

NICARAGUA
ARAP
Agriculture Reconstruction Assistance
Program

ANALYSIS OF NICARAGUAN MEAT PROCESSING
INDUSTRY

Prepared by:
Robert Campbell

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Chemonics International Inc.

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Executive Summary

This summary will address the 7 objectives outlined in the TOR for this mission and some specific recommendations for further projects. All recommendations will be discussed in detail in the body of the report. The consultant spent 15 days in Nicaragua and visited slaughter plants, cattle and pork producers, meat processors, meat retailers, and sausage makers as noted in the attached itinerary. In addition the consultant also conducted a seminar that made recommendations and suggestions.

The English language slides from this presentation are attached to this report. The Spanish translations (shown during the actual presentation) are on file at the Chemonics ARAP office in Managua. The presentation provided a forum where cattlemen and meat processors met and exchanged ideas. This interaction was positive and a start in developing a Livestock and Meat organization that could promote Nicaraguan beef and help develop standards for both carcasses and cuts.

Carcasses of locally produced animals have not reached their potential given appropriate feed, water and handling. Introduction of new genetics will take several years and is discussed more in the report; however, immediate benefit can come from improving feeding and handling. Additional benefits from improved nutrition will be a decrease in the age of cattle at slaughter and improved meat quality.

Several technological changes could be made that would improve eating quality of Nicaraguan cattle. These include electrical stimulation, aging, mechanical tenderization and use of injection/marinating technology. Electrical stimulation (ES) for tenderization requires process management and refrigeration control since the tenderization effect is a combination of the ES and the refrigeration process. Improper use of ES could worsen eating quality. Aging is another proven technology, however the cost of investing in sufficient refrigerated warehouse space to age a significant portion of Nicaraguan production may be prohibitive at this time. Mechanical tenderization is already being used for individual steaks (cube steak machines are being used at all larger slaughterhouses). Ross or Jaccard tenderizers for white muscle cuts could be introduced, if marketing will improve the price of tenderized cuts. Use of injection/marinating technology could also improve palatability of Nicaraguan beef. This technology is widely used in the US for pork and is also beginning to make inroads in beef.

Niche market opportunities for stomachs (tripe) are already being exploited by the larger plants, however an easy and nearly immediate way to improve returns would be to get producers to stop branding hides. A Nicaraguan hide averages 7 brands and this reduces its value by 15 to 30 dollars per hide. The consultant also conducted demonstrations of American style cuts at 2 local operations and at the seminar I conducted at the end of the trip. Some demand from local retailers could be developed through US style meats advertising. Use of standard cuts and an investment in meat saws would be needed. Use of European style (modified atmosphere) packaging and marketing to upscale markets could be profitable, however capital

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investment and quality control would be essential to make this work. To successfully compete in the low-fat export market, supplemental feed for cattle during the dry season so that they can reach slaughter weights at a more palatable age. Nicaragua will also need to develop a Livestock and Meat organization to market this product, in a manner similar to what the Argentines are now doing.

The consultant did observe and visit with several local meat retailers and restaurants, however, discussion of opportunities was limited by time constraints. Another trip to focus on this area of the meat utilization chain could address retailer issues. This mission could include seminars on meat color and display, meat packaging and waste reduction methods for supermarkets and other meat retailers. Safety and handling practices should also be addressed.

Several opportunities for linking producers and processors to technology and production practices present themselves. Producers could benefit from a course on sources of supplemental feed and feed storage practices in tropical areas. This short course could include lectures and demonstrations by cattle feed experts in tropical cattle feeding at Kansas State University, visits to Kansas feedlots and also visits to seed stock and genetics suppliers.

Processors could benefit from missions on meat processing as well as tours of plants that are similar in size to Nicaraguan plants. Contacts and opportunities to speak to USDA representatives could also be included. Finally, contacts with equipment and packaging suppliers would round out a course. Upcoming events that would have application for the processors would be the AMI (American Meat Institute) annual convention in Las Vegas, October 12-14; also the Meat Importers Council of America also in Las Vegas, Oct 13-14. The Iowa State University annual sausage makers short course, November 6-8; For meat equipment, the International Poultry Exposition in Atlanta, January 17-19, 2001.

