

Canadian Export to Nepal: Heatime HR System from CIAQ

Kayley Denstedt

PART 1: PRODUCT INFORMATION

Estrous Cycle Detection

Proper detection of a cow's estrous cycle is vital in producing healthy, good quality livestock. The beginning of the estrous cycle is a critical indicator for when to fertilize the cattle (Lamb *et al.*, 2009). By fertilizing the cattle at the proper time, there is a better usage of the semen when artificially inseminating. Estrous cycle detection can also illustrate any health issues that could be associated with irregularities in the cow's cycle (CIAQ, n.d.). Properly timed estrous cycles in cattle ensure that the cow is in good health and that it is fertile (CIAQ, n.d.). Fertility is a key component for the raising of livestock, as profit is made from the direct result of fertilization (calf), and also the indirect product (milk)(Wolfenson *et al.*, 1995). Estrous cycle detection has recently become a new feature in the cattle industry, due to its ability to improve fertility while limiting the amount of semen doses used (CIAQ, n. d.). This can also promote herd health in the cows that use heat detection systems (Ireland *et al.*, 1980). Improving health and fertility is of utmost importance when raising livestock, as they both relate to the quality of the product being generated (Wolfenson *et al.*, 1995).

Heatime HR System from Centre d'insemination artificielle du Québec

Centre d'insemination artificielle du Québec (CIAQ), is a limited partnership created in 1948 by three groups of Québec cattle and dairy producers (CIAQ, n. d.). CIAQ is also responsible for 45% of the artificial insemination (AI) industry in Canada (CIAQ, n. d.). CIAQ makes up 45% of the Semex Alliance (along with Westgen and Eastgen), which advertises worldwide the products and services that CIAQ offers (CIAQ, n. d.). CIAQ is based out of Saint Hyacinthe, Québec, and is a global leader in the

genetics industry (CIAQ, n. d.). Since its beginning, the company has supported the livestock industry in artificial insemination, reproductive assistance and heat detection. For these reasons, CIAQ is the preferred company in which Nepal should import the estrous cycle detection systems, due to its Canadian establishment and international influence.

The estrous cycle detection system that is supplied by CIAQ is the Heatime HR System, which involves both a tag worn by the cow and a reader (CIAQ, n. d.). The tag is attached to a collar that a cow wears, that records the movements and activity of the cow. The tag is read when the cow passes under the reader, which is installed over a high traffic area, such as near a water bowl or feeder (CIAQ, n. d.). The tags are non-invasive and can easily be taken off or put on (CIAQ, n. d.). They are lightweight and also have an average battery life of 7 years (CIAQ, n. d.). The data is sent from the tag to the reader by infrared communication, and this data can then be printed by a printer to be analyzed (CIAQ, n. d.). When the cow has higher movement rates (running, standing or walking), compared to its sedentary periods (laying down), this indicates that the cow is most likely in heat.

Canadian Benefits

Improved Trading Relationship with Nepal

By exporting the system to Nepal, there is an opening for more potential exports of other products from Canada. More agriculturally based products may be favoured to be exported over any other products, however, this could also lead to the export of products to surrounding countries, such as India or China. From the export of the Heatime HR

System, there is also a new market for doses of semen, medicine or other reproductive based products (CIAQ, n. d.).

Increase in Canadian Jobs

The Heatime HR System is manually installed by Canadian technicians (CIAQ, n. d.). When the systems are sold, CIAQ requires that one of their trained technicians install the system to ensure proper set-up and positioning. From this, some Canadian employees should be stationed in Nepal in order to establish the first round of systems and also to train Nepalese workers on how to install and maintain the systems. New employees will then fill the recently open positions in Canada. Since more systems will be produced, more employees will be needed in the company based on Canada, therefore, increasing the amount of Canadian jobs.

Raise in Company Revenue

By expanding their exporting market to Nepal, CIAQ would be able to increase their revenue. However, the market in Nepal would be relatively much smaller than it is in Canada, or other developed countries that CIAQ exports its products to. This increase in revenue would not develop enough money to enhance the technology of the system or create new products, but it would be enough to possibly lower fixed costs over a period of time.

Additional Benefits

From the use of the Heatime HR System, farmers and cattle workers will be able to better predict when to fertilize the cattle. From this, money will be saved on the purchases of doses of semen. This money can be used to purchase better quality semen, which could possibly be imported from other Canadian producers. Detection of the

estrous cycle in the cattle will also help fuel the import of other products or systems, such as medicinal creams, nutrients or even calf-pullers.

