S062848 Enhancing Sustainable Dairy Production Capacity in Cuba

Final Report to CIDA






submitted by

International Centre for Sustainable Cities

March 17, 2006

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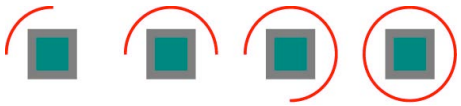

Sustainable Cities

March 17, 2006

RODERICK HANEY
International Development Projects Advisor
Projects & Innovation Section
Canadian Partnership Branch
Canadian International Development Agency
200, promenade du Portage, Gatineau (Québec)
Canada K1A 0G4

Dear Mr. Haney

Attached, please find ICSC's Final Report for the Project Enhancing Sustainable Dairy Production Capacity in Cuba.

May this letter also serve as an invoice for the final draw of $7,500 billable upon submission of our Final Project Report.

Thank you for your support in our on-going project activities.

Sincerely.

Nola Kate Seymoar

Dr. Nola Kate Seymoar
ICSC President and CEO.

An acknowledgement of support and cooperation…

This was truly a project of international collaboration and cooperation!

Due to CIDA's reporting requirements, much of this paper concerns itself with Project process and the work of the Canadian farmers. But it must be said that without the leadership and facilitation of ANAP and the hard work and undaunting spirit of the Cuban farmers at agricultural cooperative CPA 26 Julio, the successes of the Project could not have been realized.

Orlando Lugo Fonte, ANAP's President, embraced this Project from the outset and gave it his strong and continued personal support. ANAP National Office also donated 65 Siboney heifers to the CPA to improve the genetic potential of the dairy herd and supported the work through the good efforts of many ANAP professionals at the national and regional level.

Raciel Proenza Rodriguez, Director of the North American Division, MINVEC (Ministerio para la Inversion Extranjera y la Colaboracion Economica) solidly encouraged this Project from the very beginning and has continued to provide key support over the past 12 months. MINVEC was responsible for recommending the Project to ANAP, and selecting ANAP to be our partner.

The Canadian Embassy in Havana was consistently encouraging and facilitative. Cooperation Counsellor Lilly Nicholls visited the CPA 26 Julio last December to take part in Project completion celebrations. Canadian Ambassador to Cuba Alexandra Bugailiskis traveled to the CPA in January to welcome - with ANAP President Orlando Lugo Fonte - the first delegation of Canadian farmers to visit the Project. The Ambassador also met personally with the Canadian Project Team and provided me the opportunity to brief David Suzuki during a reception in his honour at the Ambassador's residence.

But the highest praise must necessarily be reserved for President Juan Sanchez Martell and the members of the agricultural cooperative 26 Julio, whose active engagement in defining and implementing the goals and objectives of this cooperative made all the difference. No one could have worked harder to make this project a success. The sense of pride and initiative that exists within its membership is exemplary. . Si, se puede! (Yes, we can!, the name of our Spanish extension video and the mantra of Cuba's Special Period), functioned like a touchstone of confidence that drove the success of this project.

Agricultural Cooperative 26 Julio aspires to be recognized as a Cooperativa de Refrencia Nacional and, hopefully after that, a Cooperativa de Excelencia. With the continued support of ANAP, I have no doubt CPA 26 Julio will succeed in their aspirations, and in doing so define a new and sustainable model for dairy production in a rural setting. This, in turn, will

create healthier and more economically stable communities, reduce the need for costly imports, and improve the value and contribution of women in the CPA workplace.
As an Agrologist for over 30 years, it has been a privilege to work with Canadian farmers Bruce Beattie, Lorne Hansen and Jim Millson, videographer Chris Crowley and outstanding Project volunteers Gladys Millson, Morgan Millson and Darryl Donneral. The bridges of cooperation and capacity building you have crafted are unique and enduring.

(And apparently don't stop flowing even when there is no funding! As I write this, I am preparing to spend the last week in March with Jim and Gladys Millson at the CPA deciding with the Cuban farmers what needs to be done to take the potential created in this project – higher milk production – and extend the nutritional benefits to the beef cattle produced by the dairy operation to add self-sustaining capacity under any Special Period circumstance. The Millsons will spend this week packaging up a hay cutter they just "picked up for Juanito" at auction. Darryl Donneral is working on a rustic milk cooling system using ground to surface water temperature gradients. Because there is no budget in place does not mean the project has stopped in anyone's mind. We are all committed to seeing this CPA realize its goal of becoming CPA Refrencia Nacional and, beyond that, Excelencia.)

Thank you to CIDA's Projects and Innovations Branch for understanding the potential of this one-year demonstration Project and supporting it. I hope you will be favourably impressed.

