Multi-Use Facility Feasibility Study

Phase One:

Opportunity Analysis

Prepared for:

Yukon Agricultural Association

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Executive Summary: Phase One Opportunity Analysis

The Yukon Agricultural Association is investigating ways in which it can provide strategic-level infrastructure and services to help develop the agricultural sector and strengthen sustainability. A central conviction is that the YAA can best do this from a well-located property on the Mayo Road near the junction of the Yukon and Takhini valleys. The overall vision is to create an agricultural complex with a broad range of facilities that can serve the agricultural community.

A number of concepts for this property have been identified; this feasibility study was directed to focus on four which could be an initial "core' for the agricultural complex. The selected projects were referenced in the "Yukon Agriculture Multi-Year Development Plan" (Serecon, 2000):

- Vegetable cold storage
- Value-added processing for red meat
- Professional-grade processing kitchen
- White meat (poultry) abattoir

The feasibility study has three components. Phase 1 (Opportunity Analysis) tests whether each core concept has sufficient demand and examines the likelihood of meeting minimal financial goals of breaking even on operating and overhead expenses within a 5 year period. Potential projects recommended by this phase will be received by a committee which will prepare a schematic design of the multi-use facility in Phase 2. Phase 3 completes the feasibility study with financial analyses of business case scenarios.

Phase 1 makes the following recommendations:

- **Vegetable cold storage.** Do not pursue at this time; there is insufficient demand at present, and serious barriers exist to increasing vegetable production. Additional research and development of this industry sector is required prior to considering investment in cold storage vegetable facilities. It is anticipated that this industry sector could grow and prosper with the right incentives, and it is recommended that YAA promote further research and development of this sector.

- **Value-added processing for red meat**. Pursue concept; there is a valid business case and the project will support several strategic-level development goals.

- **Professional-grade processing kitchen.** Pursue concept; the extra equipment needed is an incremental addition to the red meat facility and existing processors can rent space to achieve full use of facility and added revenues.

- **White meat (poultry) abattoir**. Pursue concept; business case at this stage is uncertain, but there is likelihood that poultry production will expand to cover overhead and expenses.

A Multi-use Facility containing these projects would serve several sectors of the agricultural community and would establish key links in the agrifood production chain

that extends from “farm to fork”. The facility would also be compatible with other worthwhile projects including a fuel cardlock depot, a community center, bulk storage for grain, hay, fertilizer, and possibly, an exhibition and fairground. The site would serve the Horse and Rider Association well if they wish a secure and ample location for their facilities.

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1.0 Introduction

The Yukon Agricultural Association commissioned TransNorthern Management Consulting to investigate the feasibility of four ideas for infrastructure and services that could benefit the agricultural community. The selected topics would be the core of a larger concept for an agricultural complex that ideally, would be located on the Mayo Road. The property should be central for much of the agricultural community, and it should be large, flat, and arable, so it can support a variety of projects that could benefit each sector of the farm community and the wider public as well.

The overall concept would provide secure and accessible land for many kinds of agricultural infrastructure, which could accommodate fertilizer storage, bulk fuel and cardlock outlet, vegetable storage, processing for red meat and poultry, professional kitchen facilities for secondary food processors, riding facilities, exhibitions, fairgrounds, and rodeos. With sufficient land, a variety of compatible facilities could be situated, even support facilities such as holding pens and paddocks for livestock and horses. The goal is to help Yukon agriculture develop by providing needed infrastructure that private capital is unlikely to build.

It is envisioned that the land and facilities be provided by the Yukon government and remain in its ownership. Management of the property would be furnished by a broadly structured Board of Directors drawn from government and affiliated organizations such as;

- Yukon Agricultural Association
- Growers of Organic Foods Yukon
- Yukon Horse and Riders Association
- Game Growers Association of the Yukon

A number of possible projects were identified by YAA**.** Out of the several worthy ideas, the Steering Committee asked the consultant to focus on four considered most likely to be useful, financially feasible, and mutually supporting or compatible.

- Vegetable cold storage
- Value-added processing for red meat
- White meat (poultry) abattoir
- Professional-grade processing kitchen

Each of these potential projects was to be tested against two essential criteria:

a) The project will strategically serve the agricultural sector – it will have a long-run developmental effect on one or more agricultural sector, and
b) The project will be financially self-supporting within 5 years. (This assumes the project will not have to repay its capital investments, and that it need only break even on operating expenses and overhead after 5 years.)

The study has three phases. The first phase (Opportunity Analysis) tests the demand or need for each concept, identifies opportunities and constraints, and outlines the operational requirements for a successful facility. The second phase, to be completed by a YAA committee, will prepare a schematic design for a facility to accommodate the concepts recommended by Phase 1. The third phase will analyze the financial and organizational feasibility of the resulting project.

This report summarizes the findings of Phase 1 and sets out information and recommendations to guide the design committee in Phase 2. The research referred to the following documents:

- Yukon Agriculture Multi-Year Plan (Serecon Mgt. Consulting, 2000)
- Strategic Analysis of the Yukon Agricultural Industry (TMC, 2003)
- YAA Strategic Plan (Klassen, 2006)
- Yukon ACAAF documents
- Yukon Abattoir Final Report (Research Northwest, 2004)
- Need Assessment Study on Community Kitchen (Marion, 2003)
- Whitehorse Area Cold Storage Study (Gillespie, 2004)
- Yukon Agricultural Policy
- YAA Request for Funding for Land Acquisition

Research also relied upon discussions with a large cross-section of farmers, market gardeners, processors, butchers and meat department managers, and store owners in southern and central Yukon. Field officers in CFIA, Alberta Agriculture, and the Manitoba Food Development Center were especially helpful.

Background to the Multi-Use Facility Concept.

From its beginning in Gold Rush days, the backbone of agricultural development in the Yukon has been the initiative and effort of farm families. In the Yukon, as elsewhere in Canada, there is an important and sometimes essential role for common action. Together the public and private sectors have fostered agriculture in key areas, including creating an agricultural policy with an effective land disposition program; partnering in agronomic and economic research; and developing and implementing programs. As the agricultural sector progressed, the emphasis has shifted from land disposition and achieving basic production to fostering economic sustainability.

The agricultural census of 2001 identified 170 farms in the territory, with total farm investment including land, buildings, equipment and livestock, at $50.2 million. Industry production totaled $4.2 million, while industry expenses totaled $4.7 million. In effect, the agricultural sector as a whole was operating close to break-even. Despite progress in the last 5 years, it is fair to assume that barriers to profitability, growth, and sustainability persist.

In 2003, an agricultural development strategy identified several constrictions in production and in infrastructure that were impeding farm profits and sustainability. It recommended a linked sequence of objectives and steps that could help improve profitability. One objective was increasing hay production, and thereby stimulating increases in horse ownership, increases in livestock production, and increases in agricultural services. However, the strategy noted that livestock production would remain limited by a lack of necessary meat processing infrastructure including local abattoir, cooling and processing facilities, and inspection services. Similarly, lack of an effective bulk cold storage facility would continue to inhibit Yukon growers from serving a year-round demand for vegetables. In both cases, the infrastructure impediment would limit market potential, which would in turn limit production.

Two breakthroughs in infrastructure have occurred since the development strategy was written: on the vegetable side, the Yukon Grain Farm has built substantial cold storage

facilities for serving the Yukon potato market through the winter; on the meat side, the Yukon Agriculture Branch has provided a mobile abattoir and meat inspection services for the southern Yukon. Important as these are, key links in the farm-to-fork food continuum remain missing. Chiefly, a cooling and processing facility is needed to render an inspected carcass into a block-ready product that can be wholesaled to a retail meat market, or packaged and sold directly to hotels or restaurants.

