



Site Visit Report:

Uruguay – Foot and Mouth Disease

Veterinary Services

National Center for Import and Export

Regionalization Evaluation Services

September 2002

Administrative details

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Site visit agenda: The site visit was conducted July 25-29, 2002.

- July 25 Initial meeting: Ministry of Livestock, Agriculture and Fisheries.
Welcome and presentation of the infrastructure of the General Direction of Livestock Services.
- Requirements for importation; surveillance activities; animal identification and movement controls; meat export systems.
 - Regional situation.
 - Discussion, clarifications, questions.
 - Visit to the Central Laboratory (DILAVE).
- July 26 Group 1: Visit to the San Jacinto Slaughter Plant.
Group 2: Visit to Colonia, Soriano and Bridge of Fray Bentos/Puerto Unzue.
- Colonia: Visit to the port.
 - Mercedes Soriano: Visit to a local ministry office.
 - Fray Bentos: Visit to a land border crossing.
- July 27 Group 1: Discussion with the Epidemiology Group at the Ministry of Livestock, Agriculture and Fisheries.
Group 2: Visit to the Montevideo Port, Carrasco International Airport, and the Central Office of DICOSE (Department of Animal Movement Control).
- July 28 Visit to the beef cattle establishment "La Macarena" in the department of San Jose.
- July 29 Final meeting at the Ministry of Livestock, Agriculture and Fisheries.

Abbreviations:

MGAP – Ministerio de Ganadería, Agricultura y Pesca (Ministry of Agriculture, Livestock and Fisheries)

DICOSE – División de Controles de Semovientes (Division of Animal Movement Control and Registration)

DILAVE – División de Laboratorios Veterinarios (Division of Veterinary Laboratories)

FMD – foot-and-mouth Disease

DGSG – General Direction of Livestock Services

OIE – Office International des Epizooties

PANAFTOSA – Pan American Center for Foot and Mouth Disease



Map of Uruguay

Background and Objectives of the Evaluation

Primary Disease of concern

Foot-and-mouth Disease

Commodity

Fresh, frozen, deboned, and matured beef

Potential pathway(s) of Introduction

Importation of improperly treated and contaminated beef from animals infected with foot-and-mouth disease (FMD).

Summary of previous findings

In 1997, the United States Department of Agriculture (USDA) recognized Uruguay as free of foot-and-mouth Disease (FMD). Uruguay continued to export fresh (chilled or frozen) beef to the United States (US) until October of 2000, when an outbreak of FMD (type O virus) occurred in the Artigas department located in the northern part of the country bordering Brazil. The outbreak was eradicated rapidly by stamping out and following strict biosecurity and movement restriction measures. Shortly before the outbreak in September of 2000, the Animal and Plant Health Inspection Service (APHIS) conducted a site visit to Uruguay to assess its animal health infrastructure and ongoing FMD exclusion and surveillance activities. In response to the outbreak in Artigas, APHIS placed a hold on all animal products imported from Uruguay. After the outbreak was eradicated, APHIS resumed imports from Uruguay, with the exclusion of a portion of the country that included Artigas. APHIS conducted another site visit in March 2001 to review measures taken by Uruguay to prevent introduction of FMD from Argentina and to further verify the situation in Artigas.

Background to present mission

In April of 2001 an FMD outbreak occurred in Uruguay along the border with Argentina. The first case was identified on April 24, 2001, in the western state of Soriano. This outbreak spread very rapidly until it was determined by Uruguay that the best course of action would be to vaccinate all cattle. As a result, the US removed Uruguay from the list of FMD-free countries and prohibited beef imports from the country.

Uruguay officially requested that APHIS allow imports of fresh (chilled or frozen), deboned, and matured beef. Uruguay is not seeking to regain free status at this time, as it plans to vaccinate cattle until 2003. Given the history of the disease in Uruguay and the plans to continue vaccination against FMD, APHIS determined that there is a need to conduct a quantitative risk assessment to evaluate FMD risk in beef from Uruguay. This is consistent with the approach taken by APHIS in the past for evaluating the risk of the disease in beef imports from Argentina.

Objectives of the evaluation

The main objective of this onsite evaluation is to gather data and relevant information for the purpose of conducting a quantitative assessment of the risk of importing FMD in beef from Uruguay. APHIS had a thorough knowledge of the animal health infrastructure in Uruguay as a result of a previous assessment conducted in December 2000 and a history of trade with Uruguay. The scope of the mission included verification of FMD outbreak controls, an overview of the surveillance program and laboratory capabilities, vaccination practices and eradication activities, and movement and border controls. Particular focus was placed on the regional FMD situation in Uruguay and South America and on the risk of reintroducing FMD into Uruguay from neighboring countries.

Main Findings

Authority, organization and infrastructure

The Ministry of Livestock, Agriculture and Fisheries (MGAP) has the primary responsibility of administering animal and plant health programs in Uruguay. The General Directorate of Livestock Services (DGSG) regulates and administers animal health programs. The department consists of four divisions: Division of Animal Health (DSA), Control of Stocks and Animal Movement (DICOSE), Veterinary Laboratories (DILAVE), and Animal Industry (DIA). The DGSG mission includes to: prevent, control, and eradicate animal diseases; protect veterinary public health and food safety; and provide expert advice and support to international trade of livestock products.

The main laws and decrees that provide authority to DGSG to carry its functions are:

- Animal Health Act (Law 3,606 of 1910)
- FMD Control & Foreign Disease Eradication Compensation Fund (Law 16,082 of 1989)
- National Budget Act (Law 16,736 of 1996)
- Official Regulation for Veterinary Inspection of Animal Products (Decree 369/983)

The Division of Animal Health (DSA) has the primary responsibility for carrying out disease control and eradication programs. The division is centrally located in Montevideo, with 6 regional offices within the division and 44 veterinary offices distributed among 19 departments (State equivalent). The division is further subdivided into 4 departments: field services, international trade control, dairy health control, and animal health programs. The division employs 99 veterinarians, 291 technicians, and 5 clerks (*Table 1*). The field veterinarians report directly to the regional offices, who in turn report to the central offices (*Figures 1 & 2*).

Table 1: Human and material resources – DGSG

<u>Staff</u>	<u>Veteri- narians</u>	<u>Technicians</u>	<u>Clerks</u>	<u>Total Personnel</u>	<u>Cars and Pickups</u>	<u>Motorcycles</u>	<u>Total Vehicles</u>
General Directorate of Livestock Services	9	0	8	17	4	0	4
Animal Health Division	99	291	5	395	78	150	228
Animal Industry Division	126	347	6	479	23	0	23
Veterinary Laboratory Division	61	100	12	173	10	0	10
Animal Movement and Census Division	4	25	36	65	10	0	10
TOTAL	299	763	67	1129	125	150	275

The division of Control of Stocks and Animal Movement (DICOSE) carries out the animal identification program. The animal identification system is very sophisticated and includes yearly census of all animals and a permitting system for all types of animal movements. The system allows trace-back of animals to the herd of origin.

Conclusion:

We consider Uruguay to have adequate legal authority, policies, and infrastructure to carry out FMD control and eradication programs. The veterinary service has always been timely and transparent in its communications regarding their animal health status. On both of the recent FMD introductions, Uruguay has unilaterally suspended the certification of products for export as a measure to protect its trading partners. Uruguay has the necessary veterinary infrastructure to detect and respond to FMD outbreaks, control and enforce movement restrictions, enforce compliance with zoosanitary regulations, and certify compliance with international sanitary trade requirements. The technical infrastructure is adequate and advanced technologies (e.g. GIS mapping) are utilized in conducting several animal health programs.