Support Available for Exporting Project

There are several options for financial support in this export project. The Ontario Ministry of Agriculture, Food, and Rural Affairs offers funding for Canadian-based agriculture programs, in which they are able to receive up to \$350,000 (OMAFRA, 2016)). Global Affairs Canada also has program that helps subsidize expenses, up to \$99,999, for Canadian companies that export to the world, called the CanExport program (Government of Canada, n.d.). Every 5 years, Agriculture and Agri-Food Canada has an available \$341 million through the AgriMarketing Program to support government projects from Canadian business in the agriculture industry (Agriculture and Agri-Food Canada, 2016). Farm Credit Canada also offers support for Canadian businesses through their Agribusiness and Agri-Food resources to decrease operating costs in worldwide exporting (Farm Credit Canada, 2016).

Process of Export

The first step in the process of exporting to Nepal would be to contact any groups of farmers or large-scale cattle operations to be the importer of the system in Nepal (Government of Nepal, n. d.). From these importers, the required number of readers and tags would then need to be calculated based off of how many cattle there are. The next step would then for the systems to be transported to Nepal, most likely by air. There would also be a few technicians from CIAQ that would travel to Nepal to install and set up the systems. Since the systems do not “expire”, they can be stored for long periods of time, whether this is while being transported or while waiting to be purchased

(CIAQ, n. d.). CIAQ would need to obtain exporting permits and also would require a storage space for the systems in Nepal (USAID, 2016).

PART 2: POTENTIAL BENEFITS TO NEPAL

Nepal's Developing Agriculture Industry

Nepal is a developing land-locked country located in Asia (World Bank Group, 2016). Nepal has a population of approximately 28 million people, with an estimated 80% of the Nepalese people living in the rural areas of Nepal (World Bank Group, 2016). Nepal has a GDP just over \$24 billion, with the agriculture industry accounting for approximately 40% of this value (World Bank Group, 2016). With many Nepalese owning cattle and other livestock, the usage of the Heatime HR System would be crucial in the further development of the agriculture industry. Nepalese are able to improve the quality of their livestock, and related by-products, and in turn, increase their profit. The value of the livestock is then substantially increased compared to before using the Heatime HR System.

Benefits to Nepal

By the use of the Heatime HR System, the Nepalese agriculture industry would be greatly improved. The use of the system would increase the quality of the livestock in Nepal and also increase overall herd health. By improving the livestock sector, there would be an increase in the quality of life in Nepal overall.

Improved AI Accuracy

By the detection of the cow's estrous cycle, farmers are better able to see when the proper time when the cow should be inseminated (Lamb *et al.*, 2009). From this, there are less doses of semen used, which in turn creates a higher profit as less income is spent

on semen doses that go to waste. From this, the cow spends less time “open” (not with calf), due to the accuracy of estrous detection (CIAQ, n. d.).

Higher Quality Bloodlines

Since a lesser amount of semen doses are needed for purchase, the remaining amount of funds can be put towards higher quality genetics to inseminate the cows with. From this, the cows will have an increased efficiency in their feed conversion and production over time (Ireland *et al.*, 1980). From this, the cows will produce better quality calves and have a higher market value for the farmers.

Better Herd Health

The Heatime HR System records the cow’s activity for estrous cycle habits, but these movements can also detect sickness in the cattle (CIAQ, n. d.). After a baseline of “normal” movements is recorded for each cow, their daily activity is then compared to this baseline. A farmer can see abnormalities in the cow’s behaviour and then assess whether the cow is in poor health (CIAQ, n. d.). In turn, the farmer is able to earlier detect any sickness and is able to treat any issues with antibiotics or medicine sooner. By treating any issues sooner, there is an increase in effectiveness of the treatments used (Wolfenson *et al.*, 1995).

Increase in Jobs

CIAQ requires that their own technicians install and maintain the Heatime HR Systems (CIAQ, n. d.). However, having technicians move to Nepal permanently would not be a feasible solution. Therefore, the CIAQ technicians would be able to train Nepalese workers on how to properly install and maintain the systems. There would also

need to be more people to transport the systems to various areas in Nepal. From this, there would be jobs created for the Nepalese.

Improved Tourism Industry

Since CIAQ would have technicians in Nepal to train Nepalese workers with the Heatime HR System, the tourism industry would also increase. This would be a result from the Canadian technicians staying in Nepal for a period of time. The tourism industry would also be enhanced, as the quality of the livestock, and related products, could be used in hotels, restaurants or markets and would appeal greater to the tourists in Nepal.