Major recommendations:

1. Develop an organization of Livestock and Meat producers to promote Nicaraguan meat domestically and internationally. This organization should develop industry standards and grades for carcasses and cuts and provide lobbying, technical and promotional support to the industry.
2. Immediate or nearly immediate improvement in cattle value can be achieved by reducing or eliminating the use of brands.
3. Use Nicaraguan advantages (location, land & labor) to improve cattle feeding and handling with subsequent improvement in carcass value and quality.
4. Develop carcass grade standards and set up a premium payment system to encourage the production of superior cattle.
5. Develop cut standards for Nicaraguan cuts to improve marketing efficiency.

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6. Do more processing (sausage making, patty making, hide processing) within Nicaragua to add value within the country.
7. Set up several training missions in Nicaragua to help with technical recommendations
 - a. Sausage and shelf stable processing (slim jim type products).
 - b. Retail packaging and marketing and display.
 - c. Provide expertise and assistance in setting up carcass grading and cut standards
8. Bring several groups into the US for specific missions.
 - a. Cattle producer mission on feeding, handling and feedlot operation.
 - b. Meat processor plant visit and equipment supplier visit. Tailor visit to needs of participants.
 - c. Meat processor sausage making and value added visit.

Introduction:

This report will be organized by sections. First a trip report section that will outline the activities on a day-by-day basis, with specific recommendations for each operation. This will be followed by an observations section, a recommendations section and a section on possible follow-up training and contact missions.

July 27 - AM Meeting with Hugo Arvizu of Caremba - He has a small well-run operation for making sausage and is also working on a jerky product for Mexico. He currently lacks a controlled temperature oven. He is using a wood fired smoke house for most of his product and sun drying jerky. He is planning to use waste heat from his refrigeration system to dry without the bleaching effect of the sun, however this will not be a controlled system. Mr. Arvizu is highly trained (Iowa State University) and has excellent control of his product, however lack of reasonably priced capital limits his ability to expand or buy equipment. Mr. Arvizu has a high level of competence and ability.

July 27 PM – Meeting with CONAGON, Ronald Blandon and a group of cattle producers where we had a question and answer round table regarding cattle in general, carcass characteristics, grading and meat.

July 28 AM - Visit the Matadero de San Carlos which was shut down at the time but had been operating within a week prior to my visit. The Estradas were trying to sell the plant and the Seminole tribe had looked at the plant just prior to the consultant's visit. Consultant made a reasonably in depth walk through of the facility (approximately 1 hour). The plant was physically in good shape and set up to kill ~ 150 head per day. The plant was essentially only 3 rooms: kill floor, cutting room, and gut processing area as well as coolers and freezers. The refrigeration was all Freon based. There was also no main boiler so hot water availability might need to be addressed. Corrals are in good repair, however, there is no shade or water available. Improved cattle handling would improve carcass quality. One other aspect of this plant is that it has no rendering equipment currently installed

July 28 PM - With Dr. Randall, ARAP consultant, visited the Subasta de Ganado and watched cattle being unloaded for auction. Also received a printout of the various prices paid for cattle. Size of cattle is the only

criteria that generates a price differential with the larger cattle being worth more. This presents an opportunity

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for someone to build and operate a profitable feedlot, taking advantage of compensatory gain.

Later the consultant also visited the pork production operation of Mr. Michael Sedgwick and was impressed at how clean the operation was and at how good the pigs looked. Discussed opportunities for this operation and Mr. Sedgwick spoke about the difficulties of maintaining a consistent, reliable source of reasonably priced feed. While not directly related to the cattle industry, a strong feeding industry including pork and chicken could fit in with a cattle feedlot.

