

Certificate Course
in
Food Science and Quality Control

Unit I - Quality Control of Food Materials

(6hrs)

Definition of quality control, Need and importance of quality control, principles of quality control, food related hazards - physical, chemical and biological hazards, factors affecting food safety, quality attributes of food-nutritional, microbial and sensory attributes, Sampling Method of Quality Evaluation – objectives, guidelines, Quality assurance in Food Services System-difference between quality assurance and quality control, total quality control (TQC), statistical quality control (SQC).

References:

1. An introduction to Food Science and Technology & Quality management - Devendra Bhatt & Priyanka Tomar.
2. Quality assurance in Microbiology, Bhatia,R. and Ichhpujan, R.L. CBS Publishers and Distributors, New Delhi. 2004.
3. Food Quality Management - Manoranjan Kalia.
4. Hand book of analysis & Quality Control - Rannanganna.
5. Kher, C.P. Quality control for the food industry. ITC Publishers, Geneva. 2000.

Unit II - Food Standard Laws and Safety Management

(6hrs)

Voluntary and compulsory standards, packaging and labeling, standards food laws – Hazard Analysis Critical Control Point (HACCP), CCP, Codex Alimentarius Commission (CODEX), National Codex Committee of India, ISO-22000, ISO-9001:2000, ISO22000:2005, ISO 17025/CODES/GLP, food quality management- quality management principles, external quality control activities, certification and quality marks, national standard bodies – (British Retail Consortium) BRC food and BRC IoP (Institute of Packaging) standards, (International Food Standard) IFS, (Safe Quality Food standard) SQF: 1000, SQF: 2000.

References:

1. Gazette of Food Safety and Standards Act, (2006) Food Safety regulations and food safety management. Food Safety and Standards Authority of India. New Delhi.
2. The training manual for Food Safety Regulators. (2011) Vol.III, Food Safety regulations and food safety management. Food Safety and Standards Authority of India. New Delhi.
3. Jellinek, G., Sensory Evaluation of Food-Theory and Practice., Elis Horwood Ltd.,England.,1985.

4. Manay, S., Shadaksharaswamy, M., Food Facts and Principles, New Age International (P) Limited., New Delhi., 2008.

Unit III – Fish: Nutrition and Quality

(6hrs)

Major classes of lipids in fish (triglycerides, phospholipids, wax esters etc), major fatty acids in fishes (saturated fatty acids, monounsaturated fatty acids and polyunsaturated fatty acids (PUFAs)), protein in fishes (sarcoplasmic, myofibrillar etc), minerals present in fishes (both major (Na, K and Ca) and minor (Fe, Zn, Mn, Se etc)). Sensory evaluation of fishes, chemical indicators of decay (free fatty acids, lipid peroxides, thiobarbituric acid), histamine, Indole, K value, trimethylamine, total volatile base nitrogen, ammonia and total plate count in fishes as quality indicators. Common adulterants present in fishes (ammonia and formaldehyde) and their identification.

References:

1. Mohanty, B. P. 2011. Fish as Health Food. Ch. 35, pp. 843-861, In: Handbook of Fisheries and Aquaculture, 2nd edn. ICAR – DKMA, New Delhi. ISBN: 978-81-7164-106-2.
2. Sankar T. V. 2009. Functional properties of fish proteins. A Review. Fishery Technology, 46, 2, 87-98.
3. Nutrient profile of fish. www.Cifri.res.in.
4. Fundamentals of Biochemistry. J. L. Jain. 6th Edition, 2005, S. Chand & Company.
5. A comprehensive classification system for Lipids. J. Lipid Research, 2005, 46, 839-861.
6. Fundamentals of protein structure and function. Engelbert Buxbaum. 2nd Edition, 2015, Springer International Publishing, Switzerland.
7. Seafood proteins. Zdzislaw E. Silkorski, Bonnie Sun Pan and Fereidoon Shahidi. 1994. Chapman & Hall Inc.
8. Fish Nutrition. John E. Halver and Ronald W. Hardy. 3rd Edition, 2003, Elsevier Inc.
9. Post-harvest Technology of fish and fish products. K. K. Balachandran. 2nd Edition, 2016, Daya Publishing House.

Unit IV – Dairy Science and Analysis

(6hrs)

Nutritive value of milk, role of milk and milk products in human nutrition, physico chemical properties of milk, thermal stability of milk, theory and principles of dairy microbiology, common micro organisms in milk, fermentation of milk, milk borne diseases, milk and public health. Quality analysis of milk, sensory analysis of milk, determination of specific gravity, fat, SNF, TS, acidity & pH in milk, common adulterants in milk and their detection techniques.

Standards for milk and milk products, bacteriological standards for milk and milk products – BIS, PFA standards, maximum permissible limits of aflatoxin, pesticides, antibiotic residues and heavy metals in milk and milk products.

References:

1. Dairy Science: Petersen (W.E.) Publisher – Lippincott & Company 2.
2. Outlines of Dairy Technology – Sukumar (De) – Oxford University press.
3. Indian Dairy Products – Rangappa (K.S.) & Acharya (KT) – Asia Publishing House. 4.
4. The technology of milk Processing – Ananthakrishnan, C.P., Khan, A.Q. and Padmanabhan, P.N. – Shri Lakshmi Publications.
5. Dairy India 2007, Sixth edition 6. Economics of Milk Production – Bharati Pratima Acharya Publishers.

Unit V - Analytical Methods Used for Food Quality Determination (6hrs)

Principle, working and applications of paper chromatography, TLC, GC, HPLC, HPTLC, LC/MS, inductively coupled Plasma Mass Spectrometry (ICP-MS), Spectrophotometry-introduction and principles of UV –Visible spectroscopy, Fluorimetry Atomic absorption spectroscopy, Radiotracer techniques and Electrophoresis.

References:

1. Nielsen, S.S. Introduction to the chemical analysis of foods. Jones and Bartlett Publishers, Boston, London. 2004.
2. Mahindru, S.N. Food additives. Characteristics, detection and estimation. Tata McGraw-Hill Publishing Company Limited, New Delhi. 2000.
3. Pearson, D. The Chemical Analysis of Foods. Churchill Livingstone, New York. 2002.
4. Sharma, B.K. Instrumental Methods of Chemical Analysis. Goel Publishing House, New Delhi. 2004.