AMOUNTOF HEAVY METALS IN COLD WEATHER FRUITSARE CONSUMED IN DAILY LIFE TO IMPROVE THE QUALITY OF LIFE IN THE COMMUNITY

[1]CHINNAWAT SATSANANAN, [2]WASANA SURIDECHAKUL

[1]Chemistry Field, [2]Social and Culture Management, Suan Sunandha Rajabhat University Thailand
E-mail: [1]chinnawat.sa@ssru.ac.th, [2]wasana.sur@ssru.ac.th

Abstract - This research is aim at to analysis of heavy metals in cold weather fruits eaten in daily life of the people in the community for better quality of life. All of experiments used flame atomic absorption spectrometry technique for determination of the concentration of Cr, Cu, Pb and Zn in different types of cold region fruits (digested with wet digestion method). The amounts of all heavy ions were determined 3 replicated by Atomic Absorption Spectrophotometer (AAS). The concentrations of metal ions found in all samples were less than the reported by World Health Organization values (WHO). The results concluded that the cold region fruits obtained from market were safety to consumption and make the quality of life of people in the community for better quality of life.

Index Terms - Heavy metals, Cold region fruits, Atomic absorption spectrometry

I. INTRODUCTION

Nowaday, people's lives are to eat fruit in life on a regular basis. All the time we live, we will eat cold weather fruits from various sources, whether healthy eating. Beauty treatment or other we can not deny that our lives have to eat fruit every day, no matter what the form. Based on comfort, one thing we can not overlook is the safety of fruit consumption. Perhaps, everyone may overlook by what could be dangerous or contaminated in the fruit. Those are heavy metals. Heavy metals, though small, cause disease or harm to the body. There are many types of heavy metals. Heavy metals, both copper and iron, are heavy metals that are important to the body. If it is high in volume or accumulate for a long time may cause health hazards, harmful to the kidneys, bones and the cause of cancer. Lead is dangerous to the brain, nervous system and spinal cord anemia can cause kidney failure and death. If there is arsenic contamination, harmful to the gastrointestinal and cardiovascular system [1]-[2].

Central nervous system press the bone marrow and red blood cells break down easily. There is a higher risk of death from lung cancer, bladder and kidney.

In order to improve the quality of life of the people in community, it is one of the mission of Rajabhat University to be a local University and will make the nation sustainable in the future. Heavy metals cold weather fruits consume in everyday life are being investigated. Many researchers have studied how heavy metals are used in consumer products in daily life such as:

Ajaree Thongbai, et al. found that the problem of contamination of heavy metals such as cadmium is a matter that creates more anxiety today. Due to the increased amount of water, soil and air, the increased level of contamination may be a natural occurrence or a result of human action or as a result of the two parts together. Implementing measures or efforts to control the level and severity of contamination, particularly in animal food products, is not easy in practice. The main cause of the contamination of cadmium in cattle and pig products. Often caused by the presence of contaminated cadmium in food and water. Collection of cadmium in cattle is associated with cadmium contamination in the area. While cadmium accumulation is found in pigs, which can be found in high doses. It can also be found in animals outside the contaminated areas. However, these livestock products may be transported and sold in various areas around the country. Therefore, the opportunity for consumers to get cadmium through livestock products. Especially in animals may not be different. Consumers should focus on monitoring and monitoring the contamination situation regularly. It is important to educate the public to avoid getting these harmful contaminants. At the same time, it should push data collection and analysis. The risk of cadmium exposure of the Thai population is present. This is a guideline for appropriate safety measures [3].

Vijit Ratanapanee, et al. investigated some heavy metals in traditional Thai medicine such as cadmium, chromium, copper, lead and zinc in some Thai traditional medicine by Inductive Couple Plasma-atomic emission spectrometry after pre-analysis. Buy drugs from the source of the drug in Chiang Mai. All folk medicine samples were prepared from medicinal plants to be powdered. Weigh the sample with a fine balance and digest with dry ashing at 450 ° C for 3 hours, with magnesium nitrate as a catalyst. After under optimal conditions. Determination of heavy metals in sample solution by ICP-AES method. It was found heavy metals in the range Non-detect 1.00, 0.40-1.80, 0.19-0.97, 0.28-1.58, and 24.30-39.00 ug / g for cadmium, chromium, copper, lead and zinc, respectively [5].