Quality of Life

Since there would be jobs created from importing this system to Nepal, the Nepalese would have an increased income. The improvement of the quality of livestock would also increase the profit of the farmers, as well as create a new market for the higher quality livestock. The Nepalese would also have improved quality in both dairy and meat products, depending on what type of cattle the farmer is raising, and therefore, can enhance the nutrition in the products which the Nepalese are consuming.

Quantities and Costs Associated with Export Project

Cost to Farmer

The Heatime HR System is approximately \$2000 per reader, and between \$85-\$100 per tag (CIAQ, n. d.). It is recommended that a minimum of 25 tags be purchased for accurate herd readings (CIAQ, n. d.). Taking into account the shipping cost, approximately \$5-\$10 per system, the overall purchase cost is quite high. While this may be a large expense for one individual farmer, the product would most likely be marketed towards large-scale cattle operations in Nepal. The cost would eventually balance out in

the long run, as there would be a decrease in the quantity of semen used, medicine and other products.

Potential Export Quality and Revenue

Nepal is home to over approximately 7.2 million cattle (Government of Nepal, 2014). If all the cattle in Nepal had a Heatime HR System, there would be an estimated 288,000 readers and 7.2 million tags needed for the cattle. This would create a total export potential of \$1.19 billion. However, this would not be a viable approximation, but these values do depict the potential of the export of the system to Nepal.

Challenges of Exporting to Nepal

There are some challenges that will develop along with the process of exporting to Nepal. Some of these challenges are associated with exporting from a developed country to a developing one, however, the main goal is to improve the agriculture industry for both participants.

Lack of Technology

Since Nepal is classified as a developing country, there is little to no innovation in the technology used for livestock. From this, the Nepalese have very little background in technical enhancements, therefore creating a need in training or education of computers or similar products.

Limited Education

Nepalese have a limited amount of education, specifically in the agriculture industry. This results in the Nepalese requiring some knowledge in the process of livestock estrous cycles, including the proper time to inseminate the cow or when it is in heat (CIAQ, n. d.).

Poverty in Nepal

Many Nepalese people live in poverty, especially those in rural areas (World Bank Group, 2016). From this, it would be difficult to sell and promote the Heatime HR System when the Nepalese simply cannot afford it. This makes finding proper funding or resources to support the Nepalese in order to import the Heatime HR System into Nepal.

Difficulty of Transport

Since the focus of promoting the Heatime HR System is primarily towards livestock farmers, there is a concern for the transportation to these groups of people. This is mainly due to the fact that a majority of farmers in Nepal are located in remote areas, which are a fair distance from main cities (Government of Nepal, 2014). This creates a difficulty in how often or how many systems would be able to be transported to these areas. It is also a possibility to increase the cost of transport because of this.

System Training Requirement

The Heatime HR System has an enhanced technology associated with it. The technology and software would need to be properly taught to those using it, especially the technicians in Nepal (CIAQ, n. d.). This would require the CIAQ technicians to do in depth training for the Nepalese technicians to have a deep knowledge of the system. Training would also need to take place over time, as the software and maintenance would need to be learned.

Time Period for Improvement

After both the export and import of the Heatime HR System is approved by Canada and Nepal, there would be a period of time to wait before any results are visible. This is due to the time required for production and transportation of the systems. Also,

there would be a period of time that the cow would need to wear the tag in order to obtain baseline readings of the cow's activity. This would be a slow process, but rewarding in the long-term situation.

RECOMMENDATIONS FOR EXPORT

In order to have the highest rate of success for the livestock sector in Nepal, there would need to be various changes in the agriculture industry in Nepal. There are several challenges associated with the lack of education in the reproductive industry. There would need to be a length of time in which CIAQ technicians would train the Nepalese workers to ensure that they have the required amount of knowledge for the system installation and maintenance. There would also need to be individual training for each farmer on how to read the data from the reader and how to interpret the results to improve the accuracy of the results (CIAQ, n. d.). It would also be recommended that breeders, for the service of artificial insemination, also be trained in the use of the Heatime HR System, as the system better detects when to breed the cow. By ensuring the proper training is offered for all the partners involved, the cow can be guaranteed fertilization during peak heat time.

An improved marketing outreach would also be needed, as farmers in remote areas may not be familiar with the technology being promoted. From this, it would be suggested that large-scale cattle operations or co-operations be marketed to first. These groups would be targeted to first due to higher probability of better knowledge, and higher amount of financial resources to purchase the systems. It would be after an established relationship has taken place with these partners that the Heatime HR System would be marketed to smaller, family owned livestock producers.

