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杭州市居民主要膳食镉暴露评估

Assessment on the dietary exposure of cadmium in Hangzhou residents

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中文摘要:

通过分析2011—2013年杭州市主要食品中镉污染水平及居民膳食消费量,评估杭州市居民镉暴露的安全性。方法 对各类食品中镉含量进行检测,并结合2010年杭州市居民膳食营养调查中各类食物消费量数据,获得杭州市居民膳食中镉的实际摄入量,对居民由膳食摄入的镉进行安全性评估。结果 10大类食品1 010份食品样品中镉的总检出率为73.76%(745/1 010),总超标率为5.12%(41/801)。大米、小麦及猪内脏均检出镉,检出率为100%,乳制品检出率最低(29.03%,27/93),超标食品主要是大米、水产品、猪肾、蛋类、蔬菜及食用菌。按照食品消费量的均值估算,杭州市居民每月10大类主要食品的镉暴露量为22.61 $\mu\text{g}/\text{kg BW}$,未超过每月耐受摄入量(PTMI)为25 $\mu\text{g}/\text{kg BW}$,镉的安全限值MOS=1.11。贡献率最大的3类食品分别为大米(64.16%)、蔬菜(15.28%)及水产品(14.48%)。结论 杭州市主要食品对居民膳食镉的平均贡献水平未超过PTMI值,MOS > 1,居民膳食镉暴露水平总体上安全,由于杭州市居民大米的消费量较大且大米对居民膳食镉贡献率最高,监管部门应对大米的镉污染问题予以重视。

Abstract:

To analyse the cadmium level in food and dietary intake of residents in Hangzhou for risk assessment. Methods The content of cadmium in foods were determined by the monitoring project of food contamination in Hangzhou city during 2011-2013. The actual dietary intake of cadmium was obtained by combining the data of food consumption survey in Hangzhou residents in 2010 with the data of cadmium content in foods. The dietary intake of cadmium among Hangzhou residents was assessed by provisional tolerable monthly intake (PTMI) recommended by JECFA. Results Cadmium was detected in 745 of 1 010 samples (73.76%) from ten food categories. Rice, wheat and pig viscera were all positive while the detection rate of dairy products was the lowest. The violation rate was 5.12%, mainly in rice, aquatic products, pig kidney, eggs, vegetables and edible mushrooms. Combined with the mean value of food consumption estimates, the cadmium exposure of Hangzhou residents from 10 major food categories were 22.61 $\mu\text{g}/\text{kg BW}$, which was below the PTMI (25 $\mu\text{g}/\text{kg BW}$), and the MOS value was 1.11. The highest contributor were rice(64.16%), vegetables (15.28%) and aquatic products (14.48%). Conclusion The average dietary exposure of cadmium from 10 food categories did not exceed the PTMI, the MOS was above 1, so the dietary cadmium exposure was safe in general, but more attention should be paid to the risk of cadmium exposure in higher food consumption population. Besides, based on the consumption of rice in Hangzhou and the high contribution rate of rice to dietary cadmium exposure, more attention should be paid to prevent and control cadmium contamination in the farmland.

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