

HEAVY METAL CONTENTS OF FOOD SEASONINGS AND BOUILLON CUBES FROM ABA, ABIA STATE NIGERIA

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Introduction

In Nigeria, the quest for easy to prepare dishes or fast foods has created a progressive loss of important components of the national food culture (Nnorom *et al.*, 2007). African's richly enormous variety of spices and condiments are gradually being replaced by large number of bouillon cubes in the market (Smith, 1995). Bouillon cubes and food seasonings are taste enhancers and are added to foods to enhance the taste properties of food (Akpanyung, 2005; Umedum *et al.*, 2013). The major active ingredients in bouillon cubes are salt (NaCl) and monosodium glutamate (MSG). Other raw materials used include soya beans, locust bean, onion, tomato; hydrogenate palm oil (HPO), caramel, hydrolyzed plant/ vegetable protein and natural spices (RMRDC, 2003). Knowledge of the concentrations of metals in foods are of significant interest because the metals are either essential or toxic to human health. This knowledge is vital in the calculation of dietary intake of essential minerals and for evaluation of human exposure to toxic elements. Since accumulation of heavy metals can have middle term and long term risks, strict periodic surveillance of these contaminants is advisable (Cabrera *et al.*, 2005). This research investigated the concentrations of Mg, Cu, Zn, Pb, and Cd in some popular brands of bouillon cubes and food seasonings marketed in Aba, Abia State, Nigeria.

Methods

Twenty (20) samples of different brands of food seasonings and bouillon cubes were purchased from the open markets in Aba, Abia State and used in this study. The samples were digested using an acid mixture (in the ratio of 1:2:2 for Perchloric, Nitric and Sulphuric acids) and the concentrations of Mg, Cu, Zn, Pb, and Cd determined using Atomic Absorption Spectrometer. Adequate quality assurance procedures and precautions were carried out to guarantee the reliability of the results of the present study.

Results

The Cd concentration (mg/kg) varied from 0.10 - 1.07 for bouillon cubes, 0.20 - 1.56 for chicken seasoning, 1.18 - 1.24 for beef seasoning, 0.75 - 1.14 for mixed spices, 0.48 - 0.68 for seafood seasoning and 0.62 - 0.80 for table salt. For Cu: 1.37 - 2.07 for bouillon cubes, 0.99 - 1.66 for chicken seasoning, 1.98 - 2.07 for beef seasoning, 1.49 - 2.05 for mixed spices, 1.55 - 1.96 for sea food seasoning and 1.08 - 1.14 for table salt; Mg, 85.36 - 99.25 for bouillon cubes, 65.88 - 72.58 for chicken seasoning, 62.04 - 80.44 for beef seasoning, 59.88 - 66.40 for mixed spices, 49.78 - 65.74 for seafood seasoning, and 109 - 126 for table salt; and for Zn, from 3.89 - 4.69 for bouillon cubes, 2.98 - 3.62 for chicken seasoning, 8.60 - 9.55 for beef seasoning, 6.56 - 7.25 for mixed spices, 6.22 - 8.14 for seafood seasoning and 1.23 - 1.40 for table salt. The Pb concentrations were generally low <0.002 mg/kg.

Table 1. Elemental contents of food seasonings and bouillon cubes.

Sample groups	Metal concentration (mg/kg)				
	Cd	Cu	Pb	Mg	Zn
Bouillon cubes	0.87±0.21*	1.66±0.24	<0.002	91.62±5.27	4.24±0.38
	0.10-1.07**	1.37-2.01		85.36-99.25	3.89-4.69
	0.85***	1.65		91.50	4.22
Chicken seasoning	0.73±0.64	1.29±0.32	<0.002	68.43±2.97	3.29±0.29
	0.20-1.56	0.99-1.66		65.88-72.58	2.98-3.62
	0.52	1.26		68.38	3.28
Beef seasoning	1.21±0.04	2.03±0.06	<0.002	71.24±13.01	9.08±0.67
	1.18-1.24	1.98-2.07		62.04-80.44	8.60-9.55
	1.21	2.03		70.64	9.06
Thyme	0.97	5.66	<0.002	106.23	22.56
Mixed spices	0.93±0.16	1.77±0.25	<0.002	62.30±3.06	6.95±0.30
	0.75-1.14	1.49-2.05		59.88-66.44	6.56-7.25
	0.92	1.75		62.25	6.95
Sea food seasoning	0.58±0.14	1.76±0.29	<0.002	57.76±11.29	7.18±1.36
	0.48-0.68	1.55-1.96		49.78-65.74	6.22-8.14
	0.57	1.74		52.21	7.12
Table salt	0.71±0.12	1.11±0.04	<0.002	117±11.96	1.32±0.120
	0.62-0.80	1.08-1.14		109-125.7	1.23-1.40
	0.70	1.11		117	1.31

*Mean ± SD, **Range, ***Geometric mean

Conclusion

The study revealed that the concentrations of Pb and Cd were generally low and within the acceptable range as specified for most food standards. The use of these product may not pose health risks except there is regular use of high doses of these products in food preparation.

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