

Assessment of the Export Potential of Strip Cups to Nepal

Charlene Elliott

Part I: Information related to Canadian Strip Cups

i) Strip Cup Product Information

Strip cups are essentially used to detect mastitis in raw milk (Delaval, 2014). The first stream of milk is squirted from the teat and into the strip cup (Delaval, 2014). There are approximately 3-4 squirts taken from each teat (Delaval, 2014). The cup is then inspected for any flakes, clumps or milk abnormalities (Delaval, 2014). The strip cup consists of a plastic cup that holds 1 and ½ pints and has a handle (Delaval, 2014). The cup also has a removable black anodized tray insert to allow easy cleaning of the cup (Delaval, 2014). The black screen is meant to strain small amounts of milk and avoid splashing (Delaval, 2014). The snap-in, snap-out feature of the strip screen helps to ensure that there is no contact with infected milk (Delaval, 2014).



<http://www.ambic.co.uk/stripcup.html>

ii) Definition of Mastitis and Process of Milking with Strip Cup



Mastitis is the inflammation of the mammary gland in a cow udder which in turn causes white blood cells to be released in order to attack bacteria that enters the teat canal (Sudhan et al, 2010). Milk from cows with mastitis has a high somatic cell count and the disease can be fatal to the cow (Sudhan et al, 2010). This disease can be identified by swelling, heat, redness or pain in the udder and white watery appearance, as well as flakes or clots in the milk (Sudhan et al, 2010). This is the most common disease in dairy cattle in Canada and costs the industry the most money of any disease (Riekerink et al, 2008). Mastitis is ranked as the second most common reason for culling cows in Canada and can cost \$320 to \$830 a year in

Canadian dollars (Delaval, 2014).

The hands of a person milking can become contaminated during milking by spreading pathogens from a cow's udder to milking equipment (Sudhan et al, 2010).



Most dairy farms will have the workers wear latex gloves to avoid high levels of

<http://www.cnbc.com/2014/12/06/milk-that-cow-us-farmers-revel-in-profitable-dairy-business.html>

contamination (Sudhan et al, 2010). The teats are prepared by using a solution that thoroughly cleans any dirt and bacteria off of the teats and udder (Sudhan et al, 2010). Dairy farms will commonly use a 1% iodine solution called a pre-dip to clean the udder and teats (Sudhan et al, 2010). Then, a dry towel is used to wipe the iodine dip and dirt off of the cow's teats (Sudhan et al, 2010). The use of individual towels for each cow is recommended to avoid the spread of



<https://spiritedrose.wordpress.com/jersey-cattle/how-to-produce-quality>

pathogens from cow to cow (Sudhan et al, 2010). During the foremilk stripping, several squirts of milk are removed from each milk quarter (Sudhan et al, 2010). This step is done using a strip cup where a black cup will show any abnormalities, clots or flakes (Sudhan et al, 2010). This is the most common way of discovering clinical mastitis (Sudhan et al, 2010). After this step, the milking machine is attached to the cow's udder (Sudhan et al, 2010). Once

the flow of milk slows down, the milking machine is removed from the udder and the cow is dipped with another solution (Sudhan et al, 2010). This is commonly a 2% iodine solution that is called a post-dip (Sudhan et al, 2010). A cow's teat canal stays open for an hour after suction

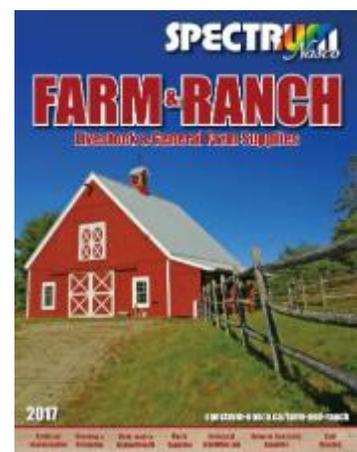
from a milker (Sudhan et al, 2010). The post-dip helps to prevent any pathogens or bacteria to enter the teat canal and avoid the start of mastitis (Sudhan et al, 2010).

