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Consultation on compliance with
maximum permissible levels
of contaminants in seafood

Larnaca, Cyprus, 24-26 June 1998

REPORT OF THE CONSULTATION ON COMPLIANCE WITH MAXIMUM PERMISSIBLE LEVELS OF CONTAMINANTS IN SEAFOOD

In cooperation with:

FAO WHO

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Introduction

1. At the invitation of the Ministry of Health of Cyprus, the Consultation on compliance with maximum permissible levels of contaminants in seafood, convened jointly by UNEP/MAP, FAO and WHO, was held at the Beau Rivage Hotel, Larnaca, from 24 to 26 June 1998.

Attendance

2. The Consultation was attended by government-designated experts from the following Contracting Parties to the Barcelona Convention: Algeria, Bosnia and Herzegovina, Croatia, Cyprus, France, Israel, Lebanon, Libyan Arab Jamahiriya, Malta, Monaco, Morocco, Slovenia, Spain, Syrian Arab Republic, and Tunisia. The full list of participants is attached as annex I.

Opening of the Consultation

3. The meeting was opened by Mr G.P. Gabrielides, Senior Programme Officer, UNEP/MAP, on behalf of the Coordinator of MAP. He explained that the question of maximum permissible levels of contaminants in seafood had been the subject of discussion at the Meeting of MED POL National Coordinators and MAP National Focal Points held in 1996 and subsequently the Extraordinary Meeting of the Contracting Parties to the Barcelona Convention (Montpellier, July 1996) had approved activities with a view to the adoption and enforcement of common measures for the protection of human health. As health-related monitoring was not one of MAP's core activities, the Consultation was being convened in cooperation with FAO and WHO.

4. Ms Dina Akkelidou, Director, State General Laboratory, Ministry of Health of Cyprus, welcomed participants to Cyprus and expressed the hope that the Consultation would have a fruitful outcome.

Address by Mr Christos Solomis, Minister for Health of Cyprus

5. Mr Solomis welcomed participants to Cyprus and wished them a pleasant and fruitful stay. He emphasized that his Government shared international concern on food safety and environmental protection. It supported the promotion of measures and policies along the lines of the recommendations and guidelines of the *Codex Alimentarius* and other international bodies with a view to protecting consumers and ensuring fair trade practices.

6. The Ministry of Health, as the competent authority for implementing the Food Control and Sale Law and Regulations, had established a National Monitoring System for Food Safety based on the concept of monitoring and control throughout the whole food chain. The System comprised enforcement control, surveillance programmes, and target-oriented projects so as to identify problems and trends and introduce corrective or, wherever possible, preventive measures. Although Cyprus possessed limited resources, the control was to a large extent effective, even though some areas such as the control of seafood safety needed to be expanded.

7. Seafood safety was of extreme importance and an integrated monitoring programme including chemical, microbiological and biological controls should be developed in order to provide health protection while at the same time effectively monitoring the pollution of the marine environment. Fish could bioaccumulate and biomagnify chemical substances so their control was an essential tool in efforts to identify marine pollution problems and trends at an early stage.

8. The Ministry of Health recognized the interrelation between seawater quality and the safety of seafood and was therefore actively involved in monitoring programmes at the national and international levels.

9. Pollution knew no boundaries and a protocol in which all Mediterranean countries could collaborate would be universally beneficial. In the long term, it could yield valuable data on which policies and measures to protect human health, the marine environment and Mediterranean fish stocks should be based.

Background and scope

10. Mr Gabrielides, Senior Programme Officer, UNEP/MAP, explained the background and scope of the meeting. He said that within the framework of MED POL Phase III the Contracting Parties had approved two types of monitoring, namely of compliance and trends. One component of compliance monitoring was health-related and included the microbiological monitoring of bathing and shellfish-growing waters, as well as the monitoring of chemical contaminants in seafood. The Consultation dealt with the latter.

11. However, compliance monitoring would only be meaningful if relevant regulations were in place. The Contracting Parties had so far only made one recommendation in as far as chemical contaminants in seafood were concerned and that referred to mercury levels.

12. The present Consultation provided a platform for the exchange of views and information among Mediterranean experts and could form a basis for enhancing cooperation among the Parties in this field.

13. Mr Enrico Casadei, representative of FAO, welcomed the representatives of Mediterranean countries and described the Joint FAO/WHO Food Standards Programme, with particular emphasis on the standards, guidelines and code of practice on fish and fisheries products in the *Codex Alimentarius*.

14. He gave the participants background information on the activities carried out by FAO in the region related to food safety and reviewed the impact of recent events on international trade. He explained that the role of the *Codex* and FAO in the area of food safety and quality had significantly increased in importance as a result of the changes brought about by the recent trade agreements within the World Trade Organization (WTO). He also informed the participants of the activities undertaken by the *Codex* to incorporate the Hazard Analysis and Critical Control Points (HACCP) principles in codes of practice with the aim of reducing the risks associated with food hazards that could not be adequately controlled using the classical approach of sampling and inspection of the final products.

15. He hoped that the role of the *Codex* in the harmonization of food standards and food regulations would be taken into consideration by the present Consultation, with particular emphasis on specific areas such as methods of analysis and sampling, establishment of maximum limits for contaminants in food, and development of monitoring programmes for contaminants in the Mediterranean basin.

Election of Officers

16. The following officers were elected by acclamation:

Chair: Ms Dina Akkelidou (Cyprus)

Vice-Chair: Ms Marie-Christine Van Klaveren (Monaco)
Mr Dean Bošnjak (Slovenia)

Rapporteur: Mr Frank Farrugia (Malta)

Adoption of the Agenda and organization of work

17. The meeting adopted the agenda attached as annex II and agreed to follow the proposed programme for its work prepared by the Secretariat.

Presentation of country reports 1

18. At the Consultation, representatives of the following countries presented reports: Algeria; Bosnia and Herzegovina; Croatia; Cyprus; France; Israel; Lebanon; Libyan Arab Jamahiriya; Malta; Monaco; Morocco; Slovenia; Spain; Syrian Arab Republic and Tunisia.

Algeria

19. The representative of Algeria said that his country did not at present have safety standards for contaminants in seafood, and the Ministry of Trade was responsible for implementing legislation covering quality-related issues. A number of institutions monitored the quality of foodstuffs in general. For example, an Executive Decree on monitoring laboratories had come into force in 1991; the Algerian Quality Monitoring and Packaging Centre also had monitoring responsibilities; university centres were called upon; and since 1996 a network of testing and quality analysis laboratories had been in existence. As far as seafood was concerned, the veterinary services only verified whether or not it was fresh. Imported seafood was subject to the most stringent criteria, either international rules or regulations in the country of origin.

Bosnia and Herzegovina

20. The representative of Bosnia and Herzegovina reported that no systematic monitoring was currently underway in her country to undertake quality control of seafood for the protection of human health, nor any legislation regulating such procedures. In that connection, assistance was provided by Croatia. Over the last few years, her country had been unable to investigate the state of its seawaters and marine flora, so no information was available on pollution levels or contamination of marine organisms. Bosnia and Herzegovina was interested and willing to adopt international legislation and standards regarding permissible levels of contaminants in seafood and on overall environmental quality. With regard to the coastal zone, it was hoped that an appropriate institution to monitor the quality of seafood could be established, drawing upon other countries´ experiences. A list of standards was being compiled which would form the basis for the management of natural resources and food in a way that safeguarded health.

Croatia

21. The representative of Croatia described the law on the sanitary quality and sanitary supervision of foodstuffs, which governed general appearance and microbiological quality, permissible quantities of harmful substances, as well as the quality of the composition which affected biological value and permissible use of additives. Administrative bodies were responsible for sanitary and veterinary inspection

1 Tables and figures in Annexes III to XI appear in the language in which they were presented.

and, in cases of inadequate sanitary quality, they had the right and duty to apply a number of measures, including banning the production of and trade in the object concerned. Under the above law, the Ministry of Health had passed regulations governing microbiological food standards; quantities of pesticides, phytotoxins, mycotoxins, metals, non-metals, histamine and similar substances found in foodstuffs. Other requirements regarding the health propriety of foodstuffs and sampling methods for the analysis and superanalysis of foodstuffs had also been adopted.

22. Although Croatian regulations governing maximum permissible levels (MPLs) for pesticide residues in and on foodstuffs currently did not apply to any type of seafood, in practice the county public health institutes analysed fish and shellfish for the most common pesticides and applied the MPLs for meat and meat products. Fresh sea-fish was not permitted to contain more than 10 mg of histamine per 100g of fish flesh, whereas frozen, canned, pasteurized semi-products and other fish products could contain 20mg per 100g of fish flesh. Seafood and its products could be traded if the edible part contained no more than 2mg per kg of PCBs. Concerning phycotoxins, legislation on paralytic shellfish poison (PSP) and diarrhetic shellfish poison (DSP) was still incomplete, regulating only the maximum permissible level of toxins in shellfish -- the edible part of shellfish was permitted to contain 40mcg of PSP per 100g, while neuroparalytic shellfish poison (NSP) and DSP had to be below the detection threshold of the official analytical method. It was expected that regulations governing the monitoring programme for phycotoxins and to determine toxic phytoplankton species in shellfish rearing areas would be elaborated by the end of 1998, and would be in complete accordance with EU regulations. Permissible quantities of metals and non-metals in fresh fish, canned products and products in other packages are set out in annex III to the present report.

