Canadian Export that Produces Rolled Corn as an Improved Animal Feed

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Introduction

A common goal amongst many Canadians is to increase the quality of food for human beings. It is ideal to improve agriculture in other countries in such a way that it also aids to the Canadian economy. This is possible and can be done by exporting products that are specific to improving agriculture in other countries. Agriculture is a growing field and notably contributes to the federal and provincial economies. In Canada Agriculture employs approximately 2.1 million people and providing 1 in 8 jobs. It also subsidizes to 8 percent of the total GDP for Canada (Gov. Can., 2014). The Canadian agriculture business will continue to grow which is why it is important to consider future opportunities for businesses. This paper will evaluate a product that could possibly have a positive impact on the Canadian economy but also be a useful tool that can make agriculture in Nepal more efficient and profitable.

Part I

In this section, particular aspects of a possible export product originating from Canada will be discussed. It is quintessential to analyze the specifications of the product such as, the production requirements, the health and nutrition that comes from the product, the market opportunities for this product and how this product with would benefit the Canadian economy. These aspects will likely reveal if the benefits with surcome the negative fallout.

Product

The product that will be evaluated is the Sven Grain Mill, a design of Apollo Machine and Products Ltd. Image 1 shows the Company logo which presents a Canadian Flag beside the Name. The small Canadian flag is a convenient way for the Company to endorse Canadian business. Apollo has been around for 40 years and is still selling product leading to believe it is a stable organization (AMP, 2000). The Apollo product is a multipurpose mill primarily used for different types of grain products. However, there are a variety of functions that it can be used for including: seed oil extraction, fertilizer grinding, peas, pulses and rolling corn (AMP, 2000). This mill excels at grinding corn to be used as a high grade livestock feed. It can also make a good mixed feed that leads to an improved feed efficiency (AMP, 2000). The Sven Grain Mill is also designed to have easy disassembly. The rolls can be removed in about 10 minutes; slots in the frame make it easier for the rolls to be lifted out. Not having to remove the bearings or pulleys when re-grooving, makes this disassembly possible. With the removal of 4 bolts the rollers can be lifted with ease (AMP, 2000). No extra effort is required. Most competitors require to take apart the entire unit for when re-grooving is required which can take about half a day. Also, there is an instant release roller that allows one to be able to clean the space between rollers. There is also a cushion conjunction with instant release to stop damage done if a bolt was missed by the magnet (AMP, 2000). These features are unique to this product. Many other grain mills require much more effort. Image 2 shows the exclusive design of the Sven Grain mill. It has a professional high quality appearance made from durable material which can add market value. The Sven Grain Mill is a very useful tool in agriculture since it is used to grind corn as livestock

feed. Corn is a very important crop in North America and is also abundant in many countries. This product can be compared too much larger industrial sized animal feed processors. For example, Companies in Canada will use a corn process called steam flaking. A corn flaker machine is very expensive and can cost $10000 or more dollars. However, no companies or very few produce Steam flakers in Canada. Most Companies, Kellogg's for example, import their Steam flakers from India (Alibaba, 2014). The corn steam flaker would be very successful for animal feed on a large scale farm due to the availability of nutrients. Large scale livestock farms are Common in Canada hence, the use of large scale livestock feed processors.

Image 1 Apollo Logo (source: http://apollomachineandproducts.com/grain-mill.html)

Image 2 Sven Grain Mill (source: http://apollomachineandprodu

Production

The Sven Grain Mill is processed by the Apollo Company at their main location in Saskatoon, Saskatchewan. They weld and manufacture the frames for the grain mills from heavy plate, which provides strength and easy maintenance. Frames consist of ½ inch to ¾ inch heavy plate steel. Competitor products tend to have difficult maintenance and vibrate when being run due to their light gauge metal bolted together (AMP 2000).

