PAN AMERICAN HEALTH ORGANIZATION
WORLD HEALTH ORGANIZATION

13th INTER-AMERICAN MEETING, AT THE MINISTERIAL LEVEL, ON HEALTH AND AGRICULTURE

Washington, D.C., 24–25 April 2003

Provisional Agenda Item 8.3

RIMSA13/8 (Eng.)
13 March 2003
ORIGINAL: SPANISH

THE SEAFOOD INDUSTRY

by Fernando Gracia
Minister of Health, Panama

CONTENTS

Page

Summary

1. In many countries of the Region, the fishing industry has considerable potential for supplying the animal protein necessary for feeding the population and generating products for export. The consumption of fish and other seafood is increasingly promoted as a healthy dietary alternative, because of its high protein and low fat content and the beneficial effects of the Omega-3 polyunsaturated fatty acids found in fatty (pelagic) fish.

2. Consumers demand that governments exercise the necessary oversight to meet their responsibilities with respect to the seafood production chain and the prevention of health risks and fraud through the sanitary surveillance of food. Society tends to procure the foods necessary for maintaining a healthy life based on its confidence in their safety, which is guaranteed by the proper handling of products in each link in the chain of production, from capture to consumption.

3. With the new inspection systems, the focus on risks to the consumer has shifted, because seafood products are only considered high-risk when there is no intermediate step to eliminate any known danger before they are consumed.

4. Analysis of the information generated by the epidemiological surveillance system facilitates characterization of the dangers and risks associated with the consumption of seafood products and the design and implementation of adequate prevention and control strategies.

Introduction

5. As in other countries, in Panama the fishing industry is very important in the supply of animal protein for the nation's population and for export. It is also a source of jobs and foreign exchange revenue for the country.

6. In its struggle for survival, mankind has always considered the sea an alternative source of the protein necessary for proper nutrition.

7. Due to ignorance and unfounded concerns, eating seafood was once considered to be dangerous. Today it is known that that assertion is untrue. A diet that includes fish is increasingly promoted for healthy eating, because of the high content of good quality proteins and low fat content of many white-fleshed species and because of the beneficial effects of the polyunsaturated Omega-3 fatty acids contained in fatty (pelagic) fish. These compounds are known to lower cholesterol levels and help to prevent cardiovascular disease. Thus, the health benefit is evident.

8. In 1928, Dr. Lehr, a veterinarian in Germany's government service, introduced the methodical, programmed sanitary inspection of seafood in the country's fish markets. The first person in the world to undertake this activity, he laid the groundwork for the sanitary inspection of seafood, basing his efforts on experiences with the sanitary inspection of livestock and the regulations governing that activity, in addition to the food laws of the period.

9. Consumers demand that their governments take action to guarantee the prevention of health risks and fraud in the seafood production chain. Society tends to procure the food products necessary for maintaining a healthy life based on its confidence in their safety.

10. Safety is guaranteed by proper food handling in each link of the food chain, from production to consumption, under the methodical eye of government inspectors with the appropriate scientific and technical knowledge to verify the "fitness" or "unfitness" of food for human consumption.

11. Compliance with the Food Law and its specifications, together with local and regional regulations, is compulsory; hence, these norms constitute the legal framework for consumer protection activities.

12. Consumers demand that the government conduct sanitary inspections on a regular basis. However, this involves greater attention not only to the seafood production chain, but to the organisms responsible for foodborne-diseases, and it can be accomplished only by ensuring the availability of an adequate number of trained professionals to perform the necessary tasks.

13. It should be noted that beyond the clinical role that part of society has assigned to veterinarians, Panama has made given this group of professionals primary responsibility for the sanitary inspection of food and, hence, seafood products, to preserve their safety and at the same time allow consumers to take greater advantage of these products. It has done so because of the emphasis on sanitary inspection of foods of animal origin (which are the most vulnerable products) and because of the academic training received by veterinarians in epidemiology, pathology, microbiology, toxicology, nutrition, public health, and environmental protection.

Food Safety Systems in the Chain of Production and Marketing

14. With the new inspection models, the sense of the risk to the population has changed. That is, seafood products are only considered high-risk when there is no intermediate step that eliminates a known health threat before the products are consumed,

and conversely, low-risk when there is an intermediate step that eliminates a known health threat before the products are consumed.