Cyprus

23. The representative of Cyprus said that the Fisheries Law CAP 135 (1961-1990) and, in particular, the amended Fisheries Regulations of 1990, were the main legal instruments to protect the marine environment and aquatic life from pollution. The main instruments to ensure protection of the quality and safety of seafood were the Food (Control and Sale) Law No.54 (1) of 1996 and the Regulations (1983-1998) on Contaminants Trace Elements (Hg. Pb. As. etc.), Pesticide Residues, Mycotoxin and Food Additives (Preservatives, Colours, etc.) The provisions for heavy metals and additives are listed in Table 2 in annex IV to the present report. As the competent authority for implementation of that law, the Ministry of Health had established a National Monitoring System for Food Safety, comprising enforcement control, surveillance programmes and target-oriented projects aiming to identify problems and trends and introduce corrective or, where possible, preventive measures. With regard to seafood, the State General Laboratory (SGL) of the Ministry of Health, in cooperation with the Health Inspection Service and other services, carried out the following programmes: (since 1986) monitoring and control of mercury and other trace elements in local and imported seafood; (since 1986) control of preservatives and other additives in imported seafood; (since 1997) microbiological control of imported seafood; (since 1997) control of residues of the veterinary drugs Chloramphenicol and Quinolones in aquaculture fish; development of a method to control hormones and antibiotics; periodic measurement of radioactivity (Cs-137) and of TVA and TVN in a small number of fish and parasites. The SGL was also actively involved in national and international programmes for the microbiological monitoring of seawaters. For MED POL, the SGL monitored faecal coliforms and faecal streptococci from 158 sampling points. In addition, the active participation of the Fisheries Department in the activities of MED POL contributed substantially to the assessment of the status and trends of pollution of the marine environment of Cyprus. Concentration of the metals Cd, Cu, Hg, Pb, and Zn were being constantly monitored in the *Mullus barbatus*, collected from the most polluted Cyprus waters around Limassol.

24. The results in Tables 3 and 3a in annex IV show that the levels of mercury in several types of imported and local fish were in general within the limits (0.5 mg/kg), except for large or medium size fish, i.e: domestic swordfish, common sea bream, grouper, common dentex and vlachos (*epinephelus spp*) imported from Egypt in 1995 and 1996, and white bream, red mullet and pandora, caught in international waters. In general, the larger the fish, the higher the concentration of mercury. Small-size fish (e.g. picarel), as well as shrimps, octopus and squid contained very low levels of mercury (<0.1mg/kg). Samples above MRL varied between 1.0% - 25.4% during the years 1990-97.

25. The results in Table 5 in annex IV show that the mean values of the concentrations of Cd, Cu, Hg, Pb and Zn in *Mullus barbatus* from Cyprus waters (Limassol area) were in the normal range for the years 1993-97 and were lower than the maximum permissible levels defined in the national legislation.

26. The SGL comprised, *inter alia*, seven official laboratories for control of foodstuffs, which were well-equipped and staffed by highly qualified and experienced analysts. A quality assurance management group and programme had been installed (since 1991), following the OECD guidelines for good laboratory practice and EN45001- ISO/IEC Guide 25. The internal quality control programme included the use of spiked samples, control charts, certified reference materials, and control and duplicate samples. External quality control mainly involved participation in collaborative studies and proficiency testings, according to the relevant *Codex Alimentarius* and EU requirements. Interlaboratory quality control of the Fisheries Department was effected through participation in the quality assurance programmes carried out by the Marine Environment Studies Laboratory (MESL) in Monaco.

27. In order to make control more systematic and to expand it to cover more parameters of significance to health, a plan of action was proposed by the SGL for the development of an integrated monitoring programme in cooperation with other competent authorities, e.g. the Fisheries Department, which would include chemical, biological and microbiological control. Such a programme would simultaneously provide for protection of health, while effectively monitoring the pollution of the marine environment.

France

28. The representative of France said that the zoosanitary regulations in effect were mainly based on Community provisions and involved the monitoring of a number of pathogens affecting oyster and abalone species susceptible to diseases caused by these pathogenic agents. The monitoring system was based on the concept of unaffected areas, i.e. those in which no case of Bonamiosis or Mateiliosis had been detected over a period of at least two years. Following approval by the Commission of the European Communities, monitoring and sampling programmes were put into effect to detect and monitor any abnormal mortality resulting from the presence of pathogens or infectious or contagious diseases. Every shellfish farmer had to keep a register showing movements of mollusc stocks and recording any abnormal mortality noted. These provisions were applied by the authorities at the local level and, if any abnormal mortality or symptom of disease, as defined in the relevant decrees, was noted, they must define the potentially contaminated area and prohibit all transport out of the area.

29. Since 1939, special sanitary regulations had governed the production and marketing of live shellfish, covering a number of closely interrelated aspects: the quality of the surrounding seawater; the criteria to be met in facilities where shellfish were processed before sale for human consumption; and the chemical and microbiological criteria to be met before shellfish could be consumed. Pursuant to a decree of 1994, incorporating Community Directive 91/492 of 15 July 1991, shellfish growing areas were

divided into four zones: zone A (deemed healthy), in which shellfish could be harvested and sold directly by an authorized shipper; zone B (slightly polluted), in which shellfish had to be kept in a purification tank for a certain period before sale; zone C (highly polluted), in which shellfish could only be harvested for relaying in another clearly identified healthy area for a long period, with or without purification; and zone D (prohibited area), in which there could be no exploitation of shellfish irrespective of the processing method (relaying, purification) or their destination.

30. The criteria used to classify production and relaying zones for live shellfish were based in the first instance on bacterial contamination in terms of the number of faecal coliforms or *E. coli* present in the flesh and intervalvular water of shellfish. Certain chemical contaminants such as lead, cadmium and mercury were also taken into account (see Table 1 in annex V). Although plankton biotoxins in the edible parts of shellfish were also analysed under the sanitary monitoring programme so as to ensure that levels remained permissible, they were not used for the initial classification of zones due to their transitory nature. After classification, a production zone was subject to regular sanitary monitoring that took into account microbiological, chemical and phytoplankton parameters, in addition to reinforced sanitary surveillance if there was any special contamination or circumstances that might increase the health risk.

31. The aforementioned provisions were complemented by monitoring of the quality of shellfish-growing waters as part of a dual approach at the biotic (production capacity of the environment) and sanitary (quality of the water and its products) levels. Although special monitoring networks in line with the applicable Community Directive had not been set up, the various monitoring structures comprising the Observation and Monitoring Network for the Coastal Marine Environment, set up by the French Marine Research and Exploitation Institute (IFREMER), largely met the Directive's requirements. For example, since 1974 the National Observation Network (RNO) had been evaluating levels and trends in the major pollutants and the overall parameters for the quality of the marine environment. The development of phytoplankton phenomena in France since 1983 had led to the establishment of a special Network for Monitoring Phytoplankton and Phytotoxins (REPHY), especially phytoplankton that was toxic to humans or marine organisms. The water and the stomach contents of molluscs were analysed and toxic tests were carried out on mice. Since 1989, the Microbiological Network (REMI) had provided a more global picture of the microbiological quality of the environment, while at the same time helping to improve consumer protection. By counting the number of faecal coliforms in molluscs, it evaluated the levels and trends in microbiological contamination of the environment, more particularly in shellfish-growing areas.

32. Finally, with regard to the sanitary criteria for live shellfish for immediate human consumption, a Decree of 2 July 1996 established the applicable organoleptic, microbiological, chemical and biological criteria (see Table 2 in annex V). These provisions were complemented by recommendations from the French Higher Council for Public Hygiene, which set the limits for lead and cadmium in molluscs, shellfish and fish. The limits for mercury were imposed by a Community decision. A draft Community regulation on lead and cadmium was currently being negotiated.

Israel

33. The representative of Israel explained that the competent authorities in his country were the Ministry of Health (Food Department), the Ministry of Agriculture and the Environment, the Fisheries Department and the Veterinary Services. Public health regulations published by the Ministry of Health (Food Department) set internationally accepted levels for pesticides and heavy metals in foodstuffs. The Israeli oceanographic centre monitored the local fish population. The Ministry of Health had three surveillance and monitoring centres for food and quality of drinking and recreational water, and one at

the Veterinary Services, as well as one private laboratory to carry out checks on heavy metals and pesticides.

34. Once a year, the Food Department analysed imported fish, fish products and shellfish for heavy metals, pesticides and veterinary drug residues. The data showed that all shipments were within the regulatory limits.

35. The majority of fish consumed in Israel was imported and sold subject to issuance of a health certificate by the Food Department of the Ministry of Health. All shipments were checked by veterinarians from the Ministry of Health and tested for TVBN and organoleptics. In addition, fish such as tuna, herring, etc. were checked for histamine. Freshwater fish and seafood were subject to microbiological checks. If these checks showed excessive levels, the authorities were empowered to destroy the shipment. As fresh fish and seafood had to be released for sale immediately, however, in the majority of cases the authorities were obliged to rely on the health certificate accompanying the shipment and this could cause problems.

36. The representative of FAO suggested that cooperation among importing/exporting countries in the region should be enhanced with a view to setting up an efficient certification system. In this connection, a *Codex* committee was working on food import/export certification with a view to establishing international procedures.

Lebanon

37. The representative of Lebanon said that much needed to be done in his country to set up structures for control and inspection, to rehabilitate laboratories and equipment for analysis, and to put in place legislation, enforcement mechanisms and monitoring programmes. Draft legislation prepared by the Ministry of the Environment was currently under discussion in Parliament and, after adoption, it would be supplemented by a series of laws, directives and other legal instruments to enable more effective and detailed control of the different aspects of marine pollution. A joint committee comprising the Lebanese Norms Association (LIBNOR), the Ministry of Agriculture, the Industrialists´ Association and representatives of the food industry was working to set up norms to control and improve the quality of food and food products, including fish and seafood. In September 1996, the Ministry of the Environment had adopted Decree No. 52/1 governing norms and limits for pollution of the air, soil and water, which contained a limited number of environmental quality norms pertaining to direct discharge of industrial wastewaters into the aquatic environment. The Ministry was currently preparing a series of laws governing limits on direct discharges into all waters, which would be based on the LBS Protocol and on the EU norms. Environmental quality standards for the aquatic environment in Lebanon are listed in annex VI to the present report.

