mobile poultry abattoir is not an inspected facility. Therefore, the meat processed therein is not certified fit for retail store sales. None the less the service still can still be/is helpful to poultry producers who do not have slaughtering facilities of their own.

Highlight 9: Marketing

This section presents findings about the marketing channels through which farmers sold their products. We were interested in determining the distance between farms and their primary markets and the proportion of their products sold through each marketing channel. Most importantly, we describe the challenges and barriers that farmers encounter in selling their products, and whether they would have the capacity to increase production.

According to the 2013 Yukon Farm Products and Services Guide, there were 69 farms listed. Forty six farms (67%) were located within 50 km of Whitehorse, 10 farms (15%) were located in the city of Dawson area and the remaining 13 farms were located elsewhere.

Figure 18: Number of farms by distance to primary market (n=45)

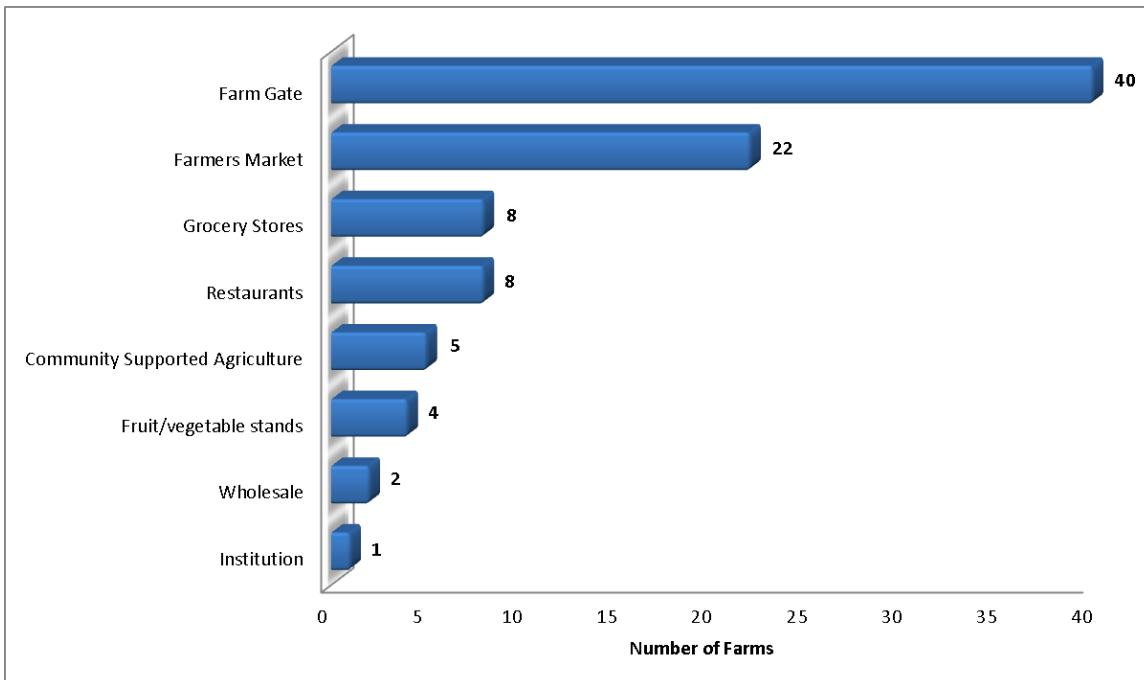


Survey results (Figure 18) indicate that the majority of farms were located within 60 km of their primary markets. With the main customer base being in Whitehorse, some farmers must travel a fair distance to service those markets.

Figure 19 (page39) illustrates the different marketing channels by which farms reported to have sold their products. The most utilized marketing channels were farm gate sales and farmers markets. On average, farmers sold approximately 60% of their produce at the farm gate, while 25% were sold at farmer markets. Most farms marketed their products via two channels. Only five farms sold their products through more than three channels.

Selling product at the farm gate does not necessarily mean that customers visit the farms to purchase farm products. Some livestock farms may deliver their meat directly to customers. Others may deliver it to a butcher shop in town (for cutting and wrapping) where customers then pick up the meat.

