International Practicum Report

Farm to Table course program Uruguay

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Summary

The international practicum I took part in was the Uruguay Farm to Table study program, which took place between October 25th and October 31st, 2010. The program was a collaboration between three institutions: Universidad de la Republica - Facultad de Veterinaria (Uruguay), the University of Minnesota – Center for Animal Health and Food Safety and Global Initiative for Food Systems Leadership, and The Ohio State University – College of Veterinary Medicine and the Veterinary Public Health Program.. The OSU delegation included: Dr. Armando Hoet, Dr. Thomas Wittum, Caitlin Lacey, Janet Buffer, Rachel Chouinard and myself (Pouneh Behin).

As participants in the program, we studied the food system in Uruguay from the farm to the table while keeping in mind issues of animal welfare and health, food safety, food protection and public health. The key objectives of the program as outlined in the Farm to Table informational brochure were to:

- Develop awareness, understanding and familiarity of the food system in exporting countries such as Uruguay and appreciate the global integration of public-private practice within food systems
- Appreciate similarities and differences among the food systems in Uruguay, the United States and other countries
- Promote and catalyze collaborative group leadership through network building opportunities, experiential and structured learning activities, and collective group activities.

The sites I was able to visit during the program included:

- La Serrana (fish plant)
- Estancia Sierra de Los Caracoles (beef farm)
- Tienda Inglesa Atlantida (supermarket)
- Carrasco (slaughterhouse)
- CONAPROLE Complejo Industrial Montevideo (dairy product processing factory)
- Government-operated dairy farm
- COLAVECO (laboratory)
- La Cumbre (dairy farm/milking and cheese production)
- DILAVE (laboratory)

Discussion of knowledge acquired

During the trip, I acquired a great length of knowledge due to the fact that I had never been on some of the sites that we visited. Some of the sites I had never visited before include: a fish plant, slaughterhouse and a beef farm. In addition, being introduced the country of Uruguay was very helpful in my career as future public health professional. Uruguay is a small democratic country with 19 different departments, similar to states in the United States. Its total population is of 3,241,003 and is not very ethnically diverse as the majority of Uruguayans are European of descent. It is located in South America and shares much history with its neighbor, Argentina. The literacy rate is approximately 98% and the country has one of the longest life expectancy at birth rates in the region. Its citizens pride themselves in its rich culture and history. Health-wise, 70% of its deaths are due to chronic communicable diseases, which also account for 60% of its total health care expenditures. Its status as a country is therefore very similar to any other industrialized country.

In order to address the various goals, a summary of experiences and acquired knowledge respective to each site visit is found below.

<u>La Serrana:</u>

At La Serrana fish plant, I was able to observe how imported shark carcasses were processed. We were told that the sharks came from the Western coast of Africa and were sent to Uruguay by a Swedish company for processing and then shipped back. The most impressive aspects of the plant were that the smell of fish was kept to a minimum, the process was extremely quick and efficient and that all the workers came from the community where the plant was built.

Estancia Sierra de Los Caracoles

At the Estancia Seirra de Los Caracoles beef farm, I noted two important aspects of how the farm was managed: the cattle lived on pastures year-round and were vaccinated against common pathogens. This type of system seems to be to be one of the best as far as animal welfare is concerned. The professors from Uruguay also told us that because of this, the fat content in beef is lower and there is therefore a lower rate of health issues associated with consuming beef. It was also interesting to learn that more than 80% of the beef produced in Uruguay got exported to other countries.

<u> Tienda Inglesa Atlantida</u>

Tienda Inglesa Atlantida was a high-end supermarket I visited. The most striking aspect of the visit to this site was the fact that the beef carcasses would get to the market uncut and the employees would proceed to cut them in front of customers. We discussed this as a group and noted the difference between how people in the U.S. and in Uruguay view the food they consume. In the U.S., people do not want to see what they eat. In other words, they would not be as comfortable purchasing meat that is cut in front of them as it is a display of where the meat is coming from. Americans have an interesting sensitivity to how their food looks that was not apparent in Uruguay.

<u>Carrasco</u>

The Carrasco slaughterhouse was the most interesting, informative and difficult site visit for me. Never having visited a slaughterhouse, I had mentally prepared myself to witness animals being slaughtered. I was blown away by the length of time it took

for the employees to process the carcass once the animal was dead. In no time, the carcass made its way across a large room where the head was cut off, the skin peeled off, the interior organs removed and the carcass cut in half. The carcass then made its way to another room where it would hang (while being rotated throughout the room) for several hours. Many of the aspects of a slaughterhouse that I had learned in VPM 723 – Food Safety and Environmental Health were displayed in front of me: from the hole made by the stunt gun used to kill the cattle to the importance of efficiency. A very interesting aspect of the process that stuck to me was how the cattle were kept and moved around right outside of the slaughterhouse before they made their way in. When I saw the cattle outside, they were extremely calm and followed one another through the maze-like walkway that had been designed for them. Although the reason behind their calmness was partly due to the fact that they were European cows, it was interesting to learn that the walkway was made curvy to follow their natural movement patterns.