Jira Suda Pepper, et al. found that the problem of contamination of heavy metals such as cadmium is a matter that creates more anxiety today. Due to the increased amount of water, soil and air, the increased

level of contamination may be a natural occurrence or a result of human action. Or as a result of the two parts together. Implementing measures or efforts to control the level and severity of contamination, particularly in animal food products, is not easy in practice. The main cause of the contamination of cadmium in cattle and pig products. Often caused by the presence of contaminated cadmium in food and water. Collection of cadmium in cattle is associated with cadmium contamination in the area. While cadmium accumulation is found in pigs, which can be found in high doses. It can also be found in animals outside the contaminated areas. However, these livestock products may be transported and sold in various areas around the country. Therefore, the opportunity for consumers to get cadmium through livestock products. Especially in animals. May not be different. Consumers should focus on monitoring and monitoring the contamination situation regularly [6]-[7].

It is important to educate the public to avoid getting these harmful contaminants. At the same time, it should push data collection and analysis. The risk of cadmium exposure of the Thai population is present. This is a guideline for appropriate safety measures. Also experience low signal noise and high stability. Which currently has mineral analysis tools. High performance elemental analysis such as Inductively Couple Plasma-Optical Emission. Spectrometer (ICP-OES) is an analytical tool. Both qualitative and quantitative tests as well. Analysts have multiple elements at the same time. (Simultaneous Multielements Analysis) using ICP technique are two parts to produce high temperature plasma with argon gas emissions through torch attached to the transmitter frequency. When the frequency into a magnetic field is induced. The electric Spark with Tesla. A high-energy electrons collide with other electrons. A chain reaction a plasma fraction OES principle makes the transition from the ground state to the substance [8]-[9].

In the work of research A. Boos and the mission of the synthesis of silica using a square and reduce surface tension of a layout, and found that the silica solution was perfectly prepared for osteoporosis is a true 3.90 NM silica can be this type of juice Cu (II) to be 0.20 mol/kg in the NaOH solution NaNO3, which make the situation for the right to extract Co (II) and Ni (II) with solutions, and it was found that the silica that can extract Co (II) and Ni (II) is 0.30 and 0.32 mol/kg, respectively [10]. Rattana Mahachai study the absorbing heavy metal with some kind of local material such as carbon ashes, violin bows, bamboo pulp and fiber corn. IT was found that lead is absorbent material in most nearly all kinds of settings, there is a leader in the range of 30-70% by weight per weight copper, Cadmium, zinc, in the range 2-10% and nickel-chrome bug of sunflower less than 1% when compared to the absorption of metal materials in chronological order are as follows: coconut fiber and silk has the ability to absorb similar metal heavy metal removal when mixed together, found that there are ways a persistent performance in the disposal method is better than non-persistent for about 5 times, but when you put the two together, using the most appropriate material ashes.

Mustafa [11] study to get rid of heavy metal waste, using egg shells and shell black ash, using egg shells and ashes removes cadmium, lead experiment, found that the column performance in elimination of heavy metal and the pH to eliminate Cadmium using egg shells. pH is a good 5-6, which is 99.75 % removal efficiency when using egg shells around 3.28 kg and lead by using the disposal ash black pH is an appropriate 3. Performance in the lead-up to 99.85 % removal when using black ash shell in the amount of 4.58 kg heavy metal removal, it is also dependent on the rate of filter with filter if the slow rate will be high-performance and have been in use for a long time.

Porntip study the absorption efficiency is dependent on temperature burned time and time suitable to absorb the shell with the controls the amount of oxygen will be control oxygen it was found that at a temperature 550 degrees celsius for 2 hours it takes to absorb 3 hours, and there is effective in absorbing the best burned at a temperature 700 degrees celsius for 3 hours it takes to absorb and then 48 hours to study the influence of the intensity and pH has an effect on the intensity of absorption was found that 500 mg per liter both of which are effective in absorbing the best pH has an effect on the absorption of pH, it was found that the capacity of white and black is 0.23 and 0.21 mg, respectively.

The substance is excited to emit light or spectrum analyzer out. For example, in Indian study heavy metal contamination in black tea leaves grown in the city in six areas. Studies on the absorption of Lead from soil into the tea found that soils with high acidity makes tea tree can absorb lead in soil. It was also found that increasing the alkalinity to the soil by adding calcium carbonate to pH. An increase of one unit can reduce the absorption of lead into the tea percent of 20-50.

The purpose of research.

The objective of this study is to determine the concentrations of Cr, Cu, Pb and Zn in cold weather fruits collected from market using flame atomic absorption spectrometry.

