

Laboratory Production Of Cattle Embryos

While it is barely 50 years since the first reliable reports of the recovery of living cells frozen to cryogenic temperatures, there has been tremendous growth in the use of cryobiology in medicine, agriculture, horticulture, forestry, and the conservation of endangered or economically important species. As the first major text on cryobiology

The seminal reference on the care of laboratory and captive animals, *The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals* is a must-have for anyone working in this field. The UFAW Handbook has been the definitive text since 1947. Written for an international audience, it contains contributions from experts from around the world. The book focuses on best practice principles throughout, providing comprehensive coverage, with all chapters being peer reviewed by anonymous referees. As well as addressing the husbandry of laboratory animals, the content is also of great value to zoos and aquaria. Changes for the eighth edition: Revised and updated to reflect developments since publication of the previous edition. New chapters on areas of growing concern, including: the 3Rs; phenotyping; statistics and experimental design; welfare assessment; legislation; training of people caring for lab animals; and euthanasia. All material combined into one volume for ease of reference. This book is published on behalf of UFAW (The Universities Federation for Animal Welfare), with whom we also publish the UFAW/Wiley-Blackwell Animal Welfare Book Series. This major series of books provides an authoritative source of information on worldwide developments, current thinking and best practice in the field of animal welfare science and technology. For details of all of the titles in the series see <http://www.wiley.com/go/ufaw>

Never before has there been such a comprehensive book of protocols. This compendium offers a full range of research techniques—from cell culture, to biochemical, to microscopic and genetic. More focused books, like Cold Spring Harbor's *Manipulating the Mouse Embryo*, are similar though more narrow in scope. This book will appeal to a broad range of researchers, from basic experimental scientists to clinical and animal scientists.

Methods in Mammalian Reproduction presents some of the techniques for manipulating, analyzing, observing, testing, and generally experimenting with mammalian mothers and their gametes and embryos. Mammalian reproduction involves an intimate relationship between mother and embryo. The first 18 chapters are arranged in an order that follows a developmental sequence from oocyte to fetal organs and the remaining seven chapters deal with the maternal side of the relationship. With strong focus on laboratory rodents and lagomorphs, the book starts with an introduction to in vitro oocyte maturation and experimental production of mammalian parthenogenetic. It goes on to describe the microtechniques in pre-implantation of embryos, production of chimeras, techniques for early embryonic tissue separation, mammalian embryo preservation by freezing, and in vitro development of whole mouse embryos beyond the implantation stage. Chapters 11-15 discuss the in vitro implantation of mouse blastocysts, advances in rabbit embryo and in large mammal embryo cultures, embryo transfer in large domestic mammals, and manipulation of marsupial embryos and pouch young. The following chapters cover reproduction experiments using marsupials, domestic farm species, and primates including humans. Finally, the concluding chapters tackle the use of amniocentesis in prenatal diagnosis, collection and analysis of female genital tract secretions, analysis of antifertility action of intrauterine devices, and surgical induction of endometriosis. This book will be helpful to students, teachers, researchers, and clinical researchers who demand for more and better procedures for analysis of mammalian reproduction.

3000 new references added since the first edition Gives information necessary to produce embryos totally through in vitro techniques Shows commercial applications of embryo and oocyte research Cattle remain at the forefront of many new developments in reproductive technology and what can be done for the cow today will later be applicable to other farm livestock and perhaps humans. This new edition reviews the considerable advances and issues in embryo production technology, based on reports since the first edition in 1994. This is a must have volume for those who own the first edition, and in itself an incredibly informative text.

Biotechnology processes are fundamentally changing the nature of the products being produced in the industry. Canola has been developed in Canada through such processes. It is a type of rapeseed that has an enhanced level of mono-unsaturated fatty acids, thus producing a healthier oil for human consumption. It is now being introduced to many other countries. This book reviews for the first time the global canola sector in order to identify fundamental trends resulting from the adoption of biotechnology. It examines the canola sector over an extended period, looking at: its local origins regional growth and international expansion analyses of public policy affecting commercialisation estimates of the costs and benefits of changes. It is essential reading for government and industry researchers and students involved in the areas of agricultural economics, plant biotechnology and crop science.

This edition is expanded to include more on animal welfare, sustainability and production systems in low and middle income countries, including smallholder production systems. - Has undergone a thorough review of all the existing chapters, with new content on the future role of cattle. - Contains quality colour illustrations, so that key information can be found at a glance. - Is beautifully written with many examples and pointers for further information. - Tackles key issues of sustainability and the requirement for increased production.

Cattle play a fundamental role in animal agriculture throughout the world. They not only provide us with a vital food source, but they also provide us with fertilizer and fuel. Keeping reproduction levels at an optimum level is therefore essential, but this is often a complicated process, especially with modern, high yielding cows. Written in a practical and user-friendly style, this book aims to help the reader understand cattle reproduction by explaining the underlying physiology of the reproductive process and the role and importance of pharmacology and technology, and showing how management techniques can improve reproductive efficiency. This edition includes: Recent research findings on the physiology of the oestrous cycle and its control; New techniques for monitoring and manipulating reproduction, including pregnancy diagnosis and embryo transfer; Advice on identifying common infertility problems and how to prevent and treat them. *Reproduction Cattle 3e* is essential reading for veterinary and agricultural students, as well as veterinarians and farmers involved in cattle reproduction.