iii) Benefits of using a Strip Cup

Mastitis is an issue in the worldwide dairy industry: it is costly due to a direct loss of production, the expense of reducing mastitis levels, and it has negative implications on milk quality (FAO, 2014). A study conducted in the United States of America showed that there is a \$185 to \$200 loss per cow with mastitis per year (FAO, 2014). The severity of the effects of mastitis on milk production depends on the causal agents, the stage of lactation, age of cow and the udder defence mechanisms (FAO, 2014). The first step in controlling mastitis is to determine the incidence of clinical and sub-clinical mastitis and assess the bacterial aspects of the disease (FAO, 2014). The economic losses caused by mastitis depends on when the disease is discovered and what treatment methods are used (FAO, 2014). One method to identify the presence of mastitis in a cow is the use of stripping before milking (FAO, 2014).

iv) Manufacturers/Suppliers in Canada

There are three well-known distributors of the strip cup in Canada including Conestogo Agri Systems, Delaval Canada and SPECTRUM Nasco, as shown in table 1. Delaval Canada would be the most convenient and reasonable company to ship the product to Nepal, as shown in table 2. Delaval has the most reasonable cost for the product with \$13.95 per cup, as show in table 2. The blue strip cups are manufactured in the United States and contribute to Canada, as Delaval is also a Canadian company (Healey, 2016). The product is



<http://spectrum-nasco.ca/farm-and-ranch>

also more reasonable than the cup from SPECTRUM Nasco since it is plastic instead of aluminum, as shown in table 2.

Table 1: Strip Cup Manufacturers and Information about Products with Comparison of Prices

Company	Company Location	Cost	Information about Product
Conestogo Agri Systems Inc.	Drayton, Ontario	\$16.99 CA	-Manufactured in the United Kingdom (Strip Cup, n.d.)
Delaval Canada	Peterborough, Ontario	\$13.95 CA	-Helps to avoid contact with infected milk -Anti-splash screen -Snap-in, snap-out screen -Manufactured in the United States (Blue Strip Cup, n.d.)
SPECTRUM Nasco	Newmarket, Ontario	\$25.45 CA	-Available through catalogue order -Order number C13479NY -Aluminum strip cup (Aluminum Strip Cup, n.d.)

Contact Information for each Company:

Conestogo Agri Systems Inc.
7506 Wellington Road 11
Alma, Ontario
Canada, N0B 1A0
Phone: 519-638-3022
Website: <http://conestogoagri.ca>

Delaval Canada
150B Jameson Drive
Peterborough, Ontario
Canada, K9J 0B9
Phone: 705-741-3100
Website: <http://www.delaval.ca>

SPECTRUM Nasco
150 Pony Drive
Newmarket, Ontario
Canada, L3Y 7B6
Phone: 905-954-4927
Website: <http://spectrum-nasco.ca/farm-and-ranch>

Table 2: Advantages and Disadvantages of Various Strip Cups

Company	Product Name	Advantages	Disadvantages
Conestogo Agri Systems Inc.	Blue Strip Cup		-Manufactured in the United Kingdom -Costs \$16.99 CA, same product as Delaval and more expensive
Delaval Canada	Blue Strip Cup	-Costs \$13.95 CA	-Not manufactured in Canada
SPECTRUM Nasco	Aluminum Strip Cup	-Made of aluminum, more durable	-Costs \$25.45 CA

v) Market Opportunity of Canadian Strip Cups in Nepal

Delaval Canada is a North American dairy company that helps with milking and feeding of cattle in over 100 countries (Delaval, 2013). The company distributes strip cups to farmers in Canada (About Delaval, 2013). These cups are manufactured with plastic in the United States and are distributed throughout Canada (About Delaval, 2013). Delaval has over 125 years of experience in innovation and the dairy industry and meets with over 10,000 milk producers on their farm (About Delaval, 2013).



