

Precision Veterinary Science and Livestock Wellness

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Preface

Veterinary science is undergoing a remarkable transformation, driven by advances in precision technologies, artificial intelligence, genomics, sensor-based monitoring, and data-driven decision-making. These innovations are redefining livestock management by enabling early disease detection, precision nutrition, reproductive efficiency, welfare assessment, and sustainable production systems. *Precision Veterinary Science and Livestock Wellness* has been prepared to provide a comprehensive understanding of these emerging concepts and their practical applications in modern animal health and production.

This book integrates the principles of veterinary medicine, precision livestock farming, biotechnology, epidemiology, environmental monitoring, and digital agriculture into a single resource. It explores the application of wearable biosensors, Internet of Things (IoT) devices, remote sensing, machine learning, genomic technologies, precision diagnostics, climate-smart livestock management, and One Health approaches that collectively enhance animal welfare, productivity, and environmental sustainability.

Designed for undergraduate and postgraduate students, researchers, veterinary practitioners, animal scientists, livestock professionals, and policymakers, this volume bridges the gap between scientific advancements and field-level implementation. Each chapter presents current concepts in a clear, systematic, and evidence-based manner, supported by illustrations, case studies, and recent technological developments.

The primary objective of this book is to promote a holistic understanding of precision veterinary science while encouraging innovation, responsible livestock management, and sustainable animal agriculture. We hope this volume serves as a valuable academic reference and practical guide for readers committed to improving livestock health, welfare, and productivity in an era of rapidly evolving agricultural technologies.

Dr. Shilpa Gajbhiye
Dr. Renu Singh
Dr. Arpana Raikwar
Dr. Prajwalini Singh Thakur

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CONTENTS

S. NO.		PAGE NO.
1.	Foundations of Precision Veterinary Science and Smart Livestock Health Management <i>Shilpa Gajbhiye</i>	1-12
2.	Artificial Intelligence and Machine Learning in Veterinary Diagnostics <i>Renu Singh</i>	13-24
3.	Precision Livestock Farming: Sensors, IoT and Real-Time Animal Monitoring <i>Arpana Raikwar</i>	25-36
4.	Genomics, Precision Breeding and Personalized Animal Healthcare <i>Prajwalini Singh Thakur</i>	37-48
5.	Wearable Technologies and Digital Biomarkers for Livestock Wellness <i>Shilpa Gajbhiye</i>	49-60
6.	Precision Nutrition and Metabolic Health in Farm Animals <i>Renu Singh</i>	61-72
7.	Early Disease Prediction, Biosurveillance and Digital Epidemiology <i>Arpana Raikwar</i>	73-84
8.	Telemedicine, Remote Veterinary Care and Smart Clinical Decision Support <i>Prajwalini Singh Thakur</i>	85-96
9.	Animal Welfare Assessment through Precision Technologies and Behavioral Analytics <i>Shilpa Gajbhiye, Renu Singh</i>	97-106

10.	Sustainable Livestock Production, Climate Resilience and Precision Health Management	107-118
	<i>Arpana Raikwar, Prajwalini Singh Thakur</i>	
11.	Big Data, Blockchain and Traceability in Veterinary and Livestock Systems	119-130
	<i>Shilpa Gajbhiye</i>	
12.	Precision Reproductive Technologies and Fertility Management in Livestock	131-142
	<i>Renu Singh</i>	
13.	Precision Biosecurity, Antimicrobial Stewardship and Pandemic Preparedness	143-154
	<i>Arpana Raikwar</i>	
14.	Computer Vision, Robotics and Autonomous Systems in Livestock Management	155-166
	<i>Prajwalini Singh Thakur</i>	
15.	Key Factors Influencing the Success of Artificial Insemination Programmes in Livestock	167-198
	<i>Animesh Patel, Shveta Singh, Abha, Eshita</i>	