Once this link is built, a key constraint to the development prospects for Yukon's forage and livestock sector will be lifted. As this study discusses in Sections 3 and 5, a market exists for high quality, all natural Yukon meat and poultry. Serving this market will contribute to Yukon's economic independence and sustainability by stimulating several areas in the agricultural sector:

- hay and grain producers,
- meat and poultry producers,
- support businesses such as sales and service for equipment, fertilizer, irrigation, and transport,
- Processors and retailers.

The processing facility would be readily compatible with other agricultural infrastructure and facilities that could be located on the same property.

Even though the need for a processing facility has been discussed for years, it has not yet been built. The reasons describe a vicious circle in production and economics: the facility is necessary if the industry is to grow, but further growth in the industry is necessary in order for private capital to build it. In development economics, a vicious circle can continue for very long time unless some outside agency changes things. This is the very circumstance in which the agricultural community and government can promote the common good by harnessing and managing public capital to build and operate infrastructure that can stimulate a new round of growth.

Historically, public investment in infrastructure has been pivotal in developing Canadian agriculture. For similar public-spirited reasons, government has built and provides yearly funding to specialized infrastructure in the Yukon, including the Yukon Arts Centre, museums in many communities, the Mt.McIntyre complex (cross-country skiing and curling), the Mt. Sima downhill ski area, the Yukon Wildlife Preserve, and the Canada Games complex. Government also maintains ongoing programs to provide support to industry such as geological surveys, forest inventories, and fisheries inventories.

The ingredients for the most successful publicly financed infrastructure projects are:

- Benefits are broadly distributed
- The project fulfils a strategic function (its existence creates the basis for further benefits and developments)
- The project can be self-sustaining
- The importance of the project is generally understood and accepted.

Few publicly-supported projects meet all of these criteria, but the agricultural processing complex identified by this report, does. The following sections examine the initial feasibility of four projects that could be the foundation for this complex, and could strengthen the sustainability of Yukon agriculture.

2.0 Opportunity Analysis: Vegetable Cold Storage.

The "Yukon Agriculture Multi-Year Development Plan" (Serecon Mgt. Consulting, 2000) suggested on p. 20 that "in order to lengthen the marketing time period for local production, storage is required for some vegetable crops." It went on to propose a strategy to "determine storage requirements" for potatoes and carrots (p. 21).

Much has changed since this report was written. Farmer's markets are now well-established outlets for in-season vegetables, and the Yukon Grain Farm has succeeded in capturing nearly 50% of the Yukon market for potatoes by placing a competitive product on the shelves of all major food retailers in Whitehorse. The Serecon study estimated Yukon retail consumption of potatoes to be approximately 500 tons/yr, setting aside home gardens, farmgate sales, and farmer's market sales. (Note, current Yukon population estimates are virtually the same as the ones employed by Serecon.)

The Yukon Grain Farm, with a several-million dollar investment in specialized equipment, irrigation, cold storage facilities, and soil improvement is cultivating 25 acres of potatoes per year with a yield of 15t/acre. They are marketing approximately 300 tons through each of the main retail outlets in Whitehorse. The product is not organic, but it is considered to be a premium-quality potato that retails for roughly twice the price of the non-Yukon varieties brought in by the distributors. Customers are loyal, and pay for freshness, quality, cleanliness, and the satisfaction of buying locally.

The Serecon estimate of Yukon's potato consumption is likely low, since the Yukon Grain Farm calculates that it supplies 50% of the local potato market in the months August – April. Increasing its storage from the current 300 ton capacity to 500 tons will enable it to supply the market year round. Fifty percent market penetration is remarkably high for any product, especially for what is normally a commodity food. Although the Yukon Grain Farm expects to expand from an 8 month market supply to a 12-month market supply, its owner suspects it will be difficult to capture additional market share. Approximately 50% of the market is willing to pay up to twice as much for higher-quality potatoes, but the other half of the local market appears to be resolutely price-sensitive and regularly shops for low-cost potatoes. It is not financially feasible to compete on price: one cannot produce a low-cost potato in the Yukon.

Organic farmers are developing a niche for organic potatoes. The Wild Blue Yonder Family Farm leads Yukon production in organic potatoes and carrots. They presently cultivate 3 acres of potatoes at 10 tons/acre and 3 acres of carrots. They have storage facilities on-farm but they sell what they produce by November. They face two constraints to expanding production: low prices limit the financial incentive, and labor capacity limits the area that can be cultivated. The critical production gap is in harvesting: the farm has equipment for each phase of cultivation but not for harvesting – a small-capacity harvester (a future expenditure) will cost between $15,000 and $20,000. Until this is obtained, 4 acres is the upper limit of what can be harvested. When and if the Wild Blue Yonder Family Farms expands its production, it will continue to store its produce on-site.

The third sizable producer in the territory is the Pelly Farms, which also has on-site storage and sells all its potatoes to nearby markets.

After these three farms are approximately 20 market gardeners, each of whom grow and market small quantities of potatoes and carrots. These gardeners sell what they produce and have little interest in substantially expanding production because of the physical difficulty of tending larger gardens by hand. For most gardeners, expanding means either mechanizing or hiring labor: neither is financially reasonable because of the low price structures for vegetables, thus there is no demand for vegetable storage at this time.

Recommendation: Promote further research and development of this industry sector. Existing small scale, non- commercial gardens cannot currently justify the development of processing or storage infrastructure at this time. However, due to the infancy of agriculture in Yukon, this area needs further review and investigation that is beyond the mandate of this report. Should the Government of Yukon wish to enhance territorial self sufficiency in vegetable production, processing and storage, and are willing to support this with appropriate subsidies to kick start the industry, a successful industry sector might develop.

3.0 Opportunity Analysis: Red Meat Processing

3.1 Overview.

The Yukon consumes approximately 5000 head of beef yearly, of which between 90 and 140 are locally produced, un-inspected, farmgate sales. The abattoir at Partridge Creek has been supplemented by a mobile abattoir well-situated to serve the Whitehorse area. This will make it easier for local farmers to market Territorially-inspected beef and elk.

In principle, inspected local meat can be retailed through supermarkets and other commercial outlets. In practice, this is unlikely in current circumstances. Supermarket and butcher shop managers have expressed little interest in carrying local beef for a variety of reasons:

- Pre-existing contractual relationships with major distributors;
- A nearly complete switch from swinging sides to block-ready meat shipments plus a greater percentage of waste and labor costs in the swinging product;
- Perceived customer preference for Canada A or AA product;
- Unknown grading standards of local product;
- High price of local product: $3.50^{+}/lb. vs. 2.00^{+/-}$/lb.;
- Perceived price sensitivity of most consumers.

In the final statement, local retailers must justify a revenue potential for every portion of their shelf space and they have little interest in experimenting with developing markets. Some small outlets in Whitehorse may be exceptions, but their volumes will not be high.

At present, this leaves Yukon growers with farmgate sales as their primary outlet. An inspected product might marginally increase sales into the farmgate market, but it is questionable that this market can grow much more. If Yukon beef farmers intend to increase production and sales, they will have to develop a new market and tailor products to it.