<http://www.31stline.com/portfolio/delaval>

vi) Benefits for Canadians for Shipping Strip Cups

Improved Economy

Although the Nepal dairy industry is not as developed as Canada's industry, exporting blue strip cups would increase revenue for Delaval Canada. Selling the product to a small market would not lead to building a new company location for Delaval (Healey, 2016). The new business opportunity would lower the fixed costs per product as it would involve selling to a

larger market (Healey, 2016). This would decrease costs per product and increase the total net profit (Healey, 2016).

More Canadian Jobs

Delaval Strip cups are manufactured in a factory that is located in the United States (About Delaval, 2013).

The product is then shipped from the factory to the distributing company in Peterborough, Ontario (About Delaval, 2013). These cups are already distributed to other smaller companies, and farmers all over Canada (About Delaval, 2013). Delaval also distributes products



<http://www.corporate-digest.com/index.php/tanzanian-economy-increases-by-almost-a-third>

to over 100 countries (About Delaval, 2013). Shipping this product to Nepal would involve a higher shipment from the manufacturing company (Healey, 2016). The product would then be loaded onto a truck and loaded onto a freight ship overseas to Nepal (Healey, 2016). The process of shipping this product would require manual labour and the increased demand for the product means that more Canadians would be employed.

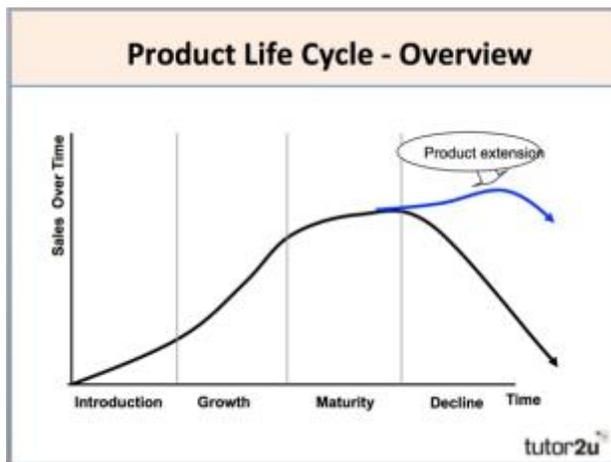
“First to Market” Benefits

There are currently no strip cups being used in Nepal on dairy farms and Canada would be the first country to ship blue strip cups to Nepal (Healey, 2016). Canada would have an opportunity to be the main importer and distributor of this product in Nepal (Healey, 2016). There is no permanent infrastructure to help with mastitis detection and treatment in Nepal (FAO, 2003). The use of the product would require some training in order for Nepalese farmers. They would learn how to use the strip cup in order to detect mastitis. Delaval or a vet clinic distributor in Nepal would be able to help install this infrastructure in the dairy industry. This would prove

Delaval to be a leader company that wants to help the Nepalese people improve their dairy industry.

Longer Product Lifecycle

All products have a life-cycle (Aitken et al, 2003). When the product is first released, it is a novelty and is in high demand (Aitken et al, 2003). The sales will increase dramatically, then start to level off and finally start to decrease (Aitken et al, 2003). This happens as the people who



<http://www.tutor2u.net/business/reference/product-life-cycle>

need the product have already bought it (Aitken et al, 2003). There are still sales of the product as people who decide they need it buy it, and as people who already have the product have to replace it (Aitken et al, 2003). The product that has entered its decline stage may find a market in a

different country (Aitken et al, 2003). This will help to extend the sale market and lower the

price of units (Aitken et al, 2003). The blue strip cup was in high demand in North America when it first came out (Aitken et al, 2003). This was when many farmers were first adopting the use of strip cups in their pre-milking routine (Aitken et al, 2003).

Part II: Export Potential to Nepal

i) Introduction to Nepal and Nepal's Dairy Industry

Nepal is a small landlocked country located between the high Himalaya and Indian plains with a population of 28 million (The World Bank, 2013).

