

See Distribution

Ref: DRPS/MFB/200187/FW

Date: 11 November 2005

FORMER ROYAL ARTILLERY RANGE HEBRIDES CORRECTED FOOD PRODUCT ANALYSIS

Reference: Documents of the NRPB Vol. 16 No. 3 2005 – Generalised Derived Limits for Radioisotopes of Cobalt et al.

1. Dstl Radiological Protection Services were tasked by the Ministry of Defence, Directorate of Safety and Claims to carry out an environmental survey of the former Royal Artillery Range, Hebrides and surrounding areas. The environmental survey was carried out during May 2004 and the findings presented to the QinetiQ workforce, locally elected representatives and press in November 2004. As a result of questions that were raised during the presentations it was agreed that food products from the local area would be sampled and assessed.
2. Following discussion with local elected representatives and the Assistant Director of the Department for Sustainable Communities (Uist and Barra) it was agreed that potatoes, rabbit meat and lamb flesh and blood would be obtained and analysed for cobalt-60. Assistant Director of the Department for Sustainable Communities (Uist and Barra) arranged collection of these samples and the locations from where they were taken from are provided below and shown on the attached map:

Sampling point	Food products	Sampling location
1	Potatoes from West Gerinish machair	NF 758418
~ 1	Lamb flesh from West Gerinish	NF 758418 approx.
~ 1	Blood from above animal	NF 758418 approx.
2	Rabbit meat from West Gerinish	NF 755435

3. To ensure that analysis techniques employed by Dstl Radiological Protection Services were commensurate with those used by other agencies, samples of the above items were provided to the Assistant Director of the Department for Sustainable Communities (Uist and Barra) and these were analysed for cobalt-60 by the UKAS Accredited Laboratories of Glasgow Scientific Services (GSS).
4. The results of the analysis undertaken by the laboratories are detailed in the Table below:

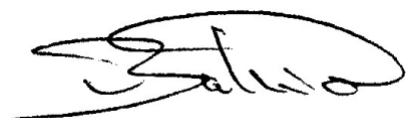
Samples	Dstl analysis (Bq kg ⁻¹ unless indicated otherwise)		GSS (Bq kg ⁻¹)
Potatoes from West Gerinish machair	With skins	Less than 0.6	Less than 1.8
	Without skins	Less than 0.5	
Lamb flesh from West Gerinish	Less than 0.8		Less than 0.9
Blood from above animal	Less than 0.8 Bq l ⁻¹		Less than 0.4
Rabbit meat from West Gerinish	Less than 0.8		Less than 0.7

5. The National Radiological Protection Board (NRPB) has published at the Reference, Generalised Derived Limits (GDLs) for cobalt-60. GDLs are intended for use as convenient reference levels against which the results of environmental monitoring can be compared and are calculated from the annual effective dose limit of 1 mSv using deliberately cautious assumptions. The calculation of GDLs by the NRPB takes into account annual intake of foods that are based on a number of national surveys. It is therefore possible to calculate the annual radiation dose resulting from foods sampled and contrast them with the dose limit for members of the public of 1 mSv y^{-1} ($1 \text{ mSv} = 1000 \mu\text{Sv}$). While the Reference provides the GDL for cobalt-60 in potatoes and sheep meat, some assumptions are required to determine the radiation dose resulting from ingestion of rabbit and black pudding made using sheep blood, namely:

- Annual consumption of rabbit is the same as that for poultry
- Annual consumption of black pudding is the same as that for offal
- Concentration of blood in black pudding is 0.33 l. kg^{-1}

Sample	Annual dose (μSv)	
Potatoes from West Gerinish machair	With skins	Less than 0.75
	Without skins	Less than 0.62
Lamb flesh from West Gerinish	Less than 0.09	
Black pudding incorporating blood from above animal	Less than 0.04	
Rabbit meat from West Gerinish	Less than 0.14	

6. It is concluded that the radiological risk to members of the public from consumption of food made from the samples taken in the area near to the former Royal Artillery Range, Hebrides are negligible.



M F BOLTWOOD

Radiation Protection Adviser

For Dstl RPA Body

Tel: 02392 768146

Fax: 02392 768150

E-mail: mfboltwood@dstl.gov.uk

Enclosure: Map of food product sampling location

Distribution:

1. Assistant Director (Uist & Barra), Comhairle Nan Eilean Siar, Balivanich, Isle of Benbecula HS7 4LA
2. Health, Safety & Environmental Officer, QinetiQ MOD Hebrides, Bldg 1, Rangehead, Isle of Benbecula HS7 5LA
3. Area Manager, QinetiQ MOD Hebrides, Isle of Benbecula HS7 5LA
4. Directorate of Safety and Claims, 6-D-40, MOD Main Building, Whitehall, London SW1A 2HB
5. Senior Chemist Radioactivity Section, Glasgow Scientific Services, Environmental Protection Services, Glasgow City Council, 64 Everard Drive, Glasgow G21 1XG

