

# The Complete Technology Book on Dairy & Poultry Industries With Farming and Processing (2nd Revised Edition)

**Author:** NIIR Board

**Format:** Paperback

**ISBN:** 9789381039083

**Code:** NI62

**Pages:** 720

**Price:** Rs. 1,275.00 **US\$** 33.95

**Publisher:** NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

Dietary habits of people have changed over the last few decades. Growing consciousness for protein rich food has given an impetus to both the dairy industry and poultry farming. Today, the dairy industry is a large organized sector with both private and government participation whereas poultry farming has indicated a rapid growth of 20% in the past few decades as well. Poultry is one of the fastest growing segments of the agricultural sector in India today. The production of agricultural crops has been rising at a rate of 1.5 to 2 % per annum that of eggs and broilers has been rising at a rate of 8 to 10 % per annum. From a backyard hobby it has culminated into an industry. The venture has largely been entrepreneurial and poultry farmers prefer to target their efforts to breeding & broiler farming for sale of ready broilers or layer farming for eggs. Poultry is the second most widely eaten meat in the world, accounting for about 30% of meat production worldwide. Dairy plants process the raw milk they receive from farmers so as to extend its marketable life. India has only a few specialized dairy farms. It is the production that characterizes the dairy industry. India is the worlds highest milk producer and all set to become the worlds largest food factory. Dairying is an important source of subsidiary income to small/marginal farmers and agricultural labourers. The manure from animals provides a good source of organic matter for improving soil fertility and crop yields. Since agriculture is mostly seasonal, there is a possibility of finding employment throughout the year for many persons through dairy farming. Thus, dairy also provides employment throughout the year. The main beneficiaries of dairy programmes are small/marginal farmers and landless labourers. Developments in the dairy and poultry industries during the last decade have been important enough to bring out a considerable amount of materials on dairy and poultry farming; processing of milk and poultry related products.

The major contents of the book are dairy farming, poultry production, breeding, fertility, forage grass and concentrates, cow behaviour and health, manufacture of butter and cheese, process measurements and controls, components of poultry diets etc. This book also describes about the feed manufacturing process, butter and cheese manufacturing processes with diagrams, housing system and management of broilers and more.

The first book of its kind which covers complete details of dairy and poultry farming, processing how to feed cows, birds in dairy and poultry, kind of diseases and their cure and other information related farming. This book will be an invaluable resource to dairy and poultry technology, institutions and for those who want to venture in this field.

## Contents

1. Dairy Farming  
Management of Dairy Stock  
Pre-natal and Post-natal  
Weaning  
Care of Weaned Calf  
Feeding Schedule for Calves on Calf-starters  
Factors Affecting Maturity  
Care During Parturition  
Post-parturition Care  
Frequency of Calving  
Secretion of Milk  
Factors Influencing Secretion  
Composition of Milk  
Water  
Fat  
Casein  
Albumin  
Globulin  
Non-protein Nitrogenous Substances  
Lactose  
Minerals  
Enzymes and Vitamins  
Milk Flavours  
Variation in the Composition of Milk  
Properties of Milk  
Specific Gravity  
Density  
Refractive Index  
Viscosity  
Surface Tension  
Freezing Point  
Heat Stability of Milk  
Testing of Milk  
Milk Sampling  
Milk-fat  
Adulteration of Milk  
Urea  
Ammonium Sulphate  
Glucose  
Freezing Point of Test  
Bacteriology of Milk  
Public Health Aspects of Milk and Milk Products  
Detection of Bacterial Contamination  
Use of Detergents for Cleaning of Utensils  
Cleaning In-place (CIP)  
Washing and Sterilization of Utensils  
Judging the Quality of Milk  
Clot-on-boiling Test.  
Alcohol Test.  
Methylene Blue Reduction Test  
Processing of Milk  
Cooling Media  
Storage of Chilled Milk

