**Effect on Crude Fiber, β-Carotene and Iron Content of Cookies during Storage**

**The topic should read: Effects of storage on the crude fiber, β-Carotene and Iron Content of Cookies made with wheat flour, pumpkin flour, and pumpkin seeds flour blends.**

**Abstract: Abstract should contain the following information: background information/objective, materials and methods/methodology, results, conclusion and keywords. The abstract below have objective, not too detailed or specific methodology. It did not describe how the cookies were made (procedure), the method employed in evaluation of the chemical and nutritional properties, and the statistical tools used to analyze the data obtained. There were no results and conclusion. The keyword should be up to 6. The number of words is below 200. Remember an abstract is a concise summary of the work. Someone is expected to obtain the core of the work by mere reading the abstract.**

Experiments were conducted to development, quality evaluation and storage stability of cookies made from wheat flour, pumpkin flour and pumpkin seed flour. The cookies were formulated by taking different proportion of flours in the ratio of (T100) 100:0:0, (T1) 90:7.5:2.5, (T2) 80:15:5, (T3) 70:20:10 and (T4) 60:25:15 respectively. Wheat flour of the ratio of 100:0:0:0:0 was considered as control. All the samples were packed in high density polyethylene (HDPE) and stored at room temperature from 0 to 120 days for quality evaluation. After preparation of cookies various chemical and nutritional properties were determined, i.e.,crude fiber, β-carotene and iron content during storage.

**Keywords:** Wheat flour, pumpkin flour, pumpkin seed flour, and HDPE.

**1. INTRODUCTION**

Food gives nutrition and energy besides satisfaction and improvement in physical and mental development to grow the humans. In the last ten years consumer demands in the field of food production have changed considerably. Consumers believe that foods contribute directly to their health.Today foods are not intended to only satisfy hunger and to provide mandatory nutrients for humans but also to retain nutrition-related diseases and improve physical and mental well-being **(Takachi *et al.*, 2008). No need for short paragraph here.**

Pumpkins (*Cucurbita moschata*) are extensively grown in tropical and subtropical countries where it traditionally consumed as freshly boiled and steamed or as a processed food items such as soup or curry. Pumpkin is high in β-carotene, which gives its yellow or orange color **(Bhaskarachary *et al*., 2008)**. β-carotene in plants that have pleasant yellow-orange color is a major source of vitamin A **(Lee, 1983; Das and Banerjee, 2013). You can insert the first paragraph here**

Utilization of foods containing carotene helps in retention of eye disorders, cancer, and skin diseases. The base material used for the preparation of bakery and confectionary products is wheat flour. Wheat flour contains a slight amount of β-carotene which is a precursor of vitamin A, available in variety of fruits and vegetables **(Tee and Lim, 1991; Olson, 1989).** Pumpkin powder can be use as the concentrated source of β-carotene in bakery and confectionary products. Pumpkin flour is also rich in various phytochemicals and can be used due to its flavor, sweetness, deep yellow-orange color, and significant amount of dietary fiber. Remove this paragraph no short paragraph!

Pumpkin can be refined into flour which has a longer shelf life. repeatition. The statement has been made above. It has been described to be an addition to cereal flours in bakery products **(Mervet Ebrahim El- Demery, 2011)**. Pumpkin flour is presently the main processed product from pumpkin fruit because it can be simply stored for a long time and easily used in the manufacturing of formulated foods. The incorporation of pumpkin flour enhances nutrient content of several food products and upgrade their flavour **(Judita *et al*., 2014)**.

Pumpkin seeds are also a superior source of fibre. They contain 31.48% crude fibre **(Nyam *et al*., 2013).** Fibre in pumpkin seeds can stop constipation, diabetes, prolong intestinal transit time, lower cholesterol level, and give satiety. Pumpkin seeds flour is a valuable by-product obtained after the removal of oil from pumpkin seeds. It is rich in fibre and helpful in maintaining intestinal role and gives satiety that is advantageous for fatty people to control the body weight. Another advantage of pumpkin seeds flour is that it is gluten-free, thus a a good recommendation to patients suffering from gluten intolerance or celiac disease **(Patel, 2013)**.

Cookies are snacks for people of all age categories. recast this statement or remove. Cookies are small, flat, baked treat, normally holding fat, flour, eggs and sugar. The major difference of the pumpkin cookies is lessening quantity of liquid used in the dough preparation **(Shakuntala and Shadaksharaswamy, 2007)**. Please conclude your problem statement here

**2. MATERIALS AND METHODS**

**State the type of study here. Is it experimental or what?**

**Where and how did you obtain your materials? Who identified your crops as it is the case here, you need to be specific.**

Flours comprising wheat flour, pumpkin flour and pumpkin seed flour were used for the present study. You need to state how to make these flours so that one can replicate to ascertain the results.The cookies were formulated using various proportions of flours and other ingredients. All the experiments were conducted in food analysis laboratory and bakery laboratory in the Department of Agricultural Engineering where?. Cookies were packaged in HDPE at room temperature and analyze the chemical and nutritional characteristics like crude fiber, β-carotene and iron content. The chemical and nutritional characteristics were done as fresh and as well as during storage for 120 days.