Figure 1: Geographic distribution of animal health offices

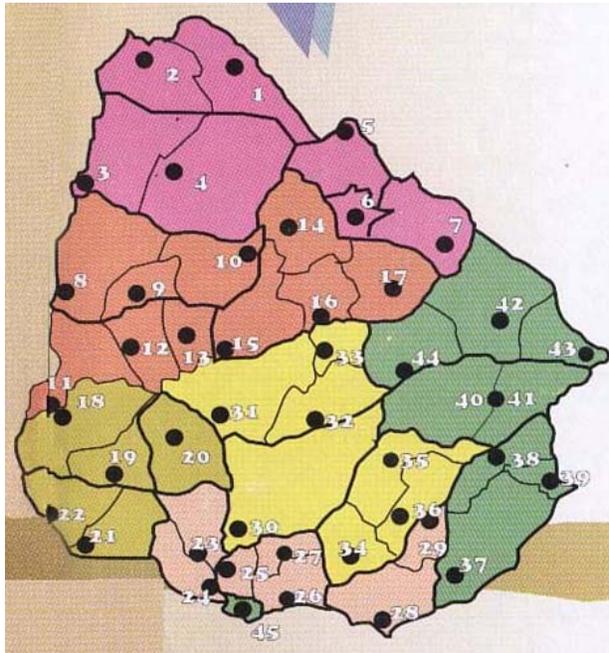
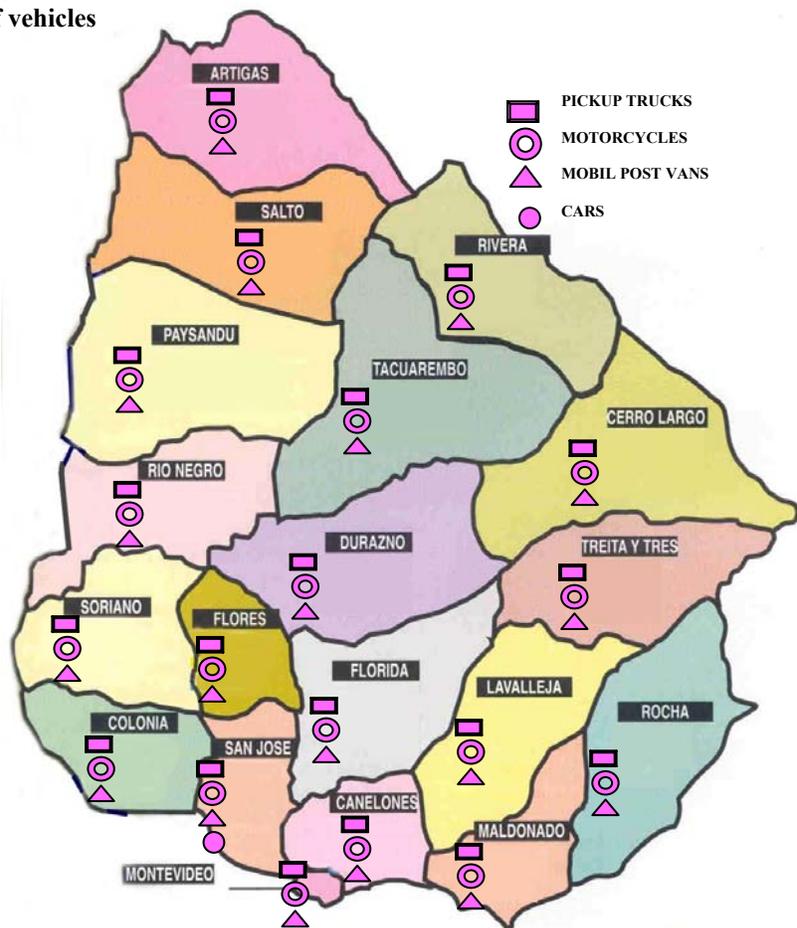


Figure 2: Geographic distribution of vehicles & mobile units by Department



Disease status, emergency response, and quarantine operations

Chronology of the outbreak:

The first suspicion of FMD was reported on April 23, 2001, in the department of Soriano. The disease was clinically confirmed on April 24, and the official laboratory confirmed the diagnosis on April 25. On May 3, the Pan American Center for Food and Mouth Disease (PANAFTOSA) confirmed the virus type as serotype A. The disease was soon confirmed in the department of Colonia, most likely due to a separate introduction of the virus. According to Uruguayan officials, the disease was reintroduced in the country, probably through mechanical introduction from active disease outbreaks in Argentina. Mechanical introduction was suspected because the virus type (serotype A) identified is identical to the virus type in Argentina and there was no evidence that species susceptible to FMD have been introduced into Uruguay from Argentina.

The last focus of FMD reported by Uruguay was on August 21, 2001. A total of 2057 foci of the disease were registered during the epidemic. A total of 76,842 cattle were affected from a total population of 15,522,399; a total of 228 sheep were affected from a total population of 913,249; and 112 pigs were affected from a total population involved of 7,598. Overall the disease was confirmed in 18 departments in the country. There was intense movement of trucks carrying both rice and sorghum during the outbreak, particularly movement toward the eastern part of Uruguay. Such movement may have contributed to the spread of the disease, as the outbreak began during the sorghum harvest.

Emergency actions:

On April 24, Uruguay immediately banned all animal movements in the department of Soriano and started the stamping out of all infected and in-contact animals in affected farms. Export certification and slaughter were discontinued. By April 26, the ban on movement of animals was extended to Colonia with the support of the police and army personnel. The ban was extended to the rest of the country on the April 27, and included all slaughter activities, public auctions, and markets. The ban on animal movement was maintained until June 7, the conclusion of the first cycle of emergency vaccination. All major roads were blocked, and all schools, offices, stores, and other public gathering places were closed (e.g., police brought food to people).

Uruguay adopted an emergency ring vaccination approach, coupled with stamping out of animal populations within the outbreak zone, and of exposed cattle within a 10-km radius of affected herds. However, because the spread of the disease was so extensive, Uruguay adopted a mass-vaccination policy on May 5, which will continue into 2003.

Previously, a small outbreak of FMD (one farm) occurred in Uruguay in the department of Artigas bordering Brazil in October of 2000. Before that, FMD had not been reported since 1990. This was attributed to Uruguay's adoption of an eradication policy using oil-based vaccines. In 1993, Uruguay declared itself free of FMD with vaccination. Vaccination against FMD was prohibited in 1994.

The site visit team verified the information submitted by Uruguay during discussions with officials and during a visit to the La Macarena Beef Cattle Ranch in San Jose. The team requested data necessary for the quantitative model. The team was interested in documenting the number of outbreaks that occurred in vaccinated cattle populations when Uruguay was carrying out its eradication campaign in the late 1980s and early 1990s (*Tables 2 and 3*). The number of outbreaks during that period will be used in the quantitative assessment to estimate the herd prevalence in the cattle population.

Polyvalent oil-adjuvant vaccines were gradually introduced in Uruguay during 1989-1990. This type of vaccine provides long-lasting immunity (1 year in revaccinated cattle) while saponin-adjuvant vaccines provide a short 4- to 6-month immunity or protection. Vaccine production in which FMD virus is inactivated with formaldehyde in was abandoned, because most vaccine-associated outbreaks occurred in

animals vaccinated with formaldehyde-inactivated vaccines. First order inactivation methods with binary ethylenimine (BEI) were adopted in Uruguay and progressively extended in all adjacent regions.

Table 2: Primary and Secondary FMD outbreaks occurring in vaccinated cattle in Uruguay

<i>Year</i>	<i>Virus Type</i>	<i>Primary</i>	<i>Secondary</i>	<i>Total</i>
<i>1988</i>	<i>Virus "C"</i>	<i>1</i>	<i>6</i>	<i>7</i>
	<i>Virus "O"</i>	<i>1</i>	<i>2</i>	<i>3</i>
<i>1989</i>	<i>Virus "C"</i>	<i>1</i>	<i>28</i>	<i>29</i>
	<i>Virus "O"</i>	<i>1</i>	<i>32</i>	<i>33</i>
<i>1990</i>	<i>Virus "C"</i>	<i>1</i>	<i>0</i>	<i>1</i>
	<i>Virus "O"</i>	<i>2</i>	<i>14</i>	<i>16</i>
	<i>Virus "A"</i>	<i>1</i>	<i>16</i>	<i>17</i>
<i>Total</i>		<i>8</i>	<i>98</i>	<i>106</i>

Source: Review of FMD Epidemiological Investigation Records 1988 to 1990, Animal Health Programs, Animal Health Division, General Department of Livestock Services, Ministry Agriculture, Livestock & Fisheries (DSA-DGSG-MGAP) Uruguay.

Table 3: Number of FMD outbreaks and species affected in Uruguay – 1988-1994.

<i>URUGUAY - MASS-VACCINATION PROGRAM 1988-1994</i>							
<i>Year</i>	<i>Outbreaks N° Farms Involved</i>	<i>Bovine Affected</i>	<i>Bovine Exposed</i>	<i>Ovine Affected</i>	<i>Ovine Exposed</i>	<i>Swine Affected</i>	<i>Swine Exposed</i>
<i>1988</i>	<i>10</i>	<i>106</i>	<i>6.891</i>	<i>4</i>	<i>14.443</i>	<i>45</i>	<i>133</i>
<i>1989</i>	<i>62</i>	<i>1.855</i>	<i>64.851</i>	<i>42</i>	<i>96.972</i>	<i>128</i>	<i>616</i>
<i>1990</i>	<i>34</i>	<i>557</i>	<i>20.361</i>	<i>60</i>	<i>22.664</i>	<i>13</i>	<i>98</i>
<i>1991</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>1992</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>1993</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>1994</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>Total</i>	<i>106</i>	<i>2.518</i>	<i>92.103</i>	<i>106</i>	<i>134.079</i>	<i>186</i>	<i>847</i>
<i>Mean</i>	<i>15</i>	<i>360</i>	<i>13.158</i>	<i>15</i>	<i>19.154</i>	<i>27</i>	<i>121</i>

Source: Animal Health Division-General Department of Livestock Services (DSA-DGSG) Uruguay Reports to OIE.