Figure 19: Number of farms by marketing channel



It is evident that it is a challenge for small to medium-sized farms to sell through marketing channels other than the farm gate and farmer markets. Restaurants, institutions, grocery stores and wholesalers often require consistently large amounts of produce, which acts as a barrier to these farmers. Especially for livestock farmers, strict regulations are in place for meat that is sold at retail level. In order for any farmer to sell at retail level, their livestock products must be slaughtered, cut and wrapped and transported with certified inspection. This is a hindrance to many small livestock producers as they often do not have a large enough number of animals to cost-effectively utilize the mobile red meat abattoir. Also, the advantage of selling at the farm gate is that farmers can sell the whole animal, whereas, retailers prefer (presumably because they sell more of) certain cuts (personal communication, Feb. 18, 2014).

Though most Yukon farmers mainly sell at the farm gate or a farmers market (and not in large quantities), they do not have much difficulty in selling all they grow. Thirty-eight farmers (83%) indicated that they sold all they produced in 2012. Additionally, 33 respondents stated that given there is seemingly “guaranteed” market demand, they would most likely be able to expand production to meet that demand.

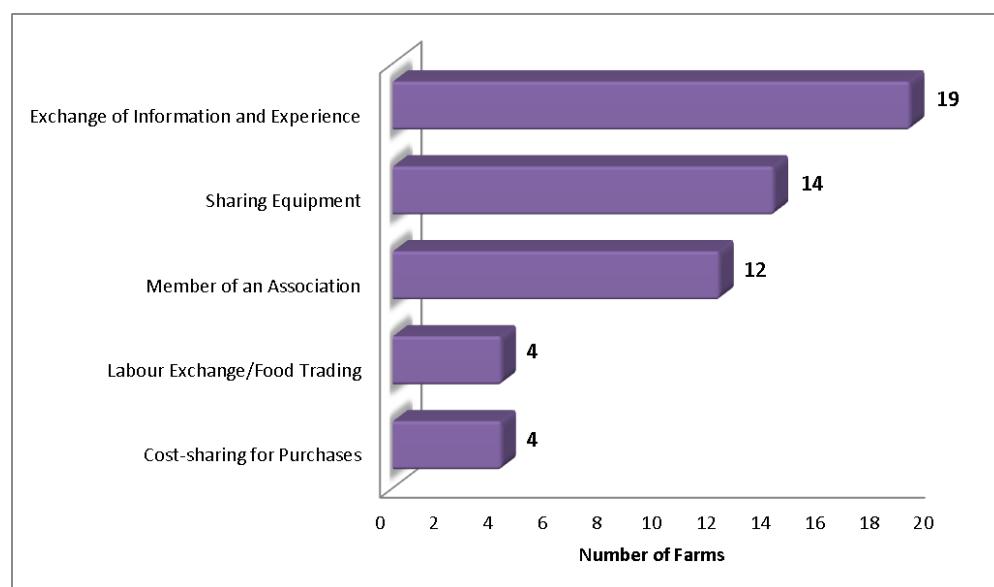
When asked what it would take for them to increase production, the most common response was the desire to see greater movement in supporting local and organic food. Especially with Yukon being heavily reliant on imported food, local farmers expressed the need for local consumers to be aware of the importance for the Territory to be able to produce as much of its own food. Finally, local farmers would like the community to recognize the hard work, long hours and cost being put into growing high-quality food.

Highlight 10: Collaboration Amongst Farm Businesses

This highlight reveals the community spirit within the farming sector by describing the ways in which farmers collaborate with each other in over-coming challenges and generally strengthen the farming sector.

Since the Yukon agriculture sector consists of mainly small to medium-sized farms, farmers would often encounter challenges that may require the assistance from other farmers to overcome. One advantage of being in a small community is the interaction between members and frequent exchange of knowledge and skills. A substantial number of farmers (38; 78%) indicated that they collaborated with other farmers to deal with some of the farming challenges they experienced. Figure 20 quantifies various ways that farmers collaborated with each other. Being a part of an association such as the Yukon Agriculture Association, Yukon Young Farmers, Farmers' Markets Association and producer associations such as Growers of Organic Food Yukon was a common form of collaboration for farmers. Regular interaction between farmers to exchange knowledge and information, and engage in discussion about successes, failures and best practices is an effective and time-honored way for farmers to advance their farming acumen.