The production of the Sven Grain Mill would require manufacturing machinery and welding equipment. There will be labour costs for the production of this product however, the costs remain unknown. The Apollo consists of 8 employees (Manta 2013). An issue with this product is that it may require maintenance for regrooving the rollers since no grain mill lasts forever. However, this product is durable relative to competitors and should work in a climate such as Nepal. It is unlikely to be needed in cold seasons, but can be cleaned from seasonal issues such as ice. The input method for the grain mills is electricity making the machine automated and very efficient but also cheap. To run a large mill it only costs 1$ per hour compared to $60 per hour just to run a tractor (AMP, 2000).

Health and Nutrition

The product discussed has potential health and nutritional benefits for livestock. This increased health within livestock would result in a higher quality animal product for consumers. As stated previously, the grain mill can be used to grind fresh livestock feed. Grinding livestock feed is beneficial due to the nutrition value it can add, especially in corn feed. For example, cracking or rolling corn will increase the digestibility by 5 to 10 percent in cattle. It is said that it will not

Image 3 ground corn feed (source: https://www.bungenorthamerica.com/products/categories/8-animal-feed-ingredients)

markedly improve average daily gain, but proper processing will improve feed conversion efficiency (Lardy, 2013). The increasing value of corn and proportion of corn in the diet of livestock, results in the increase of benefits that comes with processing the corn in such way. This is a result of the greater amount of energy the corn supplies to the livestock (Lardy, 2013). Image 3 shows an example of ground corn that is used to feed cows.

Table 1 ***Nutrient content of corn using different harvest, storage or processing methods*** **(***NE= Net Energy***)**

Corn Type	**Dry Matter**	**TDN, %**	**NE_m, Mcal/lb**	**NE_g, Mcal/lb**	**CP, %**	**Escape Protein, % of CP**
Dry Rolled Corn	86	90	1.02	0.7	9.8	60
Ear Corn	87	83	0.92	0.62	9.0	60
Steam-flaked Corn	82	94	1.06	0.73	10.0	45
High-moisture Corn	75	90	1.02	0.7	10.0	40
High-moisture Ear Corn	75	83	0.92	0.62	8.7	40
High-moisture Snapped Corn	74	81	0.90	0.59	8.8	40

(Source: http://www.ag.ndsu.edu/pubs/ansci/beef/as1238.pdf)

In Table 1 dry rolled corn does not have the highest nutritional value for consumption. Rolled corn is a cheaper way of processing, but it does not have as high of a nutritional value as steam flaked corn. Also, whole corn has less available nutrients and requires the cow to masticate (chew) which may require more time digesting. However, even though corn is very nutritious, it is recommended to be mixed with other

feeds. Corn is high in energy but it is hard for the animal to digest the protein hence the large percentage of escape protein (Lardy, 2013).