3.2 Red Meat Processing Opportunity

An opportunity exists for Yukon farmers to market fresh and value-added products from natural and/or organic meats. These specialty meats are currently in markets witnessing significant growth. The products would include fresh meat, meat sticks, and meat jerky, with a large percentage of the carcass going to value-added products. Since 1997, sales of meat snacks including meat sticks and meat jerky have grown by over 147% despite little promotion and marketing. Sale of natural meats is growing between 15% and 20% per year. Supporting the interest in natural meats is a study suggesting that sales of organic poultry will grow 30% yearly. (Data from Economic Research Services of US Dept. of Agriculture, www.ers.usda.gov; see also Laux, M. Iowa State University, quoting Organic Trade Assn. www.agmrc.org; and Agriculture and AgriFood Canada Market Information section www.agr.gc.ca)

Organic meat and poultry:

Definitions for “Organic” meat and poultry are established by certifying bodies such as the Food Alliance and recognized for labeling purposes by industry and by the USDA under the *Organic Foods Production Act*. When they are enacted, Canadian regulations will be comparable and mutually recognized.

Natural meat and poultry

While no one definition exists, "Natural" meat and poultry has come to mean antibiotic and growth hormone free. Some "Natural" beef producers have gone one step further by meeting additional stipulations such as strictly grass, grain, or hay fed cattle. These measures are targeted at consumers who are seeking assurances that their beef comes from cattle that are never fed meat by-products, eliminating potential exposure to BSE.

Issues that are becoming increasingly important in the marketing of "Natural" meat and poultry products are the environment (waste management, resource protection), animal welfare (more humane treatment), enhanced nutrition (higher nutrient content) and small farm support. These traits are becoming as important as being free from antibiotic and growth hormones when marketing "Natural" meat and poultry to a larger audience. See “Natural Beef Market in the United States” Agrifood Trade Service, CFIA www.agr.gc.ca.

The higher retail price of natural fresh meats and value-added processed meat can offset and accommodate the higher production costs of Yukon beef, elk, bison and pork. Two hurdles must be overcome: creating a strong market image that can command the price needed by producers, and presenting products that meet the requirements of retailers and consumers.

Fresh Meat. Research shows that meat markets are not receptive to the swinging sides and quarters that emerge from either of the Yukon’s abattoirs. However, Yukon-inspected natural meat (beef, bison, elk, and pork) may find a market with some established retailers if it is processed into block-ready prime cuts. Restaurants may provide an additional market.

Value-added Processed Meat. Fresh meat can be further processed into sausages, smoked and cured meats, and jerky. The value-added can be considerable: for example, with a Yukon price of $3.50/lb, $10.50 of meat inputs can be processed into $30.00 retail value of jerky (3 lb raw > 1 lb jerky).

To realize this opportunity, Yukon producers must create a market niche for Yukon meat that supports the higher prices needed. The most likely product attributes are:

- All Natural (safe, nutritious, clean)
- Local
- Environmentally responsible and humane

The market strategy would be to differentiate the “Yukon Natural” meat products from southern alternatives on basis of health, nutritional quality, local freshness, and environmental benefits. A recognized Yukon standard of natural meat would have to be created, branded, and marketed. The market image and identity of this standard can be developed and promoted in the Yukon to residents and to visitors as a clean, healthy, nutritious “Northern taste” for fresh and cured meat and for jerky snacks.

This dedicated niche marketing strategy would not compete directly with existing retail products, since no comparable “all natural” meats are carried on retail shelves here. An

"all natural" meat jerky does not appear to be on the market either – further research is needed to determine whether a marketable nitrate-free jerky can be produced.

Operation

Yukon farmers envision a facility that would receive inspected carcasses, and for a fee process them into block-ready cuts, sausages, smoked and cured meats (including hams and bacon) and ground meat. Producers would sell these products to meat markets or retail them directly to customers. Ideally, only meat deemed worthy of a "Yukon Natural" label could be marketed as such.

Jerky would be produced in the facility by an entity (possibly an entrepreneur or a producer co-op) dedicated to marketing a Yukon jerky product line created from local meat. A unified Yukon jerky company would make a more effective market presence than several local operators each promoting their own product. The entity would purchase meat from Yukon farmers, process it, and market "natural" Yukon jerky to food markets, and to businesses serving tourists, hunters, outdoor recreation, and the traveling public. Since a main objective of the business (if organized as a co-op) would be to stimulate and to support primary production of livestock, it is sufficient if its initial objectives were to break even on overhead and operating expenses.

3.3 Preliminary market estimates.

The market demand for all-natural meat (chemical and hormone-free) is increasing by 20% a year (USDA). In the Yukon, farmgate sales continue to be strong, but additional growth in new farmgate customers may be limited because of marketing constraints needed to overcome poor information and consumer habits. Since local farmers are meeting less than 1% of the demand for red meat (5000 beef/yr), it is reasonable to forecast that a highly visible "Natural Yukon" meat product line could take a small market share. For example, if each Yukoner and visitor consumed just ¼ lb of fresh natural meat per year, this would require 116 animals additional to what is currently sold. By way of comparing the scale of this assumption, note that North Americans consume approximately 111 lbs/yr of beef and an equal amount of pork per capita per year.

Local retailers do not sell natural meats, and only a few are forthcoming about sales of jerky and meat snacks. Extrapolating from available data gives an estimated local consumption of 6000 lbs of jerky yearly, a large proportion being summer sales to mining exploration companies. It is important to emphasize that jerky and meat sticks are not promoted and they are virtually invisible to the 250,000 visitors to the Yukon, thus current sales do not reflect market potential.

Market research indicates that an aggressive promotion of an all-natural Yukon jerky as a healthy snack and lunch item will find a number of niches including health and fitness buffs, school children, outdoor and recreation, tourists, and health-conscious families. Visitors can be promoted with a "taste of the Yukon" consumable.

Some modest assumptions show the possible scale of this market: if each Yukoner and each visitor consumed ¼ lb yearly of jerky (2 snack servings) this would require 38,750 lbs of jerky/year. This equates to 156 cows (@ 600 lbs/meat/cow) – 1.5 times current farmgate sales.

A modest assumption applied to possible jerky and to fresh meat sales yields a combined demand for 272 additional beef, elk, or bison, nearly tripling Yukon meat production. This would be a significant policy objective and business objective for the Yukon with vast implications for the demand for fodder, irrigation capacity, fertilizer, farm equipment, and other services. The retail size of a market of these proportions could exceed $1,000,000.

3.4 Yukon Meat Production Capacity

Could local farmers increase their production of beef, elk and bison? Yukon livestock producers south of Pelly Crossing were contacted to determine if they would increase their production if they had sales guaranteed by a processing facility. Five producers were interested in, and capable of increasing production. Two were hesitant, constrained either by limited land base or by the cost of game fencing. Two producers currently had all the market they wished to serve at the present. The concerns of most operations were to have secure markets to justify increased production, and prices that fairly accounted for Yukon costs.

A processing facility with the capacity to produce marketable fresh meat and value added meats, would assure the secure markets and price structures needed by Yukon farmers to increase their livestock. It can be expected that this would attract new livestock producers as well. Southern and central Yukon's production of red meat could double or triple in 3-4 years to meet demand from a processing facility.

3.5 Processing facility.

A newly-modified facility in Grimshaw, Alberta maintains a retail outlet, coolers, and a value-added processing floor in a 4000 square-foot renovated building. It is adjacent to its own custom abattoir handling 60 animals/week. Some animals are custom-slaughtered and processed; others are purchased and marketed. "Peace Region Beef", a hormone free and newly branded product, is marketed. Providing extra thick-sliced steaks and marinated meat packages is an additional market niche.

The valued-added red meat processing facility considered for the Mayo Road would receive carcasses and process them into the following products:

- Block-ready fresh and frozen retail meat
- Whole muscle jerky
- Ground-meat jerky
- Sausages, smoked and cured meats.