Clarification of Milk  
Homogenization  
Standardization of Milk  
Pasteurization  
Holder Method.  
High Temperature Short Time (HTST) Method.  
Operation of the Plant.  
Cold Storage  
Uperization Process  
Aseptic Filling Process  
Sterilized Milk  
Supply of Milk to Customers  
Dispensing in Cans.  
Dispensing in Bottles  
Single Service Containers  
Storage of Bottle Milk  
Transport of Pasteurized Milk  
Milk Products  
Cream  
Cream Separators  
Pasteurization of Cream  
Vacreation  
Sterilized Cream  
Curd (DAHI)  
Starter Cultures  
Butter  
Desi Butter  
Creamery Butter  
Ghee  
Prestratification Method  
Manufacture of Butter-oil  
Condensed Milk  
Milk Powder  
Infant Food  
Weaning Food  
Humanized Infant Food  
Khoya  
Ice-cream  
Softy Ice-cream  
Milk Shake  
Lassi  
Acidophilus Milk  
Chhana  
Cheese  
Processed Cheese  
Shrikhand  
Lactose  
Casein  
Milk Supply Schemes  
Indian Dairy Corporation  
Operation Flood Project  
Marketing of Milk and Milk Products  
Research in Dairying

Indigenous Milk Products  
Whey Protein Isolates  
Dairy Engineering Research  
2. Breeding  
Breeds of Cattle  
Lyre-Horned Grey Cattle  
Kankrej  
Kanwariya  
Kherigarh  
Malvi  
Tharparkar  
White or Light Grey Cattle With Coffin-Shaped Skulls  
Bachaur  
Gaolao  
Hariana  
Krishna Valley  
Mewati  
Nagauri  
Ongole  
Rathi  
Animals with Heavy Built and Curly Horns  
Dangi  
Deoni  
Gir  
  
Nimari  
Red Sindhi  
Sahiwal  
Mysore Breeds with Prominent Foreheads and Long Horns  
Hallikar  
Amritmahal  
Khillari  
Kangayam  
Alambadi  
Hilly Breeds  
Ponwar  
Siri  
New Breeds  
Karan Swiss  
Karan Fries  
Breeds of Buffaloes  
Murrah  
Bhadawari  
Jaffarabadi  
Surti  
Mehsana  
Nagpuri  
Nili-Ravi  
Herd Book  
Economic Zones  
Temperate Himalayan Region  
Dry Northern Region  
Wet Eastern Region

Southern Region  
Coastal Region  
Improvement Programme  
Performance Evaluation  
Artificial Insemination and Embryo Transfer Technology  
Meat Potential  
Economics of Dairy Farming  
Animal Health  
Feeding of Cattle  
Mineral Matter  
Nutritive Requirements of Dairy Cattle for Maintenance  
Nutritive Requirements for Growing Animals  
Requirements for Milk Production  
Nutrient Requirements for Work Cattle  
3. Breeding and Fertility  
Inheritance  
Systems of Breeding  
Practical Application  
Large-scale Breeding  
Evaluating a Bull for AI  
Choosing an AI Sire  
The Oestrus Cycle  
Heat Detection  
Postpartum Interval  
Conception Rate  
Control of Oestrus  
Pedigree Cattle  
Embryo Transplants  
Culling  
4. Cow Behaviour and Health  
Grazing and Eating  
Ruminating and Lying Down  
Walking and Other Activities  
Social Rank  
Normal Health  
Dung  
Other Indicators  
Milk Yield  
Preventive Medicine  
Mastitis  
Cell Counts  
Control Hygiene  
Summer Mastitis  
Milk Fever  
Grass Staggers  
Acetonaemia  
Bloat  
Lameness  
Metabolic Profile Test  
5. Feeding Dairy Cows  
Food Constituents  
Organic Matter  
Digestion

Digestibility  
Products of Digestion  
Utilization of Digested Products  
Food Energy  
Dry-matter Intake  
Indigestible Organic Matter  
Liveweight Changes  
New Protein System  
Feeding  
Allocation of Concentrates  
Minerals  
Vitamins  
Relative Feed Costs  
6. Forage Crops and Concentrates  
Succulent Fodders  
Turnips and Swedes  
Mangolds, Fodder Beet and Sugar Beet  
Carrots, Parsnips and Potatoes  
Kale  
Cabbages and Rape  
Root Tops  
Cereals  
Forage Maize  
Red Clover  
Grass and Forage Crops  
Comparative Yields  
Straw  
Straw Processing  
Concentrated Foods  
Energy Straights  
Protein Straights  
Concentrate Formulation  
Fats and Oils  
Urea and Biuret  
Blocks and Liquid Feeds  
Brewers' Grains  
7. Hay and Dried Grass  
Hay Making  
Barn Hay Drying  
Hay Quality and Feeding  
Hay 'Condition'  
Types of Hay  
Artificially Dried Grass  
Dried-grass Feeding  
Dried Grass and Silage  
8. Silage  
Silage Fermentation  
Wilting  
Chopping  
Additives  
Filling and Sealing  
Silage Quality  
Silage Feeding