Beginning in 1991 and up to 1994, all cattle in Uruguay were vaccinated with polyvalent, oil adjuvant BEI-inactivated vaccines. It was clear from the data presented that no outbreaks were recorded after Uruguay completely switched to polyvalent oil-adjuvant vaccine.

Team members were interested in FMD detection time (estimated time between disease introduction and detection by official authorities) by the official authority under the mass vaccination scenario. The team requested historical data of estimated detection times under both vaccination and non-vaccination scenarios. After discussions with Uruguayan officials, it was determined that because of the efficacy of the oil-adjuvant vaccine in protecting animals, there were no estimates for detection time available under a vaccination scenario. However, Uruguay provided historical data on response time by their veterinary services after onset of clinical signs under both scenarios (*Tables 4 and 5*). These values indicate

Uruguay's adequate response to FMD reports; however, they do not provide an estimate for the detection time.

Table 4: Response time by Uruguayan animal health officials to FMD outbreaks under vaccination scenario 1988-1990.

<i>Time estimated from onset FMD clinical signs to attention by animal health officials</i>	<i>Number of outbreaks</i>	<i>Proportion out of total outbreaks</i>	<i>Cumulative proportion</i>
<i>Less than 24hrs</i>	42	0.40	0.40
<i>1 day</i>	43	0.41	0.81
<i>2 days</i>	11	0.10	0.91
<i>3 days</i>	9	0.08	0.99
<i>4 days</i>	1	0.01	1.00
<i>Total</i>	106	1.00	

Source: Review of FMD Epidemiological Investigation Records 1988 to 1990, Animal Health Division, General Department of Livestock Services, Ministry Agriculture, Livestock & Fisheries, Uruguay.

Table 5: Response time by Uruguayan animal health officials to FMD outbreaks under non-vaccination scenarios.

<i>Time estimated from onset FMD clinical signs to attention by animal health officials</i>	<i>Case Frequency</i>	<i>Proportion</i>	<i>Cumulative</i>
<i>> 24 hours</i>	109	0.3597	0.3597
<i>1 day</i>	95	0.3135	0.6733
<i>2 days</i>	44	0.1452	0.8185
<i>3 days</i>	22	0.0726	0.8911
<i>4 days</i>	13	0.0429	0.9340
<i>5 days</i>	8	0.0264	0.9604
<i>6 days</i>	8	0.0264	0.9868
<i>7 days</i>	3	0.0099	0.9967
<i>8 days</i>	1	0.0033	1.0000
<i>Total</i>	303	1.00	

Source: Database Animal Health Programs (DSA-DGSG-MGAP Uruguay).

Main lessons learned from the outbreak:

Uruguayan officials indicated several lessons learned as a result of the outbreaks. They indicated a need:

- To review & strengthen their commitment with regional coordination agreements.
- To improve public awareness about prevention, control, & eradication strategies and actions.
- To increase disciplined & professional training in emergency operations task forces.

An FMD prevention public awareness campaign has been launched. The campaign includes production and distribution of FMD prevention educational materials (*Table 6*).

Table 6: Foot-and-Mouth Disease Education Campaign

DATE	ITEMS BOUGHT	QUANTITY	COST US\$
April 2001	Information leaflets (school)	600,000	\$37,800
May 2001	Leaflets for tourists and prevention posters	300,000	\$27,190
May 2001	Videos (school and high-school)	4,000	\$23,250
June 2001	Videos (TV prevention campaign)	2,500	\$11,800
July 2001	Radio broadcast		\$18,596
September 2001	Posters on vaccination in auctions	3,000	\$7,460
October 2001	Radio campaign		\$18,446
December 2001	Vaccination campaign in radios		\$18,371
December 2001	Almanacs on vaccination 2002	65,000	\$22,830
December 2001	FMD campaign for tourists entrance	500,000	\$24,930
December 2001	Stickers on FMD prevention	200,000	\$18,430
March 2002	Posters on road sides	40	\$9,680
April 2002	Radio campaign for April 2002 vaccination		\$9,680 and \$4,780
TOTAL			US\$ 298,243

Meetings with producers and communities are being organized and conducted continually:

Meetings with farmers and veterinarians

- 2001: 104 meetings
- 2002: 86 meetings

Meetings with members of the National Sanitary Emergency System (SINAESA)

- 2001: 3 meetings
- 2002: 2 meetings

Meetings with members of the Sanitary Emergency Departmental Commissions

- 2001: 19 meetings
- 2002: 1 meeting

Lectures in schools and high schools, 2001: 18 lectures

Animal Health Departmental Commissions (CODESA)

- 2001: 66 meetings
- 2002: 56 meetings

Animal Health National Honorary Commission (CONAHS)

- 2001: 48 meetings
- 2002: 22 meetings

A program has been set up for indemnification containing \$12,000,000. The money is obtained through instituting a 0.2% tax on all animals. Indemnity is paid based on replacement value for animals rather than the slaughter value, which could be an incentive for producers to report the disease. Animals are assessed by a team consisting of a government employee, a producer, and an assessor.

Uruguay's Veterinary Services has historically fulfilled timely and regular reporting to reference organizations and trade partners in accordance with OIE standards as well as the principles of the SPS-WTO Agreement. Particularly in the recent reintroductions of FMD in 2000 and 2001, OIE and trade partners were promptly notified within 24 hours on the basis of clinical diagnosis before laboratory FMD serotype and virus isolation confirmation results were available. Additionally, export health certification and shipments of potential risk products were stopped, consistent with the strong commitment of the authorities to guarantee an appropriate level of sanitary protection and risk mitigation to its international markets and trade partners.

Regional approach to FMD eradication:

Uruguay is bordered by Argentina to the west and north and Brazil to the east and north. Neither Argentina nor Brazil is recognized as FMD-free by the United States. Argentina and Brazil had recent outbreaks and are currently vaccinating animals. Paraguay was considered free with vaccination by OIE; it reported an outbreak in October 2002. The US does not recognize Paraguay as free of FMD.

To address FMD, the countries in the area are taking a regional approach to eradication. In June 1987, the governments of Argentina, Brazil, and Uruguay, jointly with the Pan-American Center (PANAFTOSA – PAHO) FMD and Animal Vesicular Diseases Regional Reference Organization for the Americas, signed an International Cooperation Agreement for the Eradication of FMD. Since 1988, the Regional Agreement introduced coordination of the national programs activities and procedures, harmonization in the type and composition of vaccines, and vaccination schedule programs in the region. During the 1990s, BEI-inactivated, polyvalent, oil-adjuvant vaccines were extensively used, reaching full mass-vaccination coverage of the region's cattle populations. This improved control activities and resulted in eradication of FMD in adjacent border countries. The Cuenca de la Plata Regional Project is expecting to have an updated regional plan by October 2002 which will include a goal for eradicating FMD by the year 2009. Members of this group include: Uruguay, Argentina, Brazil, Paraguay, and Bolivia.

Uruguay believes that a regional approach is necessary, which is why it has participated in developing the Cuenca de la Plata Project. Even with epidemiological surveillance, border controls, and public information campaigns, it is usually just a matter of time before a country gets a highly infectious disease if it is present just across the border. This could affect Uruguay's ability to remain free of FMD without vaccination in the future.

Conclusion:

Uruguay has the ability to detect, respond to, and control incursions of FMD in an effective way. Uruguayan authorities presented sufficient evidence to indicate that the outbreak was completely under control.

Uruguay showed a particular ability in adjusting its emergency response appropriately as the outbreak evolved. However, in the past 2 years, Uruguay reported two outbreaks, both due to the introduction of FMD from neighboring countries. Careful consideration of the FMD situation in the region needs to be included in assessing Uruguay's status. In that regard, the situation has improved from 2001; Argentina seems to have brought its FMD outbreak under control, as it last reported FMD in January 2002, and the southern state of Rio Grande do Sul in Brazil did not report any outbreak since 2001.

Although the private sector appears to be strongly committed to FMD eradication programs, it was not clear what the role of the private sector was during the epidemic.

