Determination of Trace Minerals in Selenium Enriched Food

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Abstract: To establish a method for determination of trace minerals in selenium enriched pro - ducts by inductively coupled plasma mass spectrometry ( ICP – MS ). The selenium enriched agr – icultural and health care products were disposed by microwave digestion the method of ICP – MS was used to determinate content of aluminum, chromium, manganese, iron, nickel, copper, zinc, arsenic, selenium, cadmium, tin, antimony, thallium and lead. The method showed good linear correlation ( 0 – 400 μg/L ) and recoveries with microwave digestion effectively decreased wastage. Detection process could be easily operated with high accuracy. The content of selenium beneficial and heavy metal minerals were different with selenium enriched a – nd common rice. In agricultural products content of selenium is obvious in millet and purple potato which certified the favourable enrichment capacity.

Key Words: selenium enriched food; inductively coupled plasma mass spectrometry; trace minerals

1.0 Introduction

1.1 Materials and Methods

1.2 Instruments

1.3 Reagents

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\( Y = 0.002158x + 0.00001030 \quad R = 0.9994 \quad 0 \sim 400 \quad 5.150 \quad 0.001 \)

\( Y = 0.02133x + 0.008286 \quad R = 0.9992 \quad 0 \sim 400 \quad 4.176 \quad 0.012 \)

\( Y = 0.005316x + 0.005316 \quad R = 0.9998 \quad 0 \sim 400 \quad 4.202 \quad 0.316 \)

\( Y = 0.0008458x + 0.00004288 \quad R = 0.9983 \quad 0 \sim 400 \quad 4.991 \quad 0.013 \)

\( Y = 0.000153x + 0.00006031 \quad R = 0.9992 \quad 0 \sim 400 \quad 4.067 \quad 0.032 \)

\( Y = 0.007824x + 0.0007832 \quad R = 0.9996 \quad 0 \sim 400 \quad 4.176 \quad 0.012 \)

\( Y = 0.01248x + 0.00001544 \quad R = 0.9995 \quad 0 \sim 400 \quad 4.725 \quad 0.007 \)

\( Y = 0.008799x + 0.0009383 \quad R = 0.9995 \quad 0 \sim 400 \quad 4.495 \quad 0.016 \)

\( 1.05 \text{ L/min} \cdot \text{RF} \cdot 1550 \text{ W} \cdot 2 \cdot 10 \text{ min} \)

第1步骤 升温时间 保持时间 保持温度 功率

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
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<tbody>
<tr>
<td>1</td>
<td>5 min</td>
<td>5 min</td>
<td>120℃</td>
<td>600 W</td>
</tr>
<tr>
<td>2</td>
<td>5 min</td>
<td>10 min</td>
<td>150℃</td>
<td>800 W</td>
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<tr>
<td>3</td>
<td>5 min</td>
<td>20 min</td>
<td>190℃</td>
<td>1000 W</td>
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富硒紫薯面 富硒口服液

富硒紫薯面 富硒小米 富硒大米 富硒胶囊 普通大米 普通小米

硒含量较非富硒食品显著

表1

<table>
<thead>
<tr>
<th>元素</th>
<th>富硒食品</th>
<th>非富硒食品</th>
<th>加标</th>
<th>回收率(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>As</td>
<td>0.173</td>
<td>5.54</td>
<td>0.007</td>
<td>7.981</td>
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<tr>
<td>Al</td>
<td>0.105</td>
<td>0.729</td>
<td>0.018</td>
<td>0.199</td>
</tr>
<tr>
<td>Cr</td>
<td>0.237</td>
<td>0.113</td>
<td>0.005</td>
<td>0.032</td>
</tr>
<tr>
<td>Mn</td>
<td>0.105</td>
<td>0.729</td>
<td>0.018</td>
<td>0.199</td>
</tr>
<tr>
<td>Fe</td>
<td>0.237</td>
<td>0.113</td>
<td>0.005</td>
<td>0.032</td>
</tr>
<tr>
<td>Ni</td>
<td>0.105</td>
<td>0.729</td>
<td>0.018</td>
<td>0.199</td>
</tr>
<tr>
<td>Cu</td>
<td>0.237</td>
<td>0.113</td>
<td>0.005</td>
<td>0.032</td>
</tr>
<tr>
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<td>0.105</td>
<td>0.729</td>
<td>0.018</td>
<td>0.199</td>
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<tr>
<td>Zn</td>
<td>0.237</td>
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<td>0.005</td>
<td>0.032</td>
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<tr>
<td>Se</td>
<td>0.237</td>
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<td>Pb</td>
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称量并消化处理普通大米及普通小米样品

现学及免疫因素等共同作用

肢端疼痛

中

定向补充人体所需

类保健食品中

长

量控制在生产工艺和成品检测中具有重要意义

它金属元素

从而有效地治疗糖尿病周围神经病变

参考文献

是补硒的良好食物来源

铁

镍

锌人体所必需微量元素含量丰富

使用微波消解配合等离子电感耦合技术简便

第38章 - 硒和癌症


表

例数 治疗前 治疗后

30 20.38 ± 4.75 17.04 ± 4.86

30 21.04 ± 3.88 10.82 ± 4.16

讨 论

根据文献资料，患者临床症状

凹叶景天

据

双肾草

发病率的增加

外洗病变部位

发病率也在不断增

采用的具体治疗手段

内服药物

外洗通过热

其突出优势如下

在肾为阴虚

在糖尿病基础上发展而来的

汗

氧自由基损伤

影响

发绀

用微生物发酵技术中酵母的富集作用分离制备硒是常用方

DPN

HATFIELD D L, CARLSON B A. 研究硒的生理功能及富硒强化食品的研究进展。食品科学

CHENG W H and LEI X G. 研究硒的生理功能及富硒强化食品的研究进展。食品科学

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dp

基本营养素


GB 2762 - 2017

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安全性

高富硒酵母的筛选及富硒强化食品的研究进展。食品科学


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糖尿病周围神经病变的药物治疗现状

patients with chronic pain through warm water

Effects of Selenium Supplementation on the Healing of Diabetic Wounds


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