38. Lebanon had recently set up a monitoring programme which included monitoring chemicals in industrial wastewater discharges into the sea; microbiological monitoring of municipal effluent discharged into the sea and at bathing spots; and chemical and microbiological monitoring of seawater and of the biological effects of pollution.

39. Concerning control and enforcement, the Consumer Protection Department of the Ministry of Economy and Trade monitored the quality of foodstuffs, the Ministry of Agriculture monitored the quality of foodstuffs of vegetable and animal origin, and the Ministry of Environment monitored pollution. However, the legislative base was insufficient, the bodies for control and inspection were badly designed and even ineffective, and the system for monitoring foodstuffs was not yet fully functional. He concluded by stating that collaboration was needed among all Ministries and institutes involved in order to coordinate actions and put in place a harmonized and effective system for monitoring and surveillance of foodstuffs, including seafood.

Libyan Arab Jamahiriya

40. The representative of the Libyan Arab Jamahiriya, after describing the structure of the fishing sector in his country, explained that the Libyan National Centre for Standardization and Metrology was responsible for preparing, approving and monitoring standards, including those for canned sea food, which are attached as annex VII. Libya also utilized ISO specifications and standards. The Libyan Marine Research Centre was carrying out field studies (surveys) with a view to amending the specification for heavy metals and petroleum hydrocarbons, even though monitoring showed that pollution remained within permissible levels.

41. In addition to the National Centre, the Libyan Arab Jamahiriya had an Office for the control and inspection of foodstuffs, under the Ministry of Health, which analysed all foodstuffs and had small units in each port. In cases of doubt, samples were sent to the laboratory or to the Industrial Research Centre and the University, which also acted as reference laboratories. The Technical Centre for Environmental Protection, under the umbrella of the Ministry of Housing and Utilities, dealt with pesticides and chemicals in its own laboratory.

Malta

42. The representative of Malta said that no regular monitoring programmes existed to evaluate pollution of the aquatic environment caused by particulate and dissolved wastes (disinfectants, hormones and antibiotics) from aquaculture units. Monitoring programmes for heavy metals in wild fish (tuna) were carried out by the State Veterinary Services, which used the accepted levels according to EU Directives and other European guidelines. The Malta Veterinary Division within the Ministry of Agriculture and Fisheries had prepared an annual plan for examination of residues in live animals and fresh meat, including fish. Analysis would be performed by the Malta Veterinary Diagnostic Laboratory, the Malta University Services, the Istituto Zooprofilattico of Rome and the Central Veterinary Laboratories Agency in the United Kingdom. The bulk of testing would be performed by the Malta Veterinary Services Laboratory. The groups of substances for which testing would be carried out under the plan are listed in annex VIII. The plan had been made possible under an FAO-funded project providing training by consultants and equipment for the Government of Malta, for which it was profoundly grateful.

43. Parliament had passed enabling acts for the protection of coastal and marine areas: the 1992 Development Planning Act, which laid down policies for the promotion of marine conservation; and the 1991 Environment Protection Act, under which came the 1993 Environment Protection (sewer Discharge Control) Regulations. The Residues in Meat Regulations were currently at the final stage of approval. They prohibited the administering of substances with a thyrostatic, oestrogenic, androgenic or gestagenic action, and of beta-agonists to farmed fish or seafood.

44. With regard to enforcement, the Pollution Control Coordination Unit (PCCU) within the Environment Protection Department coordinated oil pollution and collection activities, and monitored marine contamination by heavy metals and persistent organic pollutants. PCCU also participated in the MED POL programme. To promote a more coordinated strategy, a National Directorate had been set up with representatives from the Environment Protection Department, the Planning Authority, the Malta Maritime Authority, the National Tourism Organization, the Department of Agriculture, the Department of Health and a number of non-governmental organizations. In conclusion, he said that the Government of Malta gave high priority to environmental issues and was determined to address them on national and international levels through initiatives and cooperation among the Mediterranean States and the enactment and enforcement of local legislation.

Monaco

45. The representative of Monaco explained that her country did not have any specific text limiting the level of contaminants in seafood, but decrees or orders prohibited the installation of seafood beds in ports, established preventive procedures relating to diseased fish, laid down seafood and freshwater hygiene measures on transport, processing, storage, marketing, and sanitary inspection of fisheries products for human consumption. The Code of the Sea of 24 April 1998 contained a chapter on living resources and its articles allowed for the possibility of including a legal text on contaminant levels. Monaco had regulations on fisheries which specified fishing zones, the fishing season, and protected species and areas.

46. There were no aquaculture installations in Monaco, although there was a hatchery for breeding stock of *Dicentrarchus labrax*. Retailers of seafood were subject to periodic checks by the municipal hygiene service and, under the Franco-Monegasque Convention, French veterinary regulations applied. Monaco itself had no professional fishermen registered in Monaco, but under agreements between France and Monaco French fishermen were permitted to fish in Monegasque waters. There were checks on shellfish by the Municipal Hygiene Service, but not on fish. Two monitoring programmes for fisheries products were implemented by the Environment Service, namely one microbiological and one chemical programme for bivalves. Microbiological monitoring was aimed at identifying three main microbes. If microbial pollution was found, a sample was sent to the Central Hygiene Laboratory in Paris for analysis. The results of that monitoring were transmitted to the relevant services in Monaco. Chemical monitoring related to heavy metals. Data showed that levels were below the internationally accepted limits. Lastly, there were three other programmes in Monaco to monitor the marine environment.

Morocco

47. The representative of Morocco said that his country participated in the work on the *Codex Alimentarius*, which constituted the basis for technical standards both at the national level and for trade. The Ministry of Agriculture, Rural Development and Fisheries had established a National *Codex* Committee to follow up work on standards for food, the fixing of permissible limits of chemicals, and the development of general principles on food hygiene, inspection and certification of food. The National Laboratory within the State Ministry of the Environment had helped to prepare draft quality standards according to the environment and sectoral discharges. The relevant departments of the Ministry of Agriculture, Rural Development and Fisheries and the Ministry of Public Health had drawn up a draft circular fixing the maximum permissible levels for chemicals in marine organisms. Draft standards on foodstuff quality were also being prepared.

48. Morocco utilized the norms recommended by WHO and FAO for the maximum permissible levels of toxic substances in fisheries products. The Ministry of Agriculture, Rural Development and Fisheries was the authority responsible for quality control of fisheries products through the official veterinary laboratories. The maximum levels for certain organohalogen and organophosphorus compounds are shown in annex IX. No levels for polycyclic aromatic hydrocarbons had yet been fixed.

49. After describing existing legislation on the retail sale of seafood, the obligation to declare the marketing and sale of pesticides, regulations on organochlorine pesticides, the import, sale, possession and use of toxic substances, use in agriculture of phytosanitary substances, and protection against ionic radiation, he drew attention to draft Circular XXX of 1998, which fixed the maximum permissible levels of chemical substances in foodstuffs, including heavy metals, pesticide residues, mycotoxins, residues of phytosanitary substances and veterinary drugs, and oils and fats. It provided for interministerial committees to set food hygiene standards for dairy products, fruit and vegetables, and fisheries products.

It also included provisions on monitoring pesticide contamination in foodstuffs, covering the definition of pesticides, pesticide residues, good agricultural practices when using pesticides, maximum permissible levels of pesticide residues, maximum permissible levels of residues of foreign origin, and banned pesticides. Finally, it also covered the levels of mineral contaminants to be taken into account in risk assessment.

Slovenia

50. The representative of Slovenia explained that much of the legislation on food in his country was still that of the former Socialist Federal Republic of Yugoslavia. The State agencies responsible for health (sanitary) inspection and veterinary inspection were responsible for foods and foods of animal origin respectively.

51. A Statute fixed the maximum permissible levels of chemical contaminants in foods (see Tables 1 & 2 in annex X). The Statute contained several provisions relating to admissible levels for foods containing two or more pesticides and raw or semi-processed foods, sulphonamide residues and PCBs. Foods could be marketed if their quantity of toxic substances did not exceed the levels set out in Table 2 in annex X. For hormones, antibiotics, and other veterinary residues, Slovenia made use of EU regulations to choose adequate analytical methods. If food did not meet the specified requirements, it was deemed to be unacceptable and could not be sold for human consumption. The permissible percentage of histamine in fish flesh was governed by an Ordinance.

52. A Law provided that food had to be systematically examined for radioactive contamination, and regulations subsequently adopted fixed the maximum permissible levels.

53. Tables 3 and 4 in annex X showed the general microbiological criteria for foods, while Table 4 set out the criteria for certain types of seafood. If certain types of seafood did not meet these criteria, they could nevertheless be used as raw material for the production of other food products provided that they underwent the prescribed treatment.

54. Another statute specified that fresh and frozen fish could not be accepted for human consumption if it was infested with the parasites listed, or failed to meet the requirements of microbiological integrity, exceeded the permitted levels of pesticides and other toxic substances, hormones, antibiotics (mycotoxins) or radionuclides. These criteria applied to both crustaceans and shellfish, but in addition shellfish were rejected for human consumption if they originated from polluted water or contained biotoxins derived from marine algae. Only raw materials accepted for human consumption could be used to manufacture fish products.

55. Import of certain types of seafood was possible without a decision on veterinary-sanitary conditions if accompanied by an international veterinary certificate issued by an authorized veterinarian in the exporting country.

56. Lastly, Slovenia had a number of regulations on methods of sampling and analysis, as well as quality requirements for fish, crustaceans, shellfish, sea urchins, frogs, snails and their products.