To International Centre for Sustainable Cities President Dr. Nola-Kate Seymoar, you have believed in this Project from the outset and I have enjoyed the time we spent plotting together to make it work!

I look forward to putting in the small amount of time needed to complete CPA 26 Julio as fully self sustaining model (see Section 6.1.14) and then - working through CIDA Community Development Funds and with Canadian "constructed wetlands" environmental technology – bringing the Canadian Team together to develop an effluent-irrigated solar-power fenced rotational pasture model for milk production at a CPA upstream of Bayamo to a) clean up the river, b) utilize effluent nutrients productively, c) produce milk under conditions of drought, d) improve the economic well being of the cooperative and e) improve the livability of the city of Bayamo (more milk for the population, improved water quality, and environmentally and economically costly imports of skim milk powder can be eliminated).

Enjoying a friendly game of Bunnock… A gift from the Canadian farmers.

Si, se puede!

We all won...

Wendy Holm, P.Ag.
March 17, 2006

S062848 Enhancing Sustainable Dairy Production Capacity in Cuba
Final Report to CIDA
International Centre for Sustainable Cities
March 15, 2006

6.0.1 Summary

Enhancing Sustainable Dairy Production Capacity in Cuba has been a one-year demonstration project in Havana Province, Cuba, in which Canadian dairy farmers have shared their experience in herd management with Cuban farmers to increase milk production from sustainable, pasture-based dairy units.

The project has doubled milk production at the CPA; as the Project's grass/legume rotational pastures become fully established this spring, further production increases are anticipated.

6.0.2 Background

Built on the work of the voluntary Canada-Cuba Farmer to Farmer Project (in operation since 1999), this Project has demonstrated that Canadian and Cuban farmers have much to learn from one another.

Prior to the collapse of the Soviet Union, Cuban agriculture was highly industrialized and dependent on chemical inputs and machinery. Since 1989, the loss of their major trading partner and the American embargo has forced Cuba to produce most of its food without the aid of chemical pesticides or fertilizers. In some instances this has been very successful (close to organic production for many field crops including potatoes, vegetables and tropical vegetables, citrus and tropical fruits), in others, Cuban farmers have fallen behind (livestock production).

Cuban farmers can teach Canadians a great deal about sustainable and organic crop production and urban farming, while learning a great deal about animal husbandry from Canada.

A good example of this is Cuba's dairy sector. Cuba developed an ingenious intensive leguminous pasture management system to replace protein in the diet of dairy cows now that imported feed grains are no longer an option. Despite the success of this system, Cuba's milk production remains low 3-7 litres per milking cow per day. This is insufficient to meet Cuba's nutritional targets of one litre of milk per child per day up to the age of 12. Since 80 per cent of Cuba's population is located in urban centres, this has the largest impact on urban youth.

Many Cuban farmers believe the lack of imported cattle feed is responsible for current low production levels. But after visiting their farms, Canadian farmers believed Cuba's sustainable pasture management system is a good one that can support milk production increases of 2-3 times current levels if more attention is paid to issues such as herd management, calf rearing and insulation of electrical connections in and around milking sheds, all of which impact severely on milk production.

6.0.3 Overview

Driven by farmer to farmer decision-making, this project constructed 3 hectares of grass/legume rotational grazing. Thanks to the support of Gallagher Canada and Gallagher New Zealand, this Project also introduced to Cuba the use of solar-powered electric fencing to construct 52 quarter-hectare micro-pastures that constitute the 16 hectare rotational pasture component of the Project. Given sufficient time to source materials, the Project team believes that most of these materials – with the exception of the solar fencers - can in future be economically sourced in Cuba.

In addition to improving nutrition, changes to management practices were implemented, including adoption of night grazing and the institution of a calf program to improve nutrition and increase milk production. A women's calf brigade was created to take responsibility for the calf program, increasing the economic value and status of women's work at the CPA.

6.0.4 Impact

This project has the potential to impact significantly on urban poverty through increased nutrition available to urban children, on rural poverty through increased income through greater milk production and less money spent on inputs, and can serve as a springboard for rural economic development when, after milk supply can meet basic demand, extra milk can be used to develop value-added products such as ice cream and cheese to meet growing local and tourist demand. In addition, this approach to improved milk production is environmentally and economically sustainable, relying on solar energy and rotational pasture management practices not imported inputs.

Enhancing Sustainable Dairy Production Capacity in Cuba was developed in consultation with our Cuban partner ANAP - Asociación Nacional de Agricultores Pequeños. The project received the approval of the Cuban government (MINVEC), who also approved ANAP as our NGO project partner.