15. Panama uses the Guidelines for Epidemiological Surveillance of Foodborne Diseases, the VETAPAN Guide, which is a tool for information and epidemiological surveillance in the food chain. The country is currently attempting to introduce certain modifications to make the surveillance system more efficient, increasing the speed of information transmission and improving the sensitivity and specificity of the system.

16. Once a suspected case of foodborne disease and/or food poisoning is reported, the system is activated for the purpose of identifying the origin of the illness and thus prevent new cases. Different types of health professionals are involved in this system—i.e., veterinarians, epidemiologists, nurses, inspectors, and the entire logistical support staff.

17. Using risk analysis, food safety programs have carried out campaigns in which it has been established that, depending on the presumptive end use of the food, the food safety risks will be reduced, minimized to safe levels, or eliminated to prevent possible foodborne diseases or food poisoning.

18. The Ministry of Health of Panama, as the authority responsible for public health policy, oversees matters related to food safety through the Department of Food Protection and Zoonoses, an agency of the Bureau of Public Health. It has a multidisciplinary central office staffed with veterinarians, agronomists, chemists, biochemists, biologists, marine biologists, food engineers, lawyers, inspectors, agronomists, and administrators, as well as administrative support staff.

19. The Department of Food Protection and Zoonoses has more than 100 veterinarians in the different health regions of Panama, located in the nine provinces of the country. Under the constitution and by law, these professionals are responsible for monitoring the seafood production chain, verifying the safe handling of these products in storage facilities, fishing cooperatives in each province, small-scale and industrial fishing boats, and transport to domestic markets, up to the points of retail sale, such as public markets, seafood markets, fishmongers' stands, supermarkets, restaurants, and even export plants.

20. The central office has three sections with different responsibilities in the sanitary surveillance system:

(a) The Food Plant Inspection Section (INPLA), which the National Seafood and Aquiculture Inspection Service is part of.

(b) The Hygiene and Control Section, responsible for monitoring at the different distribution points and for food imports, seafood among them.

(c) The Sanitary Registry Section, which registers manufactured products for domestic and international distribution.

Policies, Legislation, and Regulations to Guarantee the Safety and Quality of Seafood Products

21. Under the Constitution, the Ministry of Health has Law 66, or the Sanitary Code, enacted in 1947, as the framework legislation for sanitary controls. Since its enactment, there has been compulsory veterinary inspection by the competent authorities throughout the chain of production, and fishing has subsequently been regulated through a number of Executive Decrees to provide local consumers and the export markets with food products that are nutritious, safe, and of good organoleptic quality.

22. Panama is one of the signatories of *Codex Alimentarius,* and its decrees essentially follow the *Codex* provisions. The country joined the World Trade Organization (WTO) in 1996, and since then, the following decrees on seafood products have been sent for harmonization to the WTO's *ad hoc* commission:

(a) Decree Executive No. 1, dated 03 January 1996, which institutes the *sanitary regulation of fishing and aquiculture products for human consumption*.

(b) Executive Decree 84, dated 10 June 1996, which details the *technical sanitary standards fort establishments, plants, vessels, and factory ships where fishing and aquiculture products are processed, transformed, preserved, and transported and the regulations governing sanitary inspection and controls.*

23. In order to comply the WTO requirements, Executive Decree No. 65 was issued in July 1997. This decree calls for compulsory implementation of the Hazard Analysis Critical Control Point (HACCP) methodology as a tool for guaranteeing food safety, including that of seafood products; it was superseded by Executive Decree No. 352, dated 10 October 2001, containing regulations on the compulsory application of sanitation standard operating procedures for cleaning and disinfection (SSOP), good manufacturing practices (GMP), and HACCP in slaughterhouses and plants involved in the processing, transformation, distribution, and sale of meat and dairy products, fish, eggs, and other products for human consumption.

24. These decrees have been harmonized with the European Union's Trade Regulations, Title 21 of the U.S. Code of Federal Regulations (21 CFR), and certification agreements with countries in the subregion. These latter require certification documents

(which vary with the destination of the exports), indicating, for example: saxitoxin levels within permissible limits and the absence of *Vibrio cholerae*.