If a dry recipe is used, a significant advantage of producing jerky is that the finished product is shelf-stable and it does not require the costs of cooler storage.

The mix of products would ensure that each carcass would be used completely and with maximum economic contribution. Wastes would be mostly bones and connective tissue. Much of this could be given to sled dog kennels, and the remainder could be composted. A low-cost solution uses an on-site pit using sawdust (if sufficient supplies can be obtained from the two area sawmills). Perhaps an even more effective solution would be a commercial animal waste composter that would also serve the need of the City of Whitehorse.

Equipment:
The facility would contain the equipment of a conventional butcher shop, including hanging coolers to receive carcasses, a cutting room, and equipment for rendering the carcasses into fresh meat products and raw ingredients for jerky and sausages. The following list of equipment for commercial-grade jerky making contains quotes for new machinery from Midwestern Research.

- Electric smokehouse: professional-grade smokehouses come in several capacities: one will turn 200 lbs of meat into 67 lbs of jerky in 3 hours (@$25,000 USD); the next step will convert 300 lbs of meat into 100 lbs of jerky (@$35,000 USD).
- Heavy duty mixer/grinder: mixes in seasoning and grinds lower-value cuts for ground-meat jerky and sausage. (@ $10,000 USD)
- Meat stuffer: to extrude ground meat into uniform strips for drying. (@ $8000 USD)
- Jaccard slicer: up to 28 blades in parallel, slices large whole muscles (typically rounds) into flats of defined thickness; later it slices finished jerky flats into strips. (@$20,000 USD) A slower process is to use a conventional slicer (@$3500 USD)
- Vacuum tumbler: rapidly and uniformly saturates meat with seasoning without lengthy marinade, keeping moisture content low. (@ $10,000 USD)
- Vacuum packer/sealer: (@ $4,000 USD)
- Labeler/scale printer: (@ $3,500 USD)
- Stainless steel counters, sinks, meat saw, carts, misc. (approx $15,000 CAD)

Approximate capital investment for all-new equipment (not including premises and coolers) $100,000 CAD. There is a market for sourcing used meat processing equipment. (See page 9.)

CFIA publishes guidelines for construction of food premises, guidelines for process design, and assessment standards for processing meat. (See Appendix 2) Several private-sector specialists are available to assist in designing and equipping facilities and process lines.

3.6 Recommendation

Pursue this concept.
A red meat value-added processing facility, complemented by a value-added business featuring Yukon Natural meat, has reasonable prospects of achieving several strategic goals for stimulating Yukon's agricultural industry. It has good prospect for breaking even on operating and overhead expenses within 5 years. The facility requires a rural land base, and it would provide an excellent anchor for a number of companion concepts including a processing kitchen and a white meat abattoir. A flourishing facility is easily compatible with other useful concepts such as a cardlock fuel outlet, centrally located bulk storage, a community center, and facilities for horse riders.

4.0 Opportunity Analysis: Processing Kitchen

A half-dozen Yukon food processing businesses are expanding their production beyond what is needed for occasionally participating in farmer's markets. At least two have ambitions of exporting. At present, these processors operate out of facilities in restaurants, churches and homes that are approved by Environmental Health for local markets. They are not ideal: none of these facilities would receive CFIA approval for permitting export, and most have limitations in terms of space, available equipment, and efficient layout.

Four businesses expressed interest and willingness to rent professional-grade kitchen facilities if they were provided by YAA. One business, ramping up for export, anticipates a need for up to 15 days/month. Three others are interested in principle if the new facility has advantages not offered by their current kitchens. The chief obstacles currently faced by these processors are:

- Availability of facility and scheduling;
- Inadequate space, inadequate working surfaces
- Insufficient equipment resulting in inefficient methods
- Awkward layout for separating contaminated from uncontaminated spaces
- Awkward design for cleanup
- Facility sometimes not fully clean when renter arrives.

Since a professional-grade processing kitchen would be the core of the red meat facility discussed in Section 3, it would be comparatively easy for this to be rented out to current and likely future businesses. Access to this facility would be an important service to the processing sector – now in its infancy – and it would provide additional revenue by renting out capacity when not needed by the meat business.

The following items of equipment were identified as especially helpful:

- Bottling machine
- Capping machine
- Bottle washer
- Steam kettle with agitator
- Bar extruder with interchangeable extrusion plate and adjustable cutter
- Flow wrapper (wraps bars), fully adjustable
- Conveyor oven
- Large mixer (Hobart style with removable and/or tilting bowl)
- Labeling machine (included among list of red meat processing equipment)
- Dry (warm) storage for finished products.

Yukon processors consider the Food Development Centres operated by Manitoba and Saskatchewan to be exceptional facilities. They can advise YAA on recommended equipment and fee schedules.

Recommendation: Pursue this concept as a companion to the red meat facility.

5.0 Opportunity Analysis: White meat (poultry) abattoir.

Until recently, Partridge Creek raised and marketed some 6000 broiler chickens a year, which routinely sold out at about $3.50/lb. Because of labor shortages, they are scaling back to 1200/yr, leaving a market vacancy. Yukon poultry producers report that they easily market all the chickens and turkeys they grow; most have waiting lists. It is reasonable to state that southern Yukon has considerable market potential for locally-raised poultry.

The economics of small-scale poultry raising have improved since the Yukon Grain Farm began producing competitively priced feedgrain. One small local poultry producer provided the following figures for free-range chickens:

Costs:

190 chicks	$ 300
(30 mortality)	
Feed: av. 50 lbs/day @$11 for 70 days:	$ 770

Revenue:

160 birds @7lbs ea @ $3.50/lb	$3920

Gross: $2850

This producer allocated 3 days with 6 volunteers for slaughtering. If this had been paid labor the gross profit would have been cut in half.

Note: the high price for local poultry confirms that Canada-wide data concerning strong market interest and market growth for natural, hormone-free, free-range poultry applies also in the Yukon.

Whitehorse-area poultry farmers have little market incentive to use the Partridge Creek abattoir, since they successfully sell all through the farmgate, and through farmer's markets. However, an abattoir in the Whitehorse area is very attractive. The chief incentives are operational: it is difficult and slow to slaughter and process large numbers of poultry by hand and volunteer labor is always problematic. Many hobby farmers also find it distasteful. A nearby poultry abattoir would address both objections. Local producers report that they would increase production if this were available, as it is almost as easy to raise 400 chickens as it is 200. They also suggest that more people would get into hobby farming of poultry if birds could be dropped off, and picked up the next day cooled and packaged.

A census of Yukon poultry raisers will be completed in 2007. Interviews with local producers and importers of chicks suggest that there are approximately 3000 poultry of all kinds in southern and central Yukon. This is a minute fraction of the Yukon's yearly poultry consumption of 500,000 birds (Serecon, 2000), indicating plenty of room for an all-natural poultry specialty niche.

The Hutterite colony that built the Partridge Creek poultry abattoir indicate they could duplicate the facility (excluding structure) for approximately $45,000. The processing rate depends on the number of people involved. With 14 workers, the line can handle up to 400 birds an hour. With 8 people, the facility can process 250/hr. The line can function with as little as 4 workers. The abattoir should operate at optimum capacity to

minimize start-up costs. This could be achieved by slaughtering in large batches on advertised days.

If the abattoir processed 3000 birds at $.50/lb, it could receive revenues of $10,500, assuming an average weight of 7 lbs. In principle, this could be accomplished in two days. Wages expense at $12.00/hr for a 10-person crew for 2 days would amount to $1920. The number of birds needed to meet wages for this crew would be 550. Energy and overhead expenses are not known at this time; the abattoir would be shut down when not in use.