Many dairy bloodlines in Cuba are traced back to animals purchased in Canada in the 1960's and '70's. Canadians are respected in the field of dairy management and the Canadians involved in the Farmer to Farmer project have been warmly welcomed by their Cuban colleagues.

This Project has been an important first step along the path of more meaningful farmer-to-farmer engagement that has as its mandate the ethical sharing of capacity in support of sustainable farming communities, food security and the environment.

6.0.5 Funding

Originally the budget for this project was $100,000. The cost of constructing 16.5 hectares of solar-powered electric fencing for rotational pastures, the provision of lighting for night grazing and the materials and workshops needed for the calf program increased the actual Project budget to $101,333

Of this, $75,000 was funded by CIDA Projects and Innovations Branch, $26,120 was raised by Sustainable Cities and $213 was contributed in bank interest payments.

A further $15,000 was raised by Sustainable Cities to support the non-materials costs associated with the construction of solar-powered electric fencing for rotational pastures, the provision of lighting for night grazing, and materials for the calf program.

6.1.1 A summary of activities undertaken throughout the Project and an explanation of any discrepancies between activities planned and carried out.

Activity #1: Work with NGO partners to form farmer working groups in Canada and Cuba. Completed. The Canadian Team consisted of farmers Lorne Hansen (British Columbia), Bruce Beattie (Alberta) and Jim Millson (Ontario), film-maker Chris Crowley (University of British Columbia) and Project Leader Wendy Holm, P.Ag. Canadian volunteers Morgan Millson, Gladys Millson and Darryl Donneral contributed significantly to the work of this Project. On the Cuban side, the farmers were Juan Sanchez Martell, Justo Gonzalez Gonzalez, Miguel Martin Caceres, Francisco Martin Caceres and Mario Miguel Perez from the agricultural cooperative (CPA) 26 Julio, Los Palos, Nueva Paz, Havana Province.


Activity #2: Bring Canadian farmer working group to Cuba to meet with farmers at one cooperative to identify problems and potentials, inventory needs, bench- mark current production, assess infrastructure gaps, establish goals and action plan. Completed. Canadian farmers first met with Cuban farmers in December 2004 at CPA 26 Julio in Havana Province to discuss problems and potentials and come up with a strategy and work plan.





Activity #3: Undertake improvements to farm infrastructure, monitor/discuss project development and observe progress. Completed. Three hectares of Los Pedestales rotational grass/legume pastures were erected, an additional 16 hectares of grass rotational pastures were build using solar powered electric fencing, an irrigation system (electrification, pumps and distribution) was installed, and changes were made to management practices (night feeding, hand rearing of calves, proximity of shade and water). ANAP committed to providing the CPA with 50 new F1 bred heifers.





Activity #4: Canadian farmer group returns to Cuba to transfer skills. Completed. The first return visit was in August; Holm and volunteers Morgan Millson and Darryl Donneral erected the solar-powered electric fencing. The second was in December, when the Project team (Holm, Beattie, Hansen, Millson, Crowley) and volunteer Gladys Millson spent two weeks at the CPA transferring skills. A security system for night feeding was implemented. Shade trees were planted along the perimeter of the field. A placement scheme for water troughs beneath the shade trees was agreed upon. A Women's Calf Brigade was created.






Activity #5: Develop educational tool (video or CD ROM) to share skills with other Cuban farmers. Completed – Mr. Chris Crowley of UBC Instructional Media came to Cuba in December to shoot a Spanish-language instructional video. Tape is in final editing and will be distributed to CIDA under separate cover.

Activity #6: Hold workshop with local farmers and extension staff, agricultural colleges to facilitate extension of information. Completed. Workshops were held in calf rearing, hutch construction, care of a newborn calf, monitoring calf health and developing calf rations. A basic workshop in feed mixing was held. The project was presented to scientists and extension workers at ICA.







Activity #7: Ensure equal participation of women and female children in the benefits of increased CPA income and increased local milk supplies. Completed. The creation of a Women's Calf Brigade gives women a very important role to play in the economics of dairy production. Preparing calves to become strong and productive cows by ensuring good nutrition and health care from birth forward is arguably the single most important job on a dairy farm. The extra milk available to the CPA as a result of early weaning makes a significant contribution to the economics of dairy production and the community. Report of LetFederacion de Mujeres Cubanas, Comite Municipal de Nueva Paz, Provincia la Habana is attached.

6.1.2 An overall analysis of results obtained by means of the Project in relation to objectives initially pursued (i.e. how appropriate were planned activities in achieving objectives and how did activities have to be revised in order to achieve objectives?)