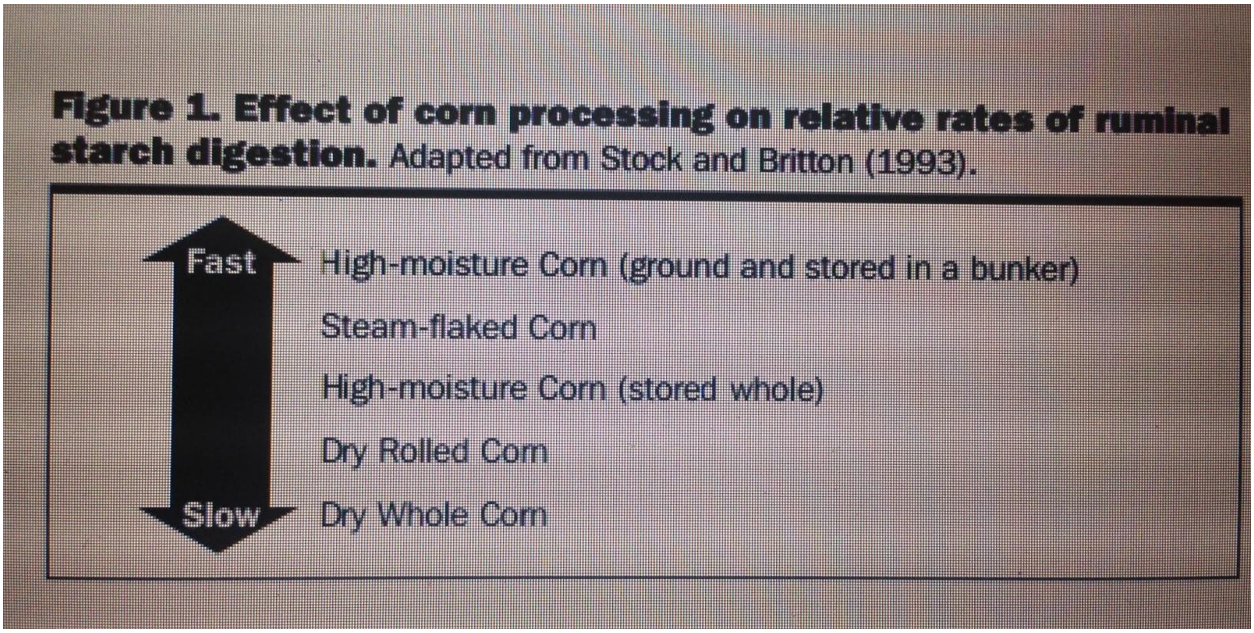

Figure 1 displays the relative rates of fermentation for various corn processing methods. Rolled corn has relatively slow digestion but this may not necessarily be a bad thing. Ground corn has high starch content. Fine ground corn however, should be avoided when feeding livestock, such as a cow. This is due to the quick fermentation period within the rumen. The rumen is the largest compartment of a four chambered stomach and is where most of the fermentation takes place. But, if the animal were to consume high doses of this form of corn it could potentially cause digestive disturbances as well as acidosis (Lardy, 2013). Acidosis is an increased acidity in the blood and other tissue. Thus, it is beneficial for livestock to be fed corn with accessible nutrients that do not cause potential damage to the livestock. The Sven Grain Mill is a revolutionary product that is able to provide nutritious feed for livestock in the form of ground corn. Studies show that for optimum dietary utilization, corn should be

processed by rolling, cracking or coarsely grinding prior to feeding. It is also said that the decision to process corn should be based on efficiencies gained from processing compared with the cost of processing (Lardy 2013). These studies show that the Sven Grain Mill could potentially be an optimal form of livestock feed processing.

Market

Although the product may be expensive it has many benefits to the production within an agriculture business. Therefore this product is likely to be marketed to an established farm with a significant amount of livestock. Most farms in a developing country are likely to be relatively small in size and be used to feed villages. Therefore, if this product was to be used in a developing country it is likely to be sold to a few farmers in a village. The estimated total commercial production of feed in Canada is 20 million tonnes and, in addition, an estimated 10 million tonnes is produced on-farm (ANAC, 2012). This states that there is always a demand for livestock feed producers in Canada. Therefore, livestock feed production may also be high demand in possible developing countries.

Benefits to Canada

Furthermore, by exporting the Sven Grain Mill from Canada, many benefits can come as a result. Since very few companies make and sell this product in Canada it opens up many different possibilities for the Apollo Machine and Product Ltd. If this export is successful and the Apollo Company generates a higher income it will create more room for expansion in the business. However, another potential result of this export could be that other companies see that this export has many positive benefits as well. They could reciprocate which than could affect multiple companies in Canada.

Even though this product is to be exported to Nepal, the same product could potentially be exported to multiple developing countries. The outcome for this would be an increase in jobs within this business, as the company or multiple companies expands there will a higher demand for employees in Canada. Since the population in Canada in increasing there will be a higher demand for jobs thus, the importance of having more jobs available. More business and more employees result in a more stable economy for Canadians.

Conclusion

In conclusion, the product discussed is the Sven Grain Mill made by the Apollo Company and is mainly used to grind fresh livestock feed. A feature of the grain mill is that is can grind corn. In many developing countries, corn is abundant and is used as an animal feed without being processed. Unprocessed corn has less nutrients available than ground corn for livestock. Therefore, this product is marketed to relatively small farms and by exporting this product to small farms around the world it can benefit the Canadian economy.

