

AGR 1100

# Navy Bean-White Bean Variety

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By: Derek Beyer

Section 103, Tuesday- 830:11:30 AM

12/1/2015

## Introduction

Nepal is a landlocked country located in South Asia, in between China and India. The nation of Nepal is trapezoidal in shape, and is approximately 200 km wide by 800 km in length, combining for a total area of 147 141 km<sup>2</sup>. Nepal is an extremely food deficit nation consisting of three different regions: Mountains, Hills and Terai. Terai is largely responsible for producing grains and fruits, where as the Mountains and Hills regions primarily focus on vegetable and livestock production (Chapagain, 2015). While rich in cultural heritage and natural beauty, Nepal remains one of the poorest countries in the world. Per capita income is estimated at \$656 US dollars. Nepal has a population of 28 million, which attributes to the food scarcity issue when one considers that Canada has a population of about 34 million citizens, but is roughly 64 times the size of Nepal (Chapagain 2015). Reports suggest that Nepal is the ninth poorest country in the world, the poorest outside of Africa (Prennushi, 1999).

The National Planning Commission (NPC) and the central bank of Nepal-Nepal Rastra Bank (NRB); NRB has been carrying out the survey in the name of the Household Budget Survey (HBS) in an interval of nearly one decade; Aside from determining household income and expenditure, the surveys collect data on many issues related to socio-economic conditions of the nation; such as: education, household characteristics, housing conditions, employment scenario, and rural and urban market information (Khanal, 2012). It illustrates the quintile distribution of income from the poorest group to the richest; signifying that the living standard of people in the richest group is 6.5 times higher than in the bottom. Agriculture turns out to contribute the least to the income source for the richest group; however, it is 2.37 times more than in the poorest section (Khanal 2012). Agriculture turns out to be the third contributor among six sources of income for the poor. But mostly, poor people in Nepal are engaged in agriculture;

however, the contribution of agriculture to income is not very significant. This suggests that productivity of agriculture is low (Khanal 2012).

Therefore the agriculture sector in Nepal is weak, yet is the main source of income for most of Nepal; as approximately 83% of Nepalese live in a rural area and only about 17% of the Nepal population consists of an urban population (Raizada, 2015). The fact that much of Nepal relies heavily on the agricultural sector for employment, yet agricultural production is consistently dwindling, is a key contributing factor to the Nation's everlasting issue relating to food scarcity. A Canadian Product that would be beneficial for exportation to Nepal for both nations is the navy bean which is a variety of white bean. As noted by guest speaker, Dr Tejendra Chapagain, an area of sector based improvement that would be beneficial to Nepal is improved seeds (Chapagain, 2015). The navy bean is a simple meal for the citizens of Nepal, as it only has to be boiled in water before consumed, and offers many beneficial aspects










#### Current Trade between Canada & Nepal

While Canada and Nepal have longstanding bilateral ties, trade and investment flows remain modest. During the period 2008-2013, two-way trade ranged from \$15 million to \$23 million per annum (Government of Canada, 2013). In 2012-13, Canadian exports to Nepal totalled \$7.1 million and Canadian imports from Nepal totalled \$11.7 million. Nepal's exports to Canada are dominated by textile garments and apparels (Government of Canada, 2013). Canada's main exports to Nepal are in the areas of aerospace, machineries, paper and paper board, vegetables and optical instruments and appliances. (Government of Canada, 2013)

#### Nutritional Value

Though navy beans do have very much flavour, they contain many beneficial nutritional aspects when consumed, For example: "Dry beans (navy beans) supply protein, complex