Figure 20: Number of farms by collaboration methods



With limited accessibility to abundant supplies of farm input products, farmers would often jointly order bulk loads of feed, fertilizer or specialized equipment. Small and medium-sized farms often would not invest heavily in machinery and equipment to perform occasional farm work; therefore, sharing of equipment, similarly, is a regular way of farm collaboration.

The mobile poultry abattoir is an example of such collaboration. A group of poultry farmers formed a partnership and submitted a grant proposal to purchase the asset. The jointly-owned mobile poultry abattoir has been successful in lowering the time required to process poultry as well as reducing the costs of operation for all partners (personal communication, Feb. 7, 2014). In addition to being available to the members of the partnership, the abattoir service is accessible to other poultry producers. In order to cover the costs of operation, a fee is charged to both members and non-members. As non-members

are not responsible for the abattoir maintenance, they are charged at a higher rate. (Non-members may choose to become a member of the partnership after two consecutive years of utilizing the abattoir services, personal communication, Feb. 7, 2014)

Lastly, exchange of labour and produce is a common form of farmer cooperation and mutual support. Not only does it strengthen the relationship within the agriculture community, it is a unique form of partnership and important dimension of the small farm economy.

Highlight 11: Challenges

From our interviews and the survey we were able to identify some particular challenges faced by Yukon farmers in regard to existing operations and the expansion of Yukon farming. The most commonly reported challenges to Yukon food production and sales include: insufficient storage, lack of communal processing facilities, marketing, the short growing season, and poor soil quality. These findings are consistent with challenges reported in previous studies (Serecon el. al, 2007 and Zapisocky and Lewis, 2010). Thus, it seems evident that they have not been sufficiently addressed.

1. Insufficient storage

Many farmers reported a lack of storage space on and off-farm. Lack of storage means farmers cannot extend sales much beyond the harvest season. Storage requirements among different farm businesses include dry storage for their grain crops; freezers for meat and fruit products; and cold storage /root cellars for vegetables. One farmer reported that due to a lack of storage, grain is sometimes left to rot in the field.

2. Lack of communal processing facilities

Many farms are small operations that cannot individually justify investment in on-farm processing equipment or facilities. Farmers have expressed the need for communal facilities such as a commercial hub/ kitchen where activities such as washing and bagging of produce, storage and value-added processing can take place.

3. Short growing season

Given that the ground is covered in snow for 7 months during the year, the optimal growing seasons is short and limited to approximately 5 months in the year. Therefore, the window for growing fresh produce is rather short in Yukon compared to more southern regions.

Regarding the meat abattoir, in particular, the long duration of low temperatures freezes the water, thus suspending the use of the facility. Hence, there is no opportunity for farmers to have their meat inspected and certified for retail sales in winter months.

4. Marketing

Expanding sales beyond the farm gate to retail stores and restaurants is time consuming and presents a significant challenge to farmers who already dedicate substantial time to tending their farms. Many have expressed that they would prefer some mechanism to aggregate their product and have it sold/ marketed by one common agent.

In the case of meat products, all meat to be sold at retail level must be inspected and certified. Although the mobile meat abattoir allows beef producers to have their products certified, most local retailers do not necessarily want locally produced meat. Retailers want large quantities of specific cuts while farmers want to sell all parts of the animals. Retailers require fresh meat year round but local farmers typically slaughter in the fall. Also, meat imports from Alberta can be purchased by retailers at lower than local prices.

One potential response to the challenge is the plan by The Potluck Food Co-op to be a retail supplier of inspected Yukon meat. The Co-op is currently exploring details of demand for and supply of local meat. Poultry farmers face a significant barrier to marketing their products because at present, no inspected abattoir exists in the Yukon. Egg producers are challenged by the lack of a federally regulated egg grading station.

5. Soil quality

Yukon soils, particularly in southern Yukon are not inherently or particularly fertile. Significant nutrient inputs are required. While all farming operations must manage soil fertility and replace mineral nutrients with soil building inputs, whether compost or synthetic fertilizer, these are costly and can present a particular barrier for new farmers seeking to prepare soil for farming.

