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Approximate composition analysis and nutritive values of different varieties of edible seeds

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ABSTRACT

Background: The Dietary Guidelines for Americans (DGA) 2015-2020 supports that healthy eating patterns should include a variety of vegetables from all five of the following vegetable subgroups: dark green, red and orange, legumes, starchy, and others. **Aims and Objective:** To determine the approximate composition and nutritive values of edible portions of different varieties of popular seeds and to identify the heavy metals contents of these seeds. **Materials and Methods:** Five different seeds were collected from traditional supermarkets in Benghazi. Moisture and Ash contents in the samples were determined by A.O.A.C method. Total fat and the crude protein content in the seed sample were measured by using soxhlet extraction, and the Kjeldahl method of AOAC, respectively. The mineral content in seeds also determined by Atomic Absorption, spectrophotometer. **Result:** Five different seeds (pumpkin, sunflower, watermelon seeds, corn and chickpea) were analyzed for determination their protein, fat, energy and moister contents. The highest and significant protein contents found in sunflower seeds 27.5% (p=0.001) whilst the lowest content was observed in corn. The highest fat and carbohydrate contents found in sunflower seeds and in the corn, 50%; 50% (P= 0.014) and (72.4%) (P=0.0005) respectively. In compared to other seeds, the moisture contents of pumpkin seeds presented the highest amount with significant values (p=0.0001). The energy contents of sunflower seeds were the predominant value 626.28 kcal/100 g followed by both pumpkin seeds and watermelon seeds 591.2 and 585.89 kcal/100g respectively. The ash content of pumpkin seeds was approximately 5.87%. Furthermore, Pumpkin seeds had higher amounts of potassium 871 mg/100g, and watermelon seed was the highest sources of calcium (86 mg/100g) than other seeds. Magnesium, Iron and copper significantly found higher in sunflower seeds. **Conclusion:** Overall seeds could be one of the good sources of food staple for macro and micronutrients, and may have health and economic beneficial. Consumption of such seeds should be at recommended levels due to presences some quantities of lead and cadmium, which could have detrimental health effect.

Key words: Seeds; Nutritive values; Approximate composition; Heavy metals

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INTRODUCTION

The Dietary Guidelines for Americans (DGA) 2015-2020 supports that healthy eating patterns should include a variety of vegetables from all five of the following vegetable subgroups: dark green, red and orange, legumes (beans and peas), starchy, and other.[1] In sub-Saharan Africa, maize is a staple food for an estimated 50% of the population and it remains the most important agricultural crop for over 70 million farm families worldwide.[2] The determination of minerals and trace elements in foodstuffs is an important part of nutritional and toxicological analyses. Copper, chromium, iron and zinc are essential micronutrients for human health. In addition, these elements play an

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important role in human metabolism, and the interest in these elements is the relationships between trace element status and oxidative diseases.[3]

The differences in mineral composition in corn products may be due to genetic factor and environmental factors like irrigation frequency, soil composition and fertilizer used.[4] Legumes are known as an excellent source of dietary protein. While the proteins present in legumes are not considered "complete", as compared to most animal-derived proteins, when combined with foods such as whole grains (e.g., whole grain bread), a balanced intake of essential amino acids can be easily achieved.[5,6] Sunflower seeds are a nutrient dense food has been found to have a potential role in chronic inflammatory conditions, bacterial and fungal infections, cardiovascular diseases, skin diseases and even cancers. These benefits of sunflower seeds are attributed to the presence of phytosterols, unsaturated fatty acids, proteins, variety of vitamins and minerals.[7] Pumpkin seed and seed oil are a rich natural source of phytosterols, Proteins, polyunsaturated fatty acids, antioxidant vitamins, carotenoids and tocopherols and various elements.[8-10] In 2000, a study was done by Pari and et al., found that important plant foods in select traditional diet of indigenous communities such as maize, pumpkin, and beans have moderate to high phenolic phytochemicals. A combination of these plant foods can be targeted for management of hyperglycemia and hypertension associated with NIDDM.[11] In addition, Chickpeas also have a low glycemic index.[12,13] When consumed long term, chickpea intake also significantly improved glycemic control in a 20-week crossover study of 45 individuals with elevated cardiovascular disease (CVD) risk factors.[13] In recent years, several studies have highlighted the health properties of pumpkin seed oil against many diseases, including hypertension, diabetes, and cancer.[14,15] The plant kingdom has proven to be the most useful in the treatment of diseases and they provide an important source of all the world's pharmaceuticals.[16] Antibacterial efficacy of sunflower seeds has been highlighted in clinical study by Bashir M et al., (2004) that was conducted in Egypt based on topically applied sunflower seed oil to prevent invasive bacterial infections in preterm infants (<34 weeks gestational age). Their study indicated that topical application of sunflower seed oil 3 times a day resulted in a significant improvement in skin condition and a highly significant reduction in the incidence of nosocomial infections compared with infants not receiving topical prophylaxis. No adverse effects were reported as a result of topical therapy.[17] The previous evidences about the health effects of seeds consumption give direction above-mentioned to carry out this experimental study about the nutritive values of different varieties of edible seeds. Nevertheless, our study is the first of its kind in Benghazi as no other study have reported from this region, where the study was designed to elucidate the nutritive values of different varieties of edible seeds. The aim of our study was to select 5 types of most popular seeds (corn, sunflower seeds, watermelon seeds, pumpkin seeds and chickpeas) which were usually consumed by the locals due to common preference and economic price, as well as the high availability throughout the year in order to determine the approximate composition and nutritive values of edible portions of different varieties of popular seeds and analyze the heavy metals contents.