25. In order to ensure up-to-date government and private inspection services, courses and seminars are offered on food safety topics, with multisectoral participation; 20 courses have been given since January 2001 to strengthen the surveillance of seafood for domestic and external consumption.

26. Panama is currently on List No. 1 of the countries approved to export seafood products to the European market.

27. In 2000, Panama was visited by staff from the U.S. Food and Drug Administration (FDA) to confirm the sanitary conditions of its export plants and the use of HACCP in each of them. Sanitary conditions and adherence to the HACCP methodology were considered satisfactory. A reinspection visit to a number of plants and an initial visit to new plants selected by the FDA are programmed for May of this year.

Institutional Structure of the Food Safety Program

28. In 1995, Panama created the National Commission on Food Protection (CONAPAL), comprised of government institutions, such as the Ministry of Livestock Development (MIDA), the Vice Ministry of Foreign Trade (VICOMEX), the Commission on Free Competition and Consumer Affairs (CLICAC), and nongovernmental organizations, such as consumer groups, livestock associations, and other entities linked with this issue.

29. Under Panamanian Law, the traditional inspection system has been expanded to include government audits, whose purpose is to verify the fishing sector's application and use of GMP, SSOP, and the food safety principles of the HACCP system. These audits are scheduled according to the type of establishment.

30. State and private laboratories are used to verify the safety of the final products, performing tests to guarantee the sanitary quality of seafood, basing their determination on microbiological and chemical criteria, such as the presence of toxic wastes and veterinary drugs in the aquaculture industry.

31. Panama's Ministry of Health operates the sanitary surveillance program for seafood, which is financed by the State and the private sector. Under Panamanian law a small fee is charged for food inspection services, lending financial sustainability to the process to maintain the sanitary surveillance of foods─seafood products among them. The fees are used to improve the monitoring of seafood processing establishments and

their final products, as well as of other establishments and foods of sanitary interest. This work is a not-for-profit undertaking, done to ensure safe food for the community at large.

32. There is continuous communication between the Ministry of Health and the associations and institutions working in health surveillance and food safety, among them: CLICAC, the universities, groups in the fishing sector (for local consumption and export), consumer groups, the Merchants and Food Association of Panama, ACOVIPA, and international technical cooperation agencies such as PAHO/WHO, FAO, and INFOPESCA.

Education and Community Participation

33. The Ministry of Health has an epidemiological surveillance system that covers the entire country. This system includes the sanitary surveillance of seafood and a system for the surveillance of marine toxins, especially saxitoxins, which are endemic to the Central American countries. If these toxins emerge and steps are not taken for their prevention and control, they can cause deaths among consumers and result in indirect economic losses from a drop in the domestic trade and export of the species involved. Sometimes an outbreak of disease caused by marine toxins can also affect the tourist industry.

34. The information produced by the epidemiological surveillance system is analyzed and facilitates the design and implementation of prevention and control strategies suited to the circumstances, thus averting the problems that could arise from the consumption of contaminated seafood. With this information, the active participation of the community and the implicated sector in the chain of production can be enlisted to adopt the prevention and control measures necessary for maintaining the safety of these products.

35. The Ministry of Health produces printed materials aimed at the different trade groups, providing orientations on how seafood products should be obtained and marketed. In every health region it has trained technical personnel, who conduct surveillance, control, and health promotion activities and offer courses in state and private training centers on sanitary food handling.

Technical Cooperation Required at the National, Regional, and Global Level

36. Notwithstanding that the quality of seafood has improved over the past decade thanks to the modernization of sanitary regulations and the implementation of quality assurance programs such as HACCP, SSOP, and GMP, technical cooperation is required in order to:

(a) Promote inter- and intrasectoral coordination, as well as coordination among countries, in food safety.

(b) Promote the review of food legislation to bring it up to date.

(c) Strengthen epidemiological surveillance of foodborne diseases (FBD)

(d) Strengthen the implementation of modern systems for sanitary quality assurance.