Conclusion

During Phase I of the Yukon Food System Design and Planning Project we have carried out three major industry engagement activities: Yukon Farmer Survey, interviews with Yukon food related business owners and operators and presentation/ feedback at the North of 60 Agriculture Conference. The presentation at the North of 60 Agriculture Conference gave us a chance to introduce the project and receive comments from participants who worked in agricultural sector on our draft food system objectives (to be utilized in the second phase of the project). The food system objectives that were unanimously endorsed by participants were: increase territorial self-reliance in agricultural foods, sustain Traditional food harvest, increase biodiversity, minimize non-renewable energy inputs and optimize energy efficiency, contribute to the local economy, and improve economic viability of farms and agri-food business. Participants expressed reticence regarding achieving the objectives of reducing greenhouse gas emissions and creating jobs.

The Yukon Farmer Survey and interviews of Yukon food related business owners and operators were conducted from Aug. 2013 to Feb. 2014. The information gathered from the survey and interviews provides a clear and concise understanding of the state of Yukon crop and livestock production as well as challenges in the sector.

Yukon agriculture is not a main employment contributor to the local economy as most farms are family-run and operated by the owners. The survey indicated that only 14% of the farm workforce were paid employees while 33% were apprentices and volunteers. The majority of the workforce (53%) were farm owner-operators. Although the primary agriculture sector is not a major source for paid employment, it has created jobs for farm owner-operators and is an opportunistic sector for future generations of farmers.

Financially, in 2012, the majority of surveyed farms made up to \$30,000 in gross cash income. Eighty-seven percent (87%) reported to have made less than \$20,000 in net cash income, with 40% reporting a net loss. Despite the high percentage rate of net loss, more than half of those farms were still in their start-up phase where their operations only began after 2010. Due to low farm net cash income, most farmers worked off-farm in addition to their farm work. Eighty percent (80%) of the survey respondents said non-farm income was their main source of income, implying that farming is not yet an enterprise that can routinely sustain a family in Yukon. This is not unusual in North America.

There were four types of food produced by Yukon farms: vegetables, fruits, field crops and livestock. Most farms produced a combination of two or more of these four product types. The survey indicated that 24 farms produced vegetables, 8 farms produced fruits, 19 farms produced field crops and 31 farms produced livestock. In 2012, the estimated total value of sales of crops and livestock production was \$6.28 million. By category, field crops had total sales of \$3.63 million, vegetables \$2.03 million, livestock \$594,196, and fruits \$22,771. The most common marketing channels that farmers sold through were at farm gate and at farmers markets.

Is There Potential for Yukon Agriculture to Expand?

Yukon's location, climate and topography are unique and different from other provinces. Thus a general food system model cannot be replicated from existing models from other provinces. Since Yukon consists of communities that are geographically widely dispersed, the economy of Yukon flourishes and strives through the development of small communities. Transportation routes into Yukon are limited. A substantial portion of Yukon food supply is reliant on the fragile highway transportation system from

outside of the territory. When the Alaska Highway was flooded in June 2012, food delivery by trucks was impossible for several days. This created greater awareness for Yukoners to take action to achieve greater levels of territorial food security.

Increased local agriculture production is one of the strategies to create a resilient food sector and economy. Per our interviews and survey, the general consensus is that there is real and substantial potential for the agriculture sector in Yukon to expand and become more established. To make farming an economically viable sector requires farmers to view it as a business not just a hobby or a lifestyle choice. Hence, there is a need for a farm business management education programs that assist farmers in financial planning and business development. Regardless, the economics of farming and local food systems is currently challenging. This can become increasingly less the case in the near and intermediate future as the interest and commitment in supporting local food grows.

Communal infrastructure, machinery and equipment are needed to support increased production. As the majority of farms in Yukon are small in size and mainly family-run, it is largely implausible for each farm to individually invest in infrastructure to support the expansion of their operation. Examples of shared facilities include a communal hub/ kitchen for product aggregation, food processing, and storage. Additionally, expansion of sales through investment in marketing strategies is equally important. To be able to sell at retail level or to institutions requires highly collaborative arrangements that may need supports from governmental agencies and innovative approaches.

Yukon farmers take great pride in being able to provide high quality fresh produce to their community. So as opposed to strictly seeing their farming enterprise in terms of a business, Yukon farmers enjoy and value the opportunity to produce nutritious, wholesome and flavorful foods for fellow Yukoners.

Next Steps in Industry Engagement

Industry engagement in Phase II will comprise additional interviews with Yukon food related businesses, and detailed interviews with key farmers. The interviews will strengthen our baseline data and we will seek to identify specific strategic opportunities for Yukon food system expansion. Farmers and other sector actors as well as community food system leaders will be encouraged to engage in development of the Food System Design.