carbohydrate, fibre and essential vitamins and minerals to the diet, yet are low in fat and sodium and contain no cholesterol” (Siddiq & Uebersax, 2012). In addition to the many positive nutritional aspects that can be associated with the consumption of navy beans, they also provide many health benefits. “The inclusion of dry beans and other legumes in the daily diet has many beneficial effects in controlling and preventing various metabolic diseases such as diabetes mellitus, coronary heart disease and colon cancer” (Siddiq & Uebersax, 2012). Furthermore navy beans are an excellent source of cholesterol-lowering fiber, as are most other beans; apart from lowering cholesterol, navy beans' high fiber content prevents blood sugar levels from rising too rapidly after a meal (Mateljan, 2007). When combined with whole grains such as brown rice, navy beans provide virtually fat-free high quality protein; navy beans are a very good source of folate and manganese and a good source of protein and vitamin B1 as well as the minerals phosphorus, copper, magnesium, iron and dietary fiber (Mateljan, 2007). Folate is beneficial to the human body as it helps lower levels of homocysteine, an amino acid that is an intermediate product in an important metabolic process called the methylation cycle. Elevated blood levels of homocysteine are an independent risk factor for heart attack, stroke, or peripheral vascular disease, and are found in between 20-40% of patients with heart disease (Mateljan, 2007). It has been estimated that consumption of 100% of the daily value (DV) of folate would, by itself, reduce the number of heart attacks suffered by Americans each year by 10%; just one cup of cooked navy beans provides 63.7% of the recommended daily intake for folate (Mateljan, 2007).

Navy Beans, cooked 1.00 cup (182.00 grams)		Calories: 255 GI: <a href="#">low</a>
Nutrient	DRI/DV	
<a href="#">fiber</a>	76%	
<a href="#">folate</a>	64%	
<a href="#">manganese</a>	48%	
<a href="#">copper</a>	42%	
<a href="#">phosphorus</a>	37%	
<a href="#">vitamin B1</a>	36%	
<a href="#">protein</a>	30%	
<a href="#">iron</a>	24%	
<a href="#">magnesium</a>	24%	

Source: Mateljan, 2007

The dietary fiber that consists within navy beans helps stabilize blood sugar levels. In addition to providing slow burning complex carbohydrates, navy beans can increase your energy by helping to replenish your iron stores. Particularly for menstruating women, who are more at risk for iron deficiency, boosting iron stores with navy beans is a good idea—especially because, unlike red meat, another source of iron, navy beans are low in calories and virtually fat-free (Mateljan, 2007).

Another health benefit associated with the consumption of navy beans, is that navy beans also contain amylase inhibitors. Simple aqueous extracts from ground navy beans contain a heat-labile fraction that slows the activity of the pancreatic, which becomes evident due to a decreasing PH level. Aqueous extract of ground navy beans may reduce the digestion of 100mg of soluble starch at PH 4.7 to 16% of the uninhibited digestion at neutrality, while in the absence of the inhibitor given the same information (at PH 4.7) the value was found to be at approximately 60% of the uninhibited digestion at neutrality, considerably higher (Bowman, D.E. 1945)

Navy Beans, cooked				
1.00 cup 182.00 grams			Calories: 255 GI: <a href="#">low</a>	
Nutrient	Amount	DRI/DV (%)	Nutrient Density	World's Healthiest Foods Rating
<a href="#">fiber</a>	19.11 g	76	5.4	excellent
<a href="#">folate</a>	254.80 mcg	64	4.5	very good
<a href="#">manganese</a>	0.96 mg	48	3.4	very good
<a href="#">copper</a>	0.38 mg	42	3.0	good
<a href="#">phosphorus</a>	262.08 mg	37	2.6	good
<a href="#">vitamin B1</a>	0.43 mg	36	2.5	good
<a href="#">protein</a>	14.98 g	30	2.1	good
<a href="#">magnesium</a>	96.46 mg	24	1.7	good
<a href="#">iron</a>	4.30 mg	24	1.7	good

Source: Mateljan, 2007

### Benefits to Canada

Canada is the largest bean exporting nation in the world, and already exports beans to 70 countries around the globe (Government of Canada, 2015). The Ontario Bean Producers Marketing Board (OBPMA) represents approximately 2000 white pea bean producers across Ontario, that produce an estimated 90% of Canada's total white bean production. On average 80% of Ontario produced beans are exported (Government of Canada, 2015). OBPMA markets beans to a total of six licensed exporting companies (Government of Canada, 2015); the Canadian pulse industry has grown tremendously over the past twenty years to become a major player in global pulse production and trade, with a strong base of Canadian processing and exporting companies. Over this time, Canada has emerged to become the world's largest exporter of lentil and pea, and a top five bean exporter. Canadian pulse production peaked in 2005 at more than 4.8 million tonnes, with pulse production normally in the range of 4 to 4.5 million tonnes per year. The value of Canadian pulses exports alone exceeded \$1 billion in 2006. Quebec

and Ontario produce bean crops (a wide array of coloured beans as well as the white navy bean); Manitoba produces white and coloured beans, as well as pea and lentil. Saskatchewan is the largest producer of pea, lentil and chickpea with a small bean industry, and Alberta produces beans under irrigation as well as pea, lentil and chickpea (Pulse Canada, 2007)