Part II

The product discussed in part one is to be aimed at an initial nation that will benefit from import, before considering exporting to other nations. Part two will include a description of the importing country, the transportation methods needed for export, necessary storage for the product, the costs that are involved with the product, the benefits to the nation of Nepal and the environmental benefits from this product. The potential for this export will also be assessed with any further steps needed.

Nepal

Nepal is located in South Asia bordered on the north by China and bordered on the South by India. It is a developing country which means that agriculture does not have advanced technology similar to North America. The geography is divided into three regions that run east to west. The physiographic areas are Mountain, Hill and Terai. Image 4 shows a geographical Map of the Nepal that divides the land into these three different regions. Most of the agriculture is in the hill region. Since Nepal isn't very flat many farms mare terraces to prevent erosion. Nepal's second most important staple crop is corn; the mountain region specifically, is very dependent on corn. Over the years corn production in Nepal has nearly doubled. Corn is mostly eaten by humans however, the use for livestock feed has increased rapidly. It is estimated that the demand for corn in Nepal will increase by 6-8% annually (Rajbhandari, 2001). What this says is that corn feed in Nepal is common, not only in the mountain region but in the hill regions as well. With the use of the Sven product, the corn feed can be more efficient and over time can save Nepalese farmers money on corn production.

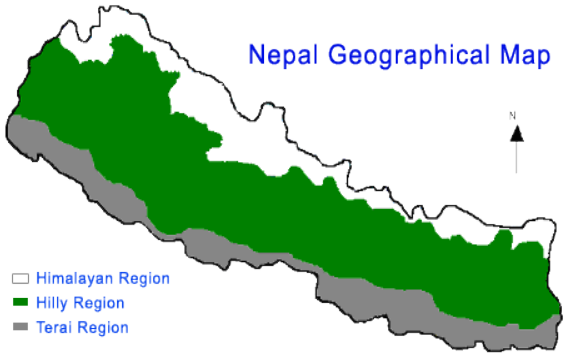

Image 4 Nepal Geographical Map (Source:http://www.nectravels.com/nepal/geographical_information.htm)

Transportation

A portion of the cost for exporting this product is the transportation. There are many different forms of transportation that could be used for this product (Sven Grain Mill) to be shipped to Nepal. Since this product is rather large and durable it is ideal to use Ocean freight for the main source of transportation. The large cargo ships will transport the export products to the shoreline of South Asia at the port of Calcutta. The charge for this product to be shipped overseas is calculated at $457.09 CAD or 40457.45 Nepalese Rupees (A1 freight, 2014). After it is shipped overseas it can be shipped using a truck service. The product would then have to be trucked from Calcutta to Nepal. The prices for the trucks that service South Asia, are displayed in Table 2 with a cost of $0.33 USD for transportation to Nepal. This price can be translated to 32.82 Nepalese Rupees.

Table 2 ***Truck service Costs in South Asia***

Country	Load limit	Cost/Km	Cost/ton*Km
India	15	$0.33	$0.044
India	12	$0.33	$0.049
Bangladesh	11	$0.27	$0.048
Nepal	10	$0.31	$0.046

(Source: Subramaniam, Arnold p. 36)

Storage

The product that is being exported to Nepal has to be practical for use on farms. The Sven Grain Mill is small in size, it would be easily stored and could be moved if need be by hand or a trolley. Therefore, this product would be very convenient for Nepalese farmers. It would not require a significant amount of storage space or require installation of the product. Again, the Sven Grain Mill is more practical than a larger grain mill or a

steam flaker for storage purposes. Once the corn is processed however, it will need to be stored as well. However, this product would supply a better alternative for animal feed which means that it could be stored the same way as the existing animal feed. However, if a Nepalese company were to want to sell the animal feed for profit there would need a form of storage such as feed bags.

