

UGC Minor Research Project titled “Utilization of Unconventional Greens and Education Intervention for Nutrition Security of School Children”

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Executive Summary

The main aim of this study was to identify and utilize the unconventional greens to improve the iron and vitamin A status in school children. Around fifteen unconventional greens were analysed for nutrient content and the green vegetable which is rich in iron and β -carotene is used for the further study. The two products namely, masala roti and masala bun were prepared with various levels of incorporation of anne greens powder and were evaluated for their acceptability. The nutrients of best acceptable product and the basic recipe were analyzed chemically and were used for the intervention study.

A total of 210 school children (13-15 years) were assessed for nutritional status. Seventy two children who had $<20 \mu\text{g/dl}$ of serum retinol were randomly selected and grouped into two, Group I (control) and group II (experimental) for further study.

Basic information such as age of the respondents and class in which studying were collected by structured pre-tested questionnaire by the investigator. Nutritional status of children was assessed by both direct and indirect methods such as directly survey, nutritional anthropometry, which included height, weight, mid-upper arm circumference and triceps. Iron and vitamin A status was assessed by way of haemoglobin and serum retinol estimation and clinical symptoms with respect to anaemia, vitamin A and B-complex.

Intervention study was conducted in the subjects who were divided into control and experimental groups. Subjects in experimental group were fed with masala roti for 3 months period. The parameters such as serum retinol and haemoglobin level and the anthropometric measurements after the supplementation.

One more group of subjects (n=138) were subjected to nutrition education intervention, wherein the nutrition education through audio visual aids, talks from experts, exhibition, display of foods etc was incorporated. A lecture for 45 minutes was delivered using visual aids followed by discussion and reassessment of knowledge after the nutrition education class. Such classes were conducted twice a week for 3 months. The knowledge

assessment tool was administered thrice during the study period initial (before education), soon after the nutrition education and one month later.

The salient results of the study are summarized here under :

- Analysis of nutrient composition of fifteen unconventional greens powder revealed that it is a potential source of iron, calcium and beta carotene on dry weight basis.
- Two products namely masala roti and masala bun were standardized with the different combination of anne greens powder, same were found to be acceptable at 3, 3 and 2 percent level. Considering all the five parameters for organoleptic evaluation, masala bun scored highest with a score of 39.12 followed by masala roti 38.82 out of a total score of 45.
- The mean values for weight, height, mid upper-arm circumference and triceps showed that the mean values were significantly lower than the reference values for all the age groups. But, as the age increased there was a reduction in the percent deficit for all the anthropometric measurements. No statistical difference was observed in the mean values for weight, height, MUAC and triceps, among children between control and experimental group.
- Categorizing the subjects according to various degree of the BMI revealed that 45 percent of children in the present study were found to be in the normal category of 20-25.
- The mean intake of foodstuffs by both the control and experimental group were significantly lower than the RDA. More than 50 percent deficit was observed in the intake of most of the foodstuffs.
- Percent adequacy in the intake of various nutrients were as follows : energy was 49-51 per cent, protein 57-60 per cent, 87-90 per cent, calcium 88 per cent, iron 44-46 per cent and β -carotene 32-38 percent which was found to be almost similar in both control and experimental groups.
- There was a positive correlation between anthropometric and biochemical status with nutrient intake. The haemoglobin and serum were found to have a highest degree of association with iron (69%) and β -carotene (64%) intake.
- The experimental group (fed with the value added masala roti) showed significant increase in weight from 29.63 to 32.10 kg and triceps increased from 8.93 to 9.97 mm, which is to the extent of 8.33 and 11.64 percent respectively.

- Masala roti incorporated with ane greens powder was selected for intervention programme (feeding). Estimation of haemoglobin and serum retinol before and after intervention programme revealed a satisfactory significant increase in the same. Thus, proving the third hypothesis that, feeding the products incorporated with ane greens powder improves iron and vitamin A status in school children.

All the above findings revealed that the health and nutritional status of school children is inadequate, especially with iron and vitamin A status. The under - utilized greens powder being a potential source of the same and they are inexpensive. Thus information, Education and Communication must be made an inexpensive. Thus information in all intervention programmes to create an awareness regarding the utilization of greens powder to better the micro-nutrient malnutrition among this population.

RECOMMENDATION FOR FURTHER STUDY

- Similar intervention study could be carried out for other age group of school children.
- Many traditional could be standardized by incorporating under-utilized greens power at various levels and bioavalailability studies may be carried out on the same.
- Similar type of study could be carried out on pregnant women to observe the impact of unconventional greens in improving the iron status in this set of population.
- Along with assessment of knowledge level, the study could be carried out including attitudes and practices in the field of nutrition and health.