MATERIALS AND METHODS

Determination of moisture

Moisture was determined by A.O.A.C method by weighing accurately about 5 gm of sample in a previously dried and tarred dish and placed the dish with its lid underneath in the oven for 2 hours. The time should be reckoned from the moment the oven attains 100º C after the dishes have been placed. Then the dishes were removed after 4 hours, cooled in the desiccator and weighed.

Determination of total ash

Ashing of food samples was done using a muffle furnace. Ash was determined by A.O.A.C method. Two grams of each sample were placed in a crucible and heated to 550°C in muffle furnace to eliminate organic components. The crucible and its contents were then cooled and weighed, and the ash evaluated as a proportion of the original dry weight of samples.

Determination of crude fat

Crude fat content was determined by extracting the fat from the sample using a solvent extraction, then determining the weight of the fat recovered. The solvent extraction method is more pronouncedly known as Soxhlet method. Generally, the basic of Soxhlet method is extraction of a lipid from a solid material. Lipid of food is soluble in organic solvent and insoluble in water, because of this, organic solvents like petroleum ether; which has been used in this procedure; has the ability to solubilize fat then fat was extracted from food in combination with the solvent. Later the fat was collected by evaporating the solvent. Almost all the solvent is distilled off and can be reused.

Approximately 2.0 gram of samples were weighed accurately into extraction thimbles. The dried boiling receiving flask was weighed correspondingly and filled with about 300 ml of petroleum ether at boiling point 40-60°C. After that, the soxhlet apparatus was assembled and allowed to reflux for 6 hours. The thimble was removed with care and petroleum ether collected from the top container and drained into another container for re-use. After that, the flask was dried at (105-110c°) for one hour, when it was almost free of petroleum ether, it was cooled in a desiccator and weighed.

Determination of crude protein

The crude protein content of the seeds samples was determined using the Kjeldahl method of AOAC. The principle of Kjeldahl method is digestion sample of seeds with a strong acid so that it releases nitrogen which can be determined by a suitable titration technique. The amount of protein present is then calculated from the nitrogen concentration of the food. Digestion, Neutralization and Titration are the basics steps to determine crude proteins. Firstly, two grams of seeds sample had been weighed into a *digestion flask* and then digested by heating it in the presence of sulfuric acid (an oxidizing agent which digests the food), anhydrous sodium sulfate (to speed up the reaction by raising the boiling point) and a catalyst, such as copper sulphate (to speed up the reaction). Digestion converts any nitrogen in the food into ammonia, and other organic matter to $C0_2$ and H_20. Ammonia gas is not liberated in an acid solution because the ammonia is in the form of the ammonium ion (NH_4^+) which binds to the sulfate ion (SO_4^{2-}) and thus remains in solution: N(food) → $(NH_4)_2SO_4$. Secondly, Neutralization after the digestion has been completed the digestion flask is connected to a receiving flask by a tube. The solution in the digestion flask is then made alkaline by addition of sodium hydroxide, which converts the ammonium sulfate into ammonia gas:$(NH_4)_2SO_4$ + 2 NaOH ® $2NH_3$ + $2H_2O$ + Na_2SO_4. The ammonia gas that is formed is liberated from the solution and moves out of the digestion flask and into the receiving flask - which contains an excess of boric acid. The low pH of the solution in the receiving flask converts the ammonia gas into the ammonium ion, and simultaneously converts the boric acid to the borate ion:

$NH_3 + H_3BO_3$ (boric acid) → $NH_4^+ + H_2BO_3^-$ (borate ion). Finally, Titration: The nitrogen content is then estimated by titration of the ammonium borate formed with standard sulfuric or hydrochloric acid, using a suitable indicator to determine the end-point of the reaction.