Nepal is a land full of snow peaks, Sherpas, yaks and yetis, and the tallest mountain, Mount Everest (GN,

2014). Hinduism is the dominant religion in Nepal (GN, 2014). In Nepal, the economy is dominated by agriculture, with approximately 68% of the population employed in agriculture (IFAD, n.d.). Nevertheless, Nepal struggles to produce enough food for the population (Bryld, 2003). Farmers do not have access to seeds or new technologies (Bryld, 2003). The crops grown in Nepal include maize, rice, sugarcane, oilseed and potatoes (GN, 2014). There are also many beef, dairy, chicken and sheep farmers (GN, 2014).



<http://www.infoplease.com/atlas/country/nepal.html>



<https://www.eilireland.org/volunteer-abroad/blog/nepal-village-life>

The dairy sector in Nepal involves milking 70% buffalos and 30% cows (Hayashi, 2005). The people of Nepal have a strong bond to their animals and do not believe in culling (GN, 2014). Milk is an important food source for the human population, with a high enrichment in protein and calcium (FAO, 2003). The people of Nepal do not always have access to safe drinking milk (FAO, 2003). Farmers own small dairy herds, milk cows by hand, and the foundation for milk shipment is lacking (Singh, 2002). Subsistence farmers will produce milk mainly for their family and sell the excess milk to the Milk Producing Co-operative Society (Joshi, D. D., n.d.). The farmers receive money for their milk 15 days later

and the pay is based on milk quality (Joshi, D. D., n.d.). The average amount of milk that a dairy cow in Nepal will give in a day is 6.5 litres (Joshi, D. D., n.d.). The undeveloped condition of the Nepalese dairy industry leaves room for further development.

Issues with Mastitis

In Asia, the levels of mastitis have increased in sync with higher-producing breeds of cows and buffalos (FAO, 2014). The other factors that have contributed to the disease include: lack of awareness, delay in detection of abnormal milk, lack of hygiene in milking, and delayed treatment of the disease (FAO, 2014).

The largest issue within the dairy sector in

Nepal is the decreased quality of milk due to debris and high bacteria content, specifically in regards to high somatic cell count caused by mastitis (Hayashi, 2005). Mastitis has a larger occurrence in breeds including Holsteins, Jerseys and Jersey crossbreds (FAO, 2014), all of which are common breeds in Nepal.

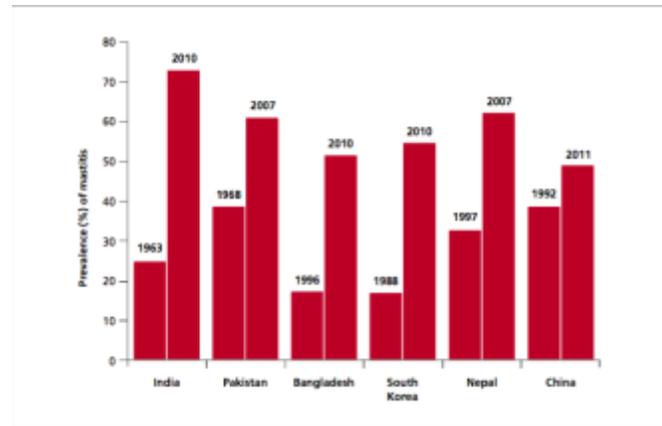


Figure 1: Prevalence of mastitis in different Asian countries, based on data from various studies and production systems (FAO, 2014)