Vaccination and eradication

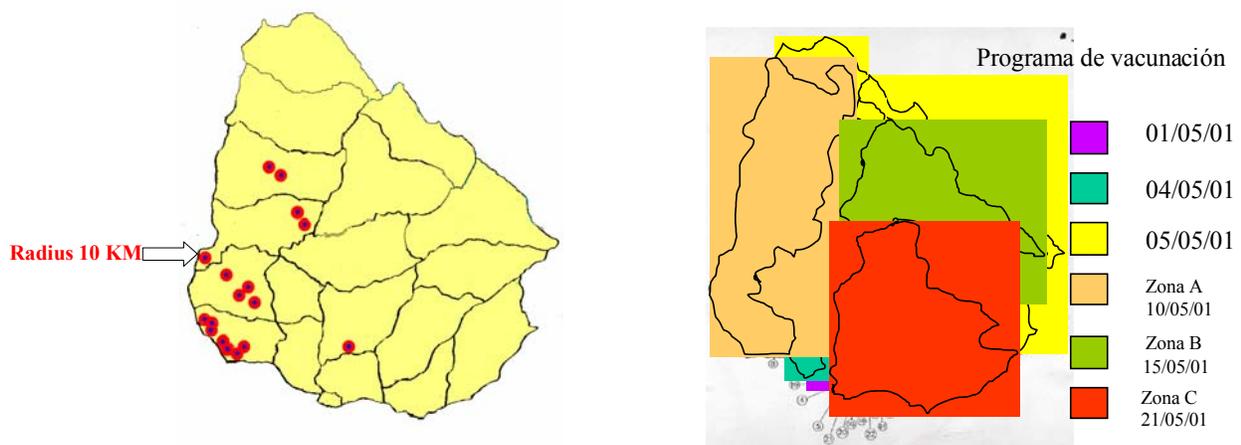
Emergency vaccination:

During the outbreak, FMD vaccination first started as 10-km ring vaccination around foci. Buffer zones were established around the foci and all cattle within buffer areas were vaccinated. In May 2001, as the outbreak expanded and ring vaccination did not limit the spread, authorities implemented strip vaccination along a line going from north to south isolating the western area of Uruguay. The disease continued to spread, and on May 5 a national campaign to vaccinate cattle was started. Neither sheep nor pigs were vaccinated.

Summary and chronology of emergency vaccination:

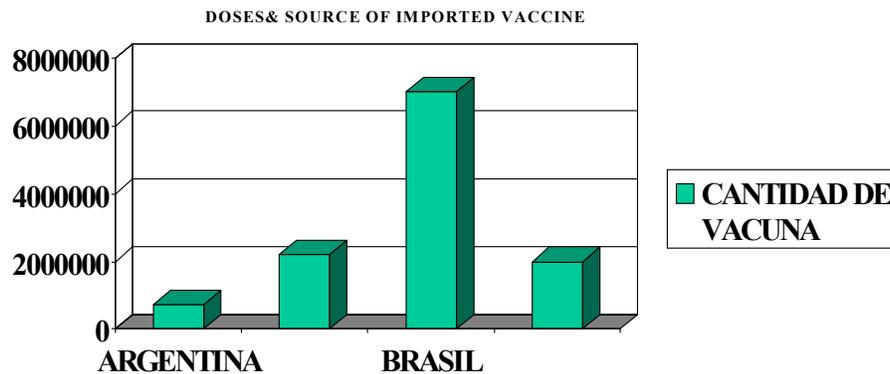
- Ring & zone buffer vaccination April 28–May 5, 2001 (**Figure 3**)
- First round mass vaccination May 5 – June 7, 2001
- Second round mass vaccination June 15 – July 22, 2001
- Special calf vaccination November 2001
- All cattle February 2002
- All cattle May 2002
- Calves November 2002
- All cattle February 2003
- Cattle less than 2 years of age May 2003

Figure 3: Emergency vaccination May 2001



FMD vaccines are not produced in Uruguay. Vaccines were purchased from both Brazil and Argentina (**Figure 4**). Initially a trivalent (A, O, C) oil-adjuvant vaccine was used for the ring and first mass vaccinations. Starting with the second mass vaccination, Uruguay began using a bivalent (A, O) vaccine. Uruguay randomly tests FMD vaccines it imports for quality control.

Figure 4: Number of doses and sources of FMD vaccine



Source: MGAP [SIC]

The government is paying for all the vaccine through 2002 because it is distributed as emergency vaccination. However, this may change depending on whether the government decides to continue vaccination on an emergency basis. The first vaccine including A, C, O was purchased for 27-33 cents/dose, and the vaccine including A and O was purchased for 19-23 cents/dose.

Compliance with vaccination:

Approximately 25-35% of premises and 35 - 45% of cattle are inspected for vaccination compliance in each vaccination cycle. All premises that have been designated as a risk premises must be vaccinated by an official or an accredited veterinarian. A risk premises is identified based on location, nationality of owner, or history of non-compliance. As an example, in Colonia there are 18 farms owned by Argentines and all are considered high-risk farms. The Colonia regional office reported 35 non-compliant farms (some farmers forgot the correct date or time, a few because they didn't want to vaccinate). The regions develop a plan to monitor for compliance so that not all the same farms are checked each time; however, the high risk farms which are checked every time, as they are vaccinated by an official or accredited veterinarian.

Uruguayan authorities visit farms to inspect vaccination activities. Inspection activities were carried out during November 2001 and during February and May 2002. During November 2001, a total of 15,025 holdings were visited, for direct control, and 72 farmers were found to be non-compliant with date and time assigned for vaccination. During February 2002, 16,909 holdings were visited, and 116 non-compliant farmers were reported. During May 2002, 12,542 holdings were visited, and 87 non-compliant farmers were detected. It was mentioned to the team that non-compliance means that the farmers were not applying the vaccine on the date and time assigned, but all of them applied the vaccine under direct official supervision.

Storage conditions for the vaccine are temperature-controlled. Throughout the country, there are 33 cold storage centers throughout the country and 194 distribution centers. The producers are instructed to bring a thermos with them. If they do not have a thermos, one is supplied to them. The vaccine is given to the producer 2 days prior to the date and time assigned to them for vaccination. They must vaccinate on their specific date and time. This allows for verification visits. An extensive training campaign is held to teach producers about the vaccine. A form is filled out in order to receive vaccine, and a second form is filled out for verification. Usually 13-15% more vaccine doses are distributed than the actual bovine population to accommodate new animals on premises and vaccine losses.

Conclusion:

Uruguay has the capability and infrastructure to carry out FMD vaccination programs. Controls are implemented through vaccination registries, census update through the Animal Registration System (DICOSE), and direct inspection by animal health officials. There is sufficient evidence to demonstrate that Uruguay can achieve high coverage levels (above 99%) through its massive vaccination program. The coverage level reaches 100% for animals moving to slaughter, as movement permits are not issued without verification of the vaccination status of all animals on the farm of origin.

During the epidemic and afterwards, FMD vaccines were available from neighboring countries at no cost to producers, which indicates easy access to vaccine supplies to move forward with vaccination plans.

Disease surveillance

Active surveillance:

Because of the vaccination status in the country, the team focused on reviewing Uruguay's active surveillance program. Uruguay has conducted two surveys in cattle to detect serum antibodies against FMD viral non-structural protein (NSP), using the 3ABC ELISA test. This test is specifically used to differentiate antibodies due to infection from those due to vaccination.

The surveys were conducted according to three geographical strata around clinical foci of the disease. The first stratum (stratum I) included farms with clinical cases within an area of 5 km from the center of the focal farm; the second stratum (stratum II) included farms located 5-10 km from the focus; and the third stratum (stratum III) included farms located more than 10 km from the center of each focus. Both strata II and III did not include farms that had clinical disease. Similar surveys were conducted for sheep using the VIAA agar gel test.

The first survey was conducted in September 2001. A total of 203 cattle farms were sampled, and of 6859 samples tested, 298 were positive. The overall prevalence in cattle was estimated to be $9.26\% \pm 2.28\%$. According to geographical strata, the prevalence was $11.08\% \pm 2.89\%$ in stratum I; $2.75\% \pm 0.84\%$ in stratum II; and $2.07\% \pm 0.93\%$ for stratum III. The second survey was conducted in February 2002 with a total of 199 cattle holdings sampled. Out of 6883 samples tested, 101 were positive. The prevalence in cattle was estimated to be $2.31\% \pm 0.52\%$; and according to geographical strata was $2.77\% \pm 0.79\%$ in stratum I; $2.41\% \pm 0.90\%$ in stratum II; and $0.63\% \pm 0.33\%$ for stratum III. The prevalence in sheep was estimated to be 1.14%. The next serological survey is scheduled for November 2002.