Tower Silage  
Big-Bale Silage  
Silage Effluent  
9. Slurry  
Composition of Slurry  
The Legal Position  
Moving Slurry  
Slurry Storage  
Short-term Storage  
Long-term Storage  
Earth-walled Compounds  
Foul Run-off  
Separators  
Organic Irrigation  
10. Milking and Milking Machines  
Udder Anatomy  
Lactation Physiology  
Rate and Frequency of Milking  
Milking Machines  
The Cluster Assembly  
Conveying the Milk  
Producing Clean Milk  
Cooling and Storing Milk  
Maintenance and Testing  
The Machine and Milking Efficiency  
Milking Machines and Mastitis  
11. Milking Parlours and Cowsheds  
Static Parlours  
Rotary Parlours  
Cowsheds  
Elements of the Work Routine  
Parlour Performance  
Selecting a Parlour  
Parlour and Dairy Buildings  
Cow Marshalling  
12. Reception and Storage of Milk  
Milk Reception  
Milk Transport Tanks  
Construction of Transport Tanks  
Inner Construction  
Storage Tanks  
Silo Tank  
Refrigerated Storage Tank  
Process Tanks  
Aseptic Tank  
13. Milk Composition  
Milk Constituents  
Effect of Breed  
Age of Cow  
Stage of Lactation and Season  
Type of Food  
Effect of Energy and Protein  
Milking Intervals

Disease  
Quality Payment Schemes  
Taints and Flavours  
Keeping Quality of Milk  
Milk in the Diet  
14. Manufacture of Butter and Cheese  
Butter Manufacture  
Churning  
Methods of Butter Making  
Batch Method  
Continuous Method  
Fritz-Eisenreich Process  
Alfa Process  
Contimab Process  
Anhydrous Milk Fat  
Cheese Manufacture  
Cheese Vats  
Cheese Press  
Cooling  
Mechanised Cheesemaking  
Curd Production  
'Double O' Vat  
Pasilac Cheesemaking Vat  
Swiss Cheese Vat  
De-wheyng and Texture Forming  
Draining/Matting Conveyor  
Finishing Coolers  
Curd Recovery Systems  
Prepressing and Mould Filling  
Pressing  
Horizontal Creeping or Gang Press  
Vertical Press  
Vacuum Press  
Continuous Block Former  
Packaging  
Vacuum Packaging Machine  
Gas-flushing Machine  
Vacuum-Skin Packaging Machine  
Ultra Filtration  
Manufacture of Casein  
15. Milk Pasteurization  
Pasteurization vs. Sterilization  
Reasons for pasteurization  
The Time and Temperature used for Pasteurization  
Commercial Methods of Pasteurization  
The Efficiency of Pasteurization  
Some other Effects of Pasteurization  
16. Milk Sterilisation  
In-bottle Sterilization  
Batch Sterilization  
UHT Processing  
Indirect Heating Systems using Plate Heat Exchangers  
Direct Heating (Injection System Type)



Fouling of Heat Exchangers  
Fouling Material  
Ways to Reduce Fouling  
17. Creaming and Cream Separation  
The Measurement of Creaming Ability  
The Importance of Creaming  
How Fast can Cream Rise on Milk?  
The Formation of Clusters  
Methods of Separation  
The effect of separation temperature  
18. Lactose and the Carbohydrates  
The Importance of the Carbohydrates  
The Composition of the Carbohydrates  
Some Properties of the Sugars  
Lactose  
Other Carbohydrates in Milk  
19. Lactose and Lactic Acid  
Lactic Acid Production  
The Manufacture of Lactose  
Uses of Lactose  
Some Physiological Properties of Lactose  
20. Casein  
The Manufacture of Casein  
Some Properties of Commercial Casein  
Coated Papers  
Casein Glues  
Casein Paints  
Casein Plastics  
Casein Fibers  
Casein in Medicine and Nutrition  
Other uses for Casein  
21. Ice-Cream  
The Importance of the Ice-cream Industry  
The Composition of Ice Cream  
The Ingredients of Ice Cream  
The Manufacture of Ice Cream  
Overrun and Dipping Losses  
Some Defects of Ice Cream  
22. Butter  
The Location of the Butter Industry  
The Grading of Butter  
The Composition of Butter  
The Manufacture of Butter  
Accelerated Aging Tests  
Butter Substitutes  
23. Homogenization  
Effects Produced by Homogenization  
Homogenizing Machinery  
The operation of Homogenizers  
The Effect of Homogenization upon Various Products  
Advantages and Disadvantages of Homogenization  
Composition and the Effects of Homogenization  
24. The Minor Constituents of Milk

