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Specific activities of natural and anthropogenic radionuclides in organic Sungyod rice samples collected from Don Pradu sub-district in Pak Phayun district in Phatthalung province, Thailand

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The small amounts of natural and anthropogenic radionuclides that accumulate in some human staple diets can cause harm to the health of consumers. In order to examine the level of radioactive background in staple food of Thai people, specific activity of natural (40K, 226Ra and 232Th) and anthropogenic (137Cs) radionuclides were studied and evaluated in 28 samples of organic Sungyod rice collected from Don Pradu sub-district, Pak Phayun district in Phatthalung province. The hyper-pure germanium (HPGe) detector and gamma-ray spectrometry analysis system which were set-up in advanced laboratory in Thailand Institute of Nuclear Technology (public Organization) or TINT were employed to perform some measurements and analysis for this study. It was found that the average values of specific activities of 40K, 226Ra, 232Th and 137Cs were 24.11 ± 2.01, 0.28 ± 0.07, 0.17 ± 0.06 and < 0.10 Bq/kg respectively. In addition, the average values of 40K, 226Ra and 232Th were also used to evaluate some related radiological hazard indices which are gamma-absorbed dose rate (D), radium equivalent activity (Raeq), external hazard index (Hex) and annual external effective dose rate (AEDout). Furthermore, by using the AEDout value, the excess lifetime cancer risk (ELCR(outdoor)) in this area would be also evaluated and presented. Moreover, Office of Atoms for Peace (OAP) annual report data, Thailand and global radioactivity measurement and calculations were used to compare and discussed with the present results. According to all results from this study, the organic Sungyod rice in the studied area were not only the low level of background radiation diet but also safe to consume.

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