



S.No.	Topic	No. of Practicals
8.	Preparation and analysis of <i>khoa</i> from cow and buffalo milk.	1
9.	Preparation and analysis of <i>chhana</i> from cow and buffalo milk.	1
10.	Preparation and analysis of <i>paneer</i> from cow and buffalo milk.	1
11.	Preparation and analysis of <i>lassi</i> from cow and buffalo milk.	1
12.	Preparation of <i>ghee</i> from cream and butter.	1
13.	Preparation of <i>rosogolla</i> and <i>gulabjamun</i> .	1
14.	Preparation of srikhand and burfi.	1
15.	Visit to dairy plant.	1
	Total	15

X. Suggested Reading

- Adnan T. 2009. *Dairy Powders and Concentrated Products (Society of Dairy Technology)*. Wiley-Blackwell.
- Adnan T. 2006. *Probiotic Dairy Products (Society of Dairy Technology series)*. Wiley-Blackwell.
- Britz. 2008. *Advanced Dairy Science and Technology*. Blackwell Publisher: Blackwell Publisher Professional.
- De. 2001. *Outlines of Dairy Technology*. Oxford.
- Hui YH. 1992. *Dairy Science and Technology Handbook*. Vol. I, II and III Wiley.
- Spreer E. 2017. *Milk and Dairy Product Technology*. Taylor and Francis.
- Walstra P, Jan TM, Wouters and Geurts TJ. 2006. *Dairy Science and Technology*. CRC, Taylor and Francis.

I. Course Title : Processing of Meat, Poultry and Fish

II. Course Code : PFE 516

III. Credit Hours : 2+1

IV. Aim of the course

To acquaint and equip the students with processing of meat, fish and poultry and the design features of the equipment used for their processing.

V. Theory

Unit I

Meat: Genetic engineering of farm animals for better meat quality, automation for the modern slaughterhouse, hot-boning of meat, new spectroscopic techniques for online monitoring of meat quality, real-time PCR for the detection of pathogens in meat, new developments in decontaminating raw meat, automated meat processing, developments in chilling and freezing of meat, high pressure processing of meat, approaches for the development of functional meat products, new techniques for analyzing raw meat, modified atmosphere packaging, perspectives for the active packaging of meat products.

Unit II

Poultry: Breeding and quality of poultry, stunning and slaughter of poultry, processing and packaging of poultry, new techniques of preservation of poultry, production of turkeys, geese, ducks and game birds, microbial hazards in poultry production and processing, latest trends in measuring quality of poultry and poultry products, treatment and disposal of poultry processing waste.

Unit III

Fish and seafood: Fresh fish handling and chill storage, modified atmospheric packaging of seafoods, fish odours and flavours, assessment of freshness of fish and seafoods, traditional dried and salted fish products, proteolysed fish products, minced fish technology, retort pouch processing technology, irradiation and microwave in fish handling and processing, advanced freezing technology for fish storage, high pressure processing of seafoods, value addition of freshwater and aqua cultured fish products, application of enzymes in fish processing and quality control, toxins, pollutants and contaminants in fish and seafoods.

Unit IV

Milk: Physical, chemical and nutritional properties of milk components, improvements in the pasteurization and sterilization of milk. Flavour generation in dairy products, controlling texture of fermented dairy products, functional dairy products, on-line measurement of product quality in dairy processing, high pressure processing of milk products, novel separation technologies to produce dairy ingredients, new technologies to increase shelf-life of dairy products, genetic engineering of milk proteins, production and utilization of functional milk proteins, methods of improving nutritional quality of milk, significance of milk fat in dairy products, chromatographic, spectrometric, ultrasound and other techniques for analysis of milk lipids.

VI. Practical

Analysis of fresh and processed meat, fish, poultry and milk products, preservation of fresh meat and fish, processing and production of different products from fresh meat, fish and milk, shelflife studies on different meat, fish and milk products. Visit to processing plants.

VII. Learning outcome

Student's capability to process meat, fish and poultry and manufacture value added products as per requirement of food industries.

VIII. Lecture Schedule

S.No.	Topic	No. of Lectures
1.	Genetic engineering of farm animals for better meat quality.	1
2.	Developments in automation of the modern slaughterhouse, hot-boning process of meat, benefits of hot boning.	1
3.	New spectroscopic techniques for online monitoring of meat quality, Real-time PCR for the detection of pathogens in meat.	2
4.	Automated meat processing, developments in chilling and freezing of meat, High pressure processing of meat, approaches for the development of functional meat products.	3
5.	New techniques for analyzing raw meat, modified atmosphere and active packaging of meat products.	2
6.	Breeding and quality of poultry, Stunning and slaughter of poultry, Processing and packaging and new techniques of preservation of poultry.	2
7.	Production of turkeys, geese, ducks and game birds.	1
8.	Microbial hazards in poultry production and processing, treatment and disposal of poultry processing waste, Latest trends in measuring quality of poultry and poultry products. Treatment and disposal of poultry processing waste.	3



S No	Topic	No. of Lectures
9.	Fish and seafood: Fresh fish handling and chill storage, modified atmospheric packaging, Assessment of freshness of fish and seafoods, different traditional and proteolysed fish products, minced fish technology.	3
10.	Retort pouch processing technology, irradiation and microwave in fish processing, Advanced freezing technology for fish storage, Value addition of freshwater and aqua cultured fish products, application of enzymes in fish processing.	3
11.	Quality control: toxins, pollutants and contaminants in fish and sea foods.	1
12.	Physical, chemical and nutritional properties of milk components, improvements in the pasteurization and sterilization of milk.	2
13.	Flavour generation in dairy products, controlling of texture in fermented dairy products.	1
14.	Functional dairy products, on-line measurement of product quality, high pressure processing, Novel separation technologies to produce dairy ingredients, new technologies to increase shelf-life of dairy products.	2
15.	Genetic engineering of milk proteins, production and utilization of functional milk proteins.	1
16.	Methods of improving nutritional quality of milk, significance of milk fat in dairy products and different techniques for analysis of milk lipids.	2
	Total	30

IX. List of Practicals

S.No.	Topic	No. of Practicals
1.	Analysis of fresh and processed meat products	1
2.	Analysis of fresh and processed fish products	1
3.	Analysis of fresh and processed poultry products	1
4.	Analysis of fresh and processed milk products	1
5.	Preservation of fresh meat and fish	1
6.	Processing and production of different products from fresh meat	2
7.	Processing and production of different products from fresh fish	2
8.	Processing and production of different products from fresh poultry	2
9.	Processing and production of different products from fresh milk	1
10.	Shelf life studies on different meat, fish and milk products	2
11.	Visit to processing plants	1
	Total	15

X. Suggested Reading

- Chooksey MK. 2003. *Fish Processing and Product Development*. CIFE, Kochi.
- Chooksey MK and Basu S. 2003. *Practical Manual on Fish Processing and Quality Control*. CIFE, Kochi.
- Hall GM. 1997. *Fish Processing Technology*. Blabie Academic and Professional.
- Lawrie RS. 1985. *Developments in Meat Sciences*. Vol III Applied Science Publishers.
- Mead GC. 1989. *Processing of Poultry*. Elsevier.
- Pearson AM and Tauber FW. 1984. *Processed Meats*. AVI Publishers.
- Stadelman WJ and Cotterill OJ. 1980. *Egg Science and Technology*. AVI Publishers.