Fatlike Substances  
Some Physical and Chemical Properties of Lecithin  
The Importance of Lecithin  
The Sterols  
The Vitamins  
Beta Carotene and Vitamin A  
Thiamin, Vitamin B1  
Ascorbic Acid, Vitamin C  
Vitamin D  
Riboflavin, Vitamin B2 or G  
Other Vitamins of Milk  
The Ash Constituents of Milk  
The Enzymes of Milk  
Phosphatase  
Amylase  
Peroxidase  
Lipase  
Oleinase  
Other Enzymes  
Some Nitrogenous Constituents of Milk  
Some Odds and Ends  
25. Proteins  
The Importance of the Proteins  
The Composition of the Proteins  
Some Properties of the Proteins  
The Structure of the Proteins  
The Amino Acids  
26. The Fats of Milk  
The Composition of Milk Fat  
Some Physical Properties of Milk Fat  
The Melting and Solidification Points of Milk Fat.  
Some Factors Affecting the Composition of Fat  
Chemical Changes in Milk Fat  
Factors Affecting the Hydrolysis of Fat  
The Oxidation of Fat  
27. Process Measurements and Controls  
Pressure Measurement  
Bourdon Tube  
Helix  
Spirals  
Low Pressure (Vacuum Measurement): Units of vacuum  
Temperature Measurement  
Solid Rod Thermometer  
Bimetallic Thermometer  
Filled-System Thermometer  
Liquid-in-Glass Thermometer  
Pressure Thermometer  
Thermal System Bulbs  
Mechanical Flowmeters  
Bellows-actuated Flowmeters  
Measurement of Total Flow  
Measurement of Liquid Level  
Hydrostatic Pressure

Capacitance Level Gage  
Weight Measurement  
Controllers  
Pneumatic Controllers  
Controllers  
Process Control  
Transmitters  
Flow Transmitter  
Density Transmitter  
Regulating Device  
28. Physical Properties of Dairy Products  
Density  
Over-run  
Boiling and Freezing Point  
Refractive Index  
Acidity and PH  
Rheological Properties  
Viscosity  
Non-Newtonian Fluids  
Food Texture  
Surface Properties  
Foaming  
Thermal Properties of Foods  
Specific Heat  
Latent Heat  
Thermal Conductivity  
Thermal Diffusivity  
Electrical and Dielectric Properties  
Electric Conductance  
Dielectric Properties  
Changes in Milk and its Constituents  
Changes During Storage  
Oxidation of Fat  
Oxidation of Protein  
Lipolysis  
Effect of Heat Treatment  
Fat  
Protein  
Enzymes  
Lactose  
Vitamins  
Minerals  
29. Poultry Production  
Common Poultry Breeds  
American Class  
Asiatic Class  
Mediterranean Class  
English Class  
Indigenous Breeds  
Karaknath  
Genetic Principles  
Quantitative Characters  
Dominant and Recessive Characters