Targeted Food Related Business Interviews:

1. Retailers (including Loblaws, Riverside Grocery, Extra Foods, Potluck Co-op)
2. Restaurants, baking, brewing, and catering businesses
3. Institutions (for example Yukon College, schools, hospitals and medical clinics)

Key Farmer Interviews: The focus of these interviews will be detailed production costs and returns. These data will support robust economic analysis and projections of opportunities for expanded production.

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Appendix I: Yukon Farmer Survey Questionnaire

Note: Included here are the questions asked in the Yukon Farmer Survey. For the sake of brevity, response options are not included. A full version of the survey, including response options, is available upon request.

PART ONE: General Farm Information

1. Name, and Farm Contact Information
2. What is your position on the farm?
3. What year did this farm first begin operating on a commercial basis? By "commercial basis" we mean "producing crops and/or animal products, on any scale, for sale to others".
4. For approximately how many years have you personally been farming?
5. How much farmland do you (or the farm owner-operator) own, lease from a private landowner, or access through a Yukon Government Grazing Lease? Please indicate units (acres / hectares / sections) by circling the one you use.

If you do not own farmland, please skip Question 6 and proceed directly to Question 7.

6. If you own farmland, did you buy it off the private market or through the Yukon Government Agriculture Branch's "Agriculture Land Program"?
7. Approximately how much of your farmland was in production in 2012?

If you use 100% of your farmland, please skip Questions 8, and 9 and proceed directly to Question 10.

8. Why didn't you use all of your land for production in 2012?
9. Would you be willing to allow someone else to farm some of that unused land? For example, a beginning or young farmer who otherwise might not be able to access farmland. If you would like, please add any comments about your answer.
10. Within the next 5 - 10 years, do you anticipate that your operation will expand, stay the same size, or shrink?

PART TWO: Farm Finances and Employees

1. In 2012, not including the owner-operator(s), did you have employees, volunteers, and/or apprentices working on this farm? Please check all that apply
2. In 2012, how many hours per week did the owner-operator(s), employees, and/or volunteers work on any aspect of the farm business, including field work (planting, weeding, harvesting, etc.), office work (record keeping, planning, etc.), and marketing (selling, delivering, packing CSAs, etc.)?
3. Is the availability of farm employees a limiting factor for your business?
4. What were the approximate total GROSS receipts (total income) of your farm in 2012? Do not include off-farm income in the amount you report.

5. What were the approximate NET receipts (total income minus fixed and variable expenses) of your farm in 2012? Do not include off-farm income in the amount you report.
6. Was 2012 a typical year for your farm in terms of profitability?
7. How many years has it taken for your initial investment in farmland and infrastructure to pay off (i.e., for your business to "break-even")? If your business hasn't broken even yet, how much longer do you expect it will take to do so?
8. Do you receive any off-farm income and/or other sources of funding for your farm such as government payments or grants? Please check all that apply.
9. Approximately what percentage of your total household income do the following sources of income make up? Please report an approximate percentage

PART THREE: Farm Production In 2012

Please skip any sections about types of production that do not apply to your farm. For example, if you did not grow vegetable crops for sale in 2012, skip the section on vegetable production.

1. Which of the following agricultural products did you produce on your farm in 2012 for sale to others? Please check all that apply.
2. Overall, what percentage of each agricultural product indicated above did you sell, give away, keep for yourself, and "waste"?

Vegetable Production in 2012: The following section is about the vegetables you grew on your farm for sale to others last year (2012).

1. In general, how would you describe your vegetable production method?
2. In 2012, did you grow any of your vegetable crops under protected culture such as hoop-houses, greenhouses, row-cover, cloches, cold-frames, or other?
3. What was the total amount of land you had in vegetable production in 2012?
4. What percentage of your vegetable crop area was irrigated?
5. What type(s) of irrigation system(s) did you primarily use on your vegetable crops? Please check all that apply.
6. Which of the following vegetables did you grow on your farm commercially in 2012? Beside the checkbox, please indicate the specific variety you grew (ex: "Carrots" - "Nantes Coreless"). By "commercially", we mean producing for sale to others on any scale.
7. Please tell us a little more about the vegetable crops you grew in 2012. Use the table below to fill out the following information:
8. How much of each vegetable crop did you produce in 2012?
9. What was your average price for each vegetable crop in 2012?