**Development of cookies**

Cookies were prepared by incorporating different levels of flours viz., wheat flour, pumpkin flour and pumpkin seed flour blends in ratio of (T100) 100:0:0, (T1) 90:7.5:2.5, (T2) 80:15:5, (T3) 70:20:10 and (T4) 60:25:15 respectively. Indicate why you chose the raio you used? What do you want to achieve by the above ratio?All the materials you have to specify the materials and the quantities used.were mixed by hand until firm dough was formed. The dough was rolled out in a baking tray and cut into round in shape with a mould. The cookies were placed in greased aluminum trays and baked in deck oven at optimum how do you mean? Specify what you mean by optimum time and temperaturetime and temperature. After baked the cookies were taken out of deck oven and cooled at room temperature. At last, the cooled cookies were packed into HDPE bags and stored at room temperature for further analysis. Indicate the interval of analysis. Was it once after production or at intervals?

**Estimation of Crude fiber, β-carotene and iron content characteristics of cookies**

Crude fiber, β-carotene and iron content were determined in all the ratio of cookies.

**Crude fiber**

Crude fiber was estimated by employing standard method of analysis **(AOAC, 1990 this is too old you can consult recent ones).**

Crude fiber (%) = $\frac{dried weight- ashed weight}{weight of sample} X 100$

**Determination of Minerals (AOAC, 2012) the mineral you have here is iron so be specific. Tell us how you determined the iron content of the cookies here**

**Calculation**

$$Concentration \left(\frac{mg}{l}\right)=\frac{\left(a-b\right)×v}{m}$$

a = Concentration in test sample solutions (mg/kg) from the graph

b= Concentration in blank solution (mg/kg) from the graph

v= Final volume make up

m= Weight in gm. of test sample

* If test solution is diluted, dilution component has to be get hold of in account
* When running replicates, the average of the results must be specified with 2 significant figures
* If concentration is in µg/kg then divide with a factor of 1000
* You have to also describe how you evaluated the betacarotene content of the cookies and the method used
* Described in detail here how you will statistically analyze and present all the data you generated from the experiments.

**3. RESULT AND DISCUSSIONS**

The studies were conducted on development and quality evaluation of cookies by incorporating various proportions of flours. e.g., wheat flour, pumpkin flour and pumpkin seed flour. The qualities of the fresh and stored cookies were evaluated for crude fiber, β-carotene and iron content.

**1. Effect on crude fiber**

The data for variation in crude fiber (%) of cookies during storage is shown in figure 1. The crude fiber of freshly prepared cookies were observed for cookies T0 (0.72%), T1 (0.84%), T2 (0.96%), T3 (1.12%) and T4 (1.28%) respectively. Highest crude fiber observed in T4 cookies as compared to other during storage. Whereas, T0 cookies reported lowest crude fiber content. The results revealed that the crude fiber content of cookies increased with increase in the incorporation of pumpkin flour and pumpkin seed flour in wheat flour.

The crude fiber was observed for T0 cookies (0.72 – 0.63%) followed by T1 (0.84 – 0.75%), T2 (0.96 – 0.87%), T3 (1.12 – 1.03%) and T4 (1.28 – 1.19%) up to 120 days of storage periods. The study revealed that crude fiber content gradually decreased as storage period increased up to 120 days at room condition. The crude fiber of cookies incorporated pumpkin flour and pumpkin seed flour with wheat flour was observed higher as compared to control cookies. Similar trends were found by **Stojceska *et al*., (2008)** cereals based ready-to-eat expanded snacks. Indicate the trend found by the above authors

**Fig.1. Effect on crude fiber (%) of cookies during storage period**s

**2. Effect on β-Carotene**

The data for variation in β-carotene (%) of cookies during storage is shown in figure 1. The β-caroteneof freshly prepared cookies were observed for cookies T0 (2.06%), T1 (3.78%), T2 (3.86%), T3 (3.89%) and T4 (3.97%) respectively. Highest β-carotene observed in T4 cookies as compared to other during storage. Whereas, T0 cookies reported lowest β-carotene. The results revealed that the β-carotene of cookies increased with increase in the incorporation of pumpkin flour and pumpkin seed flour in wheat flour. The β-carotenewas observed for T0 cookies (2.06 – 1.97%) followed by T1 (3.78 – 3.59%), T2 (3.86 – 3.68%), T3 (3.89 – 3.79%) and T4 (3.97 – 3.88%) up to 120 days of storage periods. The study revealed that β-carotenecontent gradually decreased as storage periods increased at room condition. The β-caroteneof cookies incorporated pumpkin flour and pumpkin seed flour with wheat flour was observed higher as compared to control cookies. Please compare your work with that of similar works in literature here