Spain

57. The representative of Spain said that most of her country's legislation on contaminants in seafood was derived from the Directives and decisions of the EU and was thus similar to that of France. Council Directive 91/492/EEC, which set down the sanitary conditions for the production and marketing of live molluscs, had been anchored in Royal Decrees 345/1993 and 308/93 in Spain. Responsibility for administering the law lay with the Regional Governments, working through the Departments of Health

and of Agriculture, which had set out their production areas for shellfish farming, established areas for protection and improvement, and set up a monitoring plan. The parameters that had to be measured at each sampling station are set out in Table 1 in annex XI to the present report. Production areas were classified into three classes, depending on the quantity of faecal coliforms in the flesh and in the intervalvular liquid of the molluscs. The different monitoring plans for the production and improvement areas were coordinated by the Department of Agriculture, Fisheries and Food of the central Government through the Institute of Oceanography, which received all data and tried to harmonize the methodologies applied by the different laboratories. The Institute had organized an exercise among the laboratories to compare analysis of heavy metals and organochlorine compounds in mussels. Since 1991, Spain had instituted the Mussel Watch project at 40 stations along the Mediterranean coast in order to study area variations and temporal trends in contaminant levels. The Departments of Health of the regional Governments were responsible for the sanitary control of molluscs before and during marketing.

58. Where no European legislation was available, the Department of Health, in 1991, had put in place provisions for the microbiological regulation of fresh, refrigerated and frozen seafood, salted and dried cooked products, tinned fish in vinegar, anchovies in oil, and smoked and canned products. The established maximum limits for heavy metals for fish and aquaculture products are set out in Table 2 in annex XI to the present report. In conclusion, she pointed out that the frequency and location of sampling activities were also contingent upon whether problems had been detected or were suspected, with the bulk of the efforts concentrated around shellfish growing areas.

Syrian Arab Republic

59. The representative of the Syrian Arab Republic said that his country relied more on fish from inland aquaculture than from marine fisheries, which represented a relatively underdeveloped sector. His country had identified pollution of the marine environment from land-based sources, from oil terminals and refineries, from sewage discharges and from currents originating in international waters. Monitoring of the coastal zone, which was based on the programme set up by UNEP in 1988, was carried out by the Marine Research Institute (Tishreen University), connected to the Ministry of the Environment. However, there were problems in obtaining samples of the small catches made by local fisherman for analysis. Fish analysed for heavy metals and hydrocarbons was obtained from the market, and so it was often not possible to identify the origins of such samples and pinpoint potential pollution areas. The Ministry of Supply had introduced regulations governing imported frozen fish and canned fish, setting out maximum limits for Hg and Cd content. Microbiological analysis of seawater was conducted on a regular basis and the results were passed to the Ministry of the Environment, which applied the internationally accepted standards for such contamination. The Ministry of the Environment had finalized draft legislation on air, water and soil quality which was currently before Parliament. The National Bureau of Standards was setting norms for local and imported foodstuffs, but there were practically no norms applicable specifically to marine fish. Because of the relative importance of the sector, work was focusing on the quality of freshwater and seawater and its resources. In conclusion, he hoped that it would be possible to initiate greater cooperation in the area of contamination of marine foodstuffs and human health.

Tunisia

60. The representative of Tunisia provided the meeting with some details regarding the fishing sector in Tunisia. He then explained that the national monitoring network for bivalve molluscs was supervised by the General Directorate of Animal Health, under the Ministry of Agriculture, in collaboration with a steering committee composed of representatives of several institutions involved in monitoring the marine

environment, the Pasteur Institute in Tunis, the National Marine Sciences and Technology Institute, the Veterinary Research Institute in Tunis, the National Chamber of Seafood Exporters and Regional Agricultural Development Commissions. Four sub-networks dealt with the microbiological quality of bivalve molluscs (REMI), phtyoplankton monitoring (REPHY), biotoxin monitoring (REBI), and harmful substances (RECNO). He described the different tasks of the sub-networks and presented a slide showing the procedure to be followed if contamination was detected. Council Directive 91/492/EEC, which laid down the sanitary rules for production, rearing and marketing of live bivalve molluscs, was at present applied in that network.

61. The network had been operating for 18 months and during that period one ichtyotoxic phytoplankton species had been found at a site in southern Tunisia, analyses of biotoxins and heavy metals had been satisfactory, and bacteriological results had led to the classification of production sites in categories B and C, meaning that purification was required before the molluscs could be sold for consumption.

62. He added that even though the national fish and shellfish monitoring network was not yet operational, certain results could be found in the context of scientific research.

63. As countries of the European Union represented a major source of exports for Tunisia, standards, guidelines and codes of usage had been prepared by the National Institute for the Standardization of Industrial Products (INNORPI) on the basis of French and European Union standards and Directives. The standards drawn up by INNORPI were binding and, in their absence, European or French standards applied. Export clients could, however, impose their own standards for products exported. Tunisia also had standards regarding the discharge of wastewater into the aquatic environment.

64. In addition to the monitoring network, fisheries products were subject to biological and chemical checks by the veterinary services, although the number of fishing ports and the cost of analyses meant that checks were carried out less frequently.

65. With regard to future developments, the Ministry of the Environment and Planning, together with other Ministries and institutes involved in monitoring the marine environment, intended to develop a monitoring network for all fisheries products, whether for import, export or local consumption, at the International Centre for Environmental Technologies in Tunis. Research laboratories working on the monitoring and protection of the marine and lagoon environment would be reinforced and a sanitary and environmental control laboratory would be set up for imports, exports, and products for local consumption. Tunisian standards for fisheries products would be harmonized and put into effect.

National and international legal provisions

66. Under this agenda item the meeting discussed the report entitled “Fish and shellfish safety: Standards, guidelines, monitoring systems, sampling plans and analysis” (document UNEP(OCA)/MED WG.144/2), prepared by Ms Dina Akkelidou, Director, State General Laboratory, Ministry of Health, Cyprus.

67. All representatives who took the floor congratulated Ms Akkelidou on the document, which was considered to be a concise summary of relevant legislation and directives, providing valuable information, in particular for those countries in the process of preparing or restructuring a legislative framework. The representative of France offered to transmit to the MED POL Secretariat the text of the Directives referred to in the document. He would also transmit amendments to existing Directives after adoption.

68. Ms Akkelidou said that, in preparing the report she had contacted many countries from different regions, seeking information on their progress on the subject. All countries faced problems with regard to the nature of seafoods and the complexity of the analysis work to be undertaken. Based on the information received, Cyprus had prepared a draft programme for the Mediterranean countries, which could be the first phase of collaboration in this field. She believed that it was necessary to put in place a monitoring programme for marine fish and, together with control of compliance, that could be a tool, related to MED POL III, for monitoring the pollution of the Mediterranean.

Conclusions and recommendations for future action

69. The Consultation decided to set up a drafting group to draw up the conclusions and recommendations of the meeting, comprising the representatives of Cyprus, France, Malta, Monaco, Morocco, Tunisia, and of FAO, WHO and UNEP.

70. Conclusions

(i) On the basis of the reports presented by the countries present at the Consultation, it was possible to distinguish three categories of countries: (a) those which had legal provisions, administrative structures and programmes related to monitoring and enforcement, (b) those which had regulations but were weak in enforcement and (c) those which were in the process of creating structures and enacting legislation.

(ii) The reports presented did not indicate any excessive levels of contaminants in seafood.

(iii) The Consultation agreed that the country reports, after being revised by the competent authorities in each country, could be included in the MAP Technical Reports Series. The countries which were absent should also be requested to submit a report on the existence of legal provisions for maximum permissible levels of contaminants in seafood for the protection of human health and their enforcement. The reports, which should reach the Secretariat by 30 September 1998 (preferably on diskette), should include the following sections (a) national legal provisions (b) existing monitoring programmes (c) enforcement structures (d) results and proposed actions.

(iv) The Consultation reviewed and acknowledged the work carried out so far in the framework of the MED POL programme, especially the quality assurance programme coordinated by the Marine Environmental Studies Laboratory of IAEA, Monaco, expressing the need for its continuation to assure good quality data. The issue of harmonization on a regional level was stressed, regarding the design and implementation of monitoring programmes.

(v) The Consultation reviewed existing international legal provisions and guidelines. In the area of chemical contaminants in fish and fisheries products, the *Codex Alimentarius* programme had so far recommended guideline levels only for methylmercury in fish. The EU provisions for some contaminants were considered insufficient while standards concerning fish were practically non-existent. Concern was expressed regarding the contamination of fish and molluscs by pesticides and PAHs.

(vi) The Consultation considered that the organization of a regional meeting (probably by FAO) which would bring together *Codex* and MED POL Focal Points to consolidate and reinforce information exchange would be beneficial.

Recommendations

71. On the basis of the above, the Consultation agreed to make the following recommendations, which would be transmitted to the Meeting of the Contracting Parties to the Barcelona Convention for adoption and follow-up through the relevant Focal Points.

It recommended that:

(i) The Secretariat prepare a synthesis of existing international food regulations (*Codex Alimentarius*), and regional food regulations (e.g. EU Directives). Document UNEP (OCA)/MED WG.144/2 could form the basis for this work. A model action plan for monitoring and assessing compliance with maximum permissible levels of contaminants in seafood should also be prepared.

(ii) Contracting Parties which have not already done so take measures to respect the criteria for mercury, as agreed by them at their fourth ordinary meeting (Genoa, 1985).

(iii) Contracting Parties make every effort to put in place legal provisions for the protection of human health from seafood (fish and shellfish) consumption and implement relevant monitoring and enforcement programmes.

(iv) Contracting Parties and the Secretariat make every effort to identify external funding for assisting developing countries in implementing the recommendation in (iii) above.