Late in the afternoon the consultant visited the La Colonia supermarket and looked at the meat case. The consultant believes that there are opportunities for some changes in merchandising and lighting that would have a positive impact on supermarket meat retailing

July 29 – Visit to a lamb (sheep) operation run by Ing. Pedro Zuniga, and after some discussion about our mission and the raising and marketing of lamb in Nicaragua, the consultant performed a demonstration of US style lamb cutting at his plant. After breaking and making retail cuts out of one lamb, the consultant then broke another one and showed Mr. Zuniga how to make a crown roast of lamb for special presentations. Since he is trying to develop a lamb market, having a signature roast for special presentations could be useful for him. Mr. Hugo Arvizu of CAREMBSA was also there and he helped with explanations of the cuts, once again demonstrating his strong meat industry knowledge.

July 31 - Visited a pork farm in near Leon, with Mr. Sedgwick. The farm is owned by Mr. Norman Downs. After a thorough tour, we observed a slaughter demonstration. The consultant then spent the afternoon demonstrating US style pork processing and discussed with Mr. Downs on the economics of pork and the US situation with low prices.

August 2 – The consultant visited the Carnic beef plant and also had a good tour. Carnic is one of 2 plants in Nicaragua that is currently approved for export to the US. This plant was overall in good shape, as well. They were also cutting that day so I observed Nicaraguan cutting methods. After the Carnic visit, we stopped at the Proincasa plant and arranged to visit that plant while it was in operation. This plant operates late at night, killing in the earlier portion of the evening and later cutting up the carcasses for immediate delivery to markets the next day.

In the evening the consultant met with Calixto Garcia who was representing the Seminole tribe. We discussed the cattle situation in Nicaragua and he told me that the tribe planned to put in a feedlot in the near future. I think this investment will be important for the Nicaraguan cattle industry.

August 3 - We visited the Naindaime beef plant and had an excellent tour, however since there had been a holiday on Monday, there was no cutting going on at that time, so we arranged to have a return visit on Saturday, to view the cutting room in action. I did observe the slaughtering and also saw the entire plant including a well-run rendering department and a spotlessly clean refrigeration and mechanical room. The yards were also in very good shape, landscaped and kept clean. This plant is USDA approved for export and they export about 30 % of their production. The material produced in the rendering plant is exported to chicken producers in El-Salvador and Costa Rica. One aspect of rendering is that it requires a plant of a certain size (approx 100 head/day, minimum) to be cost effective. Once the investment is made, rendering can add \$ 10 –

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12 per head to the value of a carcass (based on Nicaraguan yields of grease and meat & bone meal)

PM - We went up to the Los Brasiles plant and toured it. This plant is somewhat older and was not in operation for 4 years, however, it restarted about a year ago and a strong effort to upgrade the plant is underway. The plant currently slaughters pork 1 day per week on a separate slaughter floor from the beef floor. The rest of the week they slaughter 170 or so beef per day. They have just been approved to export to Mexico. They also have the most advanced rendering system of the 3 major plants I had seen so far. They were installing a blood drying system to go with the rest of the rendering system. The other plants were discarding blood either by burying, discharging to a lagoon or into lake Managua.

In the afternoon we went to a deli operation called Bavaria, and had an interesting talk with one of the owners about sausage and display. The location we saw had the best meat display of any that I saw while in Nicaragua.

August 4 - Visited PROINCASA in the evening when they were slaughtering. This plant was geared to the local market and processing was fairly primitive from an equipment standpoint. The plant was very clean and all the cattle were inspected by Nicaraguan government inspection staff. The inspectors were professional and competent. The plant used axes to split the carcass instead of saws, and most of the hiding/gutting was done on the floor. The coolers were small and used to set up the beef for boning rather than chilling for storage. The beef were cut by an early morning crew that came in about 6 hours after slaughter. If the refrigeration in this type of plant could be upgraded so that the carcasses could be chilled and held for 24 hours before cutting, a major improvement in shelf-life and sanitation could be achieved. Given the inadequate refrigeration, this plant appeared to be doing a good job of keeping the meat clean, under difficult conditions.

August 5 - We returned to the Nandaimé plant to observe the cutting room in operation. This was very interesting as the de-bone the cattle without using a saw to break up the carcass. The consultant demonstrated some techniques that should result in improved yields and we also discussed several ways to reduce packaging costs by using smaller bags and some simple bag loading equipment. I also got an education from Mr. Alfredo Marin on his view of the need for plants of a certain size to compete effectively in the international market place.

