

Final Report to Partners of the Americas Farmer To Farmer Program

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Country: Nicaragua

Dates: November 26 to December 6, 2009

Host: Universidad Nacional Agraria, Managua and Camoapa; Cooperative San Francisco de Asis and Cooperative Masiquito, Camoapa.

Primary Purpose: Improve the profitability of the dairy/livestock industry with a Primary focus on mineral and vitamin supplementation and to Implement the use of bio fuel digesters on farms.

Executive Summary:

The nutritional aspects of the Nicaraguan dairy and livestock industry was very accurately Described and summarized in a report by Maria Bendixen and Mark Kopecky August 17 to 30 2009. The dairy and livestock industry is a major contributor to the economy in the Department of Boaco. For the most part production and profitability in the livestock industry are severely limited by a poor level of nutrition. However, we visited 2 farms that had an average production of 25 and 15 kilos per cow per day and the cows were carrying good to adequate body condition. On these 2 farms the primary breeds or crosses were Holstein with no pure Brahmas although a few of the Holsteins appeared to exhibit a little more ear than would be expected with pure bred Holsteins. The average production on farms in Nicaragua is 3-5 kilos per day per cow. Therefore, the 2 above mentioned farms are proof that acceptable levels of milk production can be achieved with a few small changes in management practices. Also, both producers were using artificial insemination to improve the genetic potential of their dairy herd and were satisfied with reproductive performance and conception rates in their herd.

Forage quality is by far the limiting factor in profitable dairy and livestock production. As a general rule tropical forages are low in energy, protein, and digestibility and high in fiber which greatly reduces dry matter intake. Other limiting factors are that most farmers think bigger is better and would prefer to harvest forage that is 7 feet tall opposed to 2.5 to 3 feet. We know that the more mature the forage is the lower the nutritive value, the higher the fiber and the lower the dry matter intake. Most farmers don't store adequate levels of surplus

forages during the rainy season which could be used to supplement forage shortages during the dry season. Soil fertility is severely lacking because most farmers practice a cut and haul feeding system where the cattle are fed in a dry lot feed bunk. While the manure is scraped up and returned to the land much of the nutrients are lost along with all of the nutrients from the urine. Also, nutrients are constantly leaving the farm in the form of meat and milk and in most cases not being replaced. For these reasons most farmers have low milk production per cow and on average it takes cattle 5 to 6 years too reach acceptable market weight.

While my primary teaching responsibility in Nicaragua was the use of mineral and vitamin supplementation and to implement feeding trials on farms I quickly modified my approach after visiting several farms. On these first few farms I visited all cows were severely underfed and in very poor body condition. The farmers seemed to be under the impression that if they could feed their cattle a balanced mineral and vitamin supplement life would be wonderful. It was with a great deal of difficulty that I tried to convince them that they needed to implement a total balanced feeding program for their livestock. This would include adequate levels of energy, protein, minerals, vitamins and water. If any one is missing or low it will be the limiting factor in production, growth, health and reproduction. While I have seen no data to support this statement I seriously doubt that supplying mineral and vitamin supplements to mature animal that are severely deficient will make any difference. Supplying adequate levels of mineral vitamin supplementation to young stock will pay great dividends in the future.

Many of the farms we visited were feeding low levels of mineral supplements using several different methods. Most were feeding the minerals free choice in a small feeding area where the boss cows get most of the mineral and the small timid cows receive very little. A few were feeding a 20 percent protein Purina supplement which contained low levels of minerals and vitamins. There is really nothing wrong with this product except it is a very expensive protein supplement which contains minerals and vitamins but at levels much lower than needed by producing dairy cows. A much better choice would be soybean meal at 44 percent crude protein and a trace mineral salt.

Delivering minerals, vitamins and protein supplement so that all cattle receive adequate levels presents a minor challenge on some farms. However, most farms we were on had adequate feed bunk space for all animals and some were top dressing protein supplement on top of chopped forage. I suggested that they would get better results if they also top dressed salt, trace minerals and vitamins on top of the forage and protein supplement. Once the cattle began to eat this ration the ingredients would become mixed thus forming a low cost total mixed ration (TMR).

