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KEY WORDS : CERTIFICATION/IN-HOUSE REFERENCE MATERIAL/ RICE
FLOUR / STABILITY/ HOMOGENEITY

WIPHARAT CHUACHUAD : COMPARISON OF ANALYTICAL TECHNIQUES
FOR TRACE METALS FOR THE CERTIFICATION OF IN-HOUSE RICE FLOUR
REFERENCE MATERIAL. THESIS ADVISORS : JUWADEE SHIOWATANA Ph.D.,
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The certification of rice flour material for trace elements based on at least two independent methods was carried out. Fourteen elements were targeted for the certification. The analytical techniques included ICP-AES, ICP-MS, ETAAS and FAAS. Out of the 14 elements, 9 elements, namely Na, K, Mg, Ca, Ba, Cu, Zn, Fe and Mn, could be certified. Pb, Cd, Cr, Co and V could not be certified because only one analysis method was successfully performed so reference values were given for these elements. The evaluation of some methods of analysis for some elements was conducted by analyzing SRM 1568a rice flour standard reference material.

Statistical tests for the study of homogeneity for Na, K, Mg, Ca, Cu, Zn, Fe at 95 % and for Mn at 99.15 % confidence level did not reveal significant differences between the within-bottle and between-bottle variation. The rice flour material is considered to be homogeneous at 250-650 mg sample sizes. No change was observed in a long-term stability study of the material over a period of 5 months and a short-term stability study at an elevated temperature of 50 °C for a period of 5 weeks, indicating the stability of material. The comparison of results obtained from different independent methods indicated no evidence of significant differences between at least two methods for Na, K, Mg, Ca, Fe, Zn and Mn at 95% confidence level, for Ba at 98.375 % confidence level and for Cu at 99.875 % confidence level. The certified values could be assigned to the 9 elements using both mean and weighted mean together with their uncertainty at confidence levels equal to or greater than 95 %.