



MANGALORE UNIVERSITY

DEPARTMENT OF BIOSCIENCES

MSc Food Science & Nutrition

FNS 553: FOOD FORTIFICATION

39 Hrs (13× 3 units)

Course outcome:

- Describe the basic principles of food fortifications and its needs.
- List the characteristics of fortificants and fortification methods.
- Describe design of fortification and about different fortification methods.
- Write down the effect of cooking on fortified foods.

UNIT I: Food fortification – Needs, objectives, principles and rationale, selection and basis of fortificants. Types of fortification. Health benefits of fortification, Selection of nutrients for fortification, Levels to be added, Characteristics of fortificants and method of fortification. Technology of fortifying cereal products: Fortification methods. Fortification premixes, Design and composition of premixes and quality control. Fortification of bread, pasta, noodles, biscuits, and breakfast cereals.

UNIT II: Micronutrient fortification of snack products, merits and demerits of fortification, choice of products and selection of micronutrients, Setting level of fortification, Safety limits, Technological and cost limits, Challenges in fortifying snack products, Nutrient interaction and bioavailability.

UNIT III: Other special fortified products - salt, sugars, milk and oils: Salt: Technology of fortifying salt with iron and iodine, Iodine stability and quality of double fortified salt, Safety issues, Levels to be added. Sugars: Fortification with iron and vitamin A, Premix formulation, Fortification level, Packaging. Milk: Fortification with vitamin A, technology and levels. Oils: Fortification with vitamin A, Rationale of vitamin A fortification, Stability

of vitamin A in oil during storage and cooking, Effects of frying on Vitamin A content, Efficacy and safety of vitamin A added to oil, Technology of fortifying, Packaging

REFERENCES

- Lindsay Allen, Bruno de Benoist, Omar Dary and Richard Hurrell (Eds.) 2006
Guidelines on food fortification with micronutrients: World Health Organization and Food and Agriculture Organization of the United Nations
- Stakeholder consultation on Regulation for staple food Fortification: 15 April 2011: National Institute of Nutrition and Indian Council of Medical Research, Hyderabad: working paper
- www.who.int/nutrition/.../guide_food_fortification_micronutrients.pdf
- PATH: Ultra Rice technology. http://www.path.org/projects/ultra_rice.php [Accessed February 25, 2011].
- www.a2zproject.org/node/10
- www.fortaf.org
- www.a2zproject.org/node/10