(v) National authorities and laboratories responsible for the implementation of monitoring programmes make every effort to generate, for use by decision-makers, reliable laboratory data in accordance with good laboratory practice and analytical quality assurance procedures (e.g. UNEP Reference Methods 6 and 57).

(vi) National authorities and laboratories responsible for the implementation of monitoring programmes transmit their most recent data to the Secretariat, obtained in accordance with quality assurance principles, on the contamination of fish and molluscs (microbiological, heavy metals, pesticides, PAHs). For this purpose, the Secretariat will officially inform the MED POL Focal Points, pursuant to the provisions adopted under MED POL Phase III.

Any other matter

72. No subjects were raised for discussion under this agenda item.

Adoption of the report of the Consultation

73. The Consultation adopted its report at its meeting on Friday, 26 June 1998.

Closure of the Consultation

Address by Mr C. Themistokleous, Minister for Agriculture, Natural Resources and Environment of Cyprus

74. Mr A. Demetropoulos, Head of the Department of Fisheries of Cyprus, read out a closing address by the Minister for Agriculture, Natural Resources and Environment of Cyprus. The Minister stated that the preparation and adoption of safety standards in seafood was not a simple task. Compliance with standards was not easy or simple either.

75. The sea played a vital role in the economic and social development of Cyprus. Very recently, in addition to its more traditional uses such as fishing, aquaculture and recreation, the sea had also become a vital source of drinking water. Its protection was a high priority and Cyprus supported and actively participated in efforts such as the present meeting which could ensure a continuous supply of high-quality products and safe seafood, in particular, to the people.

76. Participants represented different countries which had the common aim of protecting the Mediterranean Sea and the peoples living on its shorelines from pollution. The meeting had no doubt strengthened the cooperation among all, which was the prerequisite for success.

77. He underlined his Ministry´s commitment and, by extension, that of the Government of the Republic of Cyprus, to the protection of the marine environment and said that they would spare no effort or expense to protect it. The commitment of Cyprus to the Mediterranean Action Plan and its active participation in all the components were well known. Cyprus remained keenly interested in any new developments within the MAP in its new phase, which now encompassed, *inter alia*, sustainable development issues.

78. Mr Gabrielides thanked the authorities of Cyprus for their generosity in hosting the Consultation and for the warm hospitality extended, which had contributed to the success of the meeting. He also thanked the delegates for their active participation and the staff for their hard work. The Chair closed the Consultation at 14:00 hrs on Friday 26 June 1998.

ANNEX I

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ANNEX II

AGENDA

1. Opening of the Consultation
2. Background and scope
3. Election of officers
4. Adoption of the Agenda and organisation of work
5. Presentation of country reports
6. National and international legal provisions
7. Conclusions and recommendations for future action
8. Any other matter
9. Adoption of the report of the Consultation
10. Closure of the Consultation

ANNEXE III

CROATIE

PRESENT SITUATION IN CROATIA AS FAR AS TO THE LEGAL PROVISIONS ON MAXIMUM PERMISSIBLE LEVELS OF CONTAMINANTS IN SEAFOOD AND THEIR ENFORCEMENT

PERMISSIBLE QUANTITIES OF METALS AND NON-METALS IN THE FOODSTUFFS (SEAFOOD)(mg/kg or mg/l)

food	Pb	Cd	Hg	As	Cu	Zn	Sn	Fe	Ni
fresh fish	1.0	0.1 1*	0.5 1.0*	2** 4*+ 8*+* 15***					
			MeHg 0.4 0.8*						
canned products	2.0	0.15 1.5*	0.8 1.5*	3.0** 6.0*+ 12.0*+* 22.5***	30	100	100	30	
			MeHg 0.6 1.0*						
products in other packages	2.0	0.15 1.5*	0.8 1.5*	3.0** 6.0*+ 12.0*+* 22.5***					
			MeHg 0.6 1.0*						
fish-oil	0.4			0.4	0.4			5	

* tuna, swordfish, cephalopods, shellfish, crustaceans (crabs) ** fresh-water fish and small pelagic fish *+ demersal sea-fish (finfish)
+ tuna, swordfish, shellfish, cephalopods *** crustaceans

ANNEXE IV

CHYRPE

Table 2

The Food (Control & Sale) Law No. 54(I)/96 & Regulations

I. Seafood Provisions of Regulations of 1983 for Heavy Metals

1) Mercury in Food Regulations:

- Fish fresh, dried, frozen or canned the MRL = 0,5mg/kg of food (wet basis)
- Crustacians fresh, canned or frozen the MRL = 0,5 mg/kg of food (wet basis)

2) Lead in Food Regulations:

- Fish canned, the MRL = 3,0 mg/kg of food (wet basis)
- Fish dried, the MRL = 5,0 mg/kg of food (wet basis)
- Other fish, the MRL = 2,0 mg/kg of food (wet basis)
- Crustacians, the MRL = 10,0 mg/kg of food (wet basis)

3) Arsenic in Food Regulations:

- Fish any type, the MRL = 1,0 mg/kg of food (wet basis)

II.Seafood Provisions of Regulations of 1983-97 for Additives

1) **Preservatives: the addition of Sulphur Dioxide (SO_2) in Shrimps and of Sorbic acid in Caviar and Herring is not permitted. In 1998 these Regulations have been ammended according to relevant E.U. requirements.**

2) **Colours: The addition of colours in fresh or unprocessed fish and canned crab meat is not permitted.**

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Table 3a

Levels of Mercury, Lead and Arsenic in seafood in Cyprus 1986-1991

	Mercury (Hg)		Lead (Pb)		Arsenic (As)	
Sample type	No. of samples	range mg/kg of sample	No. of samples	range mg/kg of sample	No. of samples	range mg/kg of sample
Canned fish imported: • (sardina, tuna etc)	35	0,0 - 0,34	13	0,10 - 0,60	13	< 0,10
Cyprus fresh fish: • Parrot fish, pendora, common dentex etc. • swordfish	17 17	0,.0 - 0,10 0,08 - 2,40	5	0,20 - 1,00		
Imported seafood frozen: • Sepia, squid, octopus, shrimps	89	0 - 0,10	2	0,0 - 0,90		
Imported fish frozen: Common sea bream, red snapper, white bream, salmon, red mullet, pandora etc	95	0,0 - 0,50	8	0,1 - 0,90		
Total	253		28		13	

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Table 3

INCIDENCE AND LEVEL OF MERCURY IN FISH IN CYPRUS 1993-1997

Sample type	No of Samples	No of Positive*	Range mg/Kg (Sample wet)	Average mg/Kg (Sample wet)	Imported	Local	Above MRL**
Fresh fish							
Fresh Boque	7	3	0,00-0,16	0,06	0	7	
Fresh Common Dentex	20	15	0,00-2,00	0,51	14	6	15
Fresh Cuttle Fish	1	0	0,00-0,00	0,00	0	1	
Fresh Grouper	10	9	0,00-1,25	0,57	10	0	5
Fresh Bronze Bream	1	0	0,05-0,05	0,05	0	1	
Fr. Fish Barba Nicolis	3	3	0,07-0,10	0,09	0	3	
Fresh Amberjack	1	1	0,10-0,10	0,10	0	1	
Fresh Red Mullet	15	6	0,00-0,70	0,11	1	14	1
Fresh Octopus	6	2	0,00-0,26	0,06	2	4	
Fresh Trachurus spp	2	2	0,10-0,10	0,10	0	2	
Fresh Salema	2	0	0,00-0,05	0,03	0	2	
Fresh Parrot fish	4	0	0,00-0,05	0,03	2	2	
Fresh Sea Bream	42	31	0,00-2,00	0,38	29	13	13
Fresh Skorpion Fish	1	1	0,10-0,10	0,10	0	1	
Fresh Picarel	3	1	0,00-0,10	0,03	0	3	
Fresh Pandora	12	7	0,00-0,65	0,21	0	12	3
Fresh White Bream	11	8	0,00-3,40	0,40	2	9	1
Fresh Striped Mullet	6	5	0,05-0,12	0,10	0	6	
Fresh Sword-Fish	21	21	0,20-2,00	0,54	0	21	4
Fresh Tsipoura	3	0	0,01-0,01	0,01	0	3	
Fresh Epinaphelus sp	15	12	0,02-1,70	0,46	12	3	4
Fresh Golden Picarel	1	1	0,10-0,10	0,10	0	1	
Subtotal:	187	128			72	115	46

**Positive samples were those with Hg>=0,05 mg/Kg*

*** Mercury MRL= 0,5mg/Kg*

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Table 3 (continued)

INCIDENCE AND LEVEL OF MERCURY IN FISH IN CYPRUS 1993-1997

Sample type	No of Samples	No of positive*	Range mg/Kg (sample wet)	Average mg/Kg (sample wet)	Imported	Local	Above MRL**
Frozen fish							
Cod fillets	3	2	0,02-0,06	0,05	3	0	
Crab sticks	1	0	0,05-0,05	0,05	1	0	
Frozen Cuttle Fish	2	0	0,00-0,05	0,03	2	0	
Frozen Dogfish	4	2	0,00-0,50	0,2	4	0	
Frozen Fillets	6	5	0,00-0,07	0,06	6	0	
Frozen Grouper	4	1	0,10-0,10	0,10	4	0	
Frozen Mord Shark	5	5	0,08-1,00	0,68	5	0	4
Frozen Red Mullet	2	1	0,00-0,20	0,10	2	0	
Frozen Plaice	2	0	0,00-0,00	0,00	2	0	
Frozen Prawns	6	5	0,00-0,12	0,10	5	1	
Frozen Red Snapper	55	49	0,02-0,90	0,20	55	0	2
Frozen Salmon	27	24	0,02-0,15	0,11	27	0	
Froz.Painted Comper	3	0	0,02-0,02	0,02	3	0	
Frozen Sea Bream	17	13	0,00-0,80	0,18	15	2	1
Froz. Seafood Coctail	1	1	0,14-0,14	0,14	1	0	
Frozen Pandora	6	3	0,00-0,20	0,08	6	0	
Frozen Red Fillet	6	6	0,10-0,17	0,11	6	0	
Frozen White Bream	1	0	0,00-0,00	0,00	1	0	
Frozen Squid	12	5	0,00-0,14	0,04	12	0	
Froz.Common Dentex	1	0	0,00-0,00	0,00	1	0	
Lobster	1	0	0,00-0,00	0,00	1	0	
Mackerel Fillets	1	0	0,05-0,05	0,05	1	0	
Marinated Mussels	1	0	0,03-0,03	0,03	1	0	
Mussels on the half	1	0	0,02-0,02	0,02	1	0	
Plaice Fillets	3	0	0,00-0,00	0,00	3	0	
Saith Fillets	1	1	0,07-0,07	0,07	1	0	
Sealard Fillets	1	0	0,05-0,05	0,05	1	0	
Subtotal:	**174**	**123**			**170**	**3**	**7**