Poor Quality of Raw Milk

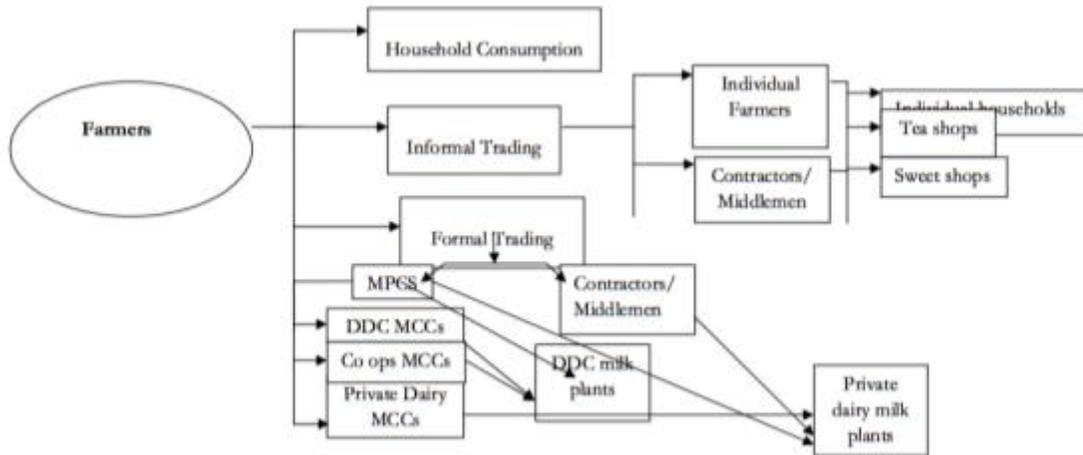


Figure 2: Informal and Formal Flow of Raw Milk (FAO, 2010)

Many dairy farmers in Nepal keep their animals in poor management situations such as mucky stalls and without pre-cleaning routines (Pradhan, 2003). The raw milk is stored on the farm and transported to market without any hygienic methods, leading to poor quality milk (Pradhan, 2003). The Milk Producer Corporations will only test the milk for fat and SNF percentages (Pradhan, 2003).

ii) Transportation of Product from Canada to Nepal

The most reasonable and convenient way to ship this product to Nepal would be using Fedex Secure Ship. The plastic strip cup weighs approximately 226 grams, which is equivalent to $\frac{1}{2}$ a pound. The product would be shipped using Fedex International Freight which is a time-definite, high priority freight service that will ship packages of all weights and sizes (Fedex, n.d.). This product would be shipped in packaging that is already provided by the Delaval distributor company. Each strip cup would take up approximately $1,000 \text{ cm}^3$. The most cost effective way to ship the product would be with 512 units, a box size of $512,000 \text{ cm}^3$, units stacked $8 \times 8 \times 8$, \$9.81 cost per unit and \$5,023.17 in total, as shown in table 3.

Table 3: The Cost to Ship a Number of units of the Blue Strip Cup on a Crate using Fedex International Economy Shipping

Number of Product Units Shipped in Bulk	Total Weight (pounds)	Total Cost	Cost to Ship per Product Unit
1	0.5 lbs	\$133.95*	\$133.95
216	108 lbs	\$2,203.08*	\$10.20
512	256 lbs	\$5,023.17*	\$9.81
1000	500 lbs	\$9,830.51*	\$9.83

*All rates were obtained from the website: (Fedex, n.d.)

As shown in figure 3, the skid of 512 strip cups would start its journey from the Delaval location in Peterborough, Ontario. The skid would travel by train on the Trans-Canada Highway from Peterborough to the eastern side of Nova Scotia. The skid would be loaded onto a freight ship and be shipped to Southern India. The skid would travel the rest of the way on a truck to Kathmandu, Nepal. The products would be distributed from this location to other places in Nepal, including dairy companies and veterinarian clinics.



Figure 3: Flow Chart of the Transportation Route of the Product Parcel

iii) Needs and Benefits to Nepal

Increased Milk Production

The average milk produced per dairy cow in Nepal is 6.5 litres per day, which is less than half of the average for a Canadian cow (Joshi, D. D., n.d.). Milk production per cow is an important

aspect to evaluate when improving a dairy herd (IFCN, 2012). Any farmer on a commercial dairy operation or family farm would benefit from higher milk yields because they lead to a higher income. A farmer that would have improved mastitis detection from using a strip cup would experience an increase in milk production (Bar et al, 2008). Cows have higher milk yields when they do not suffer from the effects of mastitis (Bar et al, 2008). The rise in milk production would have many benefits regarding the increased income for the farmer (Bar, 2008).

