

### SEMESTER III

#### PIZOF20 - INDEPENDENT ELECTIVE III B- DAIRYING

Year	SEM	Course code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
II	III	PIZOF20	Dairying	Theory	Independent Elective	-	2	100

#### Objective:

- To learn the techniques in improved milk production.
- To know the preservation and processing of milk.

#### Course Outcomes:

**On completion of the course the student will be able to...**

**CO1:** Discuss the development and management of dairying.

**CO2:** Explain properties of milk and its composition.

**CO3:** Describe various periods of milking, variations in compositions and equipments used in milking.

**CO4:** Discuss entry of bacteria into milk and types of bacteria.

**CO5:** Explain various methods of pasteurization.

CO/PSO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	H	H	M	H	H	M
CO2	H	H	M	H	H	M
CO3	H	H	M	H	H	M
CO4	H	H	M	H	H	M
CO5	H	H	M	H	H	M

CO/PO	PO					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	H	H	M	H	M	H
CO2	H	H	M	H	M	H
CO3	H	H	M	H	M	H
CO4	H	H	M	H	M	H
CO5	H	H	M	H	M	H

#### Unit 1:

1.1: Development of dairying.(K1, K2, K3, K4, K5)

1.2: Cattle population and production of milk.(K1, K2, K3, K4, K5)

1.3: Dietary requirements of milk, milk intake and income levels.(K1, K2, K3, K4, K5)

1.4: Milk production-cost relationship. (K1, K2, K3, K4, K5)

1.5: Utilisation of milk.(K1, K2, K3, K4, K5)

1.6: Nutritive value of milk.(K1, K2, K3, K4, K5)

#### Unit 2:

2.1: Lactation, milk as food. (K1, K2, K3, K4, K5)

2.2: Udder, secretion of milk, let-down of milk. (K1, K2, K3, K4, K5)

2.3: Factors affecting secretion-individuality, feeding, environment and maintenance.  
(K1, K2, K3, K4, K5)

- 2.4: Properties of milk. (K1, K2, K3, K4, K5)  
2.5: Composition of milk-proteins, fat, lactose, ash and water, vitamins.(K1, K2, K3, K4, K5)  
2.6: Thermal stability of milk.(K1, K2, K3, K4, K5)

### **Unit3:**

- 3.1: Variations in composition-period preceding milking.(K1, K2, K3, K4, K5)  
3.2: Time of milking, portion of milk tested. (K1, K2, K3, K4, K5)  
3.3: Stage of lactation, age of cow, and feed.(K1, K2, K3, K4, K5)  
3.4: Food value of milk. (K1, K2, K3, K4, K5)  
3.5: Enzymes in milk.(K1, K2, K3, K4, K5)  
3.6: Colostrum pre-milking, slimy or ropy milk.(K1, K2, K3, K4, K5)

### **Unit 4:**

- 4.1: Entry of bacteria into milk, water-supply, attendants. (K1, K2, K3, K4, K5)  
4.2: Unhealthy animals; types of bacteria in milk. (K1, K2, K3, K4, K5)  
4.3: Effects of bacteria on milk; reducing number of bacteria in milk. (K1, K2, K3, K4, K5)  
4.4: Milk borne diseases.(K1, K2, K3, K4, K5)  
4.5: Dairy utensils, cleaning.(K1, K2, K3, K4, K5)  
4.6: Sterilising utensils and equipment.(K1, K2, K3, K4, K5)

### **Unit 5:**

- 5.1: Pasteurisation of milk in India.(K1, K2, K3, K4, K5)  
5.2: Holder method of pasteurisation.(K1, K2, K3, K4, K5)  
5.3: H.T.S.T. method, pasteurising bottled milk.(K1, K2, K3, K4, K5)  
5.4: Cooling after pasteurisation.(K1, K2, K3, K4, K5)  
5.5: Homogenisation, grading milk.(K1, K2, K3, K4, K5)  
5.6: Packing of milk(K1, K2, K3, K4, K5)

### **Books for Study and Reference:**

#### **Textbooks:**

1. The technology of milk Processing – Ananthkrishnan, C.P., Khan, A.Q. and Padmanabhan, P.N. – Shri Lakshmi Publications.
2. Dastur, N. N. and Banerji, B. N Manufacture and Storage of Ghee. Ind. FarminR, IX (7), pp. 78. 1948.

#### **Reference Books:**

3. International Inst. of Agric., Rome, Dairy Cow Testing throughout the World, 1938.
4. Owe, L. T. and Goldie, J. M., The Student's Handbook of Milk and Milk Products. Worcestershire, Little bury and Company, 1947.
5. HL Rangappa, K. S. and Achayya, K. T., Chemistry and Manufacture of Indian Dairy Products. The Bangalore Printing and Publishing Co., Ltd., Bangalore, 1948.
6. Report on the Marketing of Milk in the Indian Union, India Government Publication, New Delhi, 1950.