Fruit and Berry Production in 2012: The following section is about the fruits and berries you grew on your farm for sale to others last year (2012).

1. In general, how would you describe your fruit and berry production method?
2. In 2012, did you grow any of your fruit or berry crops under protected culture such as hoop-houses, greenhouses, row-cover, cloches, cold-frames, or other?
3. What was the total amount of land you had in fruit/berry production in 2012?
4. What percentage of your fruit/berry crop area was irrigated?

5. What type(s) of irrigation system(s) did you primarily use on your fruit/berry crops? Check all that apply.
6. Which of the following fruit and berries did you grow on your farm commercially in 2012? Beside the checkbox, please indicate the specific variety you grew (ex: "Blueberries - Duke"). By "commercially", we mean producing for sale to others on any scale.
7. Please tell us a little more about the fruit and berry crops you grew in 2012. Use the table below to fill out the following information:
8. How much of each fruit and berry crop did you produce in 2012?
9. What was your average price for each fruit and berry crop in 2012?

Field Crop Production: This section is about the field crops you grew on your farm for sale to others last year (2012).

1. In general, how would you describe your field crop production method?
2. What was the total amount of land you had in field crop production in 2012?
3. Amount of land in field crop production was _____.
4. What percentage of your field crop area was irrigated?
5. What type(s) of irrigation system(s) did you primarily use on your field crops?
6. Which of the following field crops did you grow on your farm commercially in 2012? Beside the checkbox, please indicate the specific variety you grew (ex: "Wheat" - "Alvena"). By "commercially", we mean producing for sale to others on any scale.
7. Please tell us a little more about the field crops you grew in 2012. Use the table below to fill out the following information:
8. How much of each field crop did you produce in 2012?
9. What was your average price for each field crop in 2012?

LIVESTOCK Production: This section is about the livestock you raised on your farm for sale to others last year (2012).

1. In general, how would you describe your livestock production method?
2. What was the total amount of land you had dedicated to livestock production in 2012?
3. In 2012, how much (approximate %) of your livestock feed needs were satisfied by...
4. Which of the following livestock did you raise on your farm commercially in 2012? Beside the checkbox, please indicate the specific breed you raised (ex: "Laying Hens" - "Red Rock"). By "commercially", we mean producing for sale to others on any scale.
5. Please tell us a little more about the livestock you raised in 2012. Use the table below to fill out the following information:
6. How many of each livestock type did you have on your farm in 2012?
7. How much meat/milk/eggs did you produce in 2012?
8. What was your average selling price for meat/milk/eggs in 2012?

PART FOUR: Production Practices

1. Please indicate which of the following general types of inputs you use on your farm, and where you get them from. If possible, provide an estimate of how much you use.
2. Please list all the places/companies where you get your seeds.
3. How often do you encounter the following general types of pests on your farm?
4. What is the source of your irrigation water?

5. How do you store the livestock manure produced on your farm?
6. What do you do with the livestock manure produced on your farm?
7. Approximately how much of your Nitrogen needs are satisfied by manure produced on your farm?
8. Approximately how much of your Nitrogen needs are satisfied by using techniques such as cover cropping, using nitrogen-fixing crops, or green manures?
9. How many days per year is your soil covered by crop canopy, crop residue or snow?

PART FIVE: Storage and Value-Added Processing

1. Did you do any value-added processing of your farm products for sale to the public in 2012?

If you answered NO to Question 1, please skip Questions 2 to 5 and proceed directly to Question 6.

2. Which of the following types of value-added processing did you do?
3. What processing equipment did you utilize and is this equipment located on or off your farm?
4. Approximately what percentage of your total farm income came from sales of your value-added products last year?
5. Did you hire any employees specifically to help with value added processing?
6. Do you want to do more value-added processing?
7. If you answered yes to question 6, what would enable you to do more value-added processing?
8. Do you have access to any of the following storage facilities for your farm products? (Fridge/cold storage, freezer, dry storage, root cellar)
9. Is your current access to storage facilities for your farm products sufficient?
10. Please tell us about where you sell your farm products. How much of your product is sold through each of the following channels? (Farmers markets, CSA, farm gate, wholesale, grocery store, institution, restaurant, fruit/vegetable stand)
11. Are there any marketing channels which you don't currently sell through that you would like to in the future?
12. Do you sell any of your vegetable crops, fruit, or berries outside of the growing season?