Cost of Product

When corn is ground it can be sold as livestock feed at a higher cost. Therefore, farmers with corn as one of their most common crop can use the Sven Grain Mill to process corn into animal feed and sell it at a higher cost to livestock farmers. Either using this product to feed livestock or using this product to sell livestock feed to other farms will increase profits for farmers. The Sven Grain Mill will make the feed more efficient, but what does that mean? If the nutrients in ground corn are more easily absorbed in livestock then less corn will have to be digested. This means that less corn needs to be used as livestock feed. Also, it means that the livestock will absorbed more nutrients needed and as a result are healthier. Having healthy livestock is beneficial in many ways. The meat of livestock, eggs from chickens and milk from cows can be sold at a higher value. Therefore, even though the Sven Grain Mill is expensive initially, it can increase the profit of Nepalese farmers by feed efficiency.

Needs and Benefits of Nepal

Families in Nepal eat traditional foods that consist of carbohydrates, proteins, vitamin, minerals, and fats. In the mountain area, meat curries are very common dish served (Nepal Link [Unknown date]). Having high quality meats as a result of a ground

corn feed will improve the diet of Nepalese people. Meat is graded in Canada by the carcass maturity, muscling, meat quality, external fat covering, and marbling (Canada Beef 2012). The grading of the meat is directly related to the diet of the livestock. Also, Agriculture is a large part of the economy in Nepal, about 33% of the population are reliant on agriculture (Nepal Link [Unknown date]). It is a large priority to improve and expand agriculture in Nepal to open up more jobs and have more nutritious meals. The Sven Grain Mill can have many benefits to Agriculture in Nepal. The Sven Grain Mill could be used to grind the corn that is not the highest quality for being eaten by humans so that less corn goes to waste. Ground corn can increase revenue to established farms, which will make room for the company to grow. More people would be needed to be hired as the farm expands and they would be needed to work the Mills. The Sven Grain Mill could be used to start a Livestock feed company. In this case, it could give people in Nepal jobs in growing corn and selling it as livestock feed. Since it is rare to find a high quality livestock feed in Nepal the Sven Grain Mill could open many business opportunities which would put more money into the Agriculture field. Nepal would likely only Import up to 10 Sven Grain Mill products due to the relatively high price, but one grain mill could benefit many farmers in a village area.

Environmental Benefits

In the field of agriculture, a topic that must be evaluated when making decisions is sustainability. When something is sustainable in agriculture, it will be able to account for the changing world. For example, an issue for the future of agriculture today is the growing population. This is an issue because it leads to a higher demand for food and indirectly leads to issues with the environment. More and more people are becoming

aware of the changing climate due to global warming. Global warming is an issue caused by having a high level of greenhouse gases in the atmosphere. What this means for the field of agriculture is that lowering greenhouse gas emissions is becoming a high priority. The Sven Grain Mill uses electricity for automated grinding however, compared to other livestock feed processors it is very minimal. Large industrial steam flakers can use 101kw of electricity, which can be very costly and result in a large carbon footprint (Alibaba, 2014).

Recommendations and Next Steps

In order for this product to be further assessed more information needs to be discovered. The specific pricing for the Sven Grain Mill must be negotiated with the Apollo Company. Therefore, if their product were to be a possibility for export, it is likely that the best possible price would be given. Although a suggested form of transportation was discussed, more research would have to be completed in order to find the most cost efficient route. Along with packing and unpacking services and labour for the shipping of the product.

When comparing this product to the products of different countries, there are many more benefits that come with using the Sven Grain Mill. One of the benefits of the product includes the small size which allows it to be easily transported and stored. Though the cost for a Sven Grain Mill is unknown, the cost of it would be cheaper than a corn flaker. Compared to other grain mills, a Sven Grain Mill is built to be of a higher quality; therefore the higher efficiency of processing livestock feed would make it the

best option. The issue with this product being exported to Nepal would potentially be the costs if they were too high. Another issue with this product would be how many could be potentially sold and whether or not this item will be shared among farmers. It is recommended that this product, the Sven Grain Mill, is exported to Nepal as it would benefit both Canadians and Nepalese farmers. The Canadian company, Apollo Machine and Products Ltd., would benefit from this because it will potentially be making more money selling its product, the Sven Grain Mill. This will also cause more jobs to develop in Canada.

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