#### **E-Resources:**

- <http://www.asci-india.com>  
<https://dgt.gov.in>  
<http://www.dahd.nic.in>

**SEMESTER IV**  
**PEZOG20 - ELECTIVE IV A: FISHERY BIOLOGY**

Year	SEM	Course code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
II	IV	PEZOG20	Fishery Biology	Theory	Elective	5	5	100

**Objective:**

- The objective of the paper is to understand shell fisheries in India and to have knowledge about their byproducts, marketing, transportation and Insurance.

**Course Outcomes:**

**On completion of the course the student will be able to...**

**CO1:** Apply the parameters for the growth of fish, biology of fish and gears in fishery.

**CO2:** Acquire knowledge of biology and techniques of shell fisheries.

**CO3:** Apply knowledge in establishing and managing sea weed and pearl culture and byproducts of fishery.

**CO4:** Differentiate the types of fish cultures pathogens and their control measures.

**CO5:** Explain the processing, transportation and marketing of Fishes.

CO/PSO	PSO					
	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	H	H	H	H	H	H
CO2	H	H	H	H	H	H
CO3	H	H	H	H	H	H
CO4	H	H	H	H	H	H
CO5	H	H	H	H	H	H

CO/PO	PO					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	H	H	H	H	H	H
CO2	H	H	H	H	H	H
CO3	H	H	H	H	H	H
CO4	H	H	H	H	H	H
CO5	H	H	H	H	H	H

**Unit 1:  
Hours)**

**(15**

1.1: Water quality-temperature, pH, CLO<sub>2</sub>, salinity, nutrients and trace elements for the growth of fishes. (K1, K2, K3, K4, K5)

1.2: Biology of Marine edible fish - Oil sardines. (K1, K2, K3, K4, K5)

1.3: Biology of freshwater edible fish- Catla. (K1, K2, K3, K4, K5)

1.4: Indian capture methods – shafts. (K1, K2, K3, K4, K5)

1.5: Indaian capture gears. (K1, K2, K3, K4, K5)

1.6: Economic importance of commercial fisheries. (K1, K2, K3, K4, K5)

**Unit 2:**

**(15 Hours)**

2.1: Biology and culture techniques of Shell fisheries. (K1, K2, K3, K4, K5)

2.2: Marine and freshwater Crustaceans- Prawns, Lobsters, Crabs. (K1, K2, K3, K4, K5)

2.3: Molluscs – Oysters. (K1, K2, K3, K4, K5)

2.4: Clams, Cuttle fish. (K1, K2, K3, K4, K5)

- 2.5: State wise Commercial and export potential of Shell fisheries. (K1, K2, K3, K4, K5)  
2.6: Economic importance of Shell fisheries. (K1, K2, K3, K4, K5)

**Unit 3:** (15 Hours)

- 3.1: Sea weeds – Types. (K1, K2, K3, K4, K5)  
3.2: Different culture methods of sea weeds. (K1, K2, K3, K4, K5)  
3.3: Pearl culture - stages of pearl formations. (K1, K2, K3, K4, K5)  
3.4: Pearl culture techniques. (K1, K2, K3, K4, K5, K6)  
3.5: Byproducts of fishes - Fish meal – Fish oil. (K1, K2, K3, K4, K5)  
3.6: Fish manure – Chunks. (K1, K2, K3, K4, K5)

**Unit 4:** (15 Hours)

- 4.1: Composite fish culture– Paddy cum fish culture. (K1, K2, K3, K4, K5)  
4.2: Integrated fish culture. (K1, K2, K3, K4, K5)  
4.3: Sewage water fish culture. (K1, K2, K3, K4, K5)  
4.4: Raceway culture, cage, pen and rack culture system. (K1, K2, K3, K4, K5)  
4.5: Control of Parasites, predators. (K1, K2, K3, K4, K5)  
4.6: Weeds in culture ponds. (K1, K2, K3, K4, K5)

**Unit 5:** (15 Hours)

- 5.1: Methods of processing. (K1, K2, K3, K4, K5)  
5.2: Packaging. (K1, K2, K3, K4, K5)  
5.3: Storage of fishes. (K1, K2, K3, K4, K5)  
5.4: Transport facilities. (K1, K2, K3, K4, K5)  
5.5: Marketing channels. (K1, K2, K3, K4, K5)  
5.6: E-marketing. (K1, K2, K3, K4, K5)

**Books for Study and Reference:**

**Textbooks:**

1. Jingran, V.G., 1982. Fish and fisheries of India. Hindustan publishing Corporation - New Delhi
2. Hopher, B and Y. Pruginin, 1981 - Commercial fish farming, John Wiley & Sons, N.Y.  
Marine Products Export Review, 1982 MPEDA, Cochin.

**Reference Books:**

1. Pandey, K and J.P Shukla 2000. Fish and Fisheries, Rastogi Publication, Meerut.
2. Shanmugam, K. 2005. Fishery Biology and Aquaculture
3. Pradeep Kashyap. 2005. The Rural Marketing Book.

**E-Resources:**

<http://www.cifa.nic.in>  
<http://agritech.tnau.ac.in>  
<http://aquaculturetraining.com.au>  
<http://www.oftri.org>