

Measuring Norwegian reindeer external radiation exposure under field conditions

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Models and approaches have been developed to predict radiation exposure of wildlife under field conditions. However, there have been few attempts to directly measure radiation exposure of wildlife and confirm that the doses predicted by models. This is a potential issue for stakeholder acceptance of modelling based assessments. Therefore, direct dosimetry measurements of wild organisms in the field are desirable to validate prediction of external dose rates.

Norway is one of European countries that was most affected by radioactive contamination from the Chernobyl accident. Reindeer have continuingly high levels of Chernobyl-derived Cs-137. To provide a total dose estimate for the reindeer, the external exposure measurements is needed. A reindeer herd in Vågå, Norway offer the opportunity to more directly determine external dose rate (in collaboration with the Norwegian Radiation Protection Authority (NRPA) and the Vågå herders). Four types of dosimeters, thermoluminescence dosimeter or TLD (LiF:Mg, Cu, P), optical stimulated luminescence dosimeter (Al₂O₃:C), radiophotoluminescence dosimeter (phosphate glass) and direct ion storage dosimeter (Instadose 2), have been fitted to GPS collared reindeer; dosimeters were housed in an aluminium box. In total, fifteen reindeer had dosimeter boxes mounted onto their collars in January 2016. The results of this experiment will allow to compare data from four dosimeters collected over a year (and hence assess dosimeter performance and suitability for environmental use) and also validate external absorbed dose rates predicted by computer models.

This presentation will describe the experimental site and the Vågå reindeer herd, aspects of dosimetry technologies, and research plans.