Bean production in Canada is very beneficial to the Canadian economy, as it creates many jobs for Canadian citizens, as well as generates profits through exports. Scott Cottenden, who is responsible for Dry Bean Sales associated with Thompsons Revolution Limited, stated the following about bean production in Canada: “We produce way too many beans in Canada and in the US for our domestic consumption. The excess acres are grown on purpose for export. Crop production in Canada is not unlike oil. It is done for the purpose to bring money into the country, for example Navy beans packed in a 1MT tote shipped by container to Italy are worth \$770.00USD/MT in the port today. That is about \$0.46/lb CAD in the port. Take that value back to a processing plant in Canada and it is about 0.40 cents a lb CAD. We produce way too many beans in Canada and in the US for our domestic consumption. The excess acres are grown on purpose for export. Crop production in Canada is not unlike oil. It is done for the purpose to bring money into the country. So that revenue generated by exporting helps to fuel our country with jobs” (Scott Cottenden, 2015). A successful exporter of navy beans in Ontario is “Thompsons Revolution LTD” located at 2 Hyland Drive Blenheim, Ontario (Thompsons Revolution LTD, 2015).

Agriculture in itself continues to play an important role in federal and provincial economies, where it makes a significant contribution to Gross Domestic Product (GDP) and employment, directly providing one in eight jobs, employing 2.1 million people and accounting for 8.0% of total GDP. In 2011, GDP in the agriculture and agri-food system regained its value

achieved prior to the economic recession of 2009 (Government of Canada, 2013). While primary agriculture accounts for a small share of the total economy (1.7% of GDP), it is at the heart of the agriculture and agri-food system and has grown on average by 1.4% per year since 1997 (Government of Canada, 2013). According to the latest Census of Agriculture, family farms continue to evolve and restructure in response to changing market conditions so the number of farms continues to decline, but also continues to get larger. There were a reported 205,730 farms in Canada, down 10% from 2006, with the average farm size growing to 779 acres. Non-durum wheat is no longer king – it has been overtaken by canola; and soybean area also increased between 2006 and 2011. Farm performance, as measured by farm income and net worth, continued to remain strong overall (Government of Canada, 2013). Net cash income, after adjusting for inflation, was up 17% over that of 2010, as farm cash receipts grew more than net operating expenses (Government of Canada, 2013). Market receipts were boosted by higher grain and oilseed prices and red meat prices; but expenses were up in 2011 due to higher fuel, feed, fertilizer and seed prices. Farm net worth continues to grow in the face of higher asset values, particularly land values, and record low interest rates which helped keep farm debt servicing costs down. Farm debt to asset ratios continued to fall to historically low levels (Government of Canada, 2013). Young farmer enterprises (YFEs) which are managed solely by young operators between the ages of 18 and 39 years, while small in number, are important for the future of the sector. YFEs accounted for 7.5% of Canadian farms in 2010, but earned more from both farm and non-farm sources compared to older farm enterprises. Therefore bean production as well as agriculture production in general, is a major contributor to the Canadian economy. (Government of Canada, 2013)



