

Animal Feeding and Nutritional Science

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Preface

Animal feeding and nutritional science form the foundation of efficient livestock production, animal health, welfare, and sustainable food systems. The science of nutrition has evolved considerably from conventional approaches to feed formulation toward precision nutrition, functional feeds, alternative feed resources, and data-driven feeding strategies. A comprehensive understanding of nutrients, feed resources, digestion, metabolism, and nutrient requirements is therefore essential for improving animal productivity while maintaining economic and environmental sustainability.

Animal Feeding and Nutritional Science presents fundamental concepts and contemporary developments in animal nutrition in an integrated and accessible manner. The book covers essential nutrients, feed evaluation, digestion and absorption, energy and protein metabolism, minerals and vitamins, feed additives, forage and concentrate utilization, ration formulation, and nutritional management of different classes of livestock. It also highlights emerging areas such as precision feeding, alternative and sustainable feed resources, nutrigenomics, functional nutrition, and strategies for reducing nutrient losses and environmental impacts.

The book is intended to serve as a useful academic and reference resource for students, teachers, researchers, veterinarians, animal nutritionists, livestock professionals, and other stakeholders involved in animal production. By connecting established nutritional principles with modern scientific advances, this volume aims to strengthen understanding of how balanced and scientifically designed feeding programmes can enhance productivity, animal well-being, resource-use efficiency, and sustainability. It is hoped that this book will contribute meaningfully to education, research, and practical decision-making in the rapidly advancing field of animal feeding and nutritional science.

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