Partridge Creek uses unusually cold well water (1^{o}C) to chill the carcasses. The standard is to reach 5.5C (42F) in three hours. The temperature of the well water from the Mayo Road site would have to measured, to see if it was cold enough to reach this standard. A heat pump might be needed for added cooling.

*See Appendix 2 for details on a comparable abattoir produced by Brower Equipment.

Recommendation: Pursue this concept as a companion building to the red meat facility. Some economies of scale can occur in water, heating, and waste disposal. If this facility succeeds in stimulating poultry production as expected, the marketing division of the red meat enterprise could also market inspected poultry.

6.0 Conclusion.

The Opportunity Analysis has identified three projects that YAA could locate on a suitable property such as the one on the Mayo Road that could also accommodate other infrastructure for the agricultural community. The red meat and the white meat facilities will require capital expenditures in both plant and equipment; the processing kitchen can use the same structure, but will need additional equipment.

The meat processing facility, the poultry abattoir, and the community kitchen would be contained in one building. As needed infrastructure, it would contribute several important links to the agrifood product chain in the Yukon, and it would provide an anchor to attract other agricultural services to the property, which is envisioned as an agricultural complex serving the entire agricultural community.

It is proposed that the Yukon Government own the facility and the land on which it stood. It is further proposed that the land the facility be leased to the YAA. General oversight of management and policy will be to a Board composed of directors nominated by YAA and by organizations that might be considered stakeholders (i.e. facility users), for example:

- Yukon Agricultural Association
- Growers of Organic Foods Yukon
- Game Growers Association of the Yukon
- Fireweed Community Market
- Yukon Processor's Association

The board would be expanded to include related groups, such as the Yukon Horse and Riders Association, or the 4-H, if they establish facilities on the property. A producers Co-operative would be formed to actually manage the facility. It would be headed by an Executive Director proficient in meat processing, administration, and marketing. The Co-operative would develop standards for a "Yukon Natural" brand of meat and poultry. * See additional information on Alberta's Northern Beef Initiative ("Branding the Peace") in Appendix 1.

Several functions would be needed for the facility:

- Management, (including facility scheduling, booking, accounts receivable and payable, casual labor, overseeing maintenance);
- Meat processing
- Poultry abattoir operator
- Cleanup and maintenance

Phase III of this study will examine how these functions might best be delivered.

The block-ready processing of fresh meat would be provided to farmers on a fee-for-service basis by a butcher employed by or contracted to the facility. Additional value-added processing (hams, bacon, sausages, smoked meats) would also be fee-for-service to farmers, who would market their own products.

Jerky would be produced and marketed by a producer co-op which managed the facility and its equipment. Farmers could have two strategic objectives for this venture: a) additional sales of fresh meat within a "Yukon Natural" meat niche; and b) additional income through the production and sales of jerky and other value-added meats. If the value-added operation was run as a co-op, it could have less stringent standards of

success than if it was a private business. A private business would have to become profitable within a few years, depending on its capitalization.

Design and Equipment Contacts

Good resources are available for advice on designing both structures and processes.

- CFIA publishes structural criteria and process descriptions (appended). Leslie Hornby, Food Safety Officer, CFIA, Kelowna (250)470-4899 hornbyl@inspection.gc.ca) will provide information and will involve specialists as needed to facilitate the design phase.
- George Walter of the Pibroch Hutterite Colony, Alberta (780-349-6131) will advise on poultry abattoir design. He notes that the line built by his colony is identical to the one shown on www.browerequip.com. (see Appendix Three)
- Andy Titus at Midwestern Research and Supply 1-316-262-0651 will advise on jerky production.
- Source for used food processing equipment:
  MTC Food Equipment, Inc. "Buy-Sell and Broker"
  http://www.mtcfoodequipment.com
  15170 Cedar Grove Road
  Poulsbo, WA 98370 USA
  P. 360-697-6319
  F. 360-697-6738
- Plant set-up and processing equipment advice
  - George Braun at CTR Refrigeration and Food Store Equipment at 1-877-736-7287. Enviro-pak line of horizontal flow jerky ovens
- Supplies,small equipment,
  - UniPac Packaging, Edmonton, AB - Greg Urbonas, 1-800-661-3860
  - The Yes Group, Westlock, AB - Russ Paul, 1-888-678-9378

Appendix One.

The Northern Beef Initiative

The Northern Beef Initiative began in earnest more than a year ago, long before the first BSE case but stalled after the first case of BSE. We feel strongly that the market will return and we want the Peace region to be a leader in the industry when that happens.

The Northern Alberta Beef Team was spearheaded by Alberta Agriculture (AARFD) which commissioned a study to look at the migration of southern Alberta beef producers to areas outside of Alberta.

That study showed a potential 152 producers looking to expand, relocate or start a new operation outside of the province, with many looking to Saskatchewan.

Saskatchewan has already begun aggressively promoting themselves as a viable alternative for southern producers looking to relocate. Saskatchewan communities are holding seminars and booking booths at agricultural trade shows in south and central Alberta hoping to sway those producers contemplating a move...

In Northern Alberta we continue in our efforts to attract a federally inspected meat processing facility, however, without a consistent supply of beef, this is unlikely to happen.

Northern Sunrise County is taking a lead position on the Northern Alberta Beef Initiative, however is working with the M.D. of Smoky River, and Lac Cardinal.

The first show the team attended was **the North American Seed Fair** in Lethbridge, March 3 through 6. Upcoming shows include the Medicine Hat Stampede and Exhibition this summer and and Farmfair in Edmonton in November.

Check out the Northern Beef website at www.albertabeefnorth.ca.

Branding the Peace

It's a concept not that uncommon to most cattle producers - branding. And while the process of branding may be one many cattle producers are familiar with, an Alberta British Columbia cross border group, wants to put a new spin on it.

"We know we grow some of the world's best agricultural products," said Dan Dibbelt, board member for Branding the Peace and Northern Sunrise County's Economic Development Officer. "We have studies that show our honey and oats are among the world's best. The problem is we have traditionally sent away our raw product for processing as opposed to value-adding locally. Branding our products will change that."

Dibbelt compares the branding concept to that of Niagara wines, or even Silicon Valley computers - you take a product your community is known for and market it on those strengths.

Enter Peace Region beef. The province of Alberta has long been known for high quality beef products. Despite the BSE crisis, the strength of the Alberta brand goes a long way. If Branding the Peace has its way that brand recognition will further extend specifically to the Peace brand of beef.

With the Peace Brand logo officially in place the focus of the group has been to establish the criteria for products to carry the logo. The first such product is Peace Region Saskatoons under the company Berry Fields Saskatoons. With a recent contract signed with Overwaitea Foods/Save On stores, you can expect to see the logo appearing on frozen Saskatoons in your supermarket frozen food section.

Interest in the brand has also come from a variety of other Peace products, from oats to honey, from beef to bison.

“We have a group of beef producers that have formed a company and are producing a high standard of beef,” said Doris Brocke, Branding the Peace Country Association acting manager. “We are presently in the process of developing general criteria that will establish which product can carry the Peace Brand logo, Beef producers are encouraged to assist in the criteria that applies to them,” she added.

The presence of a brand will elevate branded products as a guaranteed superior product. “With that the producer can expect a premium price and the consumer a premium product,” added Dibbelt.