(e) Train human resources in public and private health centers in the areas of:

i. Epidemiology and epidemiological surveillance.

ii. Investigation of FBD outbreaks.

iii. Community health education methodologies and communication to raise awareness.

(f) Train human resources in the public and private fishing industry in:

i. Sanitation Standard Operating Procedures.

ii. Good manufacturing practices.

iii. Hazard Analysis and Critical Control Point methodology.

(g) Upgrade laboratory capacity and improve government and private laboratory networks.

37. Our staff has participated in regional seminars and national and international meetings on issues in food safety and seafood, with a view to replicating the knowledge acquired.

Conclusions and Recommendations

(a) Work to ensure that the quality of seafood products for the domestic market is equivalent to that of the products for export. To this end, efforts should be made to promote the application and development of good food handling practices and the Sanitation Standard Operating Procedures, as well as the application of HACCP principles in seafood processing plants whose products are destined for domestic consumption.

(b) Know the characteristics of the links in the food chain, from capture, to processing, to distribution in the markets, to be able to assess problems and offer viable public health solutions consistent with the reality.

(c) Ensure streamlined communication and coordination among the country agencies involved in the sanitary aspects of seafood products.

(d) Develop training programs for institutional and private sector personnel and offer community education and communication on good manufacturing practices,

sanitation standard operating procedures, and the Hazard Analysis Critical Control Point methodology to help people take responsibility for their own health.

(e) Obtain reliable and timely epidemiological information that can be used to guide the seafood industry in setting priorities and choosing sanitary strategies consistent with the reality.

(f) Foster joint projects among the agencies involved in seafood inspection, whose common purpose is to guarantee consumer health by generating appropriate information and knowledge to solve the priority problems identified by the surveillance systems.

(g) Modernize the countries' food legislation to reflect the advances in technology and promote harmonization of the legislation at the regional and global level to facilitate its application domestically and internationally.

(h) Reactivate and strengthen marine toxin surveillance networks, given the environmental changes currently under way and the likelihood that these problems will intensify in areas where outbreaks are endemic, seasonal, and/or cyclical.

(i) Upgrade the capacity of the national laboratories, especially in the identification of marine toxins and toxic waste.

References

Evaluación de la vigilancia epidemiológica de las saxitosinas en el litoral panameño. MINSA /DEPA 2001-2002. Panama.

Codex Standards for Fish and Fishery Products. FAO, 1st ed. 1989. Rome.

Fish and Fishery Products. FAO, 2nd ed. 2001. Rome.

Executive Decree No. 84, 10 June 1996. Ministry of Health, Panama.

Executive Decree No. 1, 3 January 1996. Ministry of Health, Panama.

Executive Decree No. 352, 10 October 2001. Ministry of Health, Panama.

El veterinario bromatológico y su especialización.

Annex

**Table 1. Chronological Report on Saxitoxin Control in Mollusks (Bivalves)
Panama, 2001[1]**

Date of report	Lab. No.	Origin	Product	Results
02-02-2001	106	Coclé	*Andara tuberculosa*	191.0 UR/100g
09-03-2001	807	Los Santos	*Loliolopsis diomedeae*	170.0 UR/100g
02-04-2001	946	Chorrera/ Public market	*Andara tuberculosa*	203.0 UR/100g
09-04-2001	1209	Veraguas / Guarumal Sur de Soná	*Andara tuberculosa*	212.0 UR/100g
11-04-2001	1361	Veraguas/ Guarumol	*Andara tuberculosa*	173.0 UR/100g
11-04-2001	1275	Chorrera/ Public market	*Donax assimilis*	235.0 UR/100g
11-04-2001	1274	Panamá Este/ Mamoní	*Andara tuberculosa*	250.0 UR/100g
11-04-2001	1280	Chiriquí/ Isla Boquita	*Andara tuberculosa*	208.0 UR/100g
11-04-2001	1276	Darién/ Fish market	*Solen rudis*	212.0 UR/100g
11-04-2001	1302	Darién/ Garachiné	*Andara tuberculosa*	207.0 UR/100g
11-04-2001	1303	Pmá Metro/ Public market	*Donax assimilis*	203.0 UR/100g
11-04-2001	1277	Chepo/ Coquira	*Donax assimilis*	189.0 UR/100g
11-04-2001	1279	Pmá Este/ Chiman	*Donax assimilis*	203.0 UR/100g
11-04-2001	1276	Darién	*Andara tuberculosa*	193.0 UR/100g
20-04-2001	1405	La Chorrera/ Public market	*Andara tuberculosa*	180.0 UR/100g
20-04-2001	1403	Chiriquí/ Isla Sevilla	*Andara tuberculosa*	182.0 UR/100g
20-04-2001	1404	Pmá Metro/ Fish market.	*Andara tuberculosa*	182.0 UR/100g