Chromosomes  
Inheritance of Quantitative Traits  
Objective of a Breeding Programme  
Basis of Selection  
Selection Methods  
Mating Systems  
Methods of Mating  
Important Economic Traits in Poultry  
Egg Production  
Egg Weight  
Egg Quality  
Body Size  
Conformation  
Growth  
Feed Efficiency  
Fertility and Hatchability  
Commercial Poultry Breeding Principles and Practices  
Commercial Hybrid Chicken  
Breeding Systems  
Performance Testing of Commercial Crosses  
Culling for Better Returns  
Culling from Outward Appearance  
Culling on the Basis of Moulting  
Culling on the Basis of Pigmentation  
Hatching of Eggs  
Incubation  
Testing of Incubated Eggs  
Hatchery Management  
Sexing of Chicks  
Poultry Management  
Brooder Management  
Grower Management  
Layer Management  
Male Management  
Housing for Poultry  
Feeding of Poultry  
Minerals  
Vitamins  
Feed Ingredients  
Conventional Poultry Feeds  
Non-conventional Poultry Feeds  
Energy Sources  
Vegetable Protein Sources  
Animal Protein Sources  
Economising Feeds Cost  
Processing, Preservation and Marketing  
Composition and Nutritive Value of Egg  
Maintenance of Shell Egg Quality  
Grading  
Preservation of Shell Eggs  
Preservation of Liquid Eggs  
Egg Marketing  
Distribution Channel

Marketing Agencies  
Poultry Meat  
Preservation of Poultry Meat  
Tenderization  
Poultry by Products  
Poultry Disease  
30. Digestive System of Poultry  
The Digestive System  
Supplementary Digestive Organs  
The Digestive Process  
31. Nutrient Requirements of Poultry  
Nutrition of Layer-type Chickens  
Pre-lay Period  
Nutrition of Broiler Type Chickens  
Salt for Poultry-Deficiency Symptoms  
Salt Levels in Poultry Diets  
Salt and Trace Minerals for Poultry  
Common Salt for Poultry  
Trace Minerals for Poultry  
Trace Mineral Mix for Layers and Broilers  
32. Components of Poultry Diets  
Energy and Its Definition  
Disposition of Dietary Energy  
Carbohydrates  
Proteins and Amino Acids  
Fats  
Minerals  
Vitamins  
Water  
33. Basic Ingredients in Poultry Feed and Diet Formulation  
Evaluation of Feed Stuffs  
Formulating Feeds with Locally Produced Raw Materials  
Choosing the Right Raw Materials for Quality Feeds  
Feed Production  
Least-cost Formulations  
Preparation of a Formulation Without  
the Aid of a Computer  
34. Feed Manufacturing  
Economic Feasibility of Feed Plant  
Is Pelleting Necessary  
35. Composition of Broiler Feeds  
36. Housing System and Management of Broilers  
Housing Needs of Broilers  
Temperature  
Heat Production  
Heat Loss  
Heat loss  
For Winter  
General Characteristics of A Broiler House  
Location & Salient Features of A Broiler Farms  
Grower Equipments  
Broiler Management  
Location of the Farm

Broiler Chicks  
Systems of Broiler Production  
Management Procedure  
Litter and litter management  
Temperature  
Space Requirement  
Brooder Guards  
Supply of Water to Chicks  
Supply of Feed to Chicks  
Light Management of Broilers  
Light System for Broilers  
Some Important Points Regarding Growth, Feed  
Consumption and Efficiency of Feed Conversion in Broilers  
37. Composition of Layer Feeds  
Phase Feeding of Laying Hens  
38. Composition of Breeder Feeds  
39. Modern Hatchery for Commercial Chick Production  
Location and Size of Hatchery  
Administrative Block  
Hatchery Building  
Egg Receiving, Cleaning and Fumigation Room  
Fumigation Chamber  
Storage Room  
Incubator Room  
Hatching Room  
Sexing Room  
Vaccination, Packing and Dispatch Room  
Washing Room  
Store  
Generator Room  
Use of Solar Energy in Incubation and Hatching  
Incubation Do's and Don'ts  
40. Modern Breeds of Broiler Chicken  
Plymouth Rock  
Jersey Black/White Giant  
Cornish  
Sussex  
Dorking  
Indian breeds  
Aseel  
Chittagong  
Kadaknath  
Commercial Broilers  
Franchise Hatcheries  
41. Machinery & Equipments of Poultry Industries  
42. Machinery & Equipments of Dairy Industries

## About NIIR

**NIIR PROJECT CONSULTANCY SERVICES (NPCS)** is a reliable name in the industrial world for offering integrated technical consultancy services.

NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

---

**NIIR PROJECT CONSULTANCY SERVICES** , 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** [npcs.india@gmail.com](mailto:npcs.india@gmail.com) **Website:** [NIIR.org](http://NIIR.org)

Sun, 04 Dec 2022 10:01:19 +0530