August 7 - We visited 2 municipal slaughterhouses. These operations were without refrigeration of any sort. The animals are slaughtered and then cut up for market. These plants operate in the evening hours so the product produced that night is in the market the next morning. At these small plants (3 to 15 head per night) there is no inspection of the cattle. This should be the first operations that are either closed or upgraded if Nicaragua wants to modernize its meat industry and public health. Because of the clean up constraints both plants had contamination from previous slaughters visible. Although the second plant was much newer and had tile walls for ease of cleaning, upgrading the inspection of these operations should be a priority so that sick cattle do not get fed to the public.

In the afternoon we visited the CAINSA sausage processing plant. Aida Gurdian, the owner's daughter has a degree in meat science from Texas A&M University. They are in the middle of a major upgrade, which will make them a model plant once the upgrade is finished. Once this upgrade is finished, this plant will be in excellent shape.

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August 8 - In the morning the consultant went back to Los Brasiles for an inspection and a meeting with an the head inspector from the Nicaraguan MAGFOR; Alejandro Pedro Blandon. We conducted a complete inspection of the plant and reviewed its HACCP plan.

In the afternoon, the consultant conducted a demonstration and training exercise at PROINCASA on US style beef cutting. Several of their butchers also demonstrated the Nicaraguan style of cutting for me.

August 9 – Consultant presentation on my observations and recommendations for the Nicaraguan meat and beef industry. In the afternoon I did a demonstration of US style meat cuts on a beef carcass and a pork carcass. The meeting seemed to generate some good discussion and most of the participants (more than 50) stayed on for the cutting demonstration.

General Observations :

The Export segment of the industry has consolidated and with 2 plants currently USDA certified and with 2 more that might be certified be certified, these plants are in good shape and are producing quality product, as much as the local cattle allow. Competition in the form of Los Brasiles or San Carlos should keep these plants efficient and competitive as both of Los Brasiles and San Carlos could be made into export plants with reasonable effort. An exporting plant consortium group might be something ARAP could broker to give exporting plants more market clout through size.

The cattlemen and the meat plant management owners in Nicaragua seem to have some problems communicating. Additionally the consultant understand that there are two competing cattlemen's groups. These groups should band together and work with the meat plants to promote an efficient directed cattle industry. If these groups do not get together and work for the benefit of the industry, Nicaragua will become a third tier supplier of beef behind Australia, New Zealand, Argentina and Brazil. Nicaragua has the advantages of location, labor costs and natural resources. What needs to be done to make Nicaragua a first tier (and therefore more profitable) beef supplier is to upgrade slaughtering efficiency, cattle quality, and cattle management. A national organization consisting of both cattlemen and the meat companies need to work together to develop standards and promote Nicaraguan Beef.

Cattle hides and cattle handling are poor. These practices contribute to poor quality meat and low value hides. Regulations need to be changed to allow reduced branding on hides. Going from 7 or more brands down to 1 can add \$ 10 - 15 to the value of each carcass. Putting brands on the cheek only could add \$ 5-10 more. Unbranded hides might be worth as much as \$ 30 more than current hides. Cattle handling traditions and rules need to be changed to allow cattle in slaughter and auction yards access to water and shade.

Plants such as PROINCASA do a good job under their circumstances, however lack of capital to improve processing conditions are a drawback to improvement. Municipal plants have no real oversight of the condition of the animals slaughtered. This could be a public health hazard in the long run, and eventually, bad for business if beef becomes perceived as a product that makes local consumers sick. Plants for the local market should have an upgrade plan developed and work towards improving refrigeration, sanitation, and equipment. The municipal plants should either be upgraded or phased out, and inspection services should cover all animals

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slaughtered for general public consumption.