Appendix Two:

Excerpts from CFIA "Guidelines for Constructing Fish Processing Plants"
These guidelines are largely applicable for meat processing plants.

a. Construction
b. Example of HACCP plan

CONSTRUCTIONAL REQUIREMENTS

New regulatory provisions to the Fish Inspection Regulations came into effect in April 1999, which requires establishments to meet the new specific construction requirements. This means that previously registered establishments will have to be brought up to full compliance. Please contact the District Supervisor for the exact constructional requirements for facilities constructed prior to April 1999.

Detailed information can be found the facility compliance requirements as set out in Schedules I and II of the Fish Inspection Regulations. A summary document of these compliance requirements is available on the internet at:
http://www.inspection.gc.ca/english/anima/fispoi/qmp/compconfe.shtml

The following are specific details to the major constructional requirements for a fish processing plant.

Floors

1. Processing areas require floors of concrete (light broom finish recommended), or other equally impervious and cleanable material. A MINIMUM continuous floor slope of 1 inch per 8 feet is required. There must be an impervious, washable wall/floor joint; a coved joint is recommended. Processing floors should not be painted as these have proven to not be durable.

Drains

1) Drains should be of a trough design. The trough drain should be a minimum of 6 inches in width and depth, with a minimum slope of 1 inch per 6 feet. The distance from the drain to any wall or floor crown should not exceed 15 feet.
2) If constructed of concrete, the lip of the drain should be equipped with L shaped angle iron of sufficiently robust construction to withstand forklift traffic and offset the effects of corrosion over time. They should be sufficiently embedded and anchored into the concrete to prevent flex, and to protect the concrete.
3. A slanted metal bar screen should be installed at the discharge end to prevent clogging.
4. A 4 to 6 inch diameter drain pipe off the trough drain is required.
5. Circular drains may be acceptable in areas of minimal water flow, providing the grates are large enough to prevent clogging and there is at least one drain for each 400 sq. ft. of floor area.

6. Drains must be designed so that highest point of the drainage begins at the 'most clean' part of the operation (i.e. high risk area) and the effluent drains to the 'less clean' part of the operation (i.e. low risk area)
7. Sumps should be located outside processing areas. Waste water should be discharged to the sanitary sewer system or approved screening apparatus. Contact local municipal and Department of Environment and Parks officials for more information.
8. Drains must be equipped with traps or other devices to preclude the entry of gases or vermin into the building through the drain.

Walls

1. Wall surfaces of processing areas must be durable, smooth, washable, and impervious to water (no gyproc). Where the Fire Code requires gyproc, it must be covered by approved materials.
2. Concrete block walls or durable impervious polymer panels are preferred.
3. Plywood (minimum 3/8", good one side) is acceptable, provided the studs are located on a 6 inch concrete curb (i.e. one layer of concrete blocks) to prevent rotting at the floor wall joint. The bottom edge of the plywood should overlap the concrete curb and must be well caulked to seal out moisture.
4. All wall construction and fixtures must be designed to shed water during cleanup (outdoor electrical outlet covers; window sills sloped to drain; no holes or crevices).
5. Plants must identify a facility perimeter around which all entries (loading, personnel doors, windows that can open), are constructed to prevent rodent entry (no daylight when closed; windows screened).
6. The plant must be equipped to exclude fly access while processing, and to remove existing flies in the plant (eg. UV unit). Doors may not be remain open during processing unless they are adequately protected from fly access. Anterooms or holding rooms are required at all entrances to processing areas for entry of product and employees.

Wall Coatings

1. Painted wall surfaces should be sealed with appropriate primer paint before being coated with a durable approved enamel or epoxy final coat.
2. Concrete walls must be well sealed on both sides with a waterproof coating and painted on the inside.
3. Walls must be light coloured so that dirt or insanitation is readily visible.

Ceilings

1. Ceilings must be smooth, impervious, waterproof, light coloured surfaces with no exposed pipes, joints or open support beams, REGARDLESS OF HEIGHT.
2. Gyproc is unacceptable as it is not self supporting when it absorbs water.

3. A minimum height of 9 feet is recommended otherwise the height must be sufficient to allow the orderly operation of equipment for that area.
4. Overhead fixtures such as pipes, heating units etc. should be installed such that they prevent no risk of contamination to processing areas below.

Lighting

1. Covered or shatterproof lighting must be installed throughout the processing area and in any dry storage areas. Plastic coated, shatterproof lights are preferred.
2. A minimum of 20 foot candles is required throughout the processing area and dry storage areas, 50 foot candles over any processing surfaces and 100 foot candles over inspection surfaces.

Processing Equipment

1. Processing equipment (including clean up equipment) must be constructed of approved materials such as stainless steel, aluminium or plastic. It is recommended that equipment not be constructed of dissimilar metals such as stainless steel and aluminium; these cannot be welded together, and generally require bolting or riveting. Pans and bowls must not have rolled rims, as these are not possible to clean.
2. Construction materials and methods should be employed so that equipment is smooth, without lead soldered seams or exposed screws, bolts or rivet heads. Welds must be smooth and continuous (not spot welded), without gaps between pieces of metal which are difficult to reach, for cleaning. Internal angles should have a radius greater than 1/4" (i.e., no sharp angles).
3. All product conveyors must be equipped with sprayers and scrapers if required.
4. Galvanized metal, wood, mild steel, enamel or brick are not approved materials for processing equipment.
5. Well painted wooden totes are acceptable containers for holding fresh, unprocessed fish, pending processing. Ice and fish in process must be stored in totes of approved material (aluminium, plastic).
6. Ice houses must meet the same requirements as processing areas. Ice houses must be equipped with plastic shovels and either a foot bath, or designated boots for staff. Ice chutes must be located under a protective cover.
7. Drive motors/transmissions must be located such that lubricant drip is either confined, or directed away from fish contact surfaces.

Water Supply

1. Blueprints or plans of the water supply and disposal systems are required.
2. Water must be of potable quality from an approved source (i.e. chlorinated municipal water supply). Water from other than municipal sources (e.g. well water) must be treated (ultraviolet or chlorination) to ensure potability. Live tank water within registered establishments must also be treated so that it is potable. UV systems must be equipped with a sensor measuring light intensity in the chamber, and a solenoid shut off or alarm system to alert the operator of failure.

3. A minimum 2 inch diameter water line capacity is recommended. An in plant chlorination system (2 ppm for cooling water residual; at least 20 minute contact time) is a preferred method to assure potability of the water supply and is required for canneries.
4. Water supply will be evaluated for potability compliance prior to recommending registration.
5. Where there is more than one hose outlet in the plant, vacuum interrupt backflow prevention devices should be installed, preferably in-line, to preclude back siphonage into the piping system. These devices are mandatory for bivalve and ready to eat processing plants.

Toilet Facilities

1. The schedule for the number of toilets required is as follows:
   1 - 9 employees 1 toilet
   10 - 24 employees 2 toilets
   25 - 49 employees 3 toilets
   50 - 74 employees 4 toilets
   50 - 100 employees 5 toilets

2. All staff, including office, processing and management, are to be considered for these totals. The toilet numbers for separate men and women washrooms must be considered independently.
3. For men's toilet facilities, a urinal may be substituted for a toilet as long as two thirds of the required number of toilets remain as toilets.
4. There can be no direct access from the processing area into the toilet room. An anteroom or a 90 degree turn into the toilet is required. Toilets rooms and stalls must have self closing doors. Facilities must be available for staff to hang up outer gear, before using toilets.
5. Mechanical ventilation and a floor drain are required in each washroom facility. Flooring and curbs should be impervious to water, to protect against seepage during wash down.
6. Walls and ceiling should be light coloured, water resistant, and washable.
7. Lighting levels must be 20 foot candles or more.
8. Toilet facilities in upstairs office / lunchroom locations should not be located over processing areas. All toilet facilities must be equipped with a floor drain

Offal Disposal

1. A concrete offal pad located outside the plant is required. The offal pad must be sloped to a central drain and the pad should be large enough to accommodate two containers. The area surrounding the pad must be washable and drained.