**Positive samples were those with Hg>=0,05 mg/Kg*
***Mercury MRL=0,5 mg/Kg*

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Table 3 (continued)

INCIDENCE AND LEVEL OF MERCURY IN FISH IN CYPRUS 1993-1997

Sample type	No of Samples	No of positive*	Range mg/Kg (sample wet)	Average mg/Kg (sample wet)	Imported	Local	Above MRL**
Canned fish							
Canned Anchovy	1	0	0,00-0,00	0	1	0	
Canned Mackerel	6	5	0,04-0,06	0,06	6	0	
Canned Octopus	3	3	0,10-0,20	0,17	3	0	
Canned Sardines	11	6	0,00-0,50	0,09	4	7	
Light Meat Tuna	4	3	0,04-0,10	0,09	4	0	
White Meat Tuna	4	2	0,03-0,10	0,06	4	0	
Other							
Dried Cod	3	1	0,00-0,13	0,04	3	0	
Smoked Herring	1	0	0,03-0,03	0,03	1	0	
Smoked Salmon	1	1	0,17-0,17	0,17	1	0	
Subtotal:	34	21			27	7	
Total:	395	272			269	125	53

Positive samples were those with Hg>=0,05 mg/Kg

***Mercury MRL =0,5 mg/Kg*

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Table 5

Concentration of metals (µg/g dry weight) in *Mullus barbatus* from Cyprus waters (Limassol Area)

Year	Metals				
	Cd	Cu	Hg	Pb	Zn
	n=100	n=100	n=100	n=100	n=100
1993	0,04 ± 0,02	2,44 ± 0,46	0,20 ± 0,21	0,50 ± 0,26	12,04 ± 3,91
1994	0,09 ± 0,02	3,08 ± 0,92	0,30 ± 0,09	0,59 ± 0,08	6,10 ± 0,69
1995	0,06 ± 0,01	1,82 ± 0,16	0,17 ± 0,03	1,07 ± 0,34	0,69 ± 0,79
1996	0,01 ± 0,001	2,45 ± 0,18	0,22 ± 0,03	0,53 ± 0,18	32,43 ± 2,36
1997	0,011 ± 0,004	1,44 ± 0,15	0,87 ± 0,20	0,55 ± 0,17	16,89 ± 1,02
Mean for 1993-1997	0,04 ± 0,03	2,25 ± 0,63	0,35 ± 0,29	0,65 ± 0,24	14,83 ± 10,77

Heavy Metals Laboratory - FISHERIES DEPARTMENT

ANNEXE V

FRANCE

CRITERES SANITAIRES AUXQUEL DOIVENT REPONDRE LES COQUILLAGES VIVANTS DESTINES A LA CONSOMMATION HUMAINE IMMEDIATE

(ARR. DU 2 JUILLET 1996)

CRITERES ORGANOLEPTIQUES	• CARACTERISTIQUES VISUELLES ASSOCIEES A LA FRAICHEUR ET A LA VITALITE • ABSENCE DE SOUILLURE OU DE CONTAMINATION PAR DES SUBSTANCES SUSCEPTIBLES D'EN ALTERER LE GOUT
CRITERES MICROBIOLOGIQUES	• NOMBRE LE PLUS PROBABLE DE BACTERIES FECALES PRESENTES DANS 100 G DE CHAIR DE COQUILLAGE ET DE LIQUIDE INTERVALVAIRE : ≤ 300 C. FECAUX ≤ 230 E. COLI • ABSENCE DE SALMONELLES DANS 25 G DE CHAIR
CONTAMINANTS CHIMIQUES	• ABSENCE DE RADIONUCLEIDES • ABSENCE DE COMPOSES TOXIQUES OU NOCIFS A UNE TENEUR TELLE QUE L'ABSORPTION ALIMENTAIRE CALCULEE DEPASSE LES DOSES JOURNALIERES ADMISSIBLES POUR L'HOMME
CONTAMINANTS BIOLOGIQUES	• TENEUR EN TOXINE PARALYTIQUE (PARALYTIC SHELLFISH POISON) : ≤ 80 µG/100 G DE PARTIE COMESTIBLE • LE CAS ECHANT, RECHERCHE DE LA SAXITOXINE PAR VOIE CHIMIQUE

CLASSEMENT DE SALUBRITE DES ZONES DE PRODUCTION ET DE REPARCAGE DES COQUILLAGES VIVANTS (ARR. DU 21 JUILLET 1995)

	CONTAMINANTS MICROBIOLOGIQUES (NOMBRE LE PLUS PROBABLE DE GERMES CULTIVABLES DANS 100 G DE CHAIR DE COQUILLAGE ET DE LIQUIDE INTERVALVAIRE)		CONTAMINANTS CHIMIQUES (PAR KG DE CHAIR HUMIDE)
Zone A	• 90 % DES VALEURS OBTENUES < 300 C. F. OU 230 E. COLI • AUCUNE DES VALEURS NE DOIT ETRE > 1000 C. F. > 1000 E. COLI	ET	HG TOTAL : < 0,5 mg CD : <2 mg PB :< 2 mg
Zone B	• 90 % DES VALEURS OBTENUES < 6.000 C. F. OU 4.600 E. COLI • AUCUNE DES VALEURS NE DOIT ETRE : > 60.000 C. F. > 46.000 E. COLI	ET	HG TOTAL : <0,5 mg CD : <2 mg PB : <2 mg
Zone C	• 90 % DES VALEURS OBTENUES < 60.000 C. F. OU 46.000 E. COLI • AUCUNE DES VALEURS NE DOIT ETRE : > 60.000 C. F. > 46.000 E. COLI	ET	HG TOTAL : < 0,5 mg CD : < 2 mg PB : < 2 mg
Zone D	AUCUN DES CRITERES PRECEDENTS N'EST RESPECTE		

ANNEXE VI

LIBAN

Appendix III-2

Environmental Quality Standards for Water Environment for Prescribed Substances

COMPOUND	RECOMMENDED EQSs		
	FRESH WATER	ESTUARINE WATER	MARINE WATER
Mercury (Hg) and Mercury Compounds	1 ug total Hg/l	0.5 ug dissolved Hg/l	0.3 ug dissolved Hg/l
Cadmium (Cd) and Cadmium Compounds	5 ug total Cd/l	5 ug dissolved Cd/l	2.5 ug dissolved Cd/l
Total Organohalogen Compounds	100 ug/l in total	100 ug/l in total	100 ug/l in total
Aldrin, Dieldrin, Endrin, Isodrin ('drins)	0.03 ug total 'drins/l (1)	0.03 ug total 'drins/l (1)	0.03 ug total 'drins/l (1)
Atrazine	2 ug atrazine/l (2)	2 ug atrazine/l (2)	2 ug atrazine/l (2)
Trichloromethane (CF) (Chloroform)	12 ug CF/l	12 ug CF/l	12 ug CF/l
DDT	0.025 ug DDT/l	0.025 ug DDT/l	0.025 ug DDT/l
Endosulfan	0.003 ug endosulfan/l (2)	0.003 ug endosulfan/l (2)	0.003 ug endosulfan/l (2)
1,2 Dichloroethane (EDC)	10 ug EDC/l	10 ug EDC/l	10 ug EDC/l
Hexachlorobenzene (HCB)	0.03 ug HCB/l	0.03 ug HCB/l	0.03 ug HCB/l
Hexachlorobutadiene (HCBD)	0.1 ug HCBD/l	0.1 ug HCBD/l	0.1 ug HCBD/l
Hexachlorocyclohexane (HCH)	0.1 ug HCH/l	0.02 ug HCH/l	0.02 ug HCH/l
Pentachlorophenol (PCP)	2 ug PCP/l	2 ug PCP/l	2 ug PCP/l
Simazine	2 ug simazine/l	2 ug simazine/l	2 ug simazine/l
Tetrachloroethene (PER) (Perchloroethylene)	10 ug PER/l	10 ug PER/l	10 ug PER/l
Tetrachloromethane (CTC) (Carbon tetrachloride)	12 ug CTC/l	12 ug CTC/l	12 ug CTC/l
Trichlorobenzene (TCB)	0.4 ug TCB/l	0.4 ug TCB/l	0.4 ug TCB/l

(1) EC total "drin" standard has now been superseded by standards for each compound, but the former standard is likely to be more practical in Lebanon.

(2) UK draft annual average EQS for freshwater.

(3) Based on UK EQS for triorganotin compounds.