Advanced biomedical techniques such as genetic engineering are now used extensively in animal related research and development. As the pace of development has quickened, there has been growing public anxiety about the ethical issues involved. *Animal Biotechnology and Ethics* draws together in one book some of the leading themes and issues which have emerged in the recent debates surrounding biotechnology as applied to animals. With contributions from authors of many different viewpoints, the subject is given a thorough and balanced treatment. Among those to whom the book will be of particular interest are practitioners of animal biotechnology, and those whose interest lies in assessing its credentials, such as philosophers and social or political scientists. It also has a great deal to interest policy-makers and

pressure groups, as well as more general readers. The strong chapters on the legal and regulatory framework will make it useful to those involved in advising on company policy, patenting or litigation.

This volume describes culture media and solutions used in human ART; how they have been developed for in vitro human pre-implantation embryo development, the function and importance of the various components in media and solutions and how they interact, and how the systems in which these are used can influence outcomes. Chapters discuss inorganic solutes, energy substrates, amino acids, macromolecules, cytokines, growth factors, buffers, pH, osmolality, and the interaction of these parameters. The role of incubators and other physical factors are reviewed, along with the relevance and prospects of emerging technologies: morphokinetic analysis using time-lapse imaging and dynamic fluid incubation systems. Results of prospective randomized trials are emphasized to ascertain the added value of these techniques for selecting viable embryos. This comprehensive guide will be invaluable for embryologists, physicians and all personnel involved in the fluid products used in human ART seeking to optimize their successful use of these components.

This handbook aims at focusing on the husbandry of the common water buffalo, (*Bubalis bubalis*). The book covers a broad range of topics such as the buffalo's genetic evolution, cytogenetics, subspecies, breed diversification, feeding and metabolic specificity, adaptable response to environmental stress factors, welfare, dairy requirements and production, reproduction and embryo technologies, cryopreservation, sperm cell sexing, somatic cell cloning and transgenesis. Chapters presented and reviewed in this book have been contributed by renowned scientists that have devoted years of research to the understanding of this species, and highlight the most recent advances in basic and applied science to unveil the understanding of physiological facets intrinsic to this animal species. The depth of the selected topics makes this book especially suited for readers of all academic levels of study. Researchers, students and professionals will find this book a useful guide to breeding and farming the water buffalo.

Principles of Cloning, Second Edition is the fully revised edition of the authoritative book on the science of cloning. The book presents the basic biological mechanisms of how cloning works and progresses to discuss current and potential applications in basic biology, agriculture, biotechnology, and medicine. Beginning with the history and theory behind cloning, the book goes on to examine methods of micromanipulation, nuclear transfer, genetic modification, and pregnancy and neonatal care of cloned animals. The cloning of various species—including mice, sheep, cattle, and non-mammals—is considered as well. The Editors have been involved in a number of breakthroughs using cloning technique, including the first demonstration that cloning works in differentiated cells done by the Recipient of the 2012 Nobel Prize for Physiology or Medicine – Dr John Gurdon; the cloning of the first mammal from a somatic cell – Drs Keith Campbell

and Ian Wilmut; the demonstration that cloning can reset the biological clock - Drs Michael West and Robert Lanza; the demonstration that a terminally differentiated cell can give rise to a whole new individual – Dr Rudolf Jaenisch and the cloning of the first transgenic bovine from a differentiated cell – Dr Jose Cibelli. The majority of the contributing authors are the principal investigators on each of the animal species cloned to date and are expertly qualified to present the state-of-the-art information in their respective areas. First and most comprehensive book on animal cloning, 100% revised Describes an in-depth analysis of current limitations of the technology and research areas to explore Offers cloning applications on basic biology, agriculture, biotechnology, and medicine

Animal individual life begins as combination of sperm and oocyte, which results in the embryogenesis from ovum fertilization to fetal stage. Embryology has become one central discipline for many modern biotechnologies. Although this subject has been studied for more than a century, new discoveries appear continuously. This book contains some new discoveries and updates some theories and technologies in animal and human embryology. Major content include new findings in gamete biology, new theories and discoveries in embryo implantation by three-dimensional imaging technology and new concept and actual application of embryology. Thus, this book will greatly update knowledge in embryology field and provide some basic theories and technologies for animal scientists and breeders as well as embryologists and anthropologists.

Reproductive Technologies in Animals provides the most updated and comprehensive knowledge on the various aspects and applications of reproductive technologies in production animals as well as companion, wild, exotic, and laboratory animals and birds. The text synthesizes historical information and recent discoveries, while dealing with economical and geographical issues related to the implementation of the same technologies. It also presents the effects of reproductive technology implementation on animal welfare and the possible threat of pathogen transmission. Reproductive Technologies in Animals is an important resource for academics, researchers, professionals in public and private animal business, and students at the undergraduate and graduate levels, as it gives a full and detailed first-hand analysis of all species subjected to the use of reproductive technologies. Provides research from a team of scientists and researchers whose expertise spans all aspects of animal reproductive technologies Addresses the use of reproductive technologies in a wide range of animal species Offers a complete