Blood and packing plant waste disposal is not an issue right now, however, since Carnic is disposing of blood directly into the lake, at some point (perhaps a decade) down the road, this problem will have to be addressed. By developing a plan for treating packing plant wastes nation wide NOW, the packing plants can dictate the speed of the changes and the cost of investing in sewage treatment. If they wait, they may get into situations that plants in Paraguay and Bolivia have gotten into, where they must improve their discharge situation rapidly or move. It is my understanding that AID and World Bank sources of funds look favorably on projects that reduce pollution, and agricultural processes often have high organic waste loads. An agricultural waste reduction project that looked at animal feed uses of agricultural waste might work well with the ARAP project.

Recommendations

1. Develop an organization of Livestock and Meat producers to promote Nicaraguan meat domestically and internationally. This organization should develop industry standards and grades for carcasses and cuts and provide lobbying, technical and promotional support to the industry. ARAP could provide an honest broker situation for the development of this organization. ARAP could also provide early technical support until the Nicaraguan organization was able to develop its own sources of funding, such as a per animal/per carcass fee for members
2. Immediate or nearly immediate improvement in cattle value could be achieved by reducing or eliminating the use of brands. This is where an organization such as the one described in item 1 could make a difference for its members by changing government rules for cattle identification so that branding could be reduced.
3. Use Nicaraguan advantages (location, land & labor) to improve cattle feeding and handling with subsequent improvement in carcass value and quality. Nicaragua has several advantages for cattle production that are being underutilized. If systems can be developed that provide for feed, improved handling and marketing, Nicaragua has the potential to become a premium cattle supplier to markets in both Europe and the US as well as locally.
4. Develop carcass grade standards and set up a premium payment system to encourage the production of superior cattle. Costa Rica has just set up a carcass grading system under the auspices of the Costa Rican cattleman's association. If Nicaragua does not act soon, they may continue to raise live cattle, however some of the value added processing may go elsewhere, costing jobs and export revenue for Nicaragua.
5. Develop cut standards for Nicaraguan cuts to improve marketing efficiency. The development of cut standards in the US vastly streamlined the marketing of meat cuts here in the 1970's. Using the US guides as a template I think that having a marketing tool such as a Nicaraguan cut standards book could be extremely valuable. It would also differentiate Nicaraguan product from other producers that are using US cut standards to market their beef.
6. Do more processing (sausage making, patty making, hide processing) within Nicaragua to add value within the country. Work to vertically integrate the industry with downstream applications. Although there is a healthy local sausage industry, additional technical help would allow this industry to expand and improve its product. Hide processing is another area that could improve the value added in Nicaragua. Right now all the hides are

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exported. If a group of slaughter houses and cattlemen invested in a hide plant that could handle the Nicaraguan hide output, then a local leather market could develop.

Possible follow-up training missions to Nicaragua

1. Sausage and shelf stable processing (slim jim type products).
 - Look at raw materials
 - Processing equipment needs
 - Hands on short course

2. Retail packaging and marketing and display.
 - Look at packaging
 - In-store handling
 - Lighting and display
 - Point - of - Purchase (POP) marketing
 - Shelf life management

3. Provide expertise and assistance in setting up carcass grading and cut standards
 - Develop Carcass standards, broker disagreements
 - suggest Premium/discount grids for superior/inferior carcasses
 - Provide photographic assistance (meat photography needs special lighting and backgrounds for optimum results)

Suggestions for US knowledge development missions.

1. Cattle producer mission on feeding, handling and feedlot operation.
 - Visit southern feedlots that have (at least part of the year) conditions similar to Nicaragua.
 - Learn about tropical cattle nutrition and feed storage from experts in these fields
 - Visit with cattle futures operations and agricultural economists to learn of methods to handle risk associated with cattle feeding and feed supply operations.

2. Meat processor plant visit and equipment supplier visit. Tailor visit to needs of participants.
 - Visit with trade organizations who's members might want to import Nicaraguan beef.
 - Meet with suppliers of new and used meat processing equipment
 - Attend meat processing trade show
 - Visit processing plants in the US.
 - Have an hands on short course for specific needs as suggested by potential participants
(See attached outline of short course developed for a Mexican group)

3. Meat processor/ sausage making and value added visit.
 - Hands on short course for making various types of sausage
 - Visit sausage processing plants in the US.
 - Meet with sausage equipment suppliers
 - Meet with spice, casing and other sausage making suppliers