Appendix III-2 (Cont'd)

Environmental Quality Standards for Water Environment for Prescribed Substances

COMPOUND	RECOMMENDED EQSs		
	FRESH WATER	ESTUARINE WATER	MARINE WATER
Trichloroethene (TCE) (Trichloroethylene)	10 ug TCE/l	10 ug TCE/l	10 ug TCE/l
Trifluralin	0.1 ug trifluralin/l (2)	0.1 ug trifluralin/l (2)	0.1 ug trifluralin/l (2)
Total Organophosphorus Compounds	1 ug/l in total	1 ug/l in total	1 ug/l in total
Azinphos-methyl	0.01 ug azinphos methyl/l (2)	0.01 ug azinphos methyl/l (2)	0.01 ug azinphos methyl/l (2)
Dichlorvos (DCV)	0.001 ug DCV/l	0.04 ug DCV/l	0.04 ug DCV/l (2)
Fenitrothion	0.01 ug fenitrothion/l (2)	0.01 ug fenitrothion/l (2)	0.01 ug fenitrothion/l (2)
Malathion (MLT)	0.01 ug MLT/l	0.02 ug MLT/l	0.02 ug MLT/l (2)
Organotin compounds	0.02 ug total/l	0.002 ug total/l	0.002 ug total/l (3)

(1) EC total "drin" standard has now been superseded by standards for each compound, but the former standard is likely to be more practical in Lebanon.

(2) UK draft annual average EQS for freshwater.

(3) Based on UK EQS for triorganotin compounds.

Appendix III-3

Environmental Quality Standards for Water Environment for Other Pollutants

COMPOUND	RECOMMENDED EQSs	
	FRESH WATER	ESTUARINE AND MARINE WATERS
Arsenic (As)	50 ug dissolved As/l	25 ug dissolved As/l
Boron (B)	2000 ug total B/l	7000 ug total B/l
Chromium (Cr)	50 ug dissolved Cr/l	15 ug dissolved Cr/l
Copper (Cu)	50 ug dissolved Cu/l	5 ug dissolved Cu/l
Iron (Fe)	1000 ug dissolved Fe/l	1000 ug dissolved Fe/l
Lead (Pb)	20 ug dissolved Pb/l	25 ug dissolved Pb/l
Nickel (Ni)	100 ug dissolved Ni/l	30 ug dissolved Ni/l
Tin (Sn) (inorganic)	25 ug total Sn/l	10 ug total Sn/l
Vanadium (Vn)	60 ug total Vn/l	100 ug total Vn/l
Zinc	50 ug total Zn/l	40 ug dissolved Zn/l
Cyanide	50 ug CN/l	50 ug CN/l
Sulphide	10 ug S/l	10 ug S/l
Phenols	1 ug/l total	1 ug/l total
Polycyclic aromatic hydrocarbons (PAH)	0.2 ug/l	0.2 ug/l
Total pesticides not otherwise prescribed	1 ug/l	1 ug/l

ANNEXE VII

JAMAHIRIYA ARABE LIBYENNE

Maximum permissible levels of contaminants in seafood

Libyan specification for canned (mackerel-tuna-sardines-1983)

Element	maximum permissible levels (mg/kg)
Mercury (Hg)	0.5
Arsenic (As)	1.0
Lead (Pb)	5.0
Copper (Cu)	10.00
Zinc (Zn)	50.00
Tin (Sn)	250.00

ANNEXE VIII

MALTE

Annual Plan for the Examination for residues in fish in Malta for 1998 (ANNEX I)

1	2	3	4	5	6	7	8	9
Group of substances	**Compounds**	**Species**	**Matrix**	**Laboratory method**	**Detection Limit**	**Level of action**	**Number of Samples**	**Laboratory**
B1 Antibacterial substances (without chloramphenicol)	any antibacterial agent	fish	muscle	FPT	zone of inhibition 2mm	50 ppb	90 fish	VDL(M)
	tetracyclines	fish	muscle	HPLC	10 ppb	200 ppb	10 fish	ISZP (Roma)
	sulphonamides	fish	muscle	HPLC GC.MS	10 - 100 ppb	100 ppb	30 fish	CVL (UK) ISZP (Roma)
	Quinolones	fish	muscle	HPLC	10 ppm	10 ppm	30 fish	ISZP (Roma)
B2 (a) Anthelmintics	ivermectin	fish	muscle	HPLC	2 - 5 ppb	15 ppb	20 fish	CVL (UK) ISZP (Roma)
B2 (c) Carbamates and pyrethroids	Carbamates	fish	muscle	HPLC	5 - 10 ppb	20 ppb	10 fish	CSL
	Pyrethroids	fish	muscle	GC-MS	method still under development and validation	0.5 ppm	10 fish	CSL
B3 (a) Organochlorine compounds	DDT BHC Lindane Dieldrin	fish	muscle	GC -MS	1 - 5 ppb	DDT 1.0ppm BHC, Lindane Dieldrin 0.1 ppm	10 fish	CSL
B3 (b) Organophosphorous compounds	malathion chlorfenvinphos dichlorvos coumaphos	fish	muscle	GC - MS	10 ppb	10 ppb	10 fish	CSL
B3 (c) Chemical elements	Pb	fish	muscle	GF - AAS	20 ppb	500 PPB	30 fish	VDL (M)
	Cd	fish	muscle	GF - AAS	2 ppb	50 ppb	30 fish	VDL (M)
	Hg	fish	muscle	HG - AAS	5 ppb	500 ppb bass, bream	30 fish	MUS (M)
	As	fish	muscle	HG - AAS	10 ppb	1000 ppb	30 fish	MUS (M)
B3 (f)	histamine	fish	muscle	HPLC	1 ppm	100 - 200 ppm	54 fish	CSL / VDL

Key:

VDL (M)	Veterinary Diagnostic Laboratory (Malta)	CVL (UK)	Central Veterinary Laboratory Agency (UK)
ISZP (Roma)	Istituto Zooprofilattico di Roma	MUS (M)	Malta University Services (Malta)

ANNEXE IX

MAROC

Doses maximales permissibles pour certains composés organo-halogénés :

Nature de l'élément	Dose journalière permissibles	Source
DDT	8,5 et 150 µg/Kg	(WHO/UNEP, 1995)
PCB	25 ; 150 et 450 µg/Kg	(WHO/UNEP, 1995)
HCH	1,0 ; 6,0 et 18 µg/Kg ⇔ "Aldrine et dieldrine"	(WHO/UNEP, 1995)
HCB et Heptachlor	0,1 ; 1,1 et 10,0 µg/Kg	(WHO/UNEP, 1995)
Dieldrine et aldrine	7µg	(FAO/WHO, 1971)
Heptachlor	350µg	(FAO/WHO, 1979)
DDT	350µg	(FAO/WHO, 1979)
HCH	700µg	(FAO/WHO, 1979)
HCB	420 µg	(FAO/WHO, 1979)
PCB	Pas d'ADI proposée par	FAO/WHO.
PBB (Polybromophényl)	20µg	(USEPA, 1976 ;1987)
Toxaphène	100 pg/j	(USEPA, 1976 ;1987)
Mirex	7µg	
Lindane	0,01 mg/Kg P.C./j	(WHO, 1976c)
	1,8 mg/j	(USEPA, 1988)

Doses maximales permissibles pour certains composés organo-phosphorés :

Nature de l'élément	Dose journalière permissibles	Source
L'ADI a été déterminée pour 47 composés organophosphorés ?	Se rangent entre 0,00002 mg/Kg pour le phorate à travers 0,005 mg/Kg pour le parathion jusqu'à 0,1 mg/kg pour le Crumophorate	l'OMS (1986)
Parathion inhalé	0,1 mg/m^3 pour une personne de 70 Kg inhalant 12 m^3/j durant 8h de travail) la dose hebdomadaire étant fixe 0,86mg/j.	(WHO/UNEP, 1995)
Parathion	0,005 mg/Kg ⇔ 0,35 mg/70Kg/j	(FAO/WHO, 1986)
Malathion	0,02 mg/Kg/j	FAO/WHO, 1986)
	0,33 mg/Kg/j	NRCC
Fenitrorhion	0,33 mg/Kg	NRCC
Fenthion	0,001 mg/Kg	NRCC
Azinphos-méthyle	0,0025 mg/Kg	NRCC

ANNEXE X

SLOVENIE

Table 1.*: Permissible levels of pesticides in (sea)foods

Succ. no.	Succ. no. in Table 1.*	Generic name	Permissible level in mg per kg of food
1	1	ACEFAT	0.1
2	2	ALAKLOR	0.02
3	4	ALDRIN	0.01
4	5	AMETRIN	0.1
5	7	AMITROL	0.01
6	12	BENFLURALIN	0.05
7	13	BENOMIL (TOGETHER WITH THE KARBEDAZIN AND 2-AMINO-BENZIMIDAZOL)	0,1
8	20	BROMOFOS	0.2
9	21	BROMOFOS-ETIL	0.1
10	32	CIRAM	see DITIOKARBAMATES
11	33	2.4-D	0.05
12	34	DALAPON	0.1
13	35	DAZOMET	0.01
14	36	D-D	0.001
15	37	DDT AND DERIVATES	1,0 (fish; from the fat content)
16	40	DEMETON (TOGETHER WITH DEMETON-SULFOXID AND DEMETON-SULFONOM)	0,05
17	41	DEMETON-S-METIL (TOGETHER WITH OXIDEMETON-METIL AND DEMETON-S-METILSULFON)	0,05
18	43	DIALIFOS	0.1
19	44	DIAZINON	0.1
20	46	DIELDRIN	0.01
21	53	DIKLORPROP	0.05
22	55	DIKLORVOS	0.1
23	56	DIKAMBA	0.05
24	58	DIKOFOL	0.5
25	59	DIKVAT	0.05
26	60	DIMETOAT	0.5
27	62	DINITRAMIN	0.05
28	63	DINOBUTON	0.1
29	65	DINOTERB-METIL	
30	66	DINOSEB	0.05
31	68	DIBP. DNC	0.05
32	69	DNOC	0.05
33	70	DIOKSAKARB	0.05
34	71	DIOKSATION	0.2
35	72	DISULFOTON (TOGETHER WITH DISULFOTON-SULFOKSID, DISULFOTON-SULFON, DEMETON, DEMETON-SULFOKSID AND DEMETON-SULFON)	0,1
36	73	DITIANON	1
37	74	DITIOKARBAMATI	0.05

