Radioactive contamination

A certain amount of exposure to ionizing radiation is unavoidable because many sources, including of radionuclides occur naturally in the ground and the atmosphere . Potentially hazardous contaminants and residues in herbal medicines WHO guidelines for assessing quality of herbal medicines with reference to contaminants and residues 14 Dangerous contamination may be the consequence of a nuclear accident or may arise from other sources. WHO, in close collaboration with several other international organizations, has developed guidelines for use in the event of widespread contamination by radionuclides resulting from a major nuclear accident . Examples of such radionuclides include long-lived and short-lived fi ssion products, actinides and activation products. In general the nature and the intensity of these radionuclides may differ markedly and depends on factors such as the source, which could be a reactor, reprocessing plant, fuel fabrication plant, isotope production unit or other . These guidelines emphasize that the health risks posed by herbal medicines accidentally contaminated by radionuclides depend not only on the specifi c radionuclide and the level of contamination, but also on the dose and duration of use of the product consumed. An important consideration in the testing for radioactive substances in herbal materials and products is the availability of the appropriate methodology and equipment. Member States would probably benefi t from collaboration with countries where these facilities are available. Cross-contamination of radionuclide-free herbal materials should be totally avoided during all the stages of production, transportation and storage.

Determination of radioactive contaminants 4.2.1 Method of measurement Following a severe nuclear accident, the environment may be contaminated with airborne radioactive materials. These may deposit on the leaves of medicinal plants. Their activity concentration and the type of radioactive contamination can be measured by the radiation monitoring laboratories of most of the WHO Member States. The activity concentration of radioisotopes in herbs should be assessed by the competent national radiohygiene laboratories taking into account the relevant recommendations of international organizations, such as Codex Alimentarius, the International Atomic Energy Agency (IAEA), FAO and WHO. Since radionuclides from accidental discharges vary with the type of facility involved, a generalized method of measurement is not yet available. However, should such contamination be a concern, suspect samples can be analysed by a competent laboratory. Details of laboratory techniques are available from the IAEA.1

Limit test for arsenic Arsenic is abundant in nature and its presence in herbal medicines should be no different to its wide occurrence in foods. A popular test method relies on the digestion of the plant matrix followed by subjection of the digestate to a comparative colorimetric test in a special apparatus. The test method described below uses colorimetry and does not use toxic mercuric bromide paper. The method uses N-N-diethylmethyldithiocarbamate in pyridine and it reacts with hydrogen arsenide to afford a red–purple complex. The limit is expressed in terms of arsenic (III) trioxide (As2 O3).