

Research Article

Suchitra's ChocoZinc – a naturally fortified zinc chocolate in covid times

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ABSTRACT:

Chocolate has been a dietary supplement cherished by people of all ages. Home made chocolates are rare to get in many places. Zinc as a nutritional additive is being promoted as a booster of self-immunity to fight the corona pandemic. We tried to make a chocolate with natural additives rich in zinc along with the traditional method of making the chocolate. The normal chocolate was prepared according to described techniques. The zinc fortification was done with calculated doses of pumpkin seeds and decorticated sesame. (Zinc chocolate) The preparation of chocolate was similar with the same amounts of the other ingredients. After getting the recipe both were sent for zinc estimation. The zinc content in zinc chocolate was 34.65 mg/kg while in the other normal variety was only 13.42. The value was almost three times the normal chocolate. The taste was almost similar and cannot be distinguished by ten volunteers. We accept that we have not fed the volunteers with this recipe continuously and further estimate the blood zinc level to prove our results. We suggest that fortification with pumpkin seeds and decorticated sesame can be done in many recipes including chocolate to provide supplemental zinc in covid times.

Keywords: chocolate, fortification zinc, sesame, pumpkin seed,

INTRODUCTION AND METHODS:

Zinc has become as essential mineral for human health the deficiency of which can lead on to different diseases. The human organ systems known to be affected clinically by deficiency of zinc include the epidermal, nervous, immune, musculoskeletal, skeletal, gastrointestinal and reproductive systems. Its role as immune boosting additive is established¹. This effect seems to have a role in the diet of people now in the grip of corona². Chocolate is a favourable dietary recipe in many countries. Even-though commercial chocolates are available, home made ones will have more acceptance. Fortification of chocolate is being done with calcium, iron and omega 3 fatty acids to improve their nutritive value³. In this work, we have tried to fortify home-made chocolate with natural zinc additives and tried to prove the content. The preparation of the recipe is described as follows.

One cup of coco powder, one cup of milk powder, butter 100-gram, and white sugar 150

grams were the ingredients used. The chocolate was prepared according to described technique. Mix coco powder and milk powder in a dry bowl. Make two string consistencies with sugar and water in a kadaai. Add butter and allow it to melt. Add the dry mixture to the kadaai after the melting of butter. Keep stirring and avoid lumps. When the mixture is fully done, it will not stick to the kadaai. Pour immediately to a tray already spread with butter. After it cools make pieces of chocolate. Approximately, 50 pieces were made. In the zinc chocolate, 50 grams each of pumpkin seeds and decorticated sesame seeds were added along with coco powder and milk powder during the first phase of drying in the bowl. The following procedures were similar. The coco powder and the milk powder belonged to the same brand to avoid false results. The normal variant was made as round chocolates and the zinc variety were made as rectangular ones (fig1) to avoid any confusion after the preparation.



Fig.1 showing rectangular chocoZinc

RESULTS:

The chocolate fortified with pumpkin seeds and sesame had a significantly higher content of zinc than the routinely prepared chocolate. (34.65 Vs 13.42 mg/kg). The two chocolates were given to ten doctors who could not make out any significant change in taste. There were no complications.

DISCUSSION:

Fortification of foods have been done for decades to enhance the nutritive value of commonly taken foods.⁴ Chocolate is one of the most globally liked food by people of all ages. Cocoa can be neuro protective, anti-inflammatory and beneficial cognitive effects. Even though there are some disadvantages like weight gain, chocolate made out from cocoa can be fortified with many nutrients⁵. Pastore et al⁶ have described a technique of fortification of chocolates with iron to counter the ever-increasing problem of iron deficiency in the society. Hess et al⁷ have described in a review of zinc fortification have expressed that fortification can increase dietary zinc intake and the resultant total daily zinc absorption. Many of the studies also indicate that adding zinc to food does not adversely affect the absorption of other minerals, such as iron⁶. Most of the zinc fortification have been done with chemical addition of the zinc mineral. But we had added two other natural food additives^{8,9} to chocolates. The addition of sesame may alter the taste of the recipe was the problem we expected. It was not present. The taste was unrecognizable and cannot be differentiated from the natural chocolate by healthy volunteers. Kahraman et al¹⁰ have fortified cheese successfully with zinc, still they have not done with natural food material. Ours is the first such fortification with the help of natural foods like decorticated sesame and pumpkin seeds which are proved to be zinc rich

foods. As this a natural fortification, we need not be bothered about excessive zinc intake.

Our limitation is that we have not prepared in a big way to actually feed people with such recipes and follow with bioavailability and serum zinc levels.

CONCLUSION:

Fortification of chocolate with natural food items like pumpkin seeds and decorticated sesame increase the zinc content of chocolate by around three times without affecting taste.

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REFERENCES:

1. Roohani N, Hurrell R, Kelishadi R, Schulin R. Zinc and its importance for human health: An integrative review. *J Res Med Sci.* 2013;18(2):144-157.
2. Suchitra M R, & Parthasarathy S. (2020). Nutrition and corona virus: Plan a diet in a pandemic. *International Journal of Research in Pharmaceutical Sciences*, 11(SPL1), 110-114. <https://doi.org/10.26452/ijrps.v11iSPL1.2241>.
3. Tolve R , Condelli N , Caruso MC , Barletta D , Favati F , Galgano F . Fortification of dark chocolate with microencapsulated phytosterols: chemical and sensory evaluation. *Food Funct.* 2018;9(2):1265-1273. doi:10.1039/c7fo01822c.
4. Shah D, Sachdev HS, Gera T, De-Regil LM, Peñarosas JP. Fortification of staple foods with zinc for improving zinc status and other health outcomes in the general population. *Cochrane Database of Systematic Reviews* 2016, Issue 6. Art. No.: CD010697. DOI: 10.1002/14651858.CD010697.pub2
5. Brown KH, Hambidge KM, Ranum P; Zinc Fortification Working Group. Zinc fortification of cereal flours: current recommendations and research needs. *Food Nutr Bull.* 2010;31(1

Suppl):S62-S74.

doi:10.1177/15648265100311S106

6. Dace Pastore, Sandra Muizniece-Brasava, Fortified chocolate snacks with increased level of iron. Research for Rural Development 2016, (1) 111- 117
7. Sonja Y. Hess and Kenneth H. Brown. Impact of zinc fortification on zinc nutrition. Food and Nutrition Bulletin, 2009: vol. 30,(1) (supplement) S 79 -100
8. Qamar Abbas Syed, Mafia Akram, Rizwan Shukat. Nutritional and Therapeutic Importance of the Pumpkin Seeds. Biomed J Sci & Tech Res 21(2)-2019. BJSTR. MS.ID.003586.
9. Suchitra M.R, Parthasarathy.S. Analyses Of Zinc Content Of Different Types Of Sesame Seeds In The South Indian Delta Region. International journal of scientific & technology research (IJSTR) 2020 :(9); 03, 1866-68
10. O. Kahraman and Z. Ustunol Effect of zinc fortification on Cheddar cheese quality. J. Dairy Sci.2012: 95(6) :2840–2847 <http://dx.doi.org/10.3168/jds.s.2011-4945>.