38	75	DIURON (TOGETHER WITH 3,4-DIKLORANILIN)	0,1
39	76	DODIN	1
40	77	ENDOSULFAN (TOGETHER WITH THE ALFA AND BETA ENDOSULFAN AND ENDOSULFAN SULFAT)	0,1
41	78	ENDRIN	0.001
42	79	EPTC	0,1
43	80	ETION	0.05
44	81	ETOFUMESAT	0,1
45	86	FENKLORFOS	0,5
46	87	FENITROTION	0,4
47	90	FENTION (TOGETHER WITH THE FENTION-SULFOKSID AND FENITON SULFON)	0,1
47	92	FENVALERAT	0,5
49	93	FERBAM	see DITIOKARBAMATES
50	96	FOKSIM	0,05
51	98	FONOFOS	0,1
52	99	FORAT (TOGETHER WITH THE FORATSULFOKSID AND FORATSULFON)	0,01
53	100	FORMOTION	0,3
54	101	FOSALON	0,2
55	103	FOSFAMIDON	0,05
56	106	GLIFOSAT	0.05
57	108	HCH (ALPHA+BETA+DELTA)	0,1 (fish and their products; from the fat content)
58	111	HEPTENOFOS	0,1
59	115	KLORFENAMIDIN	0.5
60	116	KLORFENSON	0,05
61	117	KLORFENVINFOS (ALFA AND BETA)	0.05
62	118	KLORIDAZON	0,1
63	119	KLORMEFOS	0,05
64	121	KLOROKSURON	0,05
65	122	KLORPIFIROS	0,05
66	125	KLORPROPILAT	0,5
67	127	KLORTOLURON (TOGETHER WITH 3-KLOR-4-METIL-ANILIN)	0,05
68	131	KAMFEKLOR (TOKSAFEN)	0,4
69	132	KAPTAFOL	0,1
70	133	KAPTAN	0,1
71	134	KARBARIL	0,1
72	135	KARBENDAZIM (TOGETHER WITH THE METABOLITE 12-AMINOBENZIMIDAZOL)	see BENOMIL
73	136	KARBOFURAN (TOGETHER WITH THE 3-HIDROKSIKARBOFURAN)	0,05

74	140	KELEVAN	0,01
75	142	KVINTOZEN	0,01
76	143	LENACIL	0,1
77	144	LEPTOFOS	0,05
78	145	LINDAN	0,5 (fish and their products; from the fat content)
79	146	LINURON (TOGETHER WITH THE 3,4-DIKLORANILIN)	0,1
80	147	MALATION	0,5
81	148	MANEB	see DITIOKARBAMATES
82	149	MANKOZEB	see DITIOKARBAMATES
83	150	MCPA	0,05
84	151	MEKOPROP (MCPP)	0,05
85	152	METAM-NATRIJ	0,01
86	153	METABENZTIAZURON	0,1
87	154	METALDEHID	0,5
88	155	METAMIDOFOS	0,1
89	157	METIDATION	0,1
90	159	METIRAM	see DITIOKARBAMATES
91	160	METIRAM-METIL	
92	161	METOBROMURON (TOGETHER WITH 4-BROMANILIN)	0,1
93	163	METOLAKLOR	0,05
94	164	METOMIL	0,1
95	167	MEVINFOS	0,1
96	170	MONOKROTOFOS	0,05
97	171	MONOLINURON (TOGETHER WITH THE 4-KLORANILIN)	0,1
98	172	NALED	0,1
99	173	NAPROPAMID	0,1
100	174	NEBURON	0,1
101	175	NITROFEN	0,01
102	178	OKSIDEMETON-METIL	see DEMETON-S-METIL
103	180	OMETOAT	0,05
104	181	PARAKVAT	0,05
105	182	PARATION	0,1
106	183	PARATION-METIL	
107	184	PEBULAT	0,1
108	185	PENTAKLORFENOL	0,01
109	190	PIRIMIFOSMETIL	0,05
110	195	PROMETRIN	0,1
111	200	PROPINEB	see DITIOKARBAMATES
112	202	PROPOKSUR	0,1
113	204	SIMAZIN	0,05
114	206	PLANTS-PROTECTIVE AGENTS ON THE BASIS OF ANORGANIC COPPER COMPOUNDS (CALCULATED AS COPPER)	10
115	209	2,4,5-T	0,01

116	211	TCMTB	0.1
117	222	TIRAM	see DITIOKARBAMATES
118	225	TRIAZOFOS	0.2
119	227	TRIFLURALIN	0.1
120	230	VAMIDOTION (TOGETHER WITH THE VAMIDOTIONSULFOKSID AND VAMIDOTIONSULFON)	0.5
121	231	VERNOLAT	0.1
122	243	METALAKSIL	0.1
123	247	FLUCITRINAT	0.2

* - in the "Statute on the quantities of pesticides and other toxic substances, hormones, antibiotics and mycotoxins, which are permitted in foods" also as Table 1.

Table 2♣.: Permissible levels of toxic substances in seafoods - in mg/kg (l)

Succ. no.	Succ. no. in Table 3. ♣	Type of food	Lead	Cadmium	Mercury	Methyl-mercury	Zinc	Tin	Arsenic	Copper	Iron	Other contaminants
1	34	Fresh fish	1	0,1 and 1,0*	0,5 and 1,0*	0,4 and 0,8*	/	/	2,0** and 4,0***	/	/	/
2	35	Fish oil	0,4	/	/	/	/	/	0,4	0,4	5	/
3	36	Fish products:										
		1. in tinplate containers (canned)	2 and 5*	0,15 and 1,5*	0,8 and 1,5*	0,6 and 1,0*	100	200	2,0 and 4,0*	30	30	/
		2. in other packaging (other packing materials)	2 and 5*	0,15 and 1,5*	0,8 and 1,5*	0,6 and 1,0*	100	/	2,0 and 4,0*	30	30	/

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* Fish which live longer (tuna, sword-fish, etc.), crustaceans, shellfish et similar

** "Blue" and "white" fish, except gruj and eel

*** Other species of fish, crustaceans and shellfish

♣ in the "Statute on the quantities of pesticides and other toxic substances, hormones, antibiotics and mycotoxins, which are permitted in foods" as Table 3.

Table 3.: General microbiological criteria for foods

Bacteria (species or group)	Norm (tolerable qty.)	Quantity of food in g (ml)
Salmonella spp.	0 (absent)	25
Coagulase-positive Staphylococcus spp.	0 (absent)	0,01
Sulphite-reducing Clostridium spp.	0 (absent)	0,01
Proteus spp.	0 (absent)	0,001
Escherichia coli	0 (absent)	0,001

Table 4.: Microbiological criteria for defined types of seafood:

Bacteria (species or group)	Norm (tolerable qty.)	Quantity of food in g					
		Pasteurised "half-preserved" products of fish, crustaceans, shellfish and turtles (11. art.)	*Sterilized (> 100°C) products of fish, crustaceans, sea urchins and turtles (12. art.)*	*Fresh fish which weigh more than 0,5 kg for each piece (13. art.)*	*Frozen fish, crustaceans and turtles which weigh more than 0,5 kg for each piece (14. art.)*	*Salt(ed) fish (15. art.)*	*Smoked and dried fish** (16. art.)*
Salmonella spp.	0 (absent)	25	*	25	25	25	25
Coagulase-positive Staphylococcus spp.	0 (absent)	0,1	*	0,1	0,1	0,1	0,1
Sulphite-reducing Clostridium spp.	0 (absent)	0,1	*	0,1	0,1	0,01	0,1
Proteus spp.	0 (absent)	0,1	*	0,1	0,1	0,01	0,1
Escherichia coli	0 (absent)	0,1	*	0,1	0,1	0,01	0,1
Total no. of microorganisms (TVC)	in 1 g	/	*	1000	1000	/	1000
No. of aerobic spore-forming bacteria	in 1 g	/	*	/	/	10000	/

/ - no criterion

* - the provision for sterilized (> 100°C) products of fish, crustaceans, sea urchins and turtles provides that these products should be sterile as a rule, but it also provides that non-sterile samples can contain 300 saprofite microorganisms per gram at the most

**- criteria for this type of seafood refer to the inner parts i.e. taken from the depth of fish flesh

ANNEXE XI

ESPAGNE

Table 1

In the protection and improvement areas the following parameters have to be measured in each sampling station.

Parameter	Frequency of sampling	Limits
Ph	Quarterly	7-9
T[a]	Quarterly	
Colour	Quarterly	
Suspended matter	Quarterly	
Salinity	Monthly	12-38
O_2	Monthly	>80%
Hydrocarbons	Quarterly	
Organohalogenated compounds	Bi-annual	
Metals: Ag, As, Cd, Cr, Cu, Hg, Ni, Pb, Zn	Bi-annual	
Coliforms, E. Coli	Quarterly	Depending on the class of the area
Compounds that influence the taste of molluscs		
Saxitoxina		

Table 2

The established maximum limits for the concentrations of heavy metals for the fish and aquaculture products are the following:

Organisms	Cd	Cu	Hg	Pb	Sn
Fish, cephalopods (fresh, freeze, tanned)	1	20	1	3	250
Bivalves and gastropods	1	20 (for oysters 60)	1	5	250
Crustaceans	1	20	1	1	250