**Fig.2 Effect on β- carotene (%) of cookies during storage period**s

**3. Effect on Iron Content**

The data for variation in iron content (mg) of cookies during storage is shown in figure 3. The iron content of freshly prepared cookies were observed for cookies T0 (17.48 mg), T1 (17.76 mg), T2 (18.03 mg), T3 (19.57 mg) and T4 (19.85 mg) respectively. Highest iron content observed in T4 cookies as compared to other during storage. Whereas, T0 cookies reported lowest iron content. The results revealed that the iron content of cookies increased with increase in the incorporation of pumpkin flour and pumpkin seed flour in wheat flour. The iron content was observed for T0 cookies (17.48 – 17.34 mg) followed by T1 (17.76 – 17.67 mg), T2 (18.03 – 17.92 mg), T3 (19.57 – 19.40 mg) and T4 (19.85 – 19.73 mg) up to 120 days of storage periods. The study revealed that iron content gradually decreased as increased in storage period under room condition. The iron content of cookies incorporated pumpkin flour and pumpkin seed flour with wheat flour was observed higher as compared to control cookies. Compare your work with other works in literature.

**Fig.3 Effect on iron content (mg/100g) of cookies during storage period**s

**CONCLUSION**

Incorporation of pumpkin flour and pumpkin seed flour into wheat flour for the development of cookies is possible based on the chemical and nutritional properties of the cookies. The results revealed that the incorporated cookies had the highest chemical and nutritional properties during the storage compared to control cookies. Therefore, the treatment (T4) has highest chemical and nutritional properties for 120 days stored at room temperature. Please conclude based on your objectives. Remember you are adding value to wheat flour as well as looking at the effects of storage on the composition

**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

**REFERENCES you need to update your references some are very old.**

**AOAC. (1990)**. Official methods of analysis. *AOAC International suite 500481 North Fredrick Avenue Gaithersburg, Maryland* 20877- 2417, USA.

**AOAC. (2012).** Association of Analytical Communities. 999.11.

**Bhaskarachary, K., Ananthan, R. and Longvah, T. (2008).** Carotene content of some common (cereals, pulses, vegetables, spices and condiments) and unconventional sources of plant origin. *Food Chemistry* 106: 85-89.

**Shakuntala, M.N. and Shadaksharaswamy, M. (2007).** Foods fact and principles. *A text book of Food Science and Technology*, Second Edition. Pp. 487-488.

**Das, S. and Banerjee, S. (2013).** Production of Pumpkin Powder and Its Utilization in Bakery Products Development: A Review. IJRET: *International Journal of Research in Engineering and Technology* eISSN: 2319-1163 | pISSN: 2321-7308

**Takachi, R., Manami, I., Junko, I., Norie, K., Motoki, I. and Shizuka, S. (2008)**. Fruit and vegetable intake and risk of total cancer and cardiovascular diseases Japan public health center-based prospective study. *American Journal of Epidemiology*, 167(1): 59-70.

**Lee, F.A. (1983)**. Basic Food Chemistry.AVI Publisher, Westport.

**Tee, E.S. and Lim, C.L. (1991)**. Carotenoids composition and content of Malaysian vegetables and fruits by AOAC and HPLC methods. *Food Chemistry* 41, 309-339.

**Olson, J.A. (1989).** Pro-vitamin A function of carotenoids: the conservation of β-carotene into vitamin A. *Journal of Nutrition* 119: 105-108.

**Mervet Ebrahim and EI-Demery (2011).** Evaluation of physico-chemical properties of toast breads fortified with pumpkin (*Cucurbita Moschata*) flour. *Faculty of specific Education Mansoura University-Egypt* 1432.

**Judita, C., Jurgita, K., Honorata, D., Elvyra, J. and Edita, J. (2014).** Pumpkin Fruit Flour as a Source for Food Enrichment in Dietary Fiber. *Notulae Botanicae Horti. Agro botanic* iCluj Napoca, 42 (1): 19-23.

**Nyam, K.L., Lau, M. and Tan, C.P. (2013).** Fibre from pumpkin (*Cucurbita pepo L*.) seeds and rinds: Physico-chemical properties, antioxidant capacity and application as bakery product ingredients. *Mal. J. Nutr*. 19: 99-109.

**Patel, S. (2013).** Pumpkin (*Cucurbita spp*.) seeds as neutraceutic: A review on status quo and scopes. *Mediterr J. Metab*; 6: 183-89.

**Stojceska, V., Ainsworth, P., Plunkett, A., Ibanoglu, E. and Ibanoglu, S. (2008).** Cauliflower by product as a new source dietary fiber, antioxidants and proteins in cereal based ready- to-eat expanded snacks. *J. food Eng*. 87:554-563.