The results of the two serological surveys made it difficult for the team to evaluate whether wild-type virus is present or absent in the country. The team was not able to ascertain whether positive results to the 3ABC ELISA survey in the second survey (101 positive sera) were a response to recent infection, a result of using unpurified FMD vaccines, or due to false-positive tests. Unpurified FMD vaccines may give a positive 3ABC ELISA result.

However, the team felt that the positive results are more likely due to the use of partially purified or unpurified vaccines, or due to false-positive tests for the following reason: the declining pattern of FMD prevalence in the two surveys indicates that the positive response may not be due to infection, particularly for strata I and III. However, the distribution of the holding was quite comparable among the three different strata, which suggested false-positive tests since both strata II and III did not include farms with registered FMD cases at any time during the outbreaks. Moreover, when the sera were further processed by the central laboratory (DILAVE) using 3ABC ELISA kits from a different source and the VIAA test, the number of positives was markedly reduced (**Table 7**). The 101 positive sera were distributed among 49 holdings scattered all over the country with no geographical or epidemiological relationship.

Uruguay is not using sentinel animals. Uruguay believes that sheep had very little involvement during the outbreak based on survey results and argues that sheep would be more useful as sentinels for FMD in serological surveys.

Table 7: Serological sampling in cattle 2002

Strata	Holdings sampled	Holdings with positive sera:		
		To UBI (1)	To Pirbright 3ABC	To VIAA (2)
I	59	18	7	10
II	65	16	6	5
III	75	15	5	2
Total holdings	199	49	18	17
Total samples	6883 (3)			
Total positive sera		101	29	31

(1) United Biomedical Inc. Long Island. New York.

(2) Virus Infection Associated Antigen.

The Division of Animal Health conducts regular official inspections for the purpose of detecting vesicular disease. These visits are carried out periodically by the field offices (**Table 8**). Uruguay has actinomycosis, BVD, and IBR. Bluetongue and vesicular stomatitis are exotic. In 2001 there were two suspicious cases of vesicular diseases. So far in 2002 there have been 13 field investigations with 4 samples being collected and sent to the laboratory with negative results. Pigs are only monitored for brucellosis at slaughter.

Table 8: Official inspections in holdings and animal concentrations carried out by the Field Department from the Division of Animal Health during the period 1998-2001

	1998	1999	2000	2001
Inspections of holdings (1)	10,909	8,126	10,666	19,291
Inspections of extractions from interdicted holdings (1) (2)	802	587	949	1,527
Inspections of animal concentrations (3)	1,628	1,261	1,344	693
Detection of outbreaks (4)	555	253	292	2,136 (5)
Sanitary control of interdicted holdings	633	327	478	172
Herd dispatch (6)	6,556	7,330	5,171	3,769
Sanitary control for exportation	1,229	206	263	217
Diary farm inspections (7)	353	291	529	241
TOTALS	22,665	18,381	19,692	28,046

Source: DSA – Field Department – Annual reports

(1) Visits by official veterinarians or technicians

(2) No animals may be taken from a holding interdicted for any reason, without previous supervision by the Official Services.

(3) Includes auctions, stock yards, and animal shows.

(4) Includes mange, ticks, lice, brucellosis, tuberculosis, FMD, and other.

(5) Includes the first visit to holdings with FMD outbreaks.

(6) Under the ticks eradication program, it includes inspections when leaving the holding and at arrival to destination.

(7) On the basis of the qualified milk program.

Laboratory support:

Uruguay has one central laboratory (DILAVE) and three regional laboratories. The central laboratory is the only one authorized to test for FMD. Only serological testing is done currently in Uruguay.

Confirmation of suspect cases is done at Pirbright, Plum Island, or PANAFTOSA. During an outbreak, the strain is re-checked every 3 months.

Standard operating procedures are in place for emergency cases. Slaughter houses periodically send samples to the laboratory. There is no location in Uruguay that is more than a 12-hour bus ride away; therefore, all samples are received within 24 hours of collection.

Conclusion:

The team believes that serological surveillance is adequate based on the surveys conducted in 2001 and 2002. Proper sampling schemes are in place; however, Uruguay did not provide clear criteria for result interpretation and testing schemes. There was no evidence submitted to indicate that any confirmatory tests (e.g., probang) were conducted on samples positive to the 3ABC ELISA. Although the team felt that positive 3ABC ELISA tests may not be a result of field virus, that possibility can not be totally excluded. More serological surveys may be needed to exclude the possibility of circulating FMD virus.

The team determined that the laboratory infrastructure is sufficient to run serological tests for FMD. The staff has good experience and is adequate in number to support the level of surveillance.

Movement controls and biosecurity

MGAP maintains an effective system of movement controls and import restrictions for all animals and animal products, passengers, and commercial shipments. Import requirements are set based on the following:

- National control mandatory regulations of the Animal Health Act (Law 3.606/1910), Importation Committee Risk Assessment & Meat Veterinary Inspection Official Regulations.
- Guidelines, Recommendations and Standards of the OIE and Codex Alimentarius.
- Definitions, Principles, & Disciplines of the SPS Agreement of the World Trade Organization (SPS-WTO) adopted by the national regulations set forth by Law 16.671/1994.
- Import-specific requirements are based on bilateral or regional agreements with trade partners.

All animals and animal products entering the country through ports and border crossings are subject to sanitary inspection by the animal health authority (*Tables 9 – 12*). Since 1992, the DGSG created an Importation Committee for products of animal origin. Its purpose is to recommend to DGSG whether to authorize an importation or not.

Table 9: Live animal importation 1999 – 2001

Year	Country	Ovine	Bovine	Swine	Equine	Camelid
1999	USA		4		9	
	Brazil	12			17	
	Argentina			2		
	Canada		3			
	Australia	2				
	Chile	1				
2000	USA				3	
	Germany				3	
	Brazil	29			9	
	New Zealand	1				
	Australia	12				
2001	USA		10		3	
	Brazil				1	
	Spain					4
Total		57	17	2	45	4

Source: MGAP 2002

Table 10: Animal products importation 1999-2001

Commodity	1999	2000	2001
BOVINE OFFALS	201,812	175,673	86,950
BOVINE MEAT PRODUCTS	17,517	21,053	37,075
PIG MEAT	5,861,800	4,877,645	10,789,790
PIG OFFALS	228,046	29,026	377
PIG MEAT PRODUCTS	562,867	524,543	732,781
POULTRY MEAT PRODUCTS	289,987	702,598	693,748
PATES	169,102	116,155	154,318
STUFFED PASTES	530,477	452,795	338,063
SOUPS	796,379	805,350	724,647
FAT & OILS	3,789,360	3,874,202	1,812,300
EGGS & DERIVATES	5,556,046	5,359,893	5,956,613
OTHER EDIBLE PRODUCTS	624,351	633,592	615,505
TRIPES	981,409	1,405,275	1,516,069
INEDIBLE PRODUCTS	192,576	74,722	432,204
TOTAL KILOGRAMS PER YEAR	19,801,729	19,052,522	23,890,440

- Pig meat accounts for 34% of total. Brazil, USA, Canada, Chile, & Denmark are main suppliers.
- Egg derivatives follow with 27%. Argentina & Brazil are main suppliers.
- Fat & oils ranks in third place with 15%. Argentina, Brazil, Canada, & USA are main suppliers.
- Tribes contribute 6%. Brazil & Argentina are main suppliers.
- Bovine offal imported from the USA accounts for 1% of the total weight.

Table 11: Importation of Semen & Embryos 2000-2001

	2000	2001
Bovine Semen	309,657 doses	296,197 doses
Bovine Embryos	163 units	1,013 units
Ovine Semen	220 doses	830 doses

- 73% of bovine semen is imported from USA.
- 24% of bovine semen is imported from Canada.
- 3% of bovine semen is imported from Australia, New Zealand & Argentina.
- 100% of ovine semen is imported from Australia & New Zealand.
- 55% of ovine embryos are from USA, 24% are from New Zealand & 21% are from Canada.

Table 12: Importation of other products 2000-2001 (in kilograms)

	2000	2001	Main Trade Partners
Wool (Lana)	2,738,895	3,322,125	Argentina-Australia-N.Zeland-USA
Leather (Cuero)	5,013,610	9,181,728	Brazil-Argentina
Hair (Pelo)	22,174	1,295	N.Zeland-Argentina-China
Dairy Products	512,884	381,843	Argentina-EEC-USA

Control of Commercial Shipments:

For each load of commercial shipment, an import permit (Documento Unico de Importacion, DUI) and a health certificate signed by a foreign government veterinarian are required. In addition, a declaration that provides information on port of entry, importer, broker, animal origin, species, breed, import purpose, quantity, and name and location of animal destination, or an affidavit must be presented by the importer (or agent) to the Uruguayan DSA import inspector and kept on file for future use (*Table 13*). All commercial shipments, including animals and animal products, must enter the country through an official border crossing point, seaport or airport (*Figure 5*).

