

## Hi Pro Medicated Dairy Calf Started Kits: A Potential Canadian Export to Nepal

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### Section I:

The potential product idea to export from Canada to Nepal to help benefit both Nepalese farmers, as well as the Canadian economy, is Hi-Pro Feeds Advantage 4 Medicated Dairy Calf Starter Kit (tag #611001). Hi-Pro Feed's Medicated Dairy Calf Starter Kit is a textured dairy calf feed sold in 50lb bags. The calf starter is used for calves from ages ranging from 3 days to 3 months to maximize the rate at which the calf can healthily gain weight, as well as improve feed efficiency (Hi-Pro Feeds, 2015). The target consumer of this product includes Nepalese farmers in the mid to high hills region who rear dairy cattle.

Early feeding of calf starter kits to calves has been believed to strongly aid in the development of a profitable cow. Studies have shown that calves fed at least a diet with at least 15% solid or textured feed, "gained faster, increased more in height at withers and had (...) better efficiencies of nutrient utilization" (Radostits, 1970). On top of this, "numerous research trials have demonstrated that feeding textured starters helps prevent *parakeratosis* (keratin build up on the papillae) in the developing rumen. Keratin build up on the papillae permanently reduces their ability to absorb nutrients." (Nutreco, 2015). This is another reason why implementing calf starters will improve nutrient absorption. Calf starters are also essential to aid in production of volatile fatty acids such as butyrate (Nutreco, 2015). Early rumen development is vital in improving feed efficiency and smoothly transitioning calves to a foraging diet, which is widespread in the mid to high hills region of Nepal. A study was done by Shur-Gain to illustrate the difference between the rumen walls of a calf that has consumed a milk based diet, opposed to the rumen

of a calf that has been fed a diet consisting of milk and a calf starter (Fig.1). The difference is visible, as the calves that have calf starters in their diet have developed many papillae. Increased number of papillae provides increased surface area for absorption of ingested nutrients in the rumen (Moran, 2005). With this, farmers will reap a better feed to gain ratio in their calves and therefore save money, which is important to a poverty-ridden country. This will also lead to better health in the adult life of the cattle and therefore provide improved dairy produce. This can be verified because it has been claimed that, “anything that detracts from feed intake and subsequent pre-weaning growth rate reduces the opportunity for enhanced milk yield as an adult” (Van Amburgh, 2014). Therefore, improving feed intake and the pre-weaning growth rate of calves by the use of supplementation, such as calf starters, in the diet of calves, milk yield will subsequently be greater.

Hi-Pro states that their medicated dairy calf starter kit prevents Coccidiosis in cattle by *Eimeria bovis* and *E. zuernii*. The company claims that this benefits farmers with better herd health and performance (Hi-Pro Feeds, 2015). Offering a product analysis of crude protein at 18%, crude fibre at 6.0% and crude fat at 4.2%, this product also provides dairy calves with the healthy start they need to be productive in the industry (Hi-Pro Feeds, 2015). The guaranteed product nutrient analysis is provided by Hi-Pro Feeds (Fig.2). This product also contains yeast culture, which “has been shown to aid in digestion and improve digestive tract health and development” (Hi-Pro Feeds, 2015).

The main ingredients found in the Hi-Pro Feeds Medicated Dairy Calf Starter Kit includes soybean meal, canola meal, Celmanax SCP yeast, Deccox 6% Dairy Calf