Determination of mineral in foods by atomic absorption, spectrophotometer

Atomic absorption spectroscopy (AAS) determines the concentrations of minerals in samples. It is a process involving the absorption by free atoms of an element of light at a wavelength specific to that element. At first sample solution is aspirated into the spray chamber through capillary tube. The liquid sample is aerolized and mixed concentration. nitric acid, about 1g of sample has weighted mixed with 10ml of concentration. nitric in the spray chamber and burned in a flame and the individual atoms of the sample are released to form a cloud inside the flame. The atoms of the element get free. To bring it from ground state into an excited state by passing UV light is required through hollow cathode lamp. On absorbing UV light at specific wavelengths, the ground state metal atoms get transitioned to higher electronic state. The region of the spectrum to be measured is selected by a monochromator. The isolated spectral line falls on the photomultiplier, the detector and the output are amplified and sent to a readout device meter, digital or analogue or through a computer data processing system. The data is processed through software.

RESULTS

Macronutrients contents of the seeds

Five different popular edible portions of seeds (pumpkin, sunflower, watermelon seeds, corn and chickpea) (Figure 1) were the most consumed by local populations have been analyzed for determination their protein, fat, energy and moister contents. For the aforementioned seeds, the highest and significant protein contents found in sunflower seeds 27.5% (p=0.001) whilst the lowest content was observed in corn. Pumpkin, watermelon and chickpea were shown the modest amounts but still significantly higher than corns (p< 0.05) (Table 1). Similarly, for

Figure 1: Investigation samples (sunflower, pumpkin, watermelon, corn, and chickpea) from traditional supermarkets in Benghazi

Table 1: Protein contents of edible portion of seeds

Types of seeds	Protein (g/100g) mean±SD	*P values
Pumpkin	21.413±0.004	
Sunflower	#27.531±0.0018	0.001
Watermelon seeds	17.822±0.0049	
Corn	6.783±0	
Chickpea	18.481±0.0037	

**Students T test was performed and α<0.05 considered as significant.*
#=present highest and significant compared to other seeds.

the fat content, by which sunflower seeds contained the highest fat contents 50% (*P*= 0.014) followed by pumpkin, watermelon, corn and chickpea 47.9%, 44.7%, 13.39% and 10.6% respectively (Table 2). The highest significant amounts of carbohydrate found in corn (72.4%) (*P*=0.0005). In compared to corn, the chickpea ranked the second contents of carbohydrate (63.5%) while the lowest carbohydrate content was reported in sunflower seeds (15.6%) (Table 3). In regarding to moisture, the values in pumpkin, sunflower, watermelon seeds, corn chickpea were 6.3%, 3.1%, 5.27%, 5.44% and 5.62% respectively (Table 4).

In compared to other seeds, the moisture contents of pumpkin seeds presented the highest amount with significant values (p=0.0001). The second highest values were shown similarity as the following order chickpeas, corn and watermelon seeds 5.62%, 5.44% and 5.27% respectively, while the lowest amount of moisture found in sunflower seeds 3.1% (Table 4).

Table 2: Fat contents of edible portion of seeds

Types of seeds	Fat (g/100g) mean±SD	*P values
Pumpkin	47.99667±0.01	
Sunflower	#50.79667±0.014	0.014
Watermelon seeds	44.71±0.011	
Corn	13.39±0.007	
Chickpea	10.60±0.003	

**Students T test was performed and α<o.o5 considered as significant.*
#=present highest and significant compared to other seeds.

Table 3: Carbohydrate contents of edible portion of seeds

Types of seeds	CHO (g/100g) mean±SD	*P values
Pumpkin	18.41±0.52	
Sunflower	15.16±4.26	
Watermelon seeds	28.05±1.51	
Corn	#72.42±1.03	0.0005
Chickpea	63.54±1.14	

**Students T test was performed and α<o.o5 considered as significant.*
#=present highest and significant compared to other seeds.