Meeting a Growing Demand for Milk

Nepal has a growing demand for milk that could be met with an increase in milk production (IFCN, 2012). The consumption of dairy is rising by 2.6% per year and the population in Nepal is growing by 1% each year (IFCN, 2016). The detection of mastitis would lead to an increase in milk production, and in turn, meet the demand for milk in Nepal.

Potential for Exports from Nepal

Nepal is only 99% self-sufficient with milk production (IFCN, 2012). The country does not ship any dairy products out of the country (IFCN, 2012). There are shortages of milk in countries east of Nepal including Thailand and China (IFCN, 2012). With an increase in milk production, Nepal would be able to export extra milk to nearby countries and help improve the Nepalese economy (IFCN, 2012).



<http://www.shutterstock.com/pic-75937858/stock-photo-jug-of-milk-against-herd-of-cows-emmental-region->

Improved Quality of Life

Nepal is a developing country that struggles with many issues related to malnutrition (WFP, 2014). Malnutrition lowers the physical and cognitive health of people, leading to decreased

production, and therefore negatively impacting the economy (WFP, 2014). Milk contains nutrients that help with physical and cognitive development (The Dairy Council, n.d.). With a higher supply of milk in Nepal, milk would be cheaper with relation to supply and demand (Aitken, 2005). The increased production would also allow easier access to milk as a result of increased supply, and this would improve the health of Nepalese citizens.

iv) Potential Nepalese Companies to Distribute Product

Table 4: Dairy Organizations and Companies Located in Nepal

Company	Location	Phone
Dairy Development Corporation	Kathmandu, Nepal	4411710
Nepal Veterinary Association	Kathmandu, Nepal	977 1-4467791
National Dairy Development Board	Anand, India	977 152-5400
Kathmandu Dairy	Kathmandu, Nepal	977 424-4155

(FAO, 2003)

v) Trade Barriers

Canada established professional trade relations with Nepal in 1965 and has since kept strong bilateral relations (GC, 2013). In Nepal, there is a High Commission of Canada located in New Delhi that represents Canada (GC, 2013). Nepal also has an embassy that was established in 2009 in Canada, with locations in Toronto and Victoria (GC, 2013). Nepal is very open and dependent on trades in relation to other Asian countries (World Bank, 2013). Nepal has opened up more trade opportunities since the country joined the World Trade Organization in 2004 (World Bank, 2013).

vi) Issues Related to Export

Lack of Market Infrastructure

The Milk Producer's Cooperative Society negotiates between the farmers and the milk processors in Nepal (FAO, 2010). Although, this society lacks organization and sufficiency that has left the farmers without support (FAO, 2010). The Dairy Development Corporation brings the milk from farms to market (Seegers, 2003). This Corporation faces issues with milk quality and has not helped farmers to improve these problems (Seegers, 2003). The National Dairy Development Board was established to help further the dairy industry but has struggled due to a lack of funding (Seegers, 2003). None of these systems in Nepal have been effective in developing the dairy industry and helping the dairy farmers in Nepal.



<https://danmilner.wordpress.com>

Nepal Poverty

Nepal is a developing country that has a poor population, with many people who only make \$14 USD in one month (IFAD, n.d.). There are higher poverty rates in rural areas where the majority of farmers reside (IFAD, n.d.). There would be a challenge for exporters with this population of poor farmers (IFAD, n.d.).

No Previous Exports from Company

Delaval does not currently export, and has never exported products to Nepal (Healey, 2016). The company would have to do research into Nepal's dairy industry and recognise the potential for selling the product (Healey, 2016). There would need to be a transportation route set up as there are no current ways for Delaval to ship the product (Healey, 2016).