[1] Translator's note: Scientific nomenclature is used for the products to avoid confusion.

Table 1.Chronological Report on Saxitoxin Control in Mollusks (Bivalves) Panama, 2001 (*cont*.)

Date of report	Lab. No.	Origin	Product	Results
26-04-2001	1571	Lagartillo / Guararé	*Andara tuberculosa*	161.0 UR/100g
26-04-2001	1518	Veraguas	*Andara tuberculosa*	182.0 UR/100g
26-04-2001	1453	Veraguas	*Andara tuberculosa*	182.0 UR/100g
27-04-2001	1519	Port of Mamoní/ Aguadulce	*Andara tuberculosa*	179.0 UR/100g
27-04-2001	1481	Boca de Parita/ Monagrillo	*Andara tuberculosa*	175.0 UR/100g
08-05-2001	1634	Panamá Este/ Fish market	*Donax assimilis*	177.0 UR/100g
08-05-2001	1635	Pacora/ Fish market	*Andara tuberculosa*	182.0 UR/100g
16-05-2001	1713	Pmá Metro/ Playa Veracruz	*Donax assimilis*	231.0 UR/100g
16-05-2001	1712	Pacora/ Rio Bayano, Fish market / Panamá Metro	*Andara tuberculosa*	180.0 UR/100g
16-05-2001	1711	Veraguas	*Andara tuberculosa*	198.0 UR/100g
18-05-2001	1840	Coclé/ Boca Nueva Antón	*Andara tuberculosa*	172.0 UR/100g
18-05-2001	1848	Pedasí/ Los Santos	*Andara tuberculosa*	184.0 UR/100g
18-05-2001	1849	P. Metro/ Fish market	*Andara tuberculosa*	184.0 UR/100g
28-05-2001	2021	P. Metro/ Fish market	*Andara tuberculosa*	196.0 UR/100g
28-05-2001	1940	Herrera	*Andara tuberculosa*	200.0 UR/100g
04-06-2001	2110	P. Metro/ Fish market	*Andara tuberculosa*	177.0 UR/100g
04-06-2001	2111	Chiriquí	*Andara tuberculosa*	163.0 UR/100g
05-06-2001	2129	P. Oeste/MercadoPúblico	*Donax assimilis*	165.0 UR/100g

Table 1. Chronological Report on Saxitoxin Control in Mollusks (Bivalves) Panama, 2001 (*cont*.)

Date of report	Lab No.	Origin	Product	Results
20-06-2001	2450	P. Metro/ Fish market	*Andara tuberculosa*	214.0 UR/100g
20-06-2001	2466	Chiriquí	*Andara tuberculosa*	207.0 UR/100g
26-06-2001	2532	P. Metro/ Fish market	*Andara tuberculosa*	207.0 UR/100g
27-06-2001	2553	Coclé	*Andara tuberculosa*	203.0 UR/100g
28-06-2001	2590	Chiriquí	*Andara tuberculosa*	206.0 UR/100g
04-07-2001	2645	Chiriquí	*Andara tuberculosa*	203.0 UR/100g
06-07-2001	2684	P. Metro / Public market	*Andara tuberculosa*	182.0 UR/100g
11-07-2001	2775	Chiriquí	*Andara tuberculosa*	173.0 UR/100g
13-07-2001	2814	P. Metro / Boca La Caja	*Andara tuberculosa*	173.0 UR/100g
19-07-2001	2910	Chiriquí	*Andara tuberculosa*	161.0 UR/100g
26-07-2001	3055	P. Metro / Fish market	*Andara tuberculosa*	171.0 UR/100g
26-07-2001	3054	Chiriquí	*Andara tuberculosa*	164.0 UR/100g
31-07-2001	3101	P. Metro / Fish market	*Andara tuberculosa*	168.0 UR/100g
09-08-2001	3276	Chiriquí	*Andara tuberculosa*	177.0 UR/100g
09-08-2001	3277	P. Metro / Fish market	*Andara tuberculosa*	173.0 UR/100g
23-08-2001	3351	Chiriquí	*Andara tuberculosa*	172.0 UR/100g
23-08-2001	3550	Coclé	*Andara tuberculosa*	172.0 UR/100g
20-08.2001	3406	Pacific coast of Chiriquí	*Andara tuberculosa*	182.0 ur/100G
03-09-2001	3759	P. Oeste/ Public market	*Andara tuberculosa*	179.0 UR/100g