CONAPROLE

At CONAPROLE, a dairy product processing factory, it was interesting to learn the huge amount of products they exported other South American countries. When I asked a question in regards to the marketing used for their products and how well they are able to stay in competition with other companies, they pointed out that companies like Nestle no longer operated in Uruguay and that they were the main producers of products such as yogurt, ice cream, and much more. When we were watching the factory employees process the dairy products, we noted the fact that one of the employees was incorrectly wearing her mask and discussed the importance of proper food safety training.

Government-operated Dairy Farm

This particular dairy farm was very interesting to me due to the fact that military personnel operated it. I had never been aware of the fact that in some countries, military personnel helped run farms and was intrigued by this process. When I asked a native of Uruguay, she informed me that when individuals sign up to serve in the armed forces, at times, they will be assigned to jobs similar to this one, where they learn how to be farmers.

<u>COLAVECO</u>

I noticed that the laboratory seemed a bit isolated right away and wondered what type of impact this had on their work. However, I quickly realized that their location was fundamental to servicing the farmers of the area. Milk is delivered to them to be tested by drop-off or mail delivery. I liked seeing that they use Total Coliform (TC) and Fecal Coliform (FC) testing for their milk, as it is a process I am familiar with. The laboratory was very clean and I was very impressed by their organizational skills for such a small facility.

<u>La Cumbre</u>

This dairy farm was founded by an immigrant from Switzerland who established himself in Colonia de Helvetia (Swiss Colony) and taught his children how to be dairy cow farmers and cheese producers. The farm environment was very welcoming and being able to witness the mechanical milking of the cattle was enlightening to me. I had only experienced the milking of cows by hand growing up in Switzerland but had never seen the new machines that exist today to take some of the burden off of humans' soldiers in the process. The farmers also allowed us to taste some of the cheese they produced. The cheese was similar to Parmesan cheese and was sold to local markets as well as others outside of the city through an intermediate contractor.

<u>DILAVE</u>

At DILAVE, we visited the various labs found on their large partial of land and were able to interact with some of the laboratory staff. It was interesting to note that they follow USDA protocol for the tests they run in their labs. In fact, some of the other facilities also said that they used American procedures for the work that they do. DILAVE is also the site where we were able to do our group presentations for the assignments that had been given to us.

Topic of focus – Shiga-toxigenic E. coli 0157:H7 in contamination of beef products

I will discuss the assigned topic I had for the entirety of the trip: Shiga-toxigenic E. coli in contamination of beef products. My group was comprised of three other individuals: Janet Buffer (OSU), Afonso Oliveira (Brazil) and Lorena Souza (Uruguay). In order to complete this assignment, we were to give a presentation on October 29th, 2010 to discuss our findings.

Escherichia coli 0157:H7 is one of many shiga-producing *E.coli* that is commonly found in the gut of humans and some animals. It is the most common in the US and several other industrialized countries. However, non-0157 shiga-toxin E. coli (STEC) outbreaks have been recorded in Argentina, Australia, Germany and Italy, among others. These subgroups included 01, 02, 015, 025, 026, 075, 086, 0111, 0145 and 0160. The bacterium itself is a gram-negative bacteria and can cause diarrhea (commonly bloody), fever and can lead to Hemolytic Uremic Syndrome (HUS) and death, especially in children, It is therefore very important to establish prevention and surveillance programs in order to prevent such outbreaks from taking place.

The transmission route of *E. coli* from cattle can occur in several ways, including: via direct contact, via milk and beef products, via contaminated vegetables, via contaminated water and more. The diagram below illustrates some of these transmission routes:



In order to discuss the issue of *E. coli* 0157:H7 in the US, Uruguay and Brazil, it is important to give a brief background on the type of production system used in each country. In Uruguay, 80% of cattle are grown on pastures (field), the status of *E. coli* 0157:H7 is considered to be free and there has been one recorded outbreak in 2002. In the US, close to 100% of cattle that go to slaughter come from feedlots. In addition, about 33% of the feedlots found in the US are large. *E. coli* 0157:H7 is considered to be endemic in the US and the most recent outbreak in beef was in 2009. Out of the three countries we studied, Brazil seems to be least likely to have a future outbreak as 90% of their beef cattle are raised on pastures (field) and they have never experienced an outbreak of *E. coli* 0157:H7.

The current programs that exist in each country differ. In Uruguay, the Ministry of Livestock, Agriculture & Fisheries - Animal Industry Division (DIA) runs several control programs and does the following: it uses Good Manufacture Practices (GMP) & HACCP and does sampling and analysis of the beef produced in the country. In addition, sampling and analysis is also done by others in the industry. This program can be said to be effective as there have not been outbreaks in the past few years since 2002. However, due to the development of feedlots in Uruguay, there could be an increase in *E. coli* O157:H7 outbreaks and the country could find itself in a similar situation as that of the US. In the United States, there are two main programs that do control and surveillance of food-borne diseases, including *E. coli* 0157:H7. These two programs are FoodNet, which is a collaboration between the CDC, FDA and USDA, and PulseNet, which is the collaboration of over 50 public health labs and is under the USDA's Food Safety and Inspection Services department. Based on the number of recalls and outbreaks the US has seen in recent vears, these programs are not effective. There have been four *E. coli* outbreaks in beef since October 26, 2007, one of which was due to the O157:H7 pathogen. In addition, the exact number of cases is unknown as underreporting occurs since some individuals will just assume that their symptoms are due to "food poisoning" and will not go see a health care practitioner. The length of time that it takes for a case to be confirmed as *E. coli* is also rather long. Overall, it can be said that the

United States should reconsider its current programs and work to establish more effective ones.

