



Third International  
Conference on Radiation  
and Applications in Various  
Fields of Research

June 8 - 12 | 2015  
Slovenska Plaža  
Budva | Montenegro  
[www.rad-conference.org](http://www.rad-conference.org)

# **RAD** **BOOK**

**OF**  
**ABSTRACTS**

**PUBLISHER:** RAD Association, Niš, Serbia  
[www.rad-association.org](http://www.rad-association.org)

**FOR THE PUBLISHER:** Prof. Dr. Goran Ristić

**EDITOR:** Prof. Dr. Goran Ristić

**COVER DESIGN:** Vladan Nikolić, M.Sc.

**TECHNICAL EDITING:** Sasa Trenčić and Vladan Nikolić

**PROOF-READING:** Saša Trenčić, MA

**ISBN:** 978-86-80300-00-9

CIP - Каталогизacija u publikaciji -  
Народна библиотека Србије, Београд

539.16(048)(0.034.2)

INTERNATIONAL Conference on Radiation and Applications in Various Fields of  
Research (3rd ; 2015 ; Budva)

Book of Abstracts [Elektronski izvor] / Third International Conference  
on Radiation and Applications in Various Fields of Research, RAD 2015, June  
8-12, 2015, Budva, Montenegro ; [editor Goran Ristić]. - Niš : RAD  
Association, 2015 (Niš : RAD Association). - 1 elektronski optički disk  
(CD-ROM) ; 12 cm

Sistemska zahteva: Nisu navedeni. - Nasl. sa naslovne strane dokumenta. -  
Tiraž 400. - Bibliografija uz svaki apstrakt.

ISBN 978-86-80300-00-9

a) Јонизујуће зрачење - Дозиметрија - Апстракти

COBISS.SR-ID 215620620



## ESTIMATION OF EFFECTIVE DOSE IN INGESTION OF FOOD CROPS FOR $^{40}\text{K}$

**Aleksandra Angeleska, Elizabeta Dimitrieska-Stojkovic,  
Risto Uzunov, Zehra Hajrulai-Musliu,  
Biljana Stojanovska-Dimzoska, Dean Jankuloski,  
Angelevski Ljupco**

University Ss. Cyril and Methodius, Faculty for Veterinary Medicine, Food Institute, Skopje, Macedonia

Numerous studies have been conducted in order to determine the factor of transition of natural radionuclides for most important agricultural products. Several projects have been conducted by the International Atomic Energy Agency (IAEA) in order to determine the transition factor. These data are extensively applied in the models of radiological estimation. The natural radioactivity of the environment arises mainly from the original radionuclides, such as  $^{40}\text{K}$  and the radionuclides from the series of  $^{232}\text{Th}$  and  $^{238}\text{U}$  and the products of their decay are considered the main cause of the internal radiation dose. Several studies have been conducted on the transition of the natural radionuclides from the soil to the plant in different regions of the world. For this reason, the goal of the current study was to estimate the effective dose that the human receives if he uses specific crops that are cultivated on previously analyzed soils. On the basis of the obtained specific activities of the soils and known TF for specific crops, specific activities in the crops have been calculated (Bq/kg). On the basis of such obtained activity for specific crops and the quantity of average ingestion of these crops in Macedonia, by using the dose coefficient  $e$ , the effective dose  $D_{\text{eff}}$  for adults is estimated. The selection of the crops is made because these crops are most commonly used in nutrition (most common crops in the nutrition).

The radiometric analysis of these samples was conducted by applying a  $\gamma$ -ray spectrometer with high purity germanium (HPGe), detector with 30% relative efficiency and energy resolution (FWHM) of 1.8 keV for 1.33 MeV referential transition to  $^{60}\text{Co}$ . The software used for obtaining data is Canberra software package Genie-2000.

From the very research one can perceive that the transport of  $^{40}\text{K}$  from the soil to all types of plants is large, and at the same time it is the most important biological element required for normal functioning of plants. The highest level of  $^{40}\text{K}$  is found in the vegetables with mean value of 802,55 Bq/kg, while the level is lowest in root crops, 339,54 Bq/kg. The different lifestyle and the different food habits also contribute for differences in the estimation of the effective dose.

The total dose of  $^{40}\text{K}$  from this research is 0.5497 mSv/year, which means that it is lower than the recommended dose which is 1 mSv/year. However, the total obtained estimated effective dose is lower than the recommended one which is 1 mSv/year.

These data can be the foundation for estimation of radioactive contamination risk for the population, which is received by ingestion of produced food. Before making final conclusions for the dangers of the exposure of the population to radioactive contamination, a more extended and more systematic examination of the field is required.

**Key words:** Radioactivity, soil, plant, transfer factor (TF)