

Analysis of macro metal content in chillie powder available in the Sri Lankan market

W.A.A.V.S. Amaradivakara¹, I. Wickramasinghe¹, R.M.G.B. Rajanayake², A. Bamunuarachchi¹

¹Department of Food Science and Technology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka

²City Analyst's Laboratory, Colombo Municipal Council, Colombo 07, Sri Lanka

Abstract—Chillie (*Capsicum annum* L.) powder is the dried, pulverized fruit of chillies and used as a spice to add pungency flavour to the dish. This study was conducted to investigate the macro metal content in chillie powder samples commonly available in the Sri Lankan market. Five brands of chillie powder samples named A, B, C, D and E, and an unbranded sample were selected for this study. Three batches from each brand and three samples from each batch were purchased. An ungrounded whole dry chillie sample was selected as the control. The macro metal content was determined using Atomic absorption spectrometric and X-ray fluorescence spectrometric techniques. Results were statistically analyzed using one-way ANOVA, at 0.05 probability level with MINITAB-14 software package. According to this study, there was no significant difference between the batches in each brand in mean metal contents. But there were significant differences among the brands in mean metal contents. According to the results Na content of all the chillie powder samples and Ca content of some brands (brand C- 955.2 ± 1.2 $\mu\text{g/g}$, brand D- 962.0 ± 0.9 $\mu\text{g/g}$ and brand E- 822.0 ± 1.0 $\mu\text{g/g}$) were found to be lower than the control (1495.2 ± 0.3 $\mu\text{g/g}$). The reason for this may be due to the loss caused by heat generation during the chillie grinding process or may be due to adulteration with plant materials with low Na and Ca content. The mean K content of chillie powder samples was within the range of 22 866.6 to 25 547.0 $\mu\text{g/g}$, while the mean Mg content varied in the range of 1991.3 – 2180.5 $\mu\text{g/g}$. These variations may be due to multiple factors, such as the differences in soil conditions where it was grown, variety of chillie, maturity of chillie, growing season, climatic condition, processing treatments and preservation method.

Index Terms— Calcium, Chillie powder, Magnesium, Potassium, Sodium

I.INTRODUCTION

Chillie crop is one of the most important commercial spice crops. Botanical name of chillie is *Capsicum annum* L. There are more than 400 different varieties of chillies found all over the world. Chillie belongs to the genus capsicum, under the solanaceae family. Chillies occur referred to as chillies, hot peppers, bell peppers, red peppers, pod peppers, cayenne peppers, paprika, pimento, and capsicum in different parts of the world [14].

Currently, chillies are used throughout the world as a spice, as a vegetable, and also in the making of beverages and medicines. Some varieties of chillies are famous for red colour because of the pigment 'capsanthin,' others are known for biting pungency attributed to 'capsaicin'. Chillie is very important as an anti-oxidant and anti-inflammatory agent. Chillie has become an essential ingredient in Sri Lankan meals. Per capita consumption of chillie in the form of dry chillie is estimated 2.32 kg per annum and the national annual requirement of dry chillie is around 42,634 Mt. The annual production of dry chillie in Sri Lanka is about 18,616 Mt, therefore, an amount of 31,242 Mt is being imported (Year 2007 figures). Chillie is mainly imported from India, as dry chillie [6].

In the chillie powder manufacturing process in Sri Lanka dried chillies are cleaned manually to remove impurities and then washed. After drying them, they are pulverized in two or more grinders to convert them into the powder form. Then chillies in powder form are passed through sieves to obtain uniform mesh size (45-65 mesh). Some manufactures use