Premix and a variety of vitamins and minerals (Fig.3) (H. Nicoll, Personal communication, November 30<sup>th</sup>). As of June 29<sup>th</sup>, 2015, the price of soybean meal and canola meal per metric ton is \$680.00 and \$321.00, respectively (Feed Grain Facts, 2015). Celmanax soluble concentrated powder yeast is a condensed yeast powder ingredient. “ Celmanax SCP is the most concentrated form of Celmanax, so you have less shipping, storage, and handling. Its disease-fighting, rumen-balancing, and production-enhancing benefits are delivered without a carrier and without GMO concerns.” (Celmanax SCP, 2015). This fact also implies that this ingredient will make shipment by weight cheaper than other similar calf starter products, which do not utilize this form of yeast. Product pricing is not given to the general public and cannot be accounted for. This calf starter also uses Deccox 6% Dairy Calf Premix to prevent *Coccidiosis*. A full list of the ingredients can be found in Figure 4. Since the ideal production mill is located in Chilliwack, British Columbia, and Hi-Pro Feeds supports local farmers, prices of these ingredients farmed in British Columbia should be monitored.

This feed also contains Selenium at 0.3mg/kg (Hi-Pro Feeds, 2015). The environmental effects of increased Selenium levels must be taken into consideration. A study was conducted in North Carolina to document the environmental effects of Selenium in a reservoir. After the introduction of additional Selenium by coal ash, which contained 100-200 micrograms Se/liter, 16 or 20 species of fish within the reservoir were completely eliminated and 2 were rendered sterile due to Selenium accumulation and dietary concentrations of Selenium between 519 and 1395 times the waterborne exposure (Lemly, 1985). Therefore,

Selenium runoff accumulation from cattle feces could have detrimental effects on species in the surrounding area.

Production of the textured feed includes cleaning and then processing of ingredients. Grains and shelled ingredients are ground using hammer-mills and then added to the other ingredients. Conveyor belts are used for movement around the facility. The feed is timed-mixed to yield a well-balanced blend. Packaging can be cost efficient using gravity to drop feed into the bags and a trip scale used to halt filling of each bag at fifty pounds. Forklifts are used to move bags onto trailers for shipment to the airport or to storage within the facility (Vosloh, 2015). These are general mill procedures based on the USDA. Operating costs will vary with utility fees and the machinery used by the company. Cost of feed will vary with cost of the ingredients.

Hi-Pro has a total of 12 mills across Northern America, 7 of which are located in Western Canada. These mills are placed in Alberta, Manitoba and British Columbia. The manufacturing center is therefore in western Ontario where the demand for employees in the manufacturing industry is increasing (Fig.4). A census was conducted by Natural Resources Canada which indicates that the labor force occupation, specifically in manufacturing, had increased by 1,326,000 from 2001 to 2006. Alberta and British Columbia contributed to about one third of this increase. The need for these employees is increasing, with this need being central to Alberta and British Columbia where Hi-Pro mills are located.

For transportation purposes, the mill in Chilliwack, British Columbia is the best option for production. This is because the most efficient shipping technique to

get the Medicated Calf Starters to Nepal will be via aircraft, over the Pacific Ocean, to the Eastern Hemisphere, directly into Nepal. To transport the product to the exportation port, a 2-axle truck will be required. The truck can carry up to 26 pallets, weighting a total of 53950lbs. This includes the 2000lbs of feed per pallet, as well as the weight of the pallets, which are each 75lbs (P. McCarthy, personal communication, November 30<sup>th</sup>, 2015). Depending on the interest and demand of the product, number of pallets transported will vary. The truck will transport the pallets 6.0km (Google Maps, 2015) to the Chilliwack Municipal Airport. The company advises consumers not to use old feed, and to keep the feed dry and cool (Hi-Pro Feeds, 2015). Therefore, to prolong the length of product usability to the Nepalese farmers, transportation via aircraft where the temperature is controlled and the transportation process itself is relatively fast, should be used. As 25% of Nepalese farmers live under the poverty line (Chapagain, 2015), this statement made by Hi-Pro Feeds is important, as it will also increase the shipping cost. In order to keep the product dry and cool, refrigeration of the product in the exportation and importation ports will be required as well as during transportation. This statement also raises an issue for the purchasers in Nepal. Although 76.3% of Nepalese people have access to electricity (The World Bank- Access to Electricity, 2015), this does not mean that the target buyers of the product do. Typically, customers will be farmers in the mid to high hills region who may be unable to access the electricity required to keep the product cool, or simply cannot afford it.

