

WORKSHOP SUMMARY¹

The use of chemicals is common in various aquaculture systems, as it is in many agricultural practices. However, with growing worldwide awareness of the need for responsible practices in aquaculture, governments and aquaculturists are increasingly concerned with the effects of the use of chemicals in aquaculture, especially those which appear likely to be hazardous to man, cultured stock and/or the environment. The need to synthesize and disseminate information on the use and management of "aquachemicals" was recognized by the Fishery Resources Division of the Food and Agriculture Organization of the United Nations (FAO) and the Southeast Asian Fisheries Development Center (SEAFDEC) Aquaculture Department, who convened "The Expert Meeting on the Use of Chemicals in Aquaculture in Asia," which was held 20-22 May 1996 at the SEAFDEC facilities in Tigbauan, Iloilo, the Philippines. Support was provided by FAO, SEAFDEC and the Canadian International Development Agency's (CIDA) ASEAN Fund. The World Health Organization (WHO) supported the participation of a human health expert. The meeting was attended by 27 participants and more than 70 observers from the public and private sectors of 20 countries. Among the attendees were representatives from the Network of Aquaculture Centres in Asia-Pacific (NACA), the Fish Health Section of the Asian Fisheries Society (FHS/AFS), the Japan International Research Center for Agricultural Sciences (JIRCAS), the GESAMP Working Group on Environmental Impacts of Coastal Aquaculture, and the ICES Working Group on Environmental Interactions of Mariculture.

The results of this expert workshop are presented in this volume. They include the texts of presentations on a wide range of topics (thematic reviews) related to the use of chemicals in aquaculture, with emphasis on the Asian Region, as well as country overview papers summarizing the use of aquachemicals in Asian countries. The general thematic reviews included:

- the use of chemicals in aquaculture: needs, usage, issues and challenges;
- antibacterial chemotherapy in aquaculture;
- ecological effects of chemical usage in aquaculture;
- transferable drug resistance plasmids in fish-pathogenic bacteria;
- the use of chemicals in aquafeeds;
- human health aspects of the use of chemicals in aquaculture; and
- regulations on the use of chemicals in aquaculture.

In addition, country over-view papers on the use of aquachemicals were presented for Bangladesh; Cambodia; China P.R.; India; Indonesia; Japan; Lao PDR; Malaysia; Nepal; Pakistan; Philippines; Sri Lanka; Taiwan; China; Thailand; and Vietnam.

General information on international initiatives and agreements relating to or impacting upon the use of chemicals in aquaculture was also presented. This included information on the *Code of Conduct for Responsible Fisheries*, and particularly, its Article 9 on Aquaculture Development (FAO 1995; also see FAO 1997); the activities of the FAO/WHO Codex Alimentarius Commission, its Joint FAO/WHO Food Standards Programme and the Proposed Draft Code of Hygienic Practice for the Products of Aquaculture; the work of the Joint FAO/WHO Expert Committee on Food Additives (JECFA); the Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) (Article XX of Legal Texts of the Uruguay Round adopted by Members of the General Agreement on Tariffs and Trade (GATT 1994); and the *International Code of Conduct on the Distribution and Use of Pesticides* (FAO 1990).

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After the presentations, participants and observers met in working groups and plenary sessions to discuss the roles and responsibilities of both the private sector (manufacturers, suppliers, retailers, and users of chemicals) and the public sector (government, line agencies and academia), in relation to the use of aquachemicals and to explore possible avenues for improved collaboration among all parties concerned.

GENERAL FINDINGS

The general findings of this expert meeting can be summarized as follows:

- A wide range of chemicals are being used in aquaculture, for numerous purposes and in different aquaculture systems. When discussing aquachemicals, it is important that clear distinctions be made between the many different aquaculture systems and species employed and the specific patterns of chemical application.
- Many chemicals are essential for successful and efficient farm and hatchery management.
- Most chemicals used in aquaculture do not appear to carry significant potential for adverse effects on human health or the environment, provided that they are applied in a technically appropriate manner.
- Significant difficulties were experienced in the compilation of data on chemical usage in Asian aquaculture, and further efforts are urgently required to generate an adequate information base to derive management advice on the safe and effective use of chemicals.
- There is a need to facilitate exchange of information and collaboration among manufacturers, suppliers, “middlemen” (salesmen, traders, etc.), importers and users (i.e., aquafarmers) of chemicals.
- The roles and responsibilities of the public sector (i.e., government and academia) are significant with regard to management and regulation of chemical usage in aquaculture.
- There are major constraints to promoting the safe and effective use of chemicals in aquaculture. These include:
 - A lack of trained manpower (e.g., experienced fish health management specialists) and related capacity-building schemes and support services to disseminate information on fish health management.
 - The misapplication of some chemicals (e.g., the excessive prophylactic use of antibacterials) that is often due to aquafarmers lacking access to information on appropriate use, or to the lack of effective yet economically viable alternative management measures or suitable alternative chemicals which would help reduce the use of some potentially hazardous chemicals. The promotion of certain chemicals by “middlemen” or drug companies may also play a significant role in the overuse of chemicals.
 - Insufficient understanding of the mode of action and efficacy of certain chemicals (e.g., some chemotherapeutants and pesticides), especially under tropical conditions.
 - Uncertainties with regard to legal and institutional frameworks to governing chemical usage in aquaculture. Specific provisions are insufficient or even lacking; the mandates and responsibilities of various line agencies in charge of public health and food safety,

agriculture, animal health services, environment etc., are sometimes not well defined, and there are enforcement problems.

- The use of chemicals in aquaculture may have significant implications for international trade of aquaculture products. Countries exporting aquaculture products, especially shrimp, are facing food safety requirements (e.g., maximum residue levels, banning of chemicals) which have been or are being formulated by importing countries. Controversy on these issues may increase due to activities by certain advocacy groups.

The findings of this expert meeting were subsequently discussed by an *ad hoc* meeting (held 24-28 May 1996) of the GESAMP (IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) Working Group on Environmental Impacts of Coastal Aquaculture, with a view to address major environmental and human health issues related to the use of chemicals in coastal aquaculture as practiced worldwide (GESAMP 1997). Additional progress towards world-wide aquaculture drug and vaccine registration has been made through various communication networks and committees established by the Workshop on International Harmonization for Aquaculture Drugs and Biologics, held in February 1997, and the Workshop and Round Table held at the European Association of Fish Pathologist's Eighth International Conference on Diseases of Fish and Shellfish, held in September 1997 (see Schnick *et al.* 1997). It is hoped that the proceedings of the Expert Meeting on the Use of Chemicals in Aquaculture in Asia will prove a useful basis to future progress in this important area.

REFERENCES

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