The results exceeded our expectations. Milk production at the CPA has already doubled as a result of improved nutrition, and this is without fully utilizing the Los Pedestales system. Once the Glycenia is fully grown and the wire mesh in place, milk production can be expected to increase substantially as a result of improved nutrition and the ability to fully implement night grazing. Further increases can be expected when the shade trees mature. The results of improved management practices will not be fully realized until the calf program is fully operational and the calves coming through the program begin to enter the milking herd.

Integral to the success of this project was that all decisions were completely in the hands of the Canada-Cuba farmer team.




6.1.3 A summary of any circumstances, economic, climatic, political, social or otherwise, which arose regionally or globally which affected Project results.

There is a yearning for collaboration and cooperation amongst farm communities. The strength of this yearning is what made this project work. For example, in the end of March, Jim and Gladys Millson are spending their own time and money to re-visit the CPA for a week to a) ensure things are going well with pasture management and calf program b) build a small feed proportioner and c) agree on the remaining work to be done this year to complete the stand-alone sustainability of the CPA model. (See 6.1.14.) It is this spirit of collaboration that has emerged between the Canadian and Cuban farmers that has fueled the success of this Pilot Project.

6.1.4 An explanation of the challenges encountered and methods used to overcome them; the steps taken; to mitigate negative effects, and/or to benefit from opportunities.

Allowing the decision process to remain firmly in the hands of the farmers meant the Project Leader took direction from the Team.

Pedestals:

Initially, it was thought that constructing two "pedestals" (grass/legume rotational pastures) would be sufficient. Once we had the opportunity to visit the cooperative in December, meet with the farmers and technical specialists and assess dairy herd potential, it was apparent to all that a three-unit pedestal system was needed to meet the nutritional requirements of the dairy herd.

The construction of a third hectare of Pedestals (high nutrition grass/legume rotational pastures for cows from 1 to 130 days of lactation) meant additional budget was needed. To create the additional funding, travel costs were cut back for the Canadian team and honourariums were reduced.

Solar Powered Electric Fenced Rotational Pastures

The necessary inclusion of a 16.5 hectare rotational grazing component placed additional budgetary and technical demands on the Project.

The farmers decided that an additional 16.5 hectares of rotational pastures were required to provide nutrition to heifers and cows past 130 days lactation. This created a need for electric fencing, and for reasons of sustainability, economics and the unavailability of local, continuous conventional power sources, a solar-powered system was determined to be the best fit.

Since one of the recommended management changes is to adopt night grazing (less heat stress, better nutritional uptake), a solar fencer with a rechargeable battery was required. When the fencing wire and various accoutrements were added, it exceeded the relatively modest amount budgeted for materials from Canada (initially considered negligible).

To respond to this, we secured a substantial donation from Gallagher New Zealand and Gallagher Canada to defray the costs of the solar powered electric fencing component and approached other donors (farmers, other Canadians) to ensure the rotational pasture component did not hold any negative budgetary implications for the rest of the Project.

The installation and use of solar fencing also required more consultation and extension. Lorne Hansen traveled to Cuba on his holidays and with Wendy Holm spent a day visiting the CPA to discuss and review the fencing requirements.

Morgan Millson and Wendy Holm visited the CPA in May to take measurements and lay out a fencing plan. In August, Morgan Millson, Darryl Donneral and Wendy Holm returned to Cuba with the fencing materials to construct the 16.5 hectares of rotational pastures.

Materials

The seeds for the Glycenia proved difficult to obtain. What should have been planted in May 2005 did not go in the ground until October 2005. This means the legumes will not be properly established until perhaps May of this year. The nutritional benefits will increase substantively when the legumes are available to the high-lactating cows (1 to 130 days lactation).

Three different grasses were planted by the Cuban farmers before one took.

Obtaining the wire mesh for the Pedestals was a challenge. The enterprise in Camaguey that had committed to produce it was unable to deliver. In the end, it had to be sourced offshore, at an additional cost. In December, just under $2,000 CUC was raised and added to the Project materials budget to allow it to be procured in Mexico. It is expected that the wire will be delivered and installed on the Pedestals before the end of March. Until the wire is in place, cattle cannot graze the Pedestals. This takes out of production the main nutritional component of the system. The nutritional benefits, and hence milk production, will increase substantively when the legumes are available to be grazed by high-lactating cows (1 to 130 days lactation).

Security

We did not anticipate the security issue surrounding night feeding, which required the construction of a watchtower and the provision of high intensity, solar powered lights for night illumination.

6.1.5 Details on how the Organization evaluated the Project's impact and list the results of this evaluation.

The primary objective of this one-year pilot project was to increase milk production in a sustainable manner. The CPA's economist reports that milk production at the CPA 26 Julio has gone from 3.43 to 7.5 litres per milking cow per day as a result of improved nutrition provided through this Project.