The product will land in Kathmandu, the largest municipality in Nepal. The target consumer includes farmers in the Mid to High Hills region who rear dairy

cattle. Feed will be distributed either directly to these farmers who have the ability to travel the distance to receive their products, or to individuals from communities within the hills region who attain the proper livestock that are capable of bringing the products to local markets in the communities for farmers to purchase. Since the farmers in the hill regions of Nepal rely on animals for transportation (Chapagain, 2015), the amount of feed they can purchase will be limited to about 7 bags maximum, as equines and mules specifically are able to carry up to 350lbs (Savory, 1970). When this project initiates, deliveries should start at once every two weeks until demand increases. Further research needs to be conducted to identify exact transportation costs.

It is important to note, that, “manufacturing, sales and delivery costs decline with increased tons sold” (Baumel, 1997). Therefore, a good tactic for Hi-Pro Feeds to consider would be to send the product to Nepal in large quantities. This will reduce the costs to the company and furthermore make the feed more affordable for the Nepalese people.

Hi-Pro Feeds currently has a North American market. If the market for this product were to ever to expand internationally, specifically to Nepal, the demand for the product would increase. This will place demand on the company to produce more feed to provide to Nepal, and overall require more employees such as the various mill operators required to run these manufacturing mills. A study done on the regional effect of the introduction of mills such as a pulp and paper mill and the resulting employment multiplier was conducted. The study illustrates the potential results of the introduction of a new Hi-Pro Feeds mill, if the demand grew large

enough to require the building of an additional mill in Western Canada. The study indicated that the overall regional income multiplier was higher than expected. This means the amount of jobs created by the introduction of a new mill to an area, even within an economically small region, is high (Greig, 2007). These jobs include direct and indirect jobs.

Holly Nicoll, the Director of Marketing at Hi-Pro Feeds, indicated that Hi-Pro Feeds is an ever-expanding company (Personal Communication, November 27<sup>th</sup> 2015). Its product demand is increasing and with this more jobs are created. Ms. Nicoll indicated that the company has a diverse variety of job opportunities within the milling facilities. This includes the direct jobs such as producers- who work to produce the feed, sales representatives- who work with customers and farmers to customize the feed and indicate their needs, as well as nutritionists. Not only does the expansion of Hi-Pro Feeds create more direct jobs but it also forms indirect agricultural jobs. Holly Nicoll indicated that Hi-Pro Feeds uses locally sourced ingredients to manufacture its products. This means that with the expansion, more Canadian farmers will be supported in their business.

A growing concern to the public is that agriculture as a practice is being abandoned (Lobao, 2001). This is due to the fact that the number of farms is decreasing (United States Summary and State Data, 2004) when in fact it is just that small family farm numbers are decreasing and large industrious farms are expanding. This is referred to as the industrialization of the agriculture industry (Lee, 2015). This implies that small-scale farms as a whole are supporting the industry less. It is justifiable to suppose that with Hi-Pro Feeds continuing its



support as the company grows, and product demand is higher, the amount of Canadian dollars going to these small-scale farmers will also increase.

The market for Hi-Pro produce is currently focused in North America. Hi-Pro Feeds stated, “we export some Canadian oats to the U.S. Our focus is making feed locally for customers across North America” (H. Nicoll, Personal communication, October 26<sup>th</sup>, 2015). Through personal Internet communications via twitter, Hi-Pro did express curiosity towards the project formed by SAKNepal and the potential for a market that would increase Canadian jobs as well as help Nepalese farmers.