Table 1. Chronological Report of Saxitoxin Control in Mollusks (Bivalves) Panama, 2001 (*cont.*)

Date of report	Lab. No.	Origin	Product	Results
12-09-2001	267	La Trinidad – Río de Jesús Veraguas	*Andara tuberculosa*	179.0 UR/100g
12-09-2001	3955	La Trinidad – Río de Jesús Veraguas	*Andara tuberculosa*	179.0 UR/100g
18-09-2001	219	El Salado Beach Coclé	*Andara tuberculosa*	172.0 UR/100g
19-09-2001	3446	Pacific coast Chiriquí	*Andara tuberculosa*	182.0 UR/100g
01-10-2001	4333	Street vendors Darién	*Andara tuberculosa*	168.0 ur/100g

Standard Value <400 UR/100g

**Table 2. Chronological Report on Saxitoxin Control in Mollusks (Bivalves)
Panama, 2002**

Date of report	Lab. No.	Origin	Product	Results
21-02-2002	344-02	Public market La Chorrera	Bivalves *(Argopecten circularis)*	193.0 UR/100g
28-01-2002	294-02	Public market - Chorrera	*Donax assimilis*	179.0 UR/100g
02-02-2002	363-02	Chiriquí	Conchas	173.0 UR/100g
02-02-2002	385-20	Herrera	Conchas	178.0 UR/100g
04-02-2002	413-02	Isla Sevilla - Chiriquí	*Andara tuberculosa*	180.0 UR/100g
02-02-2002	436-02	Boca Chica- Boca Brava Chiriqui	*Andara tuberculosa*	177.0 UR/100g
08-02-2002	533-02	Guarare – Los Santos	*Andara tuberculosa*	164.5 UR/100g
08-02-2002	537-02	Fish market Metropolitan Region	*Donax assimilis*	175.0 UR/100g
08-02-2002	571-02	El Salado de los Guabos Chiriquí	*Andara tuberculosa*	>400 UR/100g
08-02-2002	570-02	Punta de Piedra, David Chiriquí	*Andara tuberculosa*	170.0 UR/100g
22-02-2002	851-02	Isla Sevilla Chiriquí	*Andara tuberculosa*	173.0 UR/100g
22-02-2002	852-02	Public market Panamá Oeste	*Andara tuberculosa*	166.0 UR/100g
22-02-2002	853-02	El Salado Beach Coclé	*Andara tuberculosa*	166.0 UR/100g
26-02-2002	742-02	Los Santos Districts	*Andara tuberculosa*	175.0 UR/100g
28-02-2002	995-02	Isla Mangote Chiriquí	*Donax assimilis*	173.0 UR/100g
28-02-2002	996-02	Palenque Chiriquí	*Andara tuberculosa*	163.0 UR/100g
01-03-2002	948-02	Fish market Metropolitan Region	*Donax assimilis*	170.0 UR/100g
01-03-2002	943-02	Isla Guerrero Chiriquí Region	*Andara tuberculosa*	165.0 UR/100g
01-03-2002	944-02	Port of La Albina, Soná District	*Andara tuberculosa*	173.0 UR/100g

Table 2.Chronological Report on Saxitoxin Control in Mollusks (Bivalves) Panama, 2002 (*cont*.)

