

SPECIMEN FORMAT FOR THESES OF MONTH

Faculty : **Home Science**

Department : **Food Science and Nutrition**

Branch/ Area: :

Sub Subject Heading: :

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Title of the thesis : Bioavailability of iron and zinc from regional diets

(i) In Roman Script -

(ii) In roman Script -

Nomenclature of Degree: : **Ph.D**

Month & Year of Enrolment: : **24.07.2012**

Month & Year of Registration: : **24.07.2012**

Month &Year of Submission: : **23.07.2016**

Month &Year of Award : **September, 2017**

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Designation of Supervisor : Professor and Registrar

Centre/department/school in which research was conducted : **Avinashilingam Institute for Home Science and Higher Education for Women**

University's Name & Address : **Avinashilingam Institute for Home Science and Higher Education for Women, Mettupalayam Road, Coimbatore – 641 043**

Abstract within 300 words:

i) Specific Objectives:

- Assess the consumption pattern of the regional diets by the households of selected districts in Tamil Nadu
- Evaluate the nutrient potentials of the regional diets
- Assess the in-vitro bioaccessibility of iron and zinc from the regional diets
- Assess the in-vivo bioavailability of iron and zinc from the Ready To Eat (RTE) food among adolescent girls.

ii) Methodology :

The present study was a community based cross sectional survey, carried out in the households of four districts of Tamil Nadu namely Chennai, Trichy, Coimbatore and Kanyakumari. Households were selected based on adopting multi stage random sampling procedure and data on food consumption pattern, regional diets and convenience foods were elicited.

The study involves 5 stages – In Phase I, consumption pattern of regional diets from households of selected districts of Tamil Nadu were carried out by a community based survey using structured interview schedule and food frequency to collect data on the socio-economic background, frequency of food consumption pattern, regional diets prepared and consumed by the households during various occasions, cooking practices followed in the preparation of foods and to collect recipes of various food preparations.

In Phase II, nutritional evaluation of the regional diets and convenience foods were carried. From the 427 households surveyed among the four districts, the commonly consumed regional diets were identified and were subjected to nutritional evaluation for total iron and zinc content as per the AOAC procedure.

In Phase –III, the *in- vitro* bioaccessibility of iron and zinc from regional diets were assessed by in vitro method of Lutten et al (1996) and by atomic absorption spectrophotometer.

In Phase – IV, a bioavailable ready to eat iron rich food supplement was formulated. Four variations were developed of the food was developed. The ingredients were malted bajra (*pearl millet*), green gram, roasted Bengal gram, ground nut in the ratio 65:20:10:5 g respectively. This mix formed the standard. In variation 1, 5 per cent shade dried drumstick leaves were incorporated, in variation 2, 10 per cent and in variation 3, 15 per cent shade dried drumstick leaves were added respectively.

IN Phase –V, the *in vivo* bioavailability of iron and zinc among adolescent girls in the age group of 16 to 18 years were carried out and the impacts of interventions were assessed after 4 months.

iii) Findings:

- Food habits revealed that out of the 427 households surveyed about 80.33 per cent of the households were non vegetarians. Frequency of consumption of food items revealed consumption of micronutrient rich fruits, green leafy vegetables and meat were weekly once only. Also analysis of the one day's diet of the adolescent girls in the four districts revealed that consumption of all foods groups were lower when compared to RDA (2010).
- One day's diet of the adolescent girl was analysed in the lab for total iron and zinc content as per AOAC (2004) procedures. The iron intake met only 60.96 to 65.92 per cent of the RDA. The per cent RDA met for zinc was only 56.54 to 61.36
- *In-vitro* bioaccessibility of iron and zinc from regional diets were carried out by Lutten et al (1996), the results revealed that the highest iron bioaccessibility was observed in lime rice with 22.38 per cent. Fermented cereal and pulse based products such as dosa and idli also had iron bioaccessibility of 19.05 to 21.05 per cent respectively
- The nutritional evaluation of formulated ready to eat foods had energy content (calculated) ranged from 428.42 K cal to 548.27 K cal from standard to variation 3. The protein content of four ready to eat foods were in the range of 17.16g to 19.46g/ 100g. Micronutrient contents of the ready to eat foods increased on adding dried drumstick leaves. Total iron content of the ready to eat foods ranged from 8.53 g to 11.03 g from standard to variation 3. Similarly zinc, calcium and phosphorus values also increased from standard to variation 3
- The results of intervention proved that supplementation of foods rich in bioavailable iron and nutrition education significantly increased the heamatological parameters of Experimental Group I who were anaemic
- From the foregoing results, it may be concluded that regional diets contribute to iron and zinc in the dietaries of population in Tamil Nadu. Various traditional processing and cooking methods may enhance the availability of iron and zinc in the diet. Further, the impact of dietary intervention using a ready to eat convenience food to anaemic girls improved their iron nutritional status. This proved the promising results of dietary diversification as a long term strategy

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