Table 4: Moisture contents of edible portion of seeds

Types of seeds	moisture (g/100g) mean±SD	*P values
Pumpkin	#6.30±0.001	0.0001
Sunflower	3.10±0.005	
Watermelon seeds	5.27±0.002	
Corn	5.44±0.001	
Chickpea	5.62±0.001	

**Students T test was performed and α<o.o5 considered as significant, compared to other seeds.*
#=present highest and significant compared to other seeds.

Table 5 shows that the energy contents of sunflower seeds was predominant values (626.28 kcal/100 g) followed by both pumpkin seeds and watermelon seeds 591.2 and 585.89 kcal/100g respectively. Both corn and chickpeas to some extent had similar energy amounts 437.36 kcal/100g, 423.54 kcal/100g respectively.

Micronutrients contents of the seeds

Table 6 shows that, the ash contents of pumpkin seeds approximately represented the significant values 5.87% (p=0.0001) compared to other seeds. Whilst both corn and chickpeas represented the lowest amounts of ash (1.95% vs 1.74%). Furthermore, the data analysis of trace and major elements of seeds indicated that pumpkin seeds had higher amounts of potassium 871 mg/100g (p=0.000) followed by chickpeas seeds (718 mg/100g) and the least amount of potassium was found in corn seeds (470 mg/100g) which was close to watermelon seeds (477mg/100g). Furthermore magnesium, Iron and copper were significantly higher in sunflower seeds 320mg/100g, 5.42 mg/100g and 1.77 mg/100g respectively. In compare to other seeds, watermelon seeds considered as the richest sources of calcium (86 mg/100g) p=0.0001. The second seeds which have higher calcium content was sunflower seeds (75mg/100g) while, the corn seeds had the lowest sources of calcium (12.3mg/100g). However, sodium contents had higher significant values (p=0.0001) in corn seeds (60mg/100g), and watermelon seeds contained 5 mg/g which presented the lowest levels of sodium (Table 7).

Heavy metals contents of the seeds

According to the laboratory results of heavy metals in seeds, the highest contents of lead (Pb) was identified in pumpkin

Table 5: Energy contents of edible portion of seeds

Types of seeds	Energy (Kcal/100g)
Pumpkin	591.28
Sunflower	626.89
Watermelon seeds	585.89
Corn	437.36
Chickpea	423.54

Table 6: Total ash contents of edible portion of seeds

Types of seeds	Ash (g/100g) mean±SD	*P values
Pumpkin	#5.87±0.0007	0.0001
Sunflower	3.66±0.0002	
Watermelon seeds	4.26±0.001	
Corn	1.95±0.0008	
Chickpea	1.74±0.002	

**Students T test was performed and α<o.o5 considered as significant.*
#=present highest and significant compared to other seeds.

Table 7: Some major and trace mineral contents of edible portion of seeds

Types of seeds/ minerals (mg/100g)	Pumpkin (mean±SD)	Sunflower (mean±SD)	Watermelon (mean±SD)	Corn (mean±SD)	Chickpea (mean±SD)	*P values
K^+	#871±0.1	610±0.1	477±0.2	470±0.33	718±0.1	0.000
Na^+	18±0.02	8.5±0.02	5±0.01	#60±0.1	24.1±0.1	0.000
Ca^{++}	50±0.04	75±0.03	#86±0.9	12.3±0.1	57±0.11	0.000
Mg^{++}	252±	#320±0.78	230±0.45	211±0.22	78±0.45	0.000
Fe	3.1±0.11	#5.42±0.22	2.9±0.21	4.4±0.13	4.23±	0.001
Cu^{++}	0.88±0.01	#1.77±0.2	1.5±0.1	0.5±0.1	0.65±0.03	0.012

**Students T test was performed and α<0.05 considered as significant (compared with different group)*
#=present highest and significant compared to other seeds.

seeds and lowest in water melon seeds with hulls, 0.014 and 0.011 ppm respectively. But such amounts of lead still detected in pumpkin and sunflower seeds 0.006 and 0.01 ppm. Among the ready to eat seeds, (corn) contained some extent of trace amounts of (Pb) 0.007 ppm. Pumpkin seeds, and sunflower seeds were still contained an amount of Pb even without hulls. The second heavy metal was detected with limited amounts was cadmium in both pumpkin and watermelon seeds with hull, 0.005 and 0.008 ppm respectively (Table 8).