A much better feeding strategy would be to feed supplement in portable bunks in the pasture thus keeping the urine and manure on the pasture where it will do some good. However, this

will be a difficult practice to implement until we overcome a few other obstacles. First, very few farmers have fully bought into the concept of rotational grazing. Yes they all pasture their cows but I didn't see one case where the farmer was attempting to implement a managed grazing system. In one case the young son who had recently graduated from the university wanted to implement what I thought was an excellent plan but the father was very determined that this was not going to happen. I strongly suspect that it will not happen for a few more years. The second obstacle to grazing is the existing forage species. I think sugar cane and taiwan are difficult species to graze and the native tropical grasses are low in energy and protein. Also, most pastures are infested with unpalatable weeds that choke out grass growth therefore, reducing forage intake of grazed animals. Better varieties of forage grasses would improve animal production and stimulate more interest in managed grazing practices.

I am not a grass or forage expert but I have read about improved forage varieties in South America that may very well work in Nicaragua. We have some excellent forage sorghums in the United States that I think would work very well in Nicaragua. Most farmers I visited with expressed a keen interest in acquiring legumes to incorporate in their pastures. This would be an excellent management practice if a palatable legume could be found that would perform at an acceptable level in Nicaragua's climate. This practice would increase the protein content in the ration and provide nitrogen to the pastures at a very low cost.

Future education programs should include the following:

1. Continued emphasis on pasture management and implementing managed grazing practices including the incorporation of improved grass and legume varieties.
2. Pasture improvement programs to eliminate unpalatable weed species that are choking out grass growth and limiting production. Selective spraying with 2-4-D and the application of low rates of nitrogen fertilizer (in the form of dry urea) after each grazing would probably double forage production when combined with proper grazing management.
3. Develop economical methods to store surplus forage for use during the dry season with major emphasis on silage. Ensiling species such as sugar cane, taiwan, and grain sorghum would provide needed energy and by adding urea we could increase the protein content of the ensiled forage. The silage should be made, stored and fed in the field where it was grown, thus not moving the nutrients to other parts of the farm.
4. Continue to stress feeding balanced rations with adequate levels of energy, protein, minerals, vitamins and water.
5. Develop demonstration farms to show farmers that these practices will improve profitability. Mr. Dennis Rivera (the manager at Cooperative San Francisco de Asis located in Camoapa) expresses interest in implementing a manager grazing demonstration on his farm.

BACKGROUND:

My assignment was to teach farmers, technicals, cooperatives and students about the benefits of mineral and vitamin supplementation in dairy and livestock rations. Apparently I was the first volunteer in the Farmer to Farmer program to get this assignment so it was kind of developed on the fly. Hopefully, I will provide enough useful information in this report to help other volunteers that follow since it is a very important topic for the Nicaraguan livestock industry. The second part of my assignment was to establish several on farm mineral and vitamin feeding trials which was done successfully. Hopefully these trials will be continued for at least 1 year. As mentioned earlier I took the liberty to slightly modify my teaching assignment by including all 5 major nutrients including energy, protein, minerals, vitamins and water.

Unfortunately we were not able to reach as many university students as we would have liked because they were in the middle of final exams and only around to take exams. We did get to visit with a number of professors at UNA in Managua and Camoapa as well as a few students on an individual basis.

Activities/Results

Unfortunately, our flight from Minneapolis to Atlanta was delayed, due to mechanical problems causing us to miss our connecting flight to Managua on November 22. Therefore, we arrived in Managua late on November 23 which caused some scheduling problems. November 24 was spent in Managua on the UNA campus where we were able to visit with several professors and discuss their research as well as tour the campus and visit some of the research plots. As mentioned earlier the students were taking final exams so we were not able to meet with any of the classes. Vance was excited about seeing the bio digester located next to the milking area.

We did discuss the transfer of research data to the farmers and other agricultural, professionals with the professors we talked with. Everyone seems to agree there is problem but no one appears to have a solution. In the US this problem has been in part solved with our Extension Service but this probably will not happen in Nicaragua in the near future. Early in the morning on November 25 we left Managua for Camoapa. We visited a dairy where I discussed mineral and vitamin supplementation with the farmer and Vance made plans to build a bio digester on the farm. This was the point where I decided to modify my assignment slightly to include and stress the need for a complete balanced nutritional approach. Once again I will stress the fact that minerals and vitamins will not help a cow that is deficient in energy and or protein. In the afternoon we visited with several professors

at UNA Camoapa, where we discuss research and information transfer and once again we got about the same answer as we got in Managua. One professor commented that in many cases the father will not let the son implement what he learned in College because he thinks he is too young to be making management decisions. We saw several instances where this was the case.