Figure Table:



Figure 1. Comparison of the rumen wall of a calf on a milk-only diet (left) to the rumen wall of a calf fed a milk and calf starter (right). Papillae count is higher in the rumen of the calf on a diet of milk and calf starter, which provides increased surface area for nutrient absorption therefore improving digestive health and feed efficiency. (Source: Shur-Gain, 2015)

### Guaranteed Analysis

Crude Protein, min	16.0%	Phosphorous (P), min	0.5%
Crude Fat, min	4%	Salt (NaCl), min	0.1%
Crude Fiber, max	9%	Salt (NaCl), max	0.5%
Calcium (Ca), min	0.4%	Potassium (K), min	0.9%
Calcium (Ca), max	0.8%	Vitamin A, min	6,750 IU/lb
ADF, max	10%	Selenium (Se), min	.3 ppm

Figure 2: Guaranteed product analysis from Hi-Pro Feeds of various minerals and nutrients found in the Hi-Pro Feeds Advantage 4 Medicated Dairy Calf Starter Kit (Source: Hi-Pro Feeds, 2015).

Hi-Pro Feeds  
Stored Formula Report  
Pricing Plant: - Sherwood Park  
Monday, November 30, 2015

Formula Code	Description	Date Stored
64391	ADVANTAGE 4 INPLANT SUPP	11/16/2015
Code	Ingredient Name	
017550	SOYBEAN MEAL	
015300	CANOLA MEAL	
010660	FABA BEANS GRND	
012150	DISTILLERS, CORN W/SOL	
012600	MILLRUN GROUND	
018200	LIMESTONE, GLASSROCK	
047450	CEL-MAX YEAST	
041890	PC DAIRY & BEEF CALF PREMIX	
020200	SALT,bulk	
019850	DICAL 21% bulk	
020100	DYNA K (KCL)	
030050	DECCOX 6%	
024400	ZINC SULFATE 36%	
024910	AVAILA ZN 120	
988680	VIT A(45),D,E	
028550	VITAMIN E 500 AD	

Figure 3: Hi-Pro Feeds Advantage 4 Medicated Dairy Calf Starter Kit list of ingredients (H. Nicoll, Personal communication, November 30<sup>th</sup> ).