Once the Glycenia is fully grown and the wire mesh in place, milk production can be expected to further increase as a result of improved nutrition and the ability to fully implement night grazing.

Further increases can be expected when the shade trees mature.

The results of improved management practices will not be fully realized until the calf program is fully operational and the calves coming through the program begin to enter the milking herd.

Monitoring was done by project staff and partners. No external evaluator was hired as the full impact of the pedestals cannot be assessed until after the contract when the legumes grow bigger in May.

6.1.6 An analysis of how and to what extent women participated in and benefited from, Project activities.

Women were specifically brought into this project through the creation of a Women's Calf Brigade. There are 14 female farmers in this CPA. Cattle raising and milk production are the most important economic activities undertaken by this CPA. Until now, women were not involved in any livestock activities of the CPA. Proper care and nutrition of the calves is one of the most economically important activities in dairy production. Putting women in charge of rearing the dairy calves increases the value of their work and their economic contribution to the community. The entire community benefits. A new bicycle was purchased for the women to facilitate their work. A report from FMC is appended.

The successful continuation of a women's calf brigade requires the identification of several lead women to take overall responsibility for that aspect of the Project.

6.1.7 An outline and analysis of the main lessons learned in the process of Project implementation.

Lesson #1 – The farmer-to-farmer exchanges drove the Project and were directly related to it's success.

Lesson #2 – It is helpful to have someone in Havana to expedite matters and communicate strategically and effectively to all partners the project priorities of the Canadian partner.

Lesson #3 – Close liaison with the Cuban partner is critical to project success.

Lesson #4 – It is surprising we saw as much of an increase in milk production as we did given the late start for the Glycenia and the inability to graze the Pedestals without the wire mesh in place. The Security concerns were unanticipated.

Lesson #5 - Indications are that solar powered electric fencing will be an economical way to create rotational pastures in Cuba. Until the Glycenia is fully established, the wire mesh in place and the calf program in full swing, it will be difficult to analyse accurately the benefits and costs of the overall Project and its sub-components.

6.1.8 An environmental assessment of the impact of the Project, if applicable.

Not applicable.

6.1.9 A description of public engagement activities along with an explanation as to how these activities contributed to public awareness and understanding of international development issues, if applicable.

In December 2005 a formal ribbon cutting ceremony at the Project was attended by over 100 farmers, members of the scientific community, regional and national members of ANAP, and of course the Canadian Project Team. Lilly Nicholls, Cooperation Counselor at the Canadian Embassy in Havana, attended the ceremonies.



Two delegations of Canadian farmers visited the Project in January and February 2006.



The President of ANAP, Lic. Orlando Lugo Fonte, visited the Project on four occasions, most recently on January 26th with the Canadian Ambassador to Cuba, the Honourable Alexandra Bugailiskis to welcome the January farmer group and to raise for the first time at this CPA the Canadian flag.



The University of British Columbia Faculty of Agricultural Sciences' AGRO 490 Topics in Agroecology - Field Studies in Cuba profiled the project in a site visit on May 10, 2005 and will do so again May 9, 2006.

See also published columns in Canadian farm papers, below.

6.1.10 A list of materials, publications, films, etc. produced and/or purchased for this Project and their disposal.

List of Materials Left with CPA 26 Julio

SOURCED IN CUBA	CAD
Materials to construct 3 hectares of pedestals	$32,637.07
Materials for Pedestals	$4,005.41
Electrification for pedestals	$1,015.01
Carisombra	$1,479.54
Cement	$2,17.87
Irrigation (pump)	$3,957.02
Irrigation system	$11,175.56
Paint	782.92
Wire mesh	$10,003.77