## Benefits to Nepal

Staple foods are relatively inexpensive; therefore there is less strain when it comes to purchasing staple foods as opposed to purchasing other edibles in a poverty stricken nation. “Almost half (49%) of Nepal's population lives below absolute poverty line” (United Nations, 1997): This essentially means approximately half of the population of Nepal does not make the minimum income required to support human life. Exporting Canadian navy beans is a possible cheap food alternative for the estimated 28 million citizens of Nepal (Chapagain 2015), that can help to further alleviate the nations struggle with food scarcity. As stated previously the GDP per capita in Nepal is \$656 US (Tejendra), which really limits the amount of food the average Nepali citizen can buy to support their family. Navy beans will benefit the Nepali people as they are a relatively inexpensive source of sustenance with many nutritional benefits to offer. For example, the suggested retail price of a 1 pound bag of navy beans at a grocery store is \$1.50 Canadian (Cottenden, 2015). This translates into only \$1.12 US, an affordable price for the citizens of Nepal. Periodic food shortages occur throughout much of Nepal, over two-thirds of all Nepali families face chronic food shortfalls. Population pressure has led to over exploitation and chronic depletion of land and forest resources, while dwindling domestic grain production has left subsistence farmers (which make up most of the population of Nepal) to rely on the purchase of imported cereals. Shortfalls of agricultural production are particularly common in the Hills region of Nepal.

## Transportation

In order for food to be exported from Canada, it must first pass an inspection by the Canadian Food Inspection Agency (CFIA) to ensure that the product meets Canada's health and safety requirements, as well as the requirements of the importing Nation (Canadian Food

Inspection Agency, 2015). Once all requirements are met, navy beans could then be exported to Nepal.

The ideal airport for the beans to land at would be “Tribhuvan International Airport of Nepal”, as it is the most centrally located airport in Nepal. By shipping navy beans to the most central airport in Nepal, it would ultimately assist in cutting costs associated with distribution across Nepal. In contrast, Tenzig Hillary Airport as well as Nepalgunj Airport are located near the border of Nepal, which would require the product to have to be transported greater distance in order to reach various food distribution centers, such as local grocery store chains.

Transporting navy beans is relatively simple in contrast to transporting other foods commonly used as consumption, due to the fact that beans do not spoil rapidly, unlike meats and dairy products. The only conditions necessary for successful transportation of navy beans is an environment not subject to extreme temperature or moisture (Justice & Bass, 1978). This allows for a variety of transportation methods, such as train or vehicle, depending on which method of transportation is the most cost efficient.

The transportation system in Nepal depends heavily on the road network. The Mahendra Highway serves as the backbone of Nepal running the length of the country across the Terai. A number of feeder roads link to the Mahendra Highway, facilitating access to major towns throughout Nepal, India, and Tibet (United Nations World Food Programme, 2007).

Road Transportation: Nepal’s road network and density is the lowest in the South Asia, with much of this (i.e. above 60 percent) concentrated in the Terai. As a result, road access in rural areas, particularly in the hill and mountain regions, is quite limited. Only 30 percent of the rural population has access to all-weather roads and an estimated 36 percent of the population

live at least 2 hours walk from the nearest all-season road. At least 15 districts are not connected to roads that can be accessed by vehicle, though the GON considers transportation significantly difficult in 30 districts. It should be noted that, at the mountains and hill districts, road connectivity generally does not include road access beyond the district headquarters. When roads are not available within district (i.e. to connect rural areas beyond the headquarters), connectivity is established through other means, such as portering and animal transport (United Nations World Food Programme, 2007).

**Air Transportation:** Air transportation, through 42 domestic airports, plays a vital role in providing access to the Hill and Mountain belts of the country. The use of air transportation in the supply of food to remote areas is well accepted (United Nations World Food Programme, 2007).

**Portering:** Portering is the most common mode of transportation in the hills between market centers and consuming districts/households. As roads generally do not go beyond the district headquarters and landing zones are limited, portering is the primary means of transporting goods from these points to different parts of the region and district (United Nations World Food Programme, 2007).

**Animal Transportation:** Animal transport is commonly used in all three ecological belts. In the Terai, bullock carts, or *bailgadha/ladia*, are the most common means of transportation (human and goods) in rural areas. Mules, yaks and goats are commonly used for transport in the mountains. With limited road access, aggregate transportation costs to the Hill and Mountain districts can be very high. While surface transport can be considerably cheaper than air, the insurgency in some mountain areas has made this method unreliable. The recent improvement in

the socio-political context may, however, encourage the resumption of surface transport to these remote areas (United Nations World Food Programme, 2007).