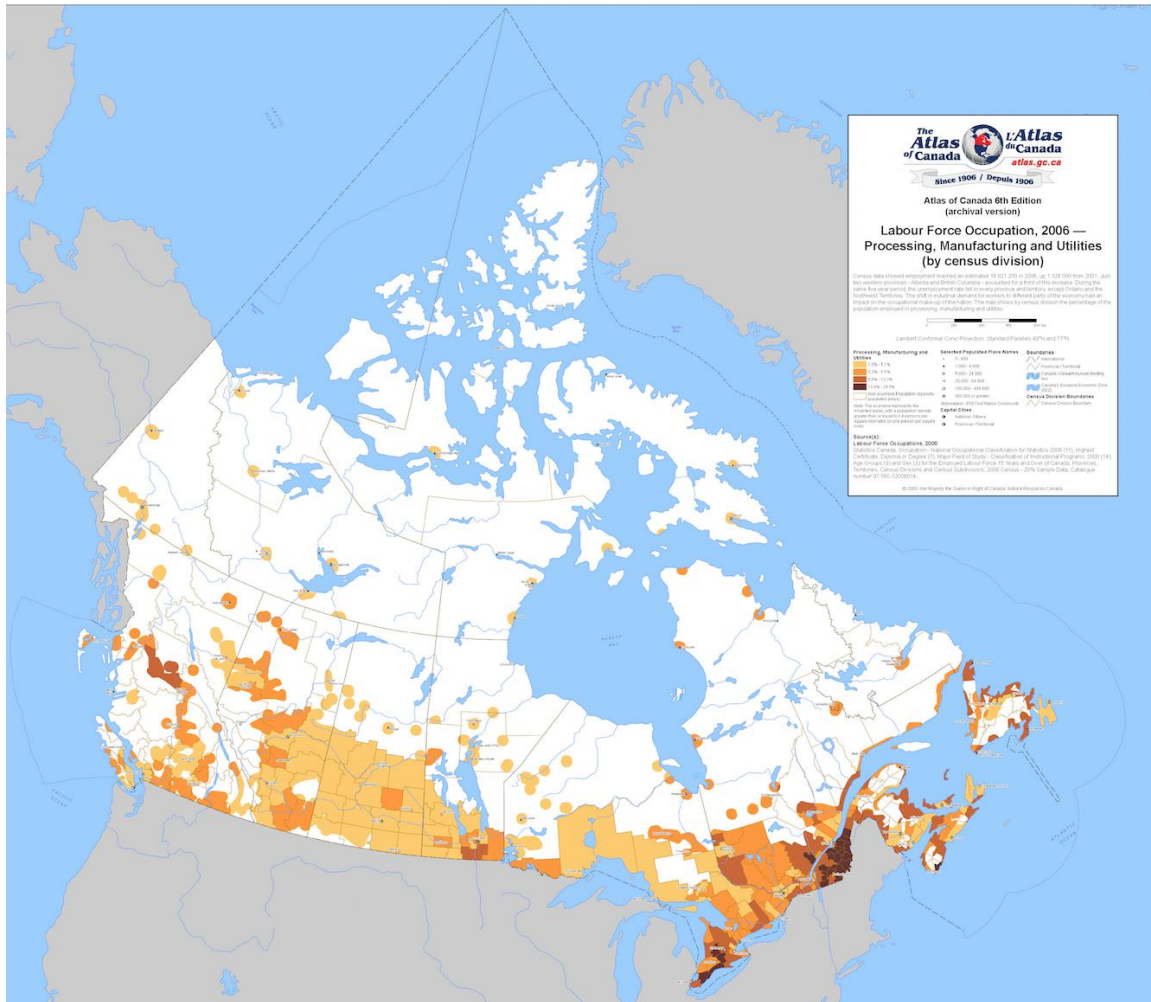


Figure 4: A natural Resources Canada study result, which illustrates the demand for employees in the manufacturing industry, is increasing, mainly in Western Canada, as indicated by the higher amount of pale orange colouring within the Western region (Source: Natural Resources Canada, 2006).

## Section II:

Nepal is a country located between China and India. Its physiographic regions include the Himalaya, High Hills, Mid Hills, Siwalik and Terai. The Hills make up 42% of Nepal and are popularly used for agricultural practices such as fruit and vegetable farming as well as livestock rearing. Nepal has a population of 27.8million

people (World Bank, 2015), 25% of which live underneath the poverty line (Chapagain, 2015). Its increasing population is leading to a demand for more food, vegetables, meat and dairy products.

Nepal is a net importer of dairy products, and is currently in the midst of a severe milk shortage (Kathmandu Post, 2015). Kathmandu, the largest municipality in Nepal, is specifically being hit by this crisis. Due to the major earthquake in April of this year, a total of 13,450 cattle and buffalo have died, and 1,422 have been injured. This has resulted in the decreased ability of farmers to uphold dairy production in Nepal. As another consequence of the earthquake, farmers have experienced large financial loss and are unable to provide proper nutrition for the development of calves and maintenance of surviving cattle (Kathmandu post, 2015). Nepal not only displays a need for assistance in reviving its dairy industry, but a promising future in the dairy industry if properly taken advantage of (Durbar, 1996).

Nepal's physical and climatic conditions provide an optimal environment for the dairy industry. With highlands for animal grazing and a diverse climate across the country, there is a good prospect for dairy farming. Nepal consists of many 'small unit dairy farms', and its livestock production currently accounts for approximately 31.5% of its gross domestic product (Poudel, 2012). With the proper revival, it would be an advantageous investment for Nepal as a whole. Furthermore, with Hi-Pro Feeds Medicated Dairy Calf Starter Kit, the dairy industry will be better prepared to produce healthy calves for meat as a byproduct of the dairy industry.