Future Studies

There are several steps required for success in this export project. It would be critical to determine the exact costs of the export and import of the system from Canada into Nepal. There would also need to be research of the proper training and costs of this training for the Nepalese. There could also be possible development for the Heatime HR technology so less tags need to be purchased for one herd, which would enhance the amount of systems sold.

COMPETITIVE PRODUCTS

There are other similar products to the Heatime HR System that would be a direct competitor to this export project. One of these systems is the HeatWatch II Estrous Detection System designed by CowChips, LLC (CowChips, n. d.). CowChips is based out of New Jersey, United States (CowChips, n. d.). This system may have an advantage due to stronger trade development from the United States. Another system that is similar is the MooMonitor+ System, developed by the company Dairymaster (Dairymaster, n. d.). Dairymaster is based out of Ireland, which is half the distance from Nepal that Québec is (Dairymaster, n. d.). Due to the decreased length in transportation compared to the Heatime HR System, the MooMonitor+ System would have a higher advantage for import, since Nepal is a developing country and there would be a decreased cost in transportation. MooMonitor+ is also available as a cellular phone application, compared to a physical system that the Heatime HR System is (Dairymaster, n. d.). This creates better accessibility for the Nepalese farmers, as they have higher availability to cellular phones compared to computers. This also makes the use of the system easier, as it is a small device when compared to the size of the Heatime HR System.

Conclusion

The Heatime HR System would be a beneficial resource for the development of the agriculture industry in Nepal. Not only would the export of the system from Canada benefit Canadian companies, but it would also benefit those in Nepal. There are various groups and individuals in both countries that would both directly and indirectly profit from the export of the Heatime HR System. With an ever-growing demand of livestock production in Nepal, it is crucial to constantly enhance the technology used to raise said livestock. The agriculture industry, specifically the livestock sector, is one to enhance over time and should be highly valued in the process of bettering the economy in Nepal.

References

- Agriculture and Agri-Food Canada. (2016). AgriMarketing Program. Retrieved from <http://www.agr.gc.ca/eng/?id=1357941192614>
- Ciaq. (n.d.) An Enterprise Owned by Quebec Breeders. Retrieved from <http://www.ciaq.com/ciaq/mission.html>
- Ciaq. (n.d.) Reproduction Assistance. Retrieved from <http://www.ciaq.com/services/reproduction-assistance.html>
- CowChips. (n. d.) HeatWatch II Components. Retrieved from <http://www.cowchips.net/products.html>
- Dairymaster. (n. d.) MooMonitor+ Health & Fertility Monitoring. Retrieved from <http://moomonitor.dairymaster.com/>
- Farm Credit Canada. (2016). Agribusiness and Agri-Food. Retrieved from <https://www.fcc-fac.ca/en/we-finance/agribusiness-and-agri-food.html>
- Government of Canada. (n. d.) Canada Business Network: CanExport Program. Retrieved from <http://www.canadabusiness.ca/programs/canexport-program-1/>
- Government of Nepal (2014). Livestock Statistics of Nepal. Retrieved from <http://www.nepal.gov.np/portal/npgea/popup/GeaCMSPortletWindow?t=3.5351026611700997&p=WebContent%2FDLS&action=e&windowstate=maximized&n=AnimalHusbandryFishing.html&m=max&mode=view>
- Ireland, J. J., Murphee, R. L., & Coulson, P. B. Accuracy of predicting stages of bovine estrous cycle by gross appearance of the Corpus Luteum. (1980). *Journal of Dairy Science*, 63(1), 155-160.
- Lamb, G. C., Dahlen, C. R., Larson, J. E., Marquezini, G., & Stevenson, J. S. (2009). Control of the estrous cycle to improve fertility for fixed-time artificial insemination in beef cattle: A review. *Journal of Animal Science*, 88(13), 181-192.
- Ontario Ministry of Agriculture, Food and Rural Affairs. (2016). Canadian Dairy Commission's Matching Investment Fund. Retrieved from <http://www.omafra.gov.on.ca/english/food/industry/funding-prog-index.htm>
- U. S. Agency for International Development. (2016). Agriculture and Food Security. Retrieved from <https://www.usaid.gov/nepal/agriculture-and-food-security>
- Wolfenson, D., Thatcher, W. W., Badinga, L., Savio, J. D., Meidan, R., Lew, B. J., Braw-Tal, R., & Berman, A. (1995). Effect of heat stress on follicular development

during the estrous cycle in lactating dairy cattle. *Biology of Reproduction*, 52(5), 1106-1113.

World Bank Group. (2016). Nepal. Retrieved from <http://data.worldbank.org/country/nepal>