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Table 5 : Public Transportation Cost by Mode of Transportation (*Unit: MT Rs. '000*)

Fiscal Year	Total			By air			By surface		
	Quantity	Transport Cost	Per MT. Cost	Quantity	Transport Cost	Per MT. Cost	Quantity	Transport Cost	Per MT. Cost
1996/97	15,114	226,819	15.0	3,655	119,780	32.8	11,459	107,039	9.3
1997/98	14,000	267,350	19.1	4,113	157,658	38.3	9,887	109,691	11.1
1998/99	16,367	334,596	20.4	4,278	195,122	45.6	12,089	139,474	11.5
1999/00	14,218	332,804	23.4	6,661	239,967	36.0	7,551	92,837	12.3
2000/01	9,773	232,118	23.8	5,187	176,060	33.9	4,584	56,058	12.2
2001/02	6,792	200,000	29.4	4,255	165,200	38.8	2,437	34,800	14.3

Source: Nepal Food Corporation, Planning Division, Central Office (2002)

Source: United Nations World Food Programme, 2007

The navy beans could be supplied to the supermarket “Bhat-Bhateni”, which is the largest grocery store chain in all of Nepal. It has been the highest taxpayer in the sector since 2008, and currently supplies more than 40,000 Nepalese daily. There is currently nine stores conveniently located in central Kathmandu, Lalitpur and Pokhara. By distributing navy beans to “Bhat-Bhateni”, the navy beans will be able to reach a considerable amount of poor Nepalese, being as Kathmandu and Pokhara are the most populated cities in Nepal. Kathmandu has a population of approximately 1,500,000, and Pokhara has an estimated population of 200 000 people (Bhat-Bhateni Supermarket & Department, 2014).

### In Conclusion

The exportation of navy beans to Nepal from a company such as Thompsons Revolution LTD would encourage economic growth in Canada by providing a new international trading

partner, in addition to providing food relief to the malnourished nation of Nepal; the exportation of navy beans from Canada to Nepal would therefore be beneficial for both nations involved.

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# Appendix

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From: Derek Beyer [mailto:derekbeyer26@hotmail.com]  
Sent: November-25-15 1:55 PM  
To: Cottenden, Scott <SCottenden@ThompsonsLimited.com>  
Subject: Re: Navy Bean Prices.

Thanks for the fast response Scott,

That helps a lot, thank you! Also, does Thompsons export navy beans by the metric ton? If so do you know the approximate price? My assignment is proving how the exportation of navy beans to Nepal can benefit both the Canadian economy as well as the Nepalese people.

Sincerely, Derek

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From: Cottenden, Scott <SCottenden@ThompsonsLimited.com>  
Sent: November 25, 2015 10:29 AM  
To: 'derekbeyer26@hotmail.com'  
Subject: Navy Bean Prices.

Hi Derek,

Thanks for the email.

I am going to assume you mean what the retail price is for a 1lb bag of Navy Beans you see on the grocery shelf.  
Suggested retail is \$1.50/lb.

If I am incorrect in that assumption or you need additional information please let me know.

Save \$3

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America, Europe, South Africa and Australia/NZ.  
In that same vein of thought Black beans and Pinto beans are more Spanish/Mexican type cultural dishes.

Now going back to your project. The grocery store price is somewhat fixed. There are a lot of politics involved in getting placed on the grocery store shelf.

The reality is the export market is the "real" price or the current price. For example Navy beans packed in a 1MT tote shipped by container to Italy are worth \$770.00USD/MT in the port today. That is about \$0.46/lb CAD in the port. Take that value back to a processing plant in Canada and it is about 0.40 cents a lb CAD. We produce way too many beans in Canada and in the US for our domestic consumption. The excess acres are grown on purpose for export. Crop production in Canada is not unlike oil. It is done for the purpose to bring money into the country.

Check this statistic but I believe in Canada 1 in 10 people work in agriculture. So that revenue generated by exporting helps to fuel our country with jobs. The benefit to Nepal? I would say a cheap (relative to meat) protein source.

If you get a few minutes check out the International Year of the Pulse.

(Pulses are beans, Peas, Lentil etc.)

I hope that helps.

Good Luck with your project.

Best Regards,

Scott

Save \$3

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