Figure 5: Official control border crossing points, seaports, and airports for the import of animals and animal products

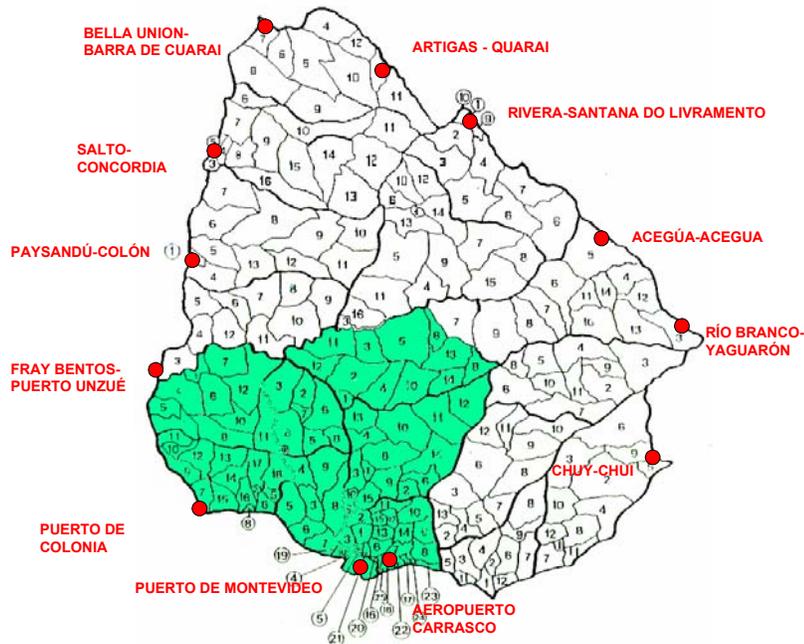


Table 13: Steps for importation of animals and animal Products

STEP	DOCUMENTS	RESPONSIBILITIES
1. Request of authorization for importation submitted to the General Director of the Livestock Services (DGSG), 1476, Mesa de Entrada.	Form. S/Imp001 Form. S/Imp002 Form. S/Imp003 Form. S/Imp004	Importer or his/her representative.
2. Registration of the process monograph and labels.	Process monograph, labels. Presentation of complementary documentation.	Presentation: importer. Registration: DIA's Technical Department and Department for the Sanitary Control of Dairy Products (DCSL). Importer.
3. Design of model Sanitary Certificates for importation of non-risk products from non-risk countries. The Committee for Risk Evaluation studies the cases of risk products and countries.	Sanitary Certificate. Technical report from the Committee.	General Department of Livestock Services (DGSG). Committee for Risk Evaluation.
4. Resolution of the DGSG: either grants or denies authorization for the importation.	Resolution in 4 copies. Notification of the interested party.	Director of the DGSG. Importer or his/her representative.
5. Request and send Border Certificate (Pase de Frontera) to the Border Point (Punto de Frontera) The Resolution from the DGSG is sent to the Border Point.	Border Certificate (Form.P/001) in fours copies. Copy of the Resolution from the DGSG.	Port of Montevideo. Importer. Importer. DCCI (Department for the Control of International Trade.)
6. The goods enter through the Border Point. Animals enter through a Border Point.	Sanitary certificate of origin. Affidavit (FormD/J001) Bill of lading Copy of DGSG's Resolution. The internal sanitary certificate is issued. A document of entrance is issued. The document of entrance is issued. Sanitary Certificate of origin. Border certificate. Service request.	Importer DCCI Importer DCCI
7. Arrival of goods at the authorized store and inspection of documents. Arrival of the animals to the quarantine station or to the approved place.	Internal sanitary certificate. Document of entrance Second copy of Border Certificate (if appropriate) Copy of sanitary certificate of origin. Document of entrance. Copy of sanitary certificate of origin.	Official Veterinary Services Interested party. Interested party. Official Veterinary Services at place of arrival.
8. Inspection of the goods. Re-inspection of animals	Form.Reinsp./001 Label Containers Product Serological tests Biological tests Vaccinations Treatments	Official Veterinary Services at the store. Official Veterinary Services at the place of arrival.

Table 13 (continued): Steps for Importation of Animals and Animal Products

STEP	DOCUMENTS	RESPONSIBILITIES
9.Sampling Microbiological analysis Radioactivity analysis Pathology Species verification analysis	Sampling document (FormA/M001) Sample submitted Report of results Form to retain samples (FormM/R/001) Sample submitted Sampling form Sampling document	DILAVE DINATEN DILAVE DILAVE
10.Goods are released Animals are released	Request for service Sanitary certificate of origin, according to Resolution of DGSG. Border certificate (if appropriate) Internal sanitary certificate or entrance document. Laboratory results (if appropriate) Radioactivity results (if appropriate) Certificate of release (if appropriate) Certificate of release.	DCCI DCSL Interested party Quarantine station staff Zone veterinarian.

Traceability and control of animal movement:

The Uruguayan system of traceability related to meat and meat products is handled by DGSG through two of its divisions, namely the Division of Control of Herds and Livestock movement (DICOSE) and the Division of Animal Industry (DIA).

The Animal Registration System - DICOSE:

DICOSE was formed in 1973 and its duties were established by Law No 14, 165 of 1974. The main duties of DICOSE are:

1. To control the stocks and movement of bovine, ovine, swine, and equine throughout the national territory.
2. To control the system of brands and marks.
3. To control the stocks of hides and wool and their movements throughout the national territory.

Control of animal movement including movement to slaughter:

The following is an outline of procedures required for registration and authorization of animal movement.

1. All farmers, producers, and slaughtering plants are required by law to register with DICOSE.
2. An affidavit is filled out with the following information:
 - a. Commercial name of the farm
 - b. Number of head classified by species and production category
 - c. Total area of the farm
 - d. Name of land holder (owner, lessee, tenant, etc.)
3. DICOSE assigns a number termed “DICOSE Number” consisting of 9 digits. The first two numbers or letters indicate the state, the second two are the police jurisdiction in that state, and the last five digits are the specific premise.
4. A DICOSE number is required before animals can be purchased. By June 30 of each year, animal owners must file an affidavit with DICOSE declaring births, deaths, changes in land extension, etc. A late filing fine (varies from US\$10-2000) is imposed on violators, and no movement permits are issued until the declaration is filed.

Some producers who own less than 10 to 20 animals are not required to register with DICOSE. This is an ongoing social problem, because if they register they will be considered wealthy enough not to receive social benefits for the poor. MGAP is working to rectify this issue, as many people who only own 10 animals often are poor and still need to receive social benefits. As a result, some animals in the rural areas are not registered.

5. All animals moving through the national territory must be accompanied by a waybill containing the following information:
 - a. The DICOSE number of the farm of origin of the animals.
 - b. The DICOSE number of the place of destination of the animals, i.e., farm or slaughtering plant.
 - c. Number of animals accompanied by the waybill, classified by categories (age, sex, etc.).
 - d. Purpose of the movement of animals, e.g., sale to another farm, grazing, slaughter, etc.
 - e. Itinerary to be followed. Movement patrols are carried out by the police department to inspect and verify truck routes. The police department receives 70% of the cost of the permits.
- Owners purchase the waybill for a fee (about US\$1). The state government office charges an additional 1% of the value of cattle being sold. As the state government office, DICOSE, and the police department are all receiving monetary benefits from these transactions, the incentive is there to work together.
6. The waybill is issued in an original plus three additional copies:
 - a. The original and the first copy are carried by the person in charge of transportation (truck driver, etc.) and accompany the animals. These copies must be stamped at the nearest police station to the place of destination. The original waybill is kept by the police who send it to DICOSE central offices, while the first copy is sent to the destination.
 - b. The owner of the animals (farm of origin) keeps the other two copies, which must be stamped at the nearest police station to the farm of origin. One of these copies is sent to the DICOSE central office and the other is kept by the owner as evidence.
 7. DICOSE central office receives the original waybill and the third copy. Using a computerized system, DICOSE keeps track of animals held by each farmer and their movement.
 8. In case of slaughtering plants, an affidavit is submitted on a monthly basis by each plant and must include the following information:
 - a. Name of the owner of the plant or abattoir.
 - b. Number of animals slaughtered in the month classified by categories.
 - c. Number of waybills received.
 - d. Destination of the hides.
 - e. Balance sheet of the animals slaughtered and hides obtained in the month.