Date of report	Lab. No.	Origin	Product	Results
01-03-2002	1040-02	Majagual - Dist. de Baru Chiriquí	*Andara tuberculosa*	168-0 UR/100g
07-03-2002	1230-02	Port of La Albina Soná- Veraguas	*Andara tuberculosa*	173.0 UR/100g
07-03-2002	1122-02	El Chumical Veracruz	*Donax assimilis*	173.0 UR/100g
07-03-2002	1180-02	Isla Sevilla Chiriquí	*Andara tuberculosa*	165.0 UR/100g
07-03-2002	1229-02	Majagual - Dist. del Baru Chiriquí	*Andara tuberculosa*	175.0 UR/100g
07-03-2002	1153-02	Punta de Piedra Chiriqui	*Andara tuberculosa*	168.0 UR/100g
18-03-2002	1228-02	El Salado Beach	Bivalves	168.0 UR/100g
18-03-2002	1240-02	Mouth of the Ajo Estuary – San Lorenzo	*Andara tuberculosa*	117.0 UR/100g
19-03-2002	1382-02	Majagual - Dist. Baru Chiriquí	*Andara tuberculosa*	168.0 UR/100g
25-03-2002	1523-02	El Salado Beach Aguadulce, Coclé	*Andara tuberculosa*	400 UR/100g
25-03-2002	1421-02	Mercado Publico Chorrera	*Donax assimilis*	166.0 UR/100g
25-03-2002	1524-02	Pacific Coast of Chiriquí	*Andara tuberculosa*	168.0 UR/100g
25-03-2002	1522-02	Mariscos Moreno Garachine - Darien	*Andara tuberculosa*	172.0 UR/100g
25-03-2002	1519-02	Pedasi Los Santos	*Andara tuberculosa*	164.0 UR/100g
27-03-2002	1555-02	Public market Panamá Oeste	Bivalves	166.0 UR/100g
27-03-2002	1609-02	Chepo	*Andara tuberculosa*	165.0 UR/100g
05-04-2002	1681-02	Isla Sevilla Chiriquí	*Andara tuberculosa*	173.0 UR/100g
03-04-2002	1680-02	Isla Sevilla Chiriquí	*Andara tuberculosa*	173.0 UR/100g
08-04-2002	1787-02	Pocri Los Santos	*Andara tuberculosa*	163.0 UR/100g
08-04-2002	1788-02	Port of La Albina Veraguas	*Andara tuberculosa*	161.0 UR/100 g

Table 2.Chronological Report on Saxitoxin Control in Mollusks (Bivalves) Panama, 2002 (*cont*.)

Date of report	Lab. No.	Origin	Product	Results
08-04-2002	1793-02	San Miguelito Region	*Andara tuberculosa*	161.0 UR/100g
08-04-2002	1794-02	Isla Batipa Chiriqui	*Andara tuberculosa*	173.0 UR/100g
08-04-2002	1767-02	El Salado Beach Coclé	Bivalves	168.0 UR/100g
08-04-2002	1896-02	Public market Panama Oeste	*Donax assimilis*	177.0 UR/100g
08-04-2002	1786-02	Beach at El Retén – Monagrillo- Herrera	*Donax assimilis*	Cantidad insuficiente de muestras (20g)
11-04-2002	1949-02	Herrera	Bivalves	166.0 UR/100g
11-04-2002	1965-02	El Salado Beach Coclé	*Andara tuberculosa*	170.0 UR/100g
11-04-2002	1966-02	Horconcito Chiriquí	*Andara tuberculosa*	171.5 UR/100g
18-04-2002	2055-02	Herrera Region	*Andara tuberculosa*	158.0 UR/100g
18-04-2002	2026-02	San Miguelito Region	*Donax assimilis*	154.0 UR/100g
18-04-2002	2004-02	San Miguelito Region	Bivalves	161.0 UR/100g
18-04-2002	1978-02	Chepo (Maje y Brujas)	*Andara tuberculosa*	163.0 UR/100g
18-04-2002	1983-02	Coclé - Antón (Boca Negra)	*Andara tuberculosa*	175.0 UR/100g
18-04-2002	2054-02	Los Santos – Tonosí (Cañas)	*Andara tuberculosa*	159.0 UR/100g

Table 2.Chronological Report on Saxitoxin Control in Mollusks (Bivalves) Panama, 2002 (*cont*.)