In Brazil, it is rather interested to note that the only two O157:H7 isolates that were detected in the state of Sao Paulo did not express the shiga toxins. However, O157:H7 strains that are isolated from human infections are all shigatoxin producers. As a result of the lack of outbreaks in beef, the country does not currently have a surveillance and control program specifically designed for this pathogen. Nonetheless, there needs to be further investigation into these claims to better understand the current situation in Brazil and how it has remained free of *E. coli* O157:H7 outbreaks in beef products.

Other recommendations in order to control the prevent future outbreaks include: do further research on the food chain to identify the route of transmission, feed cattle grass or hay five days prior to slaughter, research the use of probiotics in the prevention of *E. coli*, teach consumers how to use thermometers when cooking and promote this behavior, wash fruits and vegetables under running water before eating them, reduce the amount of time carcasses are aging, and promote irradiation of meat.

Although Uruguay is not considered a developing country, it is found in an area of the world where many of the surrounding countries suffer from great poverty and spread of infectious diseases. Looking at how Uruguay handles this and other food borne pathogens, given their climate and location, can help us establish efficient programs in other countries. When looking at outbreaks of E. coli 0157:H7 in developing countries, data on the situation is rather limited due to the fact that there is a lack of surveillance for the pathogen. Nonetheless, it is known that is endemic in developing countries and a major cause of infant diarrhea. Hemolytic Uremic Syndrome (HUS), which is a disease caused by the bacterium, is the most common cause of acute kidney failure in children. Since mortality in children under five is greater in developing countries and diarrheal diseases are the greatest burden of disease on a worldwide scale, it is imperative that control and surveillance programs for this one and other similar food borne pathogens are immediately set up. One example of an outbreak of 0157:H7 in a developing country is the one that took place in Kinshasa, Congo. From April to September 2003, 463 children ages 15 and under with severe diarrhea were admitted to the hospital of Kalembelembe in Kinshasa. All stool cultures from the patients were found positive for E. coli. The consumption of meat and drinking water was found to be the main cause for this outbreak. It is therefore of the utmost importance that such countries develop surveillance programs in order to stop similar outbreaks from taking place.

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Responsibilities

Our responsibility was to first and foremost participate and learn as much as possible in all the site visits. In addition, we were all put into groups of 4 with students/professionals from different countries and had to address a food safety/animal welfare issue by giving an analysis of each of our countries on the issue and find solutions to arising problems.

Feedback

- 1) Positive aspects
 - i. Networking opportunity with professionals and students from all over the Americas
 - ii. Learning experience We learned a great deal in just one week,

- iii. Exposed to a different culture
- iv. Exposed to a different food production system than the one found in the US
- 2) Negative aspects
 - i. Time I felt that some of these visits were a bit rushed and we could have experienced more if the program ran for a longer period of time than just a week
- 3) Unique experiences/events
 - i. Remaining in contact with other students and young professionals from the different South American countries
 - ii. Being in South America, particularly in Uruguay, was a great learning experience as their customs and traditions differ from both the US and many other Latin American countries. The majority of their population is European of descent yet consider themselves to be Latin American and have great pride in their country. I loved meeting the people there and interacting with them. The social events that were set up for us were a very nice addition to the long hours of site visits.
- 4) Overall assessment of the rotation
 - i. Overall, I would highly recommend this program to anyone interested in learning about food production systems or any other aspect of food processing and animal welfare. I felt that I learned an amazing deal of information on a daily basis and had not expected to learn so much in so little time.

Visual story of the trip (Photos)



"Bienvenido a Uruguay" (Welcome to Uruguay) sign at the Montevideo Airport



La Serrana (Fish Plant) employees cutting the shark meat into small equal pieces



La Serrana (Fish Plant) - water treatment facility found right outside of the plant



Estancia Sierra de Los Caracoles beef farm



Estancia Sierra de Los Caracoles-Farmer and former veterinarian tells us about the farm he manages



Advertisement in the Tienda Inglesa Atlantida supermarket for people to consume a lot of Vitamin C found in fruits and vegetables in order to avoid becoming ill with a cold



Employee cuts parks of the carcasse at the Tienda Inglesa Atlantida supermarket



The OSU students who took part in the program at the Carrasco slaughterhouse. From left to right: Rachel Chouin ard, Caitlin Lacey, Pouneh Behin and Janet Buffer



The government-ran dairy farm



COLAVECO laboratory



La Cumbre dairy f arm. The farmer is explaining to us how they make their cheese.



La Cumbre dairy farm. Cattle being milked.