All farms must keep movement records for 5 years. Owners of cattle must produce documents from at least 2 vaccination cycles before movement is permitted. No cattle movement is permitted nationwide in the first 15 days of the month in which vaccinations are taking place.

Specific to the state of Colonia:

A small airport is located in Colonia with sporadic flights arriving from Argentina. When passengers arrive, the airport calls MGAP, customs, and immigration. Any products confiscated are incinerated at the seaport in Colonia. All international garbage from airports, land borders, and seaports is incinerated.

There are 2 airports, 5 private seaports for yachts, 3 cargo seaports, 1 international cargo port, and 2 passenger seaports in Colonia. MGAP has 1 regional office and 2 local offices in Colonia and Carmelo. There are 15 livestock auctions which take place in the state, usually once a month. There are 2 slaughter plants for export.

Boats arriving from Argentina carrying both passengers and vehicles are checked by both MGAP and customs officials (immigration checks are carried out by Uruguay in Argentina). In Colonia there were 3 MGAP inspectors and 2 customs officials. Passengers were randomly checked. The inspectors take into account the passenger's profile as they decide whom to check. All vehicles are inspected. Items normally found and confiscated include: apples, dried fruit, sandwiches, and dulce de leche (a type of caramel). Confiscated items are examined and then incinerated. Vehicles arriving from Argentina by boat or from Argentina and Brazil by land must drive through a wheel dip and disinfection arc (*Figures 6 & 7*). While this is a good practice, the team noticed that there was no mechanism in place to clean the wheels from mud prior to driving through the wheel dip.

So far in 2002, Colonia had 2 FMD suspect cases (4/18/02 and 5/27/02). Uruguay must specify a diagnosis and cannot just report suspicion as negative for FMD. In these cases, the diagnosis was actinomycosis.

Figure 6: Geographic distribution of cleaning & disinfecting facilities

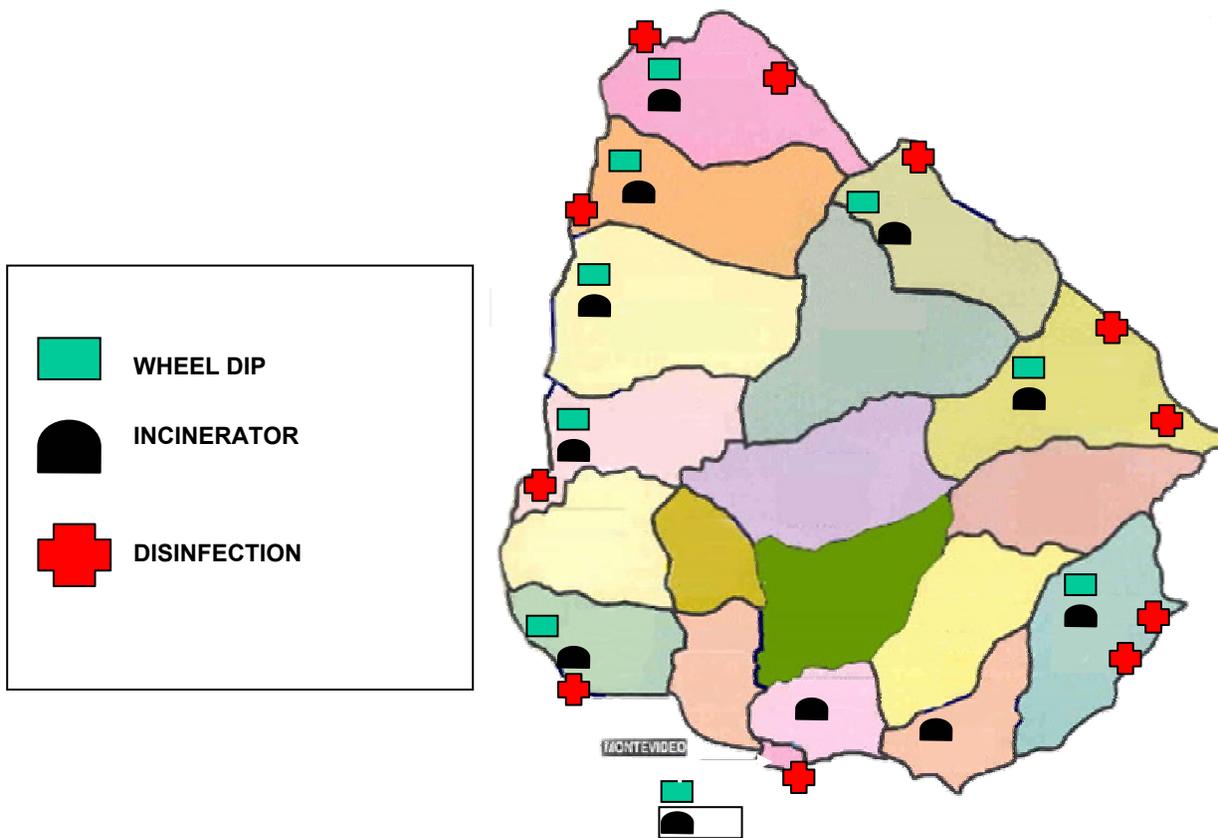


Figure 7: Disinfection facilities at the international bridge Fray Bentos – Puerto Unzué



Specific to the state of Soriano:

The regional office is located in Mercedes. Personnel are hired by the Federal government. Production includes: few dairies, very few pigs, and few sheep, mainly fattening of beef cattle, sunflower, sorghum, corn, wheat, and soybean. There are no slaughter plants authorized for export in the state. There are approximately 2,500 producers in the state, of which 42 are foreigners to Uruguay and 12 run their business for tourism (these 54 premises are considered high-risk).

During the vaccination cycle, the MGAP employees perform verification visits. If an owner doesn't vaccinate for any reason, the premises is declared to be high-risk. This means that the owner is (1) fined, (2) must now pay a private veterinarian to vaccinate his cattle, and (3) movement controls are put in place until 15 days after animals are vaccinated.

Specific to the Seaport in Montevideo:

The Buquebus is the boat carrying passengers and vehicles from Argentina. Customs and MGAP work together to check arriving passengers, baggage, and vehicles. MGAP has 5 veterinarians and 1

agricultural engineer working at the port. All checked baggage is X-rayed to look for organic material. All suspect bags are then hand checked, and negative bags are randomly sampled. All vehicles are inspected and must drive through a wheel dip as they leave the boat.

No animals enter through the seaport other than cats or dogs. Cats and dogs do not need import permits. No bird imports are allowed. The central MGAP office issues import permits (some may include special conditions). All imported products are opened. There is a low rate of rejection (usually rejections are due to paperwork problems).

Specific to Airport in Montevideo:

There are two large checked baggage x-ray machines and a smaller one for carry-on (**Figure 8**). MGAP and Cargo area officials check boxes coming in and also double-check the paperwork. Live animals are sent to the quarantine station.

Uruguay has recently initiated a declaration form for people entering the country. On this form passengers must declare if they are carrying any agricultural products. However, no system is yet in place to penalize anyone for not declaring an agricultural product.

Uruguay is separated from Argentina by the Uruguay River. There are no physical barriers that separate Uruguay from Brazil. The team visited the Fray Bentos Land Border Crossing with Argentina and had the opportunity to inspect movement control activities at the border. The team determined that inspection activities were adequate to control movements across the bridge.

Figure 8: Montevideo Airport



Conclusion:

The team concluded that Uruguay has an excellent system for traceability and control of animal movement, both internal and international. The animal registration system (DICOSE) and the permitting system for authorizing animals are strong components and are heavily utilized in conjunction with vaccination. A comparable system for control of commercial shipments also exists and is considered to be adequate to control import and export of products. Adequate biosecurity measures are in place at airports and seaports; however, it was difficult to determine their efficacy, particularly in light of the recent introduction of FMD.

Livestock demographics and slaughter processing

More than 48,000 cattle herds exist in Uruguay. Technically, all farms could be a source of export to the US if the market is re-opened. Uruguayan officials estimated that only holdings of 200 hectares and over could provide animals to slaughter plants on a regular basis. On this basis, officials eliminated from their estimates all dairy holdings and holdings under 200 hectares. DICOSE records showed the following: (a) the number of holdings eligible to export is 14,643 (30.2%); (b) the holdings total 8,570,874 head (80.9% from the total stock as per DICOSE June 2001 affidavit).