Date of report	Lab. No.	Origin	Product	Results
26-04-2002	2074-02	Estuary of Pedregal, David, Chiriquí	*Andara tuberculosa*	172.0 UR/100g
26-04-2002	2086-02	Sur Sona Vergaguas	*Andara tuberculosa*	175.0 UR/100g
26-04-2002	2170-02	Fish market Metropolitana Region	*Donax assimilis*	170.0 UR/100g
26-04-2002	2171-02	Herrera	*Andara tuberculosa*	168.0 UR/100g
26-04-2002	2172-02	El Salado Beach Aguadulce – Coclé	*Andara tuberculosa*	172.0 UR/100g
26-04-2002	2173-02	Port of Playita El Cacao – Veraguas	*Donax assimilis*	177.0 UR/100g
26-04-2002	2174-02	Manglares de Pedregal David – Chiriquí	*Andara tuberculosa*	166.0 UR/100g
30-04-2002	2204-02	Chumical – Veracruz	*Andara tuberculosa*	165.0 UR/100g
30-04-2002	2205-02	Public market Panama Oeste	*Donax assimilis*	168.0 UR/100g
07-05-2002	2313-02	Horconcitos – Chiriquí	*Andara tuberculosa*	168.0 UR/100g
07-05-2002	2292-02	Fish market	*Donax assimilis*	175.0 UR/100g
07-05-2002	2291-02	Guarumul Distrito de Sona, Veraguas	*Andara tuberculosa*	172.0 UR/100g
13-05-2002	2432-02	La Casa del Marisco Metropolitan Region	*Donax assimilis*	172.0 UR/100g
16.05-2002	2530-02	Guarare – Los Santos	*Andara tuberculosa*	166.0 UR/100g

Table 2.Chronological Report on Saxitoxin Control in Mollusks (Bivalves) Panama, 2002 (*cont*.)

Date of report	Lab. No.	Origin	Product	Results
24-05-2002	2632-02	Manglares de Pedregal David – Chiriquí	*Andara tuberculosa*	163.0 UR/100g
24-05-2002	2762-02	Las Tablas–Los Santos	*Andara tuberculosa*	159.0 UR/100g
24-05-2002	2777-02	Las Vueltas - San Lorenzo Chiriquí	*Andara tuberculosa*	156.0 UR/100g
10-06-2002	2885-02	Port of Boca Chica San Lorenzo	*Andara tuberculosa*	175.0 UR/100g
21-06-2002	3181-02	Horconcitos San Lorenzo Chiriquí	*Andara tuberculosa*	166.0 UR/100g
26-08-2002	4256-02	Fish market	*Donaz assimilis*	166.0 UR/100g
27-08-2002	4260-02	San Miguelito Region	*Andara tuberculosa*	166.0 UR/100g
02-08-2002	3689-02	Region of Western Panama Chorrera	Bivalves—*Donax assimilis*	175.0 UR/100g
24-09-2002	4911-02	Estuary of Pedregal Chiriquí	Bivalves	165.0 UR/100g
17-10-2002	5335-02	Los Santos Region	*Andara tuberculosa*	166.0 UR/100g
22-10-2002	5401-02	Western Panama	Bivalve *(Andara tuberculosa*	163.0 UR/100g
31-10-2002	5601-02	Fish market	*Andara tuberculosa*	173.0 UR/100g
07-11-2002	5698-02	Fish market	*Andara tuberculosa*	175.0 UR/100g

Table 2.Chronological Report on Saxitoxin Control in Mollusks (Bivalves) Panama, 2002 (*cont*.)

Date of report	Lab. No.	Origin	Product	Results
14-11-2002	5838-02	Boca Nueva Beach Coclé	*Andara tuberculosa*	173.0 UR/100G
14-11-2002	5839-02	El Rompío Barrios Unidos	*Andara tuberculosa*	172.0 UR/100g
05-12-2002	6191-02	Guarumal de Sona	*Andara tuberculosa*	165-0 UR/100g

Standard Value<400 UR/100g

- - -