

International Conference on

Food safety and Hygiene

September 06-08, 2018 | Edinburgh, Scotland

Food safety in metals contaminated areas, Haut Katanga, D R Congo

T Carsi Kuhangana¹, C Banza Lubaba N¹, T Muta Musambo¹, G Kasongo Tengwa¹, L Roels², E Smolders² and B Nemery² ¹University of Lubumbashi, D R Congo ²Katholieke Universiteit Leuven, Belgium

Objective: The aim of this study was to assess trace metals level in daily food and his relationship with faeces, urine and soil metals concentrations in the population of Haut Katanga Province (DRC).

Methodology: Participants (70 children and 50 adults) in different locations supplied duplicate meals of 96 consecutive hours, 96 hours total faeces samples, 24 hours total urines and an indoor and outdoor dust samples in the dry season. Concentrations of trace elements were measured in all samples by ICP-MS.

Results and Discussion: Significant different was found between the contaminated (C) and reference (R) areas, high concentrations of trace metals were found in food and soil of the contaminated areas at different level of significant ((C) versus (R) mean [minimum - maximum] in (μg.kg-1)); Al: 266685528 [19823100 - 1259732200] vs 53244155 [8983400 - 164797400], Co: 267,513 [82,745 - 1435,186] vs 114,088 [36,142 - 790,335], Cu: 2775,760 [1233,627 - 5125,207] vs 1849,187 [1051,237 - 3018,073], As: 150,013 [0,018 -506,513] vs 54,361 [0,018 - 302,538], Se: 165,378 [18,755 - 481,320] vs 98,448 [0,008 - 246,311], Mo: 419,599 [74,131 - 1564,076] vs 243,333 [89,336 - 669,653], Sb: 7,125 [0,012 -55,606] vs 17,041 [0,012 - 75,456], U: 7,236 [1,223 - 27,952] vs 3,284 [0,000 - 34,155]. And a linear relationship of metals concentration in Food-Soil, Food-Faeces and Food-Urine of contaminated areas was observed and in reference areas only As (Food-Soil) and Co (Food-Faeces) was in relationship. Concentration of Mn, Fe, Cu, Zn, Mo and U were also significant different in food cooked outside in contaminated areas and we observed a relationship between food cooked outside and concentration mean of several trace metals in contaminated areas. The daily intake of trace metals through food between children (Ch) and adults (Ad) in contaminated areas was significant different only for Cu and Zn. But these result hide the real exposure situation especially in children, that's why we estimated the daily intake of metals by kilogram



of body weight (kg-1bw) and the result in food showed that, in contaminated areas, children were twice or more exposed ((Ch) versus (Ad) mean [minimum-maximum] in (µg.kg-1bw)); Al: 2899,345 [98,000-15724,000] vs 1248,844 [68,000- 4889,000], V: 1,410[0,000-5,678] vs 0,665[0,119-2,673], Mn: 120,308[0,000-377,627] vs 55,739[10,665-141,219], Fe: 621,261[0,000-3122,027] vs 237,727[35,363-1106,725], Co: 2,876[0,000-15,976] vs 1,104[0,177-3,967], Cu: 27,626[0,000-91,246] vs 14,932[3,050-37,971], Zn: 214,800[0,000- 581,285] vs 102,505[29,131-222,011], As: 1,483[0,000-4,321] vs 0,498[0,000-1,343], Se: 1,637[0,000-4,514] vs 0,647[0,039-1,365], Mo: 4,098[0,000-15,445] vs 2,377[0,458-14,378], Cd: 0,310[0,000-0,873] vs 0,134[0,019-0,402], Sb: 0,064[0,000-0,338] vs 0,032[0,000-0,142] and U: 0,075[0,000-0,423] vs 0,033[0,006-0,093], through daily food than adults and in reference areas AI:798,077 [39,000-2653,000] vs 283,833 [36,000-1051,000], Fe: 1464,397[1,757-24,630] vs 158,702[34,180-461,106], Cu: 22,738[4,937-40,404] vs 10,059[34,180-461,106], Mo: 2,635[0,291-6,281] vs 1,352[0,253-5,003], Cd: 0,412[0,055-0,991] vs 0,127[0,016-0,336] and Pb: 2,475[7,376-0,991] vs 0,803[0,116-2,729].

Conclusion: Children are the most exposed and the exposition is higher in the contaminated areas. The most important issue is to use research outcome to plead for sustainable development for without safety environment it's difficult to provide safety food.

Speaker Biography

Trésor Carsi Kuhangana was born in Democratic Republic of Congo in 1984. He is graduate (BAC+6) in human nutrition (2014) and is currently member and researcher at the Toxicology and Environment Unit of the University of Lubumbashi in Democratic Republic of Congo since 2015. During 2016 - 2017 he worked as main investigator in the VLIR project (ZRDC2015PRO90) *Pollution par les métaux et effets sur la santé publique au Katanga, R.D.Congo* coordinated by the same research unit. He has a strong interest in Food Toxicology, especially in chemical contamination of Food. As researcher, a third cycle to increase research skills remain his priority.

e: tresordivin7@gmail.com

Journal of Food Technology and Preservation | ISSN: 2591-796X | Volume 2