SOURCED IN CANADA	
Materials to construct 16.5 hecatres of solar-power fenced rotational pastures	$11,983
Gallagher B1600 Solar Energizer	1
Gallagher B1600 Module	1
12.5 Ga. Wire (609 m. roll	16
or 2000 ft/roll)	5 bndls. + 1
Insultimber Posts	190
Tightener Handle	1
Cap (to drive insultimber posts)	1
Lightning Diverter	1
Wire Reel Spinner	1
Connectors Single Reel	4
Clips for Insultimbers	400
Joint Clamp Angle Style	100
Insulgrip Handles	10
Smart Fix Finder	1
Vinelines	pkg of 201
Insulated Handles	20
Medium Geared Wheel (400 m. Turbo Wire	4
Ground Rod Kit # 87901	3
Pig-tail Treadin Posts	200
3 Switches	3
Tighteners For Fence	30
Turbo Wire 200m.	1
32 Watt Solar Panels	2
Screw-on Insulators— 550 (pkg. of 25)	22
Nail-on Insulators # 76304 -- 50 (pkg. of 25)	2
Super Strain Insulators--125 (pkg. of 25)	5
Underground Leadout Wire (100m. roll)	1
14 ga.wire (x2)+Fence Staples	(100 + 10lbs. in a Pail)
15 ft. rolls of Weatherproof tape	10
12 Volt, Deep Cycle Batteries	2
PVC electrical conduit (½ inch)	
for handles (10 ft. length)	22
nuts, bolts, washers (for handles)	300
Assorted tools:	
pliers, tape measure wrenches,	
vice grips, screw drivers, utility knife & blades,	
hole punch, assorted hoseclamps, PVC staples,	
hacksaw & blades, rubbergloves	
Electrical Supplies:	
lightning diverter – fencer	1
fence pliers heavy duty 10"	1
12.5 GA. Leadout Cable	20 M.
Stn.Steel Battery WingNut	1
Utility Knife with Blades	1
Flashlight Fuses - 15 Amp.	10

Night Grazing Lighting	$820.00
100,000 cndl flashlight	1
150,000 cndl flashlight and charge controller	1
Electrical supplies	
Solar panel, deep cycle battery, charge control	1
Electric junction box and electrical	1
Paper, pens & Clipboard	3
Holstein Canada Reg.Book	1
Calculator (stpwatch) + batt	1
Reuseable Sisal Twine	1
Reuseable Plastic Twine	1
Scissors (given to the Vet)	1
BlueWire Calf Bottle Holder	1
"Brooks Feeds" Jacknife	1

Materials for Calf Project	$567.00
Carbolic Soap-Antaeseptic	4 Bars
Soap Dish and Container	
6 Qt. Black Calf Feed Pails	2
Calf Bottles with Nipples	3
Calf Nipples Only	3
Scotch Green Scour Pads	2 pkg.
Industrial Rubber Gloves	1 pr.
Oxytocin	3
Needles and Syringes	20
Plastic Measuring Cup 1 L.	1
Duct tape - 55 m. per roll	2
Spring Snap Links	4
Quick Links 1/4 "	4
14 of Quick Links 3/16 "	1 box
Disposable Vinyl Gloves	1 pkg.
Inv. 075545 Swivel Snaps	20
2' lengths of Downspout 3.5"	2
2' lengthsof Downspout 3.25"	3
1' length StlsSteel Flex pipe	1
Large sized Hose Clamps	8
Self Tapping Screws	12
3.5 " Pipe Gate (adjustable)	1
Drop Plastic Cups (3.5" fit)	2
Calf Collars	10
Quick Links	20
10 X 6' of Calf Chain	60 ft
10 speed bicycle	1.

Extension Video In Spanish

Si, Se Puede. Video. Chris Crowley, University of British Columbia.

Published Columns in Canadian Farm Papers

1. The little project that could… a Christmas story. BC Holstein News, Dec/Jan 05. Wendy Holm
2. Did you hear the one about the farmer's daughter? Western Dairy Farmer, May/June 05. Wendy Holm
3. Hypocrisy and opportunity… Opinion, The Western Producer, April 14, 05. Wendy R. Holm
4. What goes around comes around. Opinion, Western Producer, January 6, 05. Wendy R. Holm
5. Sharing secrets… Three Canadian dairy farmers bound for Cuba! B.C. Holstein News, Dec 04. Wendy Holm
6. Bringing Dairy Management to Cuba. Letters. Ontario Farmer. August 10, 04
7. Cuban farm exchange entering second phase. B.C. Fruit Grower. Fall, 04, Wendy Holm.
8. Trio brings farm know-how to Cuba. . Ian Cumming. Ontario Farmer. August 3, 04

Technical papers and workshop proceedings:

1. Final pasture plan. Morgan Millson. Land O Mills Holsteins, Enniskillen, Ont. Aug 05
2. Draft Ration, November 2005. Gladys Millson. Land O Mills Holsteins, Enniskillen, Ont. Jan 06
3. Calf Feeding at Birth. Gladys Millson. Land O Mills Holsteins, Enniskillen, Ont. Jan 06
4. Calf Care: Management Strategies. Gladys Millson, Land O Mills Holsteins, Enniskillen, Ont. Dec 05 (Spanish translation: Cuidado de los terneros. Estrategia de su manejo. Gladis Millson)
5. Bottle Feeding Calves. Gladys Millson, Land O Mills Holsteins. Enniskillen, Ont.. Dec 05 (Spanish translation: La botella que alimenta al ternero. Gladis Millson)
6. Calf Management Based On Fecal Matter Observation, Gladys Millson. Land O Mills Holsteins. Enniskillen, Ont. Dec 05 (Spanish translation: Cuidado del Ternero Basado en la Observacion de la Materias Fecales. Gladis Millson)
7. Si se puede con metodos sostenible incrementar la produccion de leche. Juan Carlos Loyola, ANAP. Dec 05
8. Diagrama de Cercas Electricas. Juan Carlos Loyola, ANAP. Dec 05
9. Algunas Recomendaciones Necesarias Para El Trabajo Con El Sistems De Cercas Electricas. Lic. Juan Carlos Loyola, ANAP. Dec 05
10. Teat Dipping after Hand Milking Gladys Millson. Land O Mills Holsteins. Enniskillen, Ont. Dec 05
11. King grass nutritive analysis. Gladys Millson. Land O Mills Holsteins. Enniskillen, Ont. Dec 05.
12. Nutritive Analysis of Cowpeas, Oystershells, Limestone & Napier Grass. Gladys Millson. Land O Mills Holsteins. Enniskillen, Ont. Dec 05.
13. Gravity-Flow Feed Proportioner & Mixer and Diagram: Gravity Flow Feed Proportioner And Mixer. Gladys Millson, Land O Mills Holsteins. Enniskillen, Ont. Jan, 06

Project Reports:

1. January 2005 Project Report, Enhancing Sustainable Dairy Production Capacity in Cuba, Submitted to Sustainable Cities, January 10, 2005. Wendy Holm, P.Ag.
2. CIDA Technical Cooperation Report. Project Summary, S062848 ICSC Enhancing Sustainable Dairy Production Capacity in Cuba. March 28, 2005, Sustainable Cities.
3. Semi-Annual Report to CIDA, S062848 Enhancing Sustainable Dairy Production Capacity in Cuba. International Centre for Sustainable Cities, April 27, 2005
4. Informe de progresso del proyecto "Incremento de la Capacidad para la produccion lechera sostenibile en Cuba", Diciembre 1-2004 a Febrero 28 de 2005. ANAP Asociación Nacional de Agricultores Pequeño and (translated): Report in Progress of the "Project the Enhancing Sustainable Diary Production Capacity in Cuba",
5. June Project Report - Enhancing Sustainable Dairy Production Capacity in Cuba, Submitted to Sustainable Cities June 30, 2005, Wendy Holm, P.Ag.
6. Cuba Update: Enhancing Sustainable Dairy Production Capacity in Cuba, International Centre for Sustainable Cities, June 30, 2005,
7. Project Summary, Enhancing Sustainable Dairy Production Capacity in Cuba, July 1, 2005, International Centre for Sustainable Cities
8. Project Meeting (Notes) - August 8, 2005, Enhancing Sustainable Dairy Production Capacity in Cuba. CPA 26 JULIO, Los Palos, Nueva Paz, Habana Province
9. August Project Report Enhancing Sustainable Dairy Production Capacity in Cuba (CIDA), Use of Solar Powered Electric Fencing for Rotational Grazing, Cuba (ICSC), Submitted to Sustainable Cities August 22, 2005, Wendy Holm, P.Ag.
10. November Project Memo, Enhancing Sustainable Dairy Production Capacity in Cuba,
11. ANAP Asociación Nacional de Agricultores Pequeños, Direccion Nacional. Final Report of the Project Enhancing Sustainable Dairy Production Capacity in Cuba.
12. FMC Beneficios del Proyecto amantemiento manual de terneros para la mujer Leticia Ormaza Valdez, Secretaria General, FMC, Nueva Paz, March 11, 2006.

6.1.11 A description of each of the intellectual property rights subject-matters created under the agreement, a designation of the persons licensed or to be licensed in the territory in which the project is executed, a description of the copies of the subject-matters to be delivered to such persons and those to be delivered to CIDA, an identification of the holders of rights in subject-matters created under or outside the agreement and serving as components or complements thereof, and contact information (names and addresses) for these holders.

Does not apply.

6.1.12 Shared responsibility and accountability for results on the part of Organization's partners.

The Canadian and Cuban farmers working in close collaboration were the prime decision-makers throughout this Pilot Project process.

6.1.13 An assessment of the sustainability of results achieved beyond the life of the Project.

The work completed at CPA 26 Julio will serve as a model for other dairy cooperatives in Cuba. The project has the strong support of ANAP and scientific institutes (Instituto de Ciencia Animal.) The use of solar fencing for rotational pasture construction is a new use of this renewable energy source in Cuba.

