

Advances in Livestock Production Systems

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Preface

Livestock production systems are undergoing a profound transformation driven by advances in science, technology, sustainability, and changing societal demands. *Advances in Livestock Production Systems* presents a comprehensive perspective on modern approaches that aim to improve animal productivity, welfare, resource efficiency, and environmental sustainability.

The book brings together contemporary concepts and practices in livestock production, including precision livestock farming, smart sensing technologies, digital monitoring, improved nutrition and feeding strategies, genetics and breeding, reproductive management, disease prevention, animal welfare, and sustainable resource utilization. Particular emphasis is placed on integrating emerging technologies such as artificial intelligence, Internet of Things (IoT), automation, data analytics, and advanced decision-support systems into livestock enterprises.

Modern livestock production must balance productivity with responsible management of land, water, feed, energy, and other natural resources. Therefore, the book also highlights sustainable production systems, climate-smart practices, methane mitigation, circular agriculture, pasture management, and the One Health approach linking animal, human, and environmental health.

This book is intended to serve as a useful reference for students, researchers, teachers, livestock professionals, veterinarians, farmers, and policymakers. It seeks to bridge scientific knowledge with practical applications and encourage innovative, evidence-based approaches for developing resilient, productive, and sustainable livestock production systems. The contributions compiled here provide valuable insights into the future of livestock agriculture and its role in ensuring food security and rural development.

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