Livestock is marketed at public auctions (auctions/fairs). About 200 premises are approved by the Division of Animal Health to operate as sale yards within the country. More than 2,000 public auctions take place per year in Uruguay. More than 1 million cattle and around 2 million sheep are sold per year.

The average annual slaughter of cattle during 2001 was slightly higher than 1.7 million heads, with the following composition: 52% steer, 43% cows, and the remaining categories 5%. The annual production of beef reaches on average 420,000 tons, of which 250,000 - 270,000 tons are exported, while the remaining 150,000 – 170,000 tons are consumed domestically.

The swine population in the country is not large, since grain is not produced in Uruguay. There are approximately 300,000 backyard pig farms. Pigs were involved in the Artigas outbreak in 2000, but in the 2001 outbreak only those pigs fed milk from infected cows became infected (about 120). There are some swill feeders around Montevideo which are not under official control.

Currently there are 56 slaughter facilities in Uruguay, of which only 15 can export to the US. Some slaughter plants process more than one species. Slaughter plants are not allowed to buy animals at auctions, only directly from the farms where the animals have resided for at least 40 days before shipment.

Procedures for sending animals to slaughter:

In addition to movement restrictions mentioned in the previous section, there is a required 15-day withdrawal period after vaccination before animals can move or be sent to slaughter. Typically, there is one dealer in each department who is authorized to ship animals to an export slaughter plant. Animals must have been in Uruguay for at least 90 days and on the specific farm for at least 40 days before movement to slaughter is authorized. For all movement of animals to slaughter, the producer must first notify a private veterinarian of the proposed movement. The private veterinarian in turn notifies MGAP at least 48 hours prior to the movement, and purchases the yellow eartags and health certificate from MGAP. The veterinarian must examine all animals and put on the eartags. The producer then purchases a movement permit from DICOSE, and gets authorization from the police department.

MGAP initiated the yellow eartag system during this FMD outbreak. Whether or not the system will stay in place is still under debate. If Uruguayan officials decide to stop using the eartags; a different system would first be implemented. However, before any changes take place MGAP would first confer with NAFTA member countries and the EU.

Slaughter inspection system:

The Division of Animal Industry (DIA) controls the shipping waybills through its official veterinary services in slaughtering plants. Three official documents must accompany the truck to the slaughter plant: the eartag certificate, the health certificate, and the waybill. The DIA inspector checks all documents and registers part of the information from each document in an official registry. Animals are inspected on arrival at the plant and as many times as necessary (**Figure 9**). The last examination must be performed immediately before slaughter. Animals are assigned a “herd number” painted on their back, and are placed in an assigned pen. All animals must be rested for 12 to 24 hours before slaughter. All the animals

slaughtered at any approved plant must be subjected to a post-mortem examination of the carcass and all its parts, including offal, at the time of slaughter (*Figure 10*).

Figure 9: Antemortem inspection



Figure 10: Postmortem Inspection



Maturation and pH control:

Carcasses are chilled and allowed to mature for 24 hours at temperatures over 2°C, measured when the first carcass is entered into the chiller (**Figure 11**). When the chiller is full, the door is locked by the official veterinary inspector. The inspector records times and temperatures when the first carcass enters the chiller, at the moment the chiller door is closed, and again 24 hours after maturation has started. After 24 hours the chiller is opened, and carcasses are moved to the pH control station.

All meat processed for export must be pH-tested. Testing is done by plant personnel under strict supervision by DIA. The pH is electronically measured before deboning, in the *longissimus dorsi* muscle in cattle and in the *psoas* muscle in sheep and must be lower than 6.0 in both cases (**Figure 12**). In the past APHIS required a cutoff pH of 5.8 or lower as a condition for importation of matured deboned beef from countries where vaccination against FMD is practiced. The instrument used to measure the pH is calibrated according to the manufacturer's specifications. Carcasses with a pH reading equal to or higher than 6.0 is identified with a seal reading "R pH" (rejected due to pH), and are stored in a separate chiller. Rejected carcasses are diverted to local markets (**Figure 13**). The number of carcasses approved or rejected for export is registered in the pH control notebook.

Figure 11: Carcass maturation



Figure 12: Control of pH



Figure 13: Approved and rejected carcasses



Team members verified pH controls, maturation, and deboning procedures at the San Jacinto plant, which exports to the EU and other countries. Maturation records were examined, and actual rejected and approved seals were verified. There is a laboratory in the plant where pH calibration takes place on a daily basis. Calibration and rejection records were examined and verified (**Figure 14**). All records were found to be adequate.

Figure 14: pH Calibration



Procedures for exporting product:

At all times, the facilities and equipment must allow the identification of all parts of the animal each time the inspector deems it necessary (**Figure 15**). Veterinary Inspection must confirm that all the labels and inscriptions that appear on containers agree with the information appearing in accompanying documentation and with product characteristics.

Figure 15: Carcass labeling



All carcasses are deboned for the purpose of export. The deboning process consists of removing bones, major lymph nodes, and blood clots (*Figure 16*). After deboning the meat is packaged and labeled (*Figures 17 & 18*). Products processed for export are not commingled with any other products and are packaged separately from other products. Products are then inspected for export and stored until shipment (*Figure 19*).

Figure 16: Deboning



Figure 17: Packaging



Figure 18: Labeling



Figure 19: Product Storage



Products are chilled for a maximum of 15 days and can be frozen for up to 6 months. However, products are typically kept frozen for 1 to 2 months. All products must be re-inspected before they are approved for exportation. Products arriving at a warehouse are re-inspected by the DIA-IIC according to the regulations of the International Trade Control Department; data and information are recorded in the Internal Control Form (FIC) and inventory register. An International Sanitary Certificate issued by DIA must accompany all exported goods. It certifies the class, origin, and sanitary and hygienic conditions of the products. The certificates are adjusted to the requirements of the importing countries.

The slaughter plant labels boxes with an export sticker and the packaging date (which is usually 2 days after slaughter). At the exporting plant a veterinarian monitors the loading of a container, closes it with an official seal, and signs the certificate. The container can be sent directly to the port or to a cold storage facility near the port, where an MGAP veterinarian checks the seal and certificate. The cold storage facility is not permitted to make any changes to the shipment or to re-label any product. If needed, a box

can be traced to the lot at the slaughter plant, the state of origin, and to a range of 1-10 farms, depending on the situation.

Conclusion:

The team concluded that Uruguay has a system in place to update its livestock census and to control the movement of animals to slaughter. Uruguay has adequate control of inspection activities in slaughter plants, including ante- and post-mortem inspections and verification of maturation procedures and pH controls. The team felt that Uruguay has the ability to certify compliance with USDA's import requirements for matured and deboned beef.

Summary

Strong points

Uruguay has demonstrated its ability to respond in an organized way when FMD outbreaks occur. The veterinary service has always been timely and transparent in its communications regarding Uruguay's animal health status. On both recent introductions of FMD, Uruguay unilaterally suspended the certification of products for export to protect its trading partners.

Slaughter plants appear to be well managed and capable of aging beef properly, which would decrease the risk of the US importing FMD through meat products. Mitigation measures are in place with a sufficient work force to monitor the disease status of the country, thus decreasing the risk to a level in which it is unlikely that infected animals would be shipped to export slaughter plants.

Vaccination is widely practiced, with a good compliance rate and understanding among producers of its importance.

Weak points

In the past 2 years, Uruguay reported two outbreaks, both due to the introduction of FMD from neighboring countries. Careful consideration of the FMD situation in the region needs to be included in assessing Uruguay's status. In this respect, the situation has improved from 2001; Argentina reports that it has brought its FMD outbreak under control, as it last reported FMD in January 2002, and the southern state of Rio Grande do Sul in Brazil did not report any outbreak since 2001.

PANAFTOSA, through the Cuenca de la Plata program, has recognized the importance of a regional approach for the control of FMD and has initiated a series of in-country audits that have resulted in specific recommendations to strengthen FMD programs in the region.

Recommendations

Uruguay should continue to conduct periodic surveys to assess the potential circulation of FMDV in cattle and sheep.

Uruguay should continue with its public education and information campaigns to ensure quick reporting of suspicious cases.

Uruguay should initiate a system to ensure that agricultural products are declared upon entering the country (such as assessing penalties on violators).

Uruguay should continue to encourage and actively pursue regional FMD control activities.

Overall Conclusion

We believe that Uruguay has the ability to detect, control, and respond to FMD incursions in an effective way. Massive vaccination of the bovine population will limit the spread of FMDV and eventually will lead to eradication. There was no evidence of presence of FMD in the country. In terms of the importation of matured deboned beef, Uruguay can certify compliance with USDA import requirements.