In total, the time frame and the budget in this first Pilot Project were too limited to allow for sufficient capacity building to truly embrace and acknowledge the Cuban farmer's goal of sustainability and self-sufficiency. See below.

6.1.14 Recommendations to CIDA with regard to any other item at the Organization's discretion.

It is recommended that CIDA consider funding for a further year to allow for the following activities that would enable the project to become a model for other Cuban cooperatives – a Referencia Nacional - in the sustainable and self-sufficient production of milk and dairy products.

To consolidate and build upon the success of this first year pilot project, it would be desirable to complement the nutrition provided the milking herd by adding the capability to formulate on-farm feed rations for the remaining livestock owned by the CPA (bulls, calves and open heifers). This would allow the CPA to be completely self-sufficient in livestock production, reducing the need for imported inputs and creating a solid and sustainable model for other CPA's to emulate. One additional year of work to complete the capacity building process would include:

a. Construction of an additional 5 hectares of irrigated rotational grazing to provide nutrition for non-lactating open and bred heifers and cows. (The CPA's new solar-powered electric fencer provides sufficient power to provide the electricity for the additional micro-pastures; the remaining electric fencing components can be sourced in Cuba.)

b. Creation of 5 hectares of irrigated protein and carbohydrate crops (corn, sorghum, soybeans, etc.) for the formulation of feed rations.

c. In collaboration with ICA, creation of 5 hectares of test plots for forage production. The purpose of this will be to trial different species of grasses and assess the results in terms of production, yields, and nutrition.

d. In collaboration with ICA, creation of 5 hectares of silvo-pasture for bulls.

e. Construction of an inexpensive, rustic feed mill and mixer for on-farm formulation of feed rations, including identification of sources for mineral additives for rations (the only off-farm input that may be needed).

f. Provision of one more year of support to CPA to monitor elaboration and outcomes of other elements of the project - e.g. calf rearing program (women's calf brigade), proximity of shade and water, and night feeding.

g. Introduction of a small yoghurt production facility to be operated by the, women's calf brigade. Since hand rearing of the calves will increase milk availability to the CPA, some of this milk would be taken back by the women to produce fresh, healthy yoghurt for the CPA and the community (value-added).

h. Delivery of workshops and preparation of training materials as appropriate.

i. Ongoing liaison with ANAP, ICA, and FMC.

A small budget is anticipated for the above work. The resulting "CPA 26 Julio model" will demonstrate a needed and balanced "cooperative-sector" complement to nearby Instituto de Ciencia Animal's Empressa and UBPC- scale demonstration models.

Together, CPA 26 Julio and ICA could support one another's interests and function as an easily accessible training centre for the sustainable production of milk and livestock across Cuba, whether at UBPC's, CPA's or CCS's.

Enhancing Sustainable Dairy Production Capacity in Cuba
Income and Expense Statement

	BUDGETED			ACTUAL		
	BUDGETED	**CIDA**	**ICSC**	**TOTAL**	**EXP-CIDA**	**EXP-ICSC**
INCOME						
Interest				212.53		$213
CIDA	$75,000	$75,000		$75,000	$75,000	
ICSC	$25,000		$25,000	$26,120	$0	$26,120
Total Income	**$100,000**	**$75,000**	**$25,000**	**$101,333**	**$75,000**	**$26,333**
EXPENSES						
ICSC Jen, Wendy, NK	$3,600		$3,600	$3,596	$0	$3,596
Travel	$20,292	$18,743	$1,549	$22,671	$21,227	$1,444
Car Rental	$2,600		$2,600	$2,144	$280	$1,864
Honouraria	$19,780	$19,780		$18,275	$18,275	$0
Translation	$478	$478		$479	$351	$128
Materials for calf project				$567		$567
Materials for night illumination				$820		$820
Materials for solar powered electric fencing				$11,983		$11,983
CPA 26 Julio (Pedestals)	$31,000	$31,000		$33,868	$33,868	$0
Materials for CCS	$908		$908	$278	$0	$278
Prod'n of videotape	$3,000		$3,000	$3,000	$0	$3,000
Seminar	$300		$300	$0	$0	$0
Monitoring and evaluation	$3,000	$3,000		$780	$0	$780
ANAP Administration	$2,000	$2,000		$1,000	$1,000	$0
Sub-total	$86,958	$75,000	$11,957	$99,460	$75,000	$24,460
ICSC Administration	$13,043		$13,043	$1,872	$0	$1,872
Total Expenses	**$100,001**	**$75,000**	**$25,000**	**$101,333**	**$75,000**	**$26,333**

Budget discrepancies: additional funding was allocated to purchase materials for the solar powered fencing, night security and the calf program.