Miscellaneous Requirements - Processing areas

1. Non-hand operated hand washing sinks are required in processing areas.
2. Hand washing basins, at least 24" wide, plumbed into a drain, equipped with hot and cold water, liquid or powdered soap and single service towel dispensers must be installed in numbers and locations such that they are visible from the processing area(s), and easily accessible.
3. For utensil washing, a free standing double (triple recommended) compartment sink of adequate size, entirely constructed of approved material, plumbed into a drain, and equipped with hot and cold water is also required. Processing plants handling shucked bivalves must have a triple compartment sink.
4. Hand washing basins and equipment washing sinks must be separate pieces of equipment. Sinks and basins must be built to be free standing and washable (i.e. not built into in wooden or arborite / laminate finished counters or cupboards) and sealed at the wall/sink joint.
5. Wash down hoses are required in key areas of the plant. These must be connected to outlets that are not part of a sink as outlined above. Hose racks are required.
6. Mechanical ventilation and hoods are required for any cooking, blanching, smoking, etc. of fish products.
7. Racks must be provided for air drying and storage of gloves, aprons, and other waterproof garments after cleaning and disinfection, and located in a washable area of the plant.
8. Staff must be supplied with hair nets and smocks or coveralls; Change rooms and appropriate facilities must be provided for storage of this equipment.

Freezers and Cold Storages

The regulatory requirements for these items are very technical and are complicated by the many varieties of equipment and installations available. Specific proposals will be individually evaluated. Some specific requirements include:

1. Cold storages must be an integral part of the plant, and be capable of continuously holding frozen product at colder than -18 degrees Celsius. Product is not to be frozen in cold storages. Chest freezers and shipping containers are not acceptable as cold storages.

2. Blast freezers must be capable of -29 degrees Celsius, with air flow of 2m/sec. across the product. Frozen product is not to be stored in blast freezers.

THE HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP) PLAN

Processors must develop, document and implement a HACCP Plan to address any health and safety hazards related to the product or process. The processor must apply the principles of HACCP to identify any significant hazards and for those significant hazards identified, develop a HACCP plan to prevent, eliminate or reduce the hazard to an acceptable level.

The HACCP system consists of the following seven principles:

Principle1 - Conduct a hazard analysis.
Principle 2 - Determine the Critical Control Points (CCPs).
Principle 3 - Establish critical limit(s).
Principle 4 - Establish a system to monitor control of the CCP.
Principle 5 - Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.
Principle 6 - Establish procedures for verification to confirm that the HACCP systems is working effectively.
Principle 7 - Establish documentation concerning all procedures and records appropriate to these principles and their application.

Every processor must analyze their products and processes to determine if any health and safety hazards are present and, where significant hazards are identified, appropriate controls must be put in place. The application of the HACCP principles must be consistent with the Recommended International Code of Practice - General Principles of Food Hygiene, CAC/RCP 1-1969, Rev.3 (1997), Amd. (1999).

Appendix Three: from www.browerequip.com

Processing Plan

for

400 Birds Per Hour

As you begin planning your processing operation, obtain the advice of your local inspector. Requirements vary from one geographic area to another. By obtaining the blessing of your local inspector, you can often save time and expense. Local extension personnel can also be a good source of knowledge.

A summary of personnel required is shown in Exhibit 1. You will need 3 people to kill, scald, and pick. You will need about 12 people to eviscerate and pack. Exhibit 2 shows the approximate location of these 15 people.

KILL

When killing the bird, it is best to cut the carotid artery, not the windpipe. This allows the bird to more easily bleed and minimizes shock. A properly bled bird will have little or no blood around the bone or joint. If you use an electric stunner and blood appears in the joints, the bird has been stunned too hard. Turn the setting lower. Do not cut the head off as the bird is bled. This will result in an undesirable appearance. The head should be removed during the evisceration process. Estimate bleeding time at about 1 minute and 15 seconds.

SCALD AND PICK

After birds are bled, they should be scalded then picked as soon as they can be loaded into your scalder. SCALD AND PICK WITHOUT DELAY. The scald is the key to a good pick. When analyzing damaged birds, please note. If bird shows a bruise, the bruise happened before the bird was killed or during death shudder. A bled bird will not bruise. The darker the bruise the older the injury. If a broken bone has blood around it, the breakage occurred while the bird was alive. The darker the blood, the older the injury. Pick only long enough to pull feathers. Extending pick risks skin tearage. Excessive skin tearage in the breast and inner thigh are signs scald is too hot or long. Fatty tissue under skin should not liquefy. If fat breakdown occurs, scald is too hot.

Recommended Scald Capacities are:

Model No.		Length of Scald	Birds Scalded At One Time
BM60	Broilers	1 minute	9
(Galvanized)	Pheasants	1 minute	9
	Turkey Hens	1 minute	3
	Turkey Toms	1 minute	3
	Quail	30 seconds	15-20
	Duck	1 minute	9

Scald Temperatures:			
	Broilers	145° F	(63° C)
	Quail	127° F	(53° C)
	Duck	150° F	(66° C)

CAPACITIES ARE NOT GUARANTEED

All capacities indicated for individual machines or for complete systems are approximate. The ability to achieve the capacities indicated depends on many factors including but not limited to labor force experience, plant layout, whether or not equipment is operated under continuous production and size of the birds. Capacities indicated generally assume a 2.5 pound (1.1 kilogram) broiler. Birds larger than that will reduce capacity.

Recommended Pick Capacities are:

Model No.		Length of Pick	Birds Picked At One Time
BP30SS	Broilers	30 seconds	10
	Pheasants	30 seconds	10
	Turkey Hens	30 seconds	3-4
	Turkey Toms	30 seconds	2
	Quail	15 seconds	20-30
	Duck	30 seconds	10
QBP23	Broilers	30 seconds	6
	Pheasants	30 seconds	6
	Quail	15 seconds	20-25
	Duck	30 seconds	4

When processing pheasant and turkeys, hand strip heavy wing and tail feathers ("flight feathers") before picking. Water fowl are a difficult species to pick--whether they are dry picked (no scald) or if they are scalded and picked.

Use only Model SS48SS Scalder and Model SP38SS Picker for larger turkey operations. Our smaller picker and scalder can be used if you are processing a few turkeys. If when picking, it is apparent that the birds are not sufficienty scalded, we recommend a longer scald, not a higher temperature.

Consider placing a sturdy step or platform between your scalder and picker. This can improve productivity by making it easier to move birds between the two machines.

Make sure your Model BM60 Scalder is properly vented and that the vent is open. Without venting, heat builds up under the scalder and can cause equipment damage. Also, efficiency will be reduced resulting in higher gas consumption.

With practice, you can achieve a yellow skin if desired. A bird has two skins. The outer yellow skin is usually loosened in the scald. However, if you drop the scald temperature to 127° F (53°C), the outer yellow skin will remain in place. Scald for the same length of time, just drop the temperature.

There are markets for feet. Should you elect to market them, you can get them in presentable condition. Scald the feet twice (1 minute each time) and pick once for 30 seconds. The skin should be removed and should have a marketable item.

EVISCERATE

The following operating plan is recommended. These recommendations may or may not fit your operation.

