

Environmental Health Criteria 5

Nitrates, Nitrites and N-Nitroso Compounds

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INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY

ENVIRONMENTAL HEALTH CRITERIA 5

Nitrates, Nitrites and N-Nitroso Compounds

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NOTE TO READERS OF THE CRITERIA DOCUMENTS

While every effort has been made to present information in the criteria documents as accurately as possible without unduly delaying their publication, mistakes might have occurred and are likely to occur in the future. In the interest of all users of the environmental health criteria documents, readers are kindly requested to communicate any errors found to the Division of Environmental Health, World Health Organization, Geneva, Switzerland, in order that they may be included in corrigenda which will appear in subsequent volumes.

In addition, experts in any particular field dealt with in the criteria documents are kindly requested to make available to the WHO Secretariat any important published information that may have inadvertently been omitted and which may change the evaluation of health risks from exposure to the environmental agent under examination, so that the information may be considered in the event of updating and re-evaluating the conclusions contained in the criteria documents.

WHO TASK GROUP ON ENVIRONMENTAL HEALTH CRITERIA FOR NITRATES,

NITRITES, AND N-NITROSO COMPOUNDS

Lyons, France, 16-21 February 1976

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List of Abbreviations

DMN *N*-methyl- *N*-nitrosomethanamine (*N*-nitrosodimethylamine, dimethylnitrosamine)

DEN *N*-ethyl- *N*-nitrosoethanamine (*N*-nitrosodiethylamine, diethylnitrosamine)

DMA *N*-methylethanamine (dimethylamine)

DEA *N*-ethylethanamine (diethylamine)

TMA *N,N*-dimethylethanamine (trimethylamine)

TMAO trimethyloxamine (trimethylamine oxide)

ENVIRONMENTAL HEALTH CRITERIA FOR NITRATES, NITRITES, AND N-NITROSO COMPOUNDS

A WHO Task Group on Environmental Health Criteria for Nitrates, Nitrites and *N*-nitroso compounds met in Lyons from 16 to 20 February 1976. Dr Higginson, Director of the International Agency for Research on Cancer opened the meeting on behalf of the Director-General. The Task Group reviewed and amended the second draft of the criteria document and made an evaluation of the health risks from exposure to these compounds.

The preparation of the first draft of the criteria document was based on national reviews of health effects research on nitrates, nitrites, and *N*-nitroso compounds received from the national focal points for collaboration in the WHO Environmental Health Criteria Programme in Bulgaria, Canada, Czechoslovakia, the Federal Republic of Germany, Netherlands, New Zealand, Poland, the United Kingdom, the USA, and the USSR. Dr I. C. Munro, Toxicological Research Division, Health Protection Branch of the Department of National Health and Welfare, Ottawa, Ontario, Canada, prepared both the first draft and the second draft which took into account the comments received from the national focal points in Bulgaria, Canada, Czechoslovakia, Finland, Japan, New Zealand, Poland, Sweden, USA, and the USSR; from the United Nations Industrial Development Organization (UNIDO), the Food and Agriculture Organization of the United Nations (FAO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Atomic Energy Agency (IAEA), the Health Protection Directorate of the Commission of the European Communities (CEC), and from the International Federation of Pharmaceutical Manufacturers' Associations (IFPMA).

At the request of the Secretariat, comments were also received from Dr S. Oden, Agricultural College, Department of Soil Science, Division of Ecochemistry, Uppsala, Sweden.

The collaboration of these national institutions, international organizations and individual experts is gratefully acknowledged. Without their assistance this document could not have been completed. The collaboration of the International Agency for Research on Cancer in the preparation of the document and in acting as host to the Task Group is also greatly appreciated.

The Secretariat wishes to thank Mr A. W. Kenny, Department of the Environment, London, England and Mr D. A. H. Price, Chorley Wood, Herts, England for their advice in the preparation of some sections of the document and Dr Munro for his help in the final phases of editing.

This document is based primarily on national contributions and on original publications listed in the reference section. In addition, some recent publications reviewing the environmental health aspects of

nitrites, nitrites and *N*-nitroso compounds have been used. These include reviews and symposia by the US National Academy of Sciences, Washington, DC (Committee on Nitrate Accumulation, 1972), the US Department of Health, Education and Welfare (1970), the US Environmental Protection Agency,^a the International Agency for Research on Cancer (Bogovski 8: Walker, 1974; Bogovski et al., 1972a; Walker et al., 1970), Druckrey et al. (1967), Lee (1970a), Magee & Barnes (1967), Magee et al. (1976), Montesano & Bartch (1976), and Sen (1974).

Details concerning the WHO Environmental Health Criteria Programme including the definition of some terms frequently used in the documents may be found in the general introduction to the Environmental Health Criteria Programme published together with the environmental health criteria document on mercury (Environmental Health Criteria 1 -- Mercury, World Health Organization, Geneva, 1976).

^a "US Environmental Protection Agency (1976) Scientific and technical assessment report on nitrosamines. Preprint of document submitted for publication in the STAR series, Washington DC, Office of Research and Development, 210 pp.

1. SUMMARY AND RECOMMENDATIONS FOR FURTHER STUDIES

1.1 Summary

1.1.1 Analytical methods

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