II. DETAILS EXPERIMENTAL

2.1. Materials and Methods

A. EQUIPMENT

Atomic Absorption Spectrophotometer, the company GBC model AVANTA (Australia)

- Crucible
- Micropipet
- Filler paper No. 1 (Whatman)
- Furnace model Nabertherm (Germany)
- Glassware basic in operation room

B. CHEMICALS SUBSTANCE

- Cr(aq) 1000 ppm [Spectracer UK Ltd]
- Cu(aq) 1000 ppm [Merck K GaA]
- Pb(aq) 1000 ppm [Merck K GaA]
- Zn(aq)1000 ppm [Spectracer UK Ltd]
- Conc. HNO_3 (68-70 %) [BAKER ANALYZED]
- 0.01 M HNO_3

C. SAMPLE PREPARATION

This research prepared standard solution of heavy metal of 4 kinds: Cr, Cu, Pb and Zn to have concentration as follow:
0.2, 0.6, 0.8, 1.5, 1.8 ppm for Cr
1.0, 3.0, 5.0, 10.0, 15.0 ppm for Cu
0.2, 0.6, 0.8, 1.5, 1.8 ppm for Pb
2.0, 5.0, 10.0, 15.0, 20.0 ppm for Zn

The cold weather fruits were collected from Market in Table I and store in refrigerator at 4 ^{o}C. The samples were digested as following: 10 of each was dissolved in 1M nitric acid (10 ml), boiled to complete the dissolution and filtrated. The obtained precipitate was transferred to 10 ml volumetric flask and fill up to the level with de-ionized water. To determine the amounts of heavy metal by use Atomic Adsorption Spectrophotometer (AAS).

Table I: Type of cold weather fruits used in the present study.

No.	Name
1	Apple
2	Chinese pear
3	Grape
4	Persimmon
5	Strawberry

III. RESULT AND DISCUSSION

The accepted values of the concentrations of Cr, Cu, Pb and Zn in fruits as reported in the World Health Organization (WHO) were presented in Table II.

Table II: Level of heavy metals in fruits as reported in WHO.

Heavy metal	Concentration (mg/L)
Cr	0.030
Cu	0.050
Pb	0.040
Zn	0.030

The concentrations of Cr in cold weather fruits were presented in Table III.

Table III: The concentration of Cr in cold weather fruits.

No.	Name	Concentration (mg/L)
1	Apple	0.013
2	Chinese pear	0.014
3	Grape	0.017
4	Persimmon	0.015
5	Strawberry	0.019

It was found that the concentration of this metal (Cr) was ranged from 0.013 mg/L to 0.019 mg/L, which means that, the concentrations of Cr in all examined cold weather fruits were less than the reported level shown in Table III.

Table IV: The concentration of Cu in cold weather fruits.

No.	Name	Concentration (mg/L)
1	Apple	0.012
2	Chinese pear	0.007
3	Grape	0.015
4	Persimmon	0.012
5	Strawberry	0.019

The results of analysis indicated that the concentrations of the Cu in all examined cold weather fruits varied from 0.007 mg/L to 0.019 mg/L as shown in Table IV and was less than the standard value.

Table V: The concentration of Pb in cold weather fruits.

No.	Name	Concentration (mg/L)
1	Apple	0.009
2	Chinese pear	0.005
3	Grape	0.020
4	Persimmon	0.014
5	Strawberry	0.013

The results of analysis indicated that the concentrations of the Pb in all examined cold weather fruits varied from 0.005 mg/L to 0.020 mg/L as shown in Table V and was less than the standard value.

Table VI: The concentration of Zn in cold weather fruits.

No.	Name	Concentration (mg/L)
1	Apple	0.011
2	Chinese pear	0.013
3	Grape	0.023
4	Persimmon	0.020
5	Strawberry	0.026

Table VI present the concentration level of Zn in all examined cold weather fruits.

The obtained results from this table indicated that the concentrations ranged from 0.011 mg/L to 0.026 mg/L. These values were lower than the accepted values reported in Table II.

Table VII: The summary of the concentration of heavymetal in cold weather fruits.

No.	Name	Concentration (mg/L)			
		Cr	Cu	Pb	Zn
1	Apple	0.013	0.012	0.009	0.011
2	Chinese pear	0.014	0.007	0.005	0.013
3	Grape	0.017	0.015	0.020	0.023
4	Persimmon	0.015	0.012	0.014	0.020
5	Strawberry	0.019	0.019	0.013	0.026

The summary of concentration of heavy metal in all examined cold weather fruits were presented in Table VII. It is very clear that these values are less than the reported values which indicated in Table II.

CONCLUSIONS

The amounts of heavy metal Cr(II), Cu(II), Pb(II) and Zn(II) in all types of cold weather fruits from Apple, Chinese pear, Grape, Persimmon and Strawberry were lower than the reported values of the World Health Organization (WHO).

This result confirmed that all types of cold weather fruits obtained from market were safe to consumption for long live living. Because of food, fruit and people were related in all dimensions together. People from baby to older were consumed foods all time and everyday. Thus, the safecold weather fruits will safe quality of life of people forever to reduce the disorder symptom.

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