One worker can remove the feet and cut the oil gland. This should be done before birds are eviscerated. Position a barrel or cart near the eviscerating table to collect feet.

The second employee cuts neck skin and pulls crop.

One worker can open tail. pull vent, draw entrails. When drawing entails, contamination can result if the operation is improperly performed. Care must be taken to pull out the intestines without tearing them. Separate giblet mass at this time and discard offal.

One person can separate the heart, liver and gizzard. Carefully pinch the gall off the liver or cut it off with the heart liver shears. The gall may cause contamination and discoloration if broken. You can remove the sack around the heart with your fingers. If regulations require the tubes that go into the heart be trimmed, use shears to trim.

Use one employee to trim, split and wash gizzards. Use shears for trimming (a hacksaw blade also works well to split open gizzards).

One worker can peel gizzards and help take giblets to the point where they will be chilled. This worker will not be busy all the time. However, it is difficult to combine this operation with another.

Use one worker to remove lungs and wash cavity. The next worker can remove the heads, cut necks, wash carcasses and drop into chill tank.

CHILL

Consult a refrigeration or ice machine manufacturer or other expert about chilling your birds. This can be a capital intensive part of your operation. Purchase equipment that can be serviced in your locale. Purchasing an ice bin allows you to run your ice machine

24 hours a day. Other options for consideration include placing ice storage inside a cooler or placing an ice machine on top of a small cooler. In other words, there are several creative possibilities for adding the cooling capability you need.

Chilling is necessary to reduce pathogen development. Chilling by itself will not reduce pathogens. Birds need to be thoroughly washed as well. Birds need to be chilled to below 40°F (4°C), i.e. 35 - 37°F (2-3°C) within 4 hours of death. Maintenance of the bird at this temperature can give shelf life of 7-10 days. The amount of ice depends on the ratio of ice to water and also depends on the temperature of the room where chilling is performed. For chilling, estimate 1.5 pounds to 1.75 pounds (.7-.8kg) of ice per bird. This is where the water in your chill tank is about 35°F (2°C) and where room temperature is 68-77°F (20-25°C). To maintain birds in a cooler, estimate 10-15 pounds of ice (4.5-6.8kg) in a tray of say 20 birds.

Using Brower's chill pump Model No. CTAP60 (or CTAP50) will help your ice go further. Don't overload your chill tanks. Capacities are approximately:

Model No.		
PP430	75-100	Chickens
PP412	50-75	Chickens
PP433	20-30	Chickens

You will probably need two workers to ice, make boxes, pack boxes, weigh and stack or load. A foreman should handle one of these positions as packing twenty boxes per hour is not a full-time job for one person. Be sure to train one of these people and make them responsible for assuring birds are properly chilled.

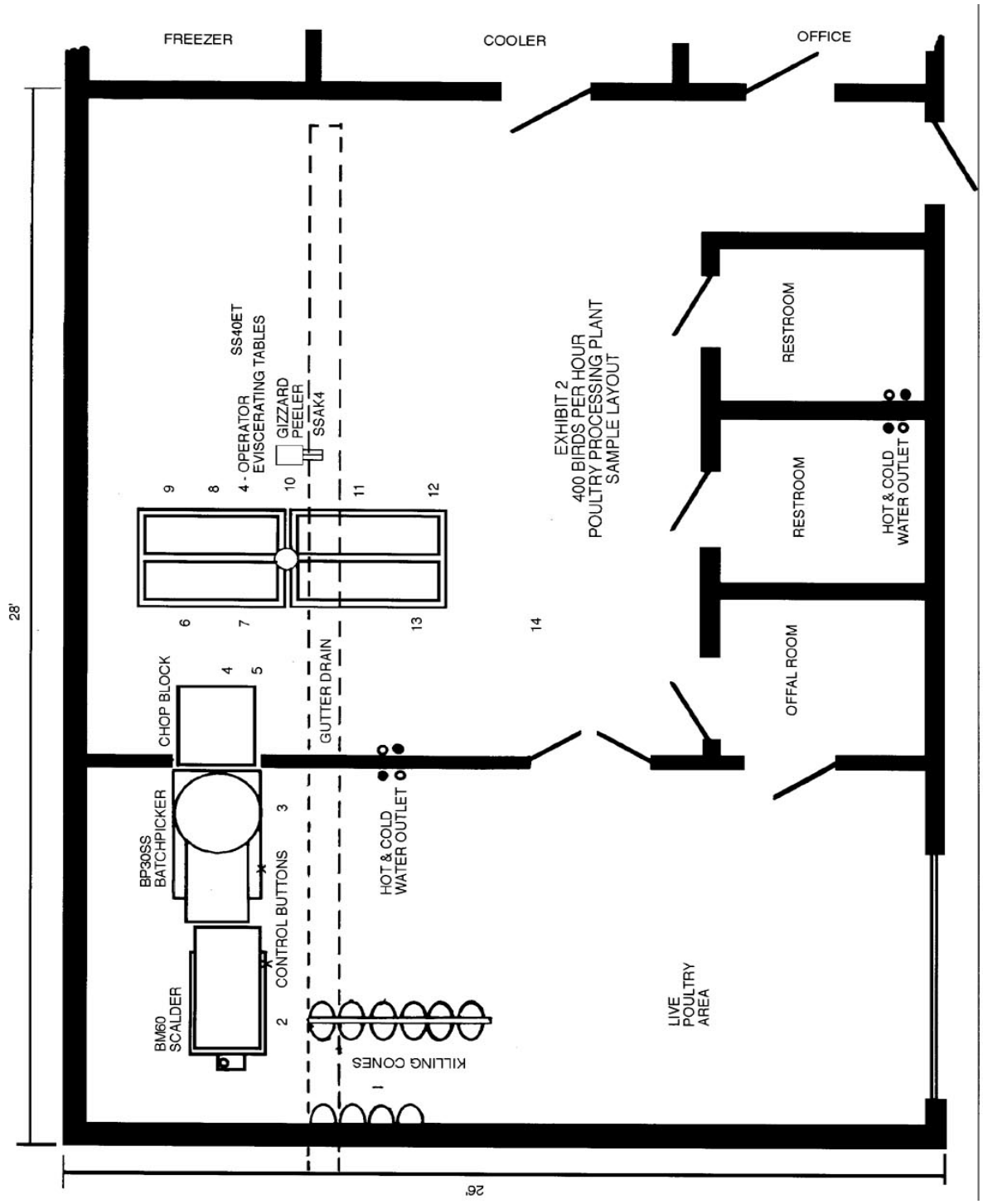
You will need two wheel trucks for moving coops and ice boxes. You may want to purchase small tables to facilitate your operation after you have had some experience.

We also recommend our electric stunner to reduce death shudder and carcass damage. To keep your stainless looking bright, mineral oil is excellent for cleanup.

EXHIBIT 1

LABOR REQUIREMENTS TO PROCESS
400 BIRDS PER HOUR USING SKILLED LABOR

1.	Hang and bleed	2 - people
2.	Scalder	1 - person
3.	Picker	1 - person
4.	Remove feet, cut oil gland	1 - person
5.	Cut neck skin and pull crop	1 - person
6.	Open tail, remove vent, draw entrails, and separate giblet mass	1 - person
7.	Trim heart & liver	1 - person
8.	Trim, open and wash gizzards	1 - person
9.	Peel gizzzards, tend to giblets/chill tanks	1 - person
10.	Remove lungs, wash cavity	1 - person
11.	Remove heads, cut necks and wash carcasses	1 - person
12.	Package birds, general labor	2 - person
		Total 14 - people



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