Table 8: Some heavy metals levels of hulls and edible portion of seeds

Types of seeds/heavy metals mg/kg (PPM)	As	Pb	Cd	Hg
Chickpea	BDL	BDL	BDL	BDL
Corn	BDL	0.007	BDL	BDL
Pumpkin seeds with hull	BDL	0.014	0.005	BDL
Watermelon seeds with hull	BDL	0.009	0.008	BDL
Sunflower seeds with hull	BDL	0.011	BDL	BDL
Pumpkin seeds without hull	BDL	0.006	BDL	BDL
Watermelon seeds without hull	BDL	BDL	BDL	BDL
Sunflower seeds without hull	BDL	0.010	BDL	BDL

DISCUSSION

Knowledge of the nutritive value of local dishes and foodstuffs ingredients are necessary in order to encourage the increased cultivation and consumption of those that are highly nutritive. This consumption will help to supplement the nutrients of the staple carbohydrate foods for people who cannot afford enough protein foods of animal origin.

The result of the current study shown that the sunflower seeds contained the highest amount of protein (27.531%) fat (50.79%), energy (626.89 kcal/100g), and also contained the highest amount of magnesium, iron and copper 320mg/100g, 5.42 mg/100g and 1.77 mg/100g respectively. In compared to other seeds these amounts made a significant difference (p<0.05). In contrast to the previous work was done by Aishwarya, and et al.,[18] values of sunflower seeds protein in current study were higher than their finding 27.5% vs 19.69% and slightly lower values for fat (50.79% vs 53%, and carbohydrates (15.6% vs 18.72%) with slightly higher of energy (626.98 kcal/100g vs 616 kcal/100g). On the other hands, a number of works (19, 20) reported that variable amounts of protein 60%, fat 18%, 4% of carbohydrate and energy 460 kcal/100 g which means higher amounts of protein and lower amounts amount of fat, carbohydrate and energy. These variability in the findings could be due to cultivation, fertilization or pesticides or natural of land and soils. In regard moisture contents and total ash, the present results were similar to previous studies.[18-20] Regarding calcium, iron and magnesium contents of sunflower seeds, our study indicates that the calcium contents were lower more than three times than the result showed by Aishwarya and colleagues. However, iron and magnesium were approximately similar.[18] This could be probably due to sample preparation or variation in the methods and natural of cultivated soils.

The comparative analysis between seeds in this study shown that pumpkin seeds found to have the richest sources of moisture 6.3% and total ashes (5.8%) with highest amounts of potassium 871 mg/100g (p< 0.05). This values determined in pumpkin seeds considered to be higher than the other reported study by Patel et al., (for energy (591% vs 559%, CHO 18% vs 10%, potassium 871% vs 801%, sodium 18mg/100g vs 7% mg/100g and calcium 50mg/100g vs 46mg/100g).[21] These values will not be considerable high. Although, data of present study for protein and fat and other micronutrients were shown lower when compared to findings of Patel and colleagues. Macronutrients contents of pumpkin seeds were shown similar to finding of Karanja et al., and others.[19,20] The significant moisture contents of for pumpkin seeds in this study (p< 0.05) was different from the findings of Elinge and their colleagues 6.3% vs 5%, but the difference was slightly higher. The results that were reported by Elinge indicated that higher protein and carbohydrates contents of the pumpkin seeds than findings of the current study 27% vs 21% and 28% vs 18% respectively. On the other hands, fat (37% vs 47.9 %) and energy (560 kcal% vs 591%) were below the values of this study. In fact, the differences between such finding especially protein, fat and CHO result from variation in the energy values. The explanation for such variation could be due to different species of pumpkin. These variations could be possibly due to different minerals contents when compared to findings of the current study.[22]

In the present finding and among seeds, watermelon seeds considered a richest sources of calcium 86mg/100g ($p< 0.05$). Several numbers of studies reported closely related values.[23-25] Based on the approximate analysis of watermelon seeds in this study, the protein, fat, carbohydrate, energy and total ashes will be considerable nutritive values. In the study conducted by Tabiri et al.,[23] on the watermelon seeds found that moisture content in the range of 7.40 - 8.50%; fat, 26.50 - 27.83%; protein, 16.33 - 17.75%; ash, 2.00 - 3.00%; carbohydrate, 9.55 - 15.32% and energy value of 354.05 - 369.11 kcal/100g. In comparison to Tabiri et al.,[23] the findings of the current study were similar, except of proteins which showed moisture 5.2%, fat 44.7%, CHO 28%, total ashes 4.26% and energy 585 kcal/100 g. The result has been found lower in fat, CHO, total ashes and therefore also energy contents than our analysis values. Nevertheless, moisture contents of seeds in this study were less than the Tabiri et al., observations.[23] The reason why huge variation have been reported possibly due to place of study.