If you answered NO to Question 12, please skip Questions 13 and 14 and proceed directly to Question 15.

13. Do you charge higher prices for these crops or animal products when you sell them outside the growing season?
14. Where do you store the crops or animal products that you sell outside of the growing season?
15. Approximately how far away is your farm from your primary market (where you sell the most of your products)?
16. Is the distance of your farm from your primary market a barrier/challenge to your success?
17. Are you able to sell all that you grow?

If you answered NO to Question 17, skip Question 18 and proceed directly to Question 19.

18. If you were confident that there was sufficient demand for your farm products, could you grow and sell more?
19. What would it take for you to be able to sell all that you grow?
20. Do you collaborate in any way with other farmers to overcome the challenges of farming in the

Yukon?

21. Do you know any other farmers who aren't listed in the Yukon Farm Products Guide who might be willing to participate in our survey?
22. We are hoping to visit some farms this summer or fall. Would you be interested in having one or two of our research team members visit your farm?

Appendix II: YFSDP Project Advisory Committee Terms of Reference

Yukon Food System Design and Planning Project Advisory Committee Terms of Reference – January 2014

Purpose

The Yukon Food System Design and Planning Project Advisory Committee has been established to respond to general and specific requests from the Institute for Sustainable Food Systems (ISFS) Research Team for guidance and advice as they work towards completion of the Yukon Food System Design and Planning Project. Specific duties include:

- Provide technical advice
- Provide insights into Yukon's agriculture, food system, and communities
- Help ISFS researchers connect with relevant organizational, industry, and individual stakeholders in Yukon's food system
- Represent the Yukon Food System Design and Planning Project to the public at large

Composition

The Advisory Committee will include members from agriculture and agri-food related organizations, businesses, or government agencies. Individuals on the Advisory Committee should bring skills/experience in at least one area of the food system, for example agriculture or food processing.

Advisory Committee members are encouraged to join the committee for the duration of the project, but participation can be for a more limited portion of the project timeframe.

Composition as of January 2014 is as follows:

- Dr. Chris Hawkins (VP Research and Community Engagement, Yukon College)
- John Lenart (Dawson area farmer)
- Kim Melton (Growers of Organic Food Yukon)
- Tony Hill (Director, Yukon Government Department of Energy, Mines and Resources - Agriculture Branch)
- Joan Norberg (Whitehorse area farmer)

Vacant positions are as follows:

- Yukon First Nations Representative

Institute for Sustainable Food Systems Liaisons:

The Advisory Committee will meet primarily with the following research team liaisons from the Institute for Sustainable Food Systems)

- Dr. Kent Mullinix (Institute Director and Principle Investigator - Yukon Food System Design and Planning Project)
- Caitlin Dorward (Institute Research Associate and Project Researcher - Yukon Food System Design and Planning Project)

Kent can be contacted by telephone at 604.612.1252 or by email to kent.mullinix@kpu.ca.

Caitlin can be contacted by telephone at 604.599.2533 or by email to Caitlin.dorward@kpu.ca.

Meeting Schedule and Format

Meetings of the Advisory Committee with ISFS Liaisons will take place as necessary and at least three times per year. The meeting schedule outlined below is tentative and will be confirmed with committee members two weeks prior to each meeting date.

At least one meeting per year will be conducted in person. All other meetings will be conducted by teleconference.

Meetings will be chaired by ISFS Liaison Kent Mullinx.

Some ad-hoc meetings with a specific member or members of the Advisory Committee may also be held to address questions specific to an industry, sector, or community. In the event that such a meeting is planned, all members of the Advisory Committee will be notified in advance and will be provided with minutes after the meeting has taken place.

[Tentative meeting schedule will be added here]

Distribution of Meeting Minutes

Meeting minutes will be taken by Caitlin Dorward or another ISFS representative. Draft minutes will be circulated to the Advisory Committee for review. Edits will be accepted for one week and then a final version of the meeting minutes circulated to the Advisory Committee. This final version of the minutes will be made available publically.

Compensation

Participation is voluntary but some costs of participation (ie: mileage) can be reimbursed by ISFS. Copies of receipts must be submitted in order for reimbursement to be processed.