This is relevant because the increasing population is placing a demand on both dairy and meat products (Chapagain, 2015).

It has been stated that, “insufficient feed availability and the prevalence of diseases and parasites are the major causes of decreasing productivity in livestock systems in Nepal.” (Poudel, 2012). By exporting Hi-Pro Feeds Medicated Dairy Calf Starter Kits, Nepalese farmers would have an improved chance at overcoming this devastation to the cattle population. The medicated calf starter kit would provide crucial nutrition for calves and would protect them from parasitic infestation, specifically from *Coccidiosis*, which is a large threat in the midst of post-earthquake conditions.

A common display in underdeveloped countries is the fact that they all have agriculture as one of the most important, if not only, major industry (Johnston, 1961). This can be seen in Nepal as the agricultural sector employs more than 70% of the population (Chapagain, 2015). Fittingly, it is important for Nepal to uphold its agricultural industry. It has been noted that, “the relative decline of the agricultural sector will not proceed as rapidly or as far in countries that have a marked comparative advantage in exporting agricultural products” (Johnston, 1961). Therefore, Nepal’s agricultural sector will better thrive if Nepal is able to revive its dairy cattle herds, and create enough revenue to become a net exporter of dairy products. India is currently Nepal’s biggest trading partner, holding 66% of Nepal’s exports (tradingeconomics.com, 2015). This means there is a preexisting trade relationship that holds potential. Canada and the United States exhibit a trade relationship where Canada exports beef to the United States, and the United States

exports beef to Canada (Robinson, 2015). A similar link could be created between Nepal and India for dairy products to better fit the needs of the domestic market and increase income. With increased dairy cattle health from the use of Hi-Pro Medicated Dairy Calf Starter Kits, it can be insinuated that the quality of the dairy products of Nepal will improve. If the grade of these products exceeds those of India, Nepal has the potential to be profitable from exporting higher quality, more expensive dairy products and importing lower grade, less expensive products from India. The reason it would benefit Nepal to import lower quality products is due to the fact that the domestic market cannot afford to purchase expensive dairy products since 25% of the population lives below the poverty line (Chapagain, 2014). The financial benefit that could result for Nepal from creating strong exportation ties, specifically in the exportation of dairy products is great, because Nepal is currently in a trade deficit at a record low of 76499 million NPR (tradingeconomics.com, 2015). Overall, this product does not immediately illustrate any potential harm to the Nepalese farmers.

One potential problem with the exportation of this product is that it will be competing with other products that promote similar ideas such as gastrointestinal health and weight gain for the production of healthy livestock. One product that displays market competition for Hi\_Pro Medicated Calf Starter Kits is SUKAFeedR Probiotics Cattle Feed for Weight Gain. This product is created by Shandong Sukahan Bio-technology Company Limited. Shandong Sukahan Bio-Technology is a manufacturing and trading company based in China. The feed contains probiotics such as *Bacillus* and *Bifidobacteria* to help improve the gastrointestinal environment

of the ruminant and inhibit the growth of harmful bacteria (Alibaba, 2015). The location of the manufacturer is its main advantage. China, the location of the manufacturer, borders Nepal. This means the product could be transported on a nine-hour flight to Nepal from China, versus a nineteen-hour flight from Canada. Therefore transportation would be more cost efficient, and to poverty-wracked country, this is vital.

Overall, the exportation of Hi-Pro Feeds Advantage 4 Medicated Dairy Calf Starter Kits has been proven to benefit both Canada and Nepal. Canadian farmers in Western Ontario will be profitable as the company expands itself, product demand increases and requires more feed ingredients. More jobs within the mills will be produced. Nepalese people will become more profitable in the dairy industry with improved calf health and therefore an improved ability to revive the cattle herd numbers after the earthquake of April 2015. If this opportunity is acted upon, this product could largely benefit not only the agricultural industry as a whole, but also both of the countries affiliated with them.

Word Count: 3174

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