Dried corn or maize (roasted salted corn) and chickpeas seeds were shown highly significant values of their carbohydrate contents 72.4% and 63.5% respectively ($p<0.05$) and also sodium contents 60mg/100g particularly for dried corn ($p< 0.05$). Present of high sodium in corn due to roasted method which let the corn dried and edible. Maize is generally known to be high in carbohydrate and as such a good source of calories.[26] The carbohydrates contents reported in this study was agrees with reports of Ullah[4] and Abiose et al.[27] The macronutrient contents of corn seeds shown in Tables 1-5 as following protein, fat, CHO, moisture and energy, 6.7%, 13.39%, 72.4%, 5.44% and 437 kcal/100 g respectively. Fat contents were found to be three times higher than the work done by Abiose[27] so that these amounts of fat will add calories. Therefore, the energy values in the samples of this study were higher than those reported by Abiose et al., 437 vs375 kcal/100 g. However, the mount of protein and moisture of the samples in the current study was less than the previous work 6.7% vs 9.8% and 5.44% vs 7.65%.[27,28] Such differences in contents could be referred to storage conditions or desiccation methods. Several studies [4,29-31] were shown inconstant with the data of this study in of protein, CHO and total ashes.

Chickpeas seeds on the other words have approximately similar macronutrient content of fat, CHO, moisture and energy as a corn but to some extent higher protein. Even though, also similar total ash but different in some elements such as potassium, sodium, calcium and magnesium. Nutritional values were also determined somewhere else.[1,27] The amounts of macronutrients (except fat and total energy) and micronutrients were agree with reports of Wallace and et al.,[1] Because of fat contents of chickpeas in the current study was slightly high (10% vs 6 %) which result in elevated the energy values of chickpeas.

Environmental pollution is the main cause of heavy metal contamination in the food chain, and lead and cadmium are two potentially harmful metals that have aroused considerable concern.

Lead contamination of the environment is increasing, and the prolonged intake of even low concentrations of Pb can cause serious toxic effects.[32] Approximately 80% of the total human Pb intake is supplied by the diet.[33] Cadmium is a toxic element present in low concentrations in nature; high levels are often associated with human activity and are found in urban and industrial waste disposal areas.[32] Therefore, this study targeted some have metals in earlier mentioned seeds with and without hulls because seeds consumer used their tooth, tongues and saliva for intake such seeds which will mix with outer husk or shells. Some amounts of heavy metals (Pb, Cd) were found in different seeds. For examples (Pb) were detected in the following levels 0.007, 0.014, 0.009, 0.011, 0.006 and 0.010 ppm in corn, pumpkin seeds with hull, watermelon seeds with hull, sunflower seeds with hull, pumpkin seeds without hull, sunflower seeds without hull respectively. Cadmium was another heavy metal found in limited amounts in pumpkin seeds with hull and watermelon seeds with hull 0.005 vs 0.008 ppm respectively. These are below the reported in the literature in some seeds. However, these values considered to be lower than in the literature.[32] There is no information about the local heavy metal specification therefore, precaution should be taken while consuming such seeds due to their nature marketing and environmental pollution with heavy metals.

CONCLUSION

Sunflower seeds considered the richest sources of protein fat, energy, calcium, magnesium and iron. Whilst pumpkin seeds have highest potassium contents and roasted salted corn have good sources of sodium. Both roasted dry corn and chickpeas richest sources of carbohydrates. Elemental analysis shows that sunflower seeds being the richest sources of magnesium iron and copper whilst pumpkin being the highest potassium. Overall seeds could be one of the good sources of food staple for macro and micronutrients. Even though, consumption of such seeds should be at recommended levels due to presences some limits of Lead and cadmium, which they are in some extent cause detrimental health effect.

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SS - Manuscript preparation and reviewed the literature**; AA -** Interpretation of results, Concept and design of the study; **AA -** Review of literature and scripted the methodology of the study**; SA -** Concept, coordination of academic writing; **EM, IA and OA -** Manuscript preparation, Analysis; **SA -** working and supervision on analysis of seeds in laboratory.

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