Transport of Product to Farmers



There are few reliable roads in Nepal and it is hard to transport products to other towns and farms (Donnges, 2005). There are many remote areas, outside of towns and cities where the majority of farms are located (Donnges, 2005). It

<https://www.pinterest.com/pin/357543657894155568/>

would be difficult for farmers to travel to a nearby city

to buy a product, or for a company to distribute to individual farms (Donnges, 2005).

Lack of Agricultural Education

The people of Nepal are often uneducated and do not have as much dairy knowledge as an average Canadian farmer (Ng et al, 2010). A study that trained Nepalese women in mastitis prevention showed that the prevalence of mastitis in trained households was lower after one year (Ng et al, 2010). Many of the Nepalese farmers do not have enough education about what mastitis is, how to treat mastitis and how to prevent mastitis (Ng et al, 2010).

vii) Competitive Products in Nearby Nations

There are companies that manufacture and distribute strip cups that are located in countries near Nepal, as shown in table 5. BouMatic has locations throughout China which is north of the Nepal border (BMR, n.d.). The company locations would already have a similar product close to Nepal for exporting. This would be more convenient and cost less money rather than shipping the product overseas from Canada.

Table 5: Comparison of Similar Products from Nearby Countries to Nepal

Company	Location	Product Name	Cost
BouMatic	Shanghai, China	Blue Strip Cup	\$14.99 US (BMR, n.d.)
BouMatic	Johar Town, Pakistan	Blue Strip Cup	\$14.99 US (BMR, n.d.)
Amazon.com	Worldwide shipping	Blue Strip Cup	\$13.99 US (Strip cup, n.d.)

viii) Recommendations for Export of Product

To maximize the success of the shipment of this product, the Nepalese dairy farms would need to become educated about mastitis detection (Ng et al, 2010). Mastitis can be identified by swelling, heat, redness or pain in the udder and white watery appearance, as well as flakes or clots in the milk (Sudhan et al, 2010). These symptoms may not be identified by Nepalese farmers if they do not receive education about how to identify mastitis (Ng et al, 2010). There are dairy organizations in Nepal, including the National Dairy Development Board (NDDB) (Seeegrs, 2003). The NDDB was created to help further the dairy industry in Nepal in regards to milk quality (Seegers, 2003). Establishing a system to help farmers in Nepal with mastitis detection would make the export of blue strip cups more profitable and make the product effective.



<http://www.express.co.uk/life-style/top10facts/657792/Ten-things-top-facts-flags-Indonesia-Poland-Malaysia-Monaco-Chad-Romania>

Marketing to the Nepalese farmers is important to ensure that the product is successful. The larger dairy farms in Nepal should be marketed to first, since they have more knowledge about the dairy industry, are more innovative, and know more about dairy diseases (Bryld, 2003).

Then, the product would be well-known in Nepal and the small-scale farmers would gain more knowledge about the product.

ix) Future Studies

The implementation of the blue strip cups would help farmers detect mastitis in their cows and buffalos. This would require educating the farmers about how to recognize signs of mastitis while pre-stripping. The next step in mastitis prevention would be to establish a way to treat mastitis in cows and buffalos. A product that treats mastitis is called cefa-lak (Schering, 2006). Cefa-lak is an antibiotic treatment for bovine mastitis caused by bacteria strains (Schering, 2006). The treatment is in the form of a tube and costs \$3.59 per tube (Schering, 2006).

If Nepal adopts this method of filtering milk to detect mastitis early in cows and buffalos, a future study would need to be conducted to determine how much the cases of unclean milk and mastitis have decreased. This study would have to be conducted by a dairy organization in Nepal, such as the Dairy Development Corporation that brings the milk from the farmer to the market. The milk in Nepal lacks quality and the decrease in mastitis would help improve quality (Seegers, 2003). When the corporation picks up milk from farms, it would be convenient to take a sample of milk and have it tested for quality. The information collected from these tests would provide an overview of how effective the use of strip cups has been.

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