

Estimation of Doses from Ingestion of Contaminated Food in the Event of a Nuclear Detonation

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The project PREDICT (Improvements in atmospheric dispersion modelling and protective action strategies in case of nuclear detonations) is a collaboration between 13 northern European institutes from 7 countries. PREDICT's aim is to enable the existing decision support systems such as ARGOS and JRODOS to simulate and predict consequences due to the fallout of a nuclear detonation. This objective is pursued by improving and adapting nationally used atmospheric dispersion and transport codes as well as foodchain transfer models to capture the peculiarities of nuclear detonation.

The main focus of the initial activities of PREDICT has been on determining the characteristics of the radioactive cloud following a nuclear detonation and in ranking radionuclides that are radiologically important, in terms of their dose contribution from different pathways (ground-shine, inhalation and ingestion). With regards to the estimation of ingestion dose, our focus has been on foodstuffs that were likely to (a) form substantial parts of the diet and (b) be important in terms of potential radionuclide transfer at specific timepoints (1 day, 7 days, 30 days, 6 months and 1 year). Based on these considerations, 7 food groups have been identified: Cereals, Leafy vegetables, Root vegetables, Potatoes, Fruits and berries, Dairy products and Meat. In addition, we anticipated that we would also need to consider transfer to grass as a feedstuff for grazing (dairy and meat) cattle.

In the present work, a brief overview of the contributions from the Norwegian partners in the PREDICT project will be given along with a more elaborated account of the work conducted related to the adaptation of FDMT (Terrestrial Food chain and Dose Module). FDMT is the radionuclide transfer foodchain module of ARGOS which is used by Norway in order to estimate contamination levels in food and feed products, as well as to predict doses to the public in case of a nuclear or radiological accident.