We worked in the Camoapa area Nov. 25 – 28 where we visited a number of farms and implemented several mineral feeding trials. One trial was on the farm mentioned earlier where the cows were averaging 25 liters / cow/day. The farmer was feeding a 20% protein Purina supplement containing some minerals and vitamins. He was also supplementing minerals free choice from 3 inverted tires but I observed that the boss cows got most of the mineral. Also, he was not feeding any salt. I suggested that he switch to soybean meal (44% crude protein) which is cheaper and top dress the salt, minerals and vitamins on top of the protein supplement. He said he would try it. Also, I did notice some of these cows licking the bunk and the wall which is classic behavior for animals deficient in minerals. Cows producing at these levels need minerals and vitamins supplemented at a higher level than cows producing 3 – 5 liters per day.

The cows on this farm were primarily Holstein or Holstein crosses. Brahma or Brahma Crosses are not going to give this level of milk production. It appeared to me that many of the dairy farmers in Nicaragua are beef farmer who sell some milk on the side. If this practice is profitable and they are happy with the financial results then why should they make a change? On the other hand if they view the primary enterprise as a dairy perhaps they should look at dairy breeds that will produce more milk.

We met with the managers of the cooperatives Masiguito and San Francisco where it was decided to have a large meeting for members. Vance would present information on building bio digesters and designing practical grazing systems. I would present information on dairy and livestock nutrition with emphasis on mineral and vitamin supplementation. The meeting was scheduled for December 4, 2009.

Sunday November 28 was spent at Selva Negro for a little RR. I got to see my first coffee plantation which was very enjoyable.

November 29 – December 4 we were back working in the Camoapa area. We visited many of the farmers who had signed up for the meeting on Dec. 4. Vance built a bio digester and I discussed dairy nutrition. On one farm we made 2 bags of silage from sugar cane and Taiwan with the help of some university students. I would like to see this trial done using sugar cane, taiwan grass, grain sorghum and urea. I would be willing to bet it will produce a lot of meat and milk during the dry season at a very low cost.

Our large group meet took place as scheduled on Dec. 4 as planned at the Cooperative San Francisco de ASIS with approximately 24 members in attendance. I was my first time teaching through an interpreter which was quite a challenge but all in all I think everything went quite well. There were lots of questions afterwards which usually means you did not explain things very well and or the audience was really interested in what you had to say. After the meeting we went to the farm of one of the ladies in attendance who manages the farm for her father. Here we set up another mineral supplementation trial and took several soil samples. She was in the process of spraying the unpalatable broadleaf weeds with 2-4-D to improve the pastures. I hope I hear about the results. This was our final farm visit in the Camoapa area.

On the morning of Dec. 5 we traveled from Camoapa to San Jose where we visited 2 farms. We set up 2 mineral feeding trials and discussed pasture management. After that we headed for Managua to prepare for our return flight to the US on Sunday morning and the end of what was a very rewarding experience and educational experience for me.

Comments/Follow-up:

Nicaragua has a vast untapped potential to produce meat and milk. Many of the dairy farms I worked with 20 years ago in Wisconsin were milking 40 cows. Today on the same amount of land they are milking 150 cows by making a few changes in management practices. Most farmers will not believe this but it is possible.

Vance and I arrived back in Wisconsin to freezing temperatures and 2 days later a blizzard that produced 1.5 feet of snow, heavy winds and temperatures that dropped to -0f. These conditions are life threatening to both man and livestock. We both agreed that it would be easier to carry cattle through your dry season than it is to carry them through our winter.

Finally, farmers should work together to improve the Nicaragua livestock industry rather than view each other as competitors. View the rest of the world as your computer if you want but not each other. Someone will need to take the inactive and get small groups of farmers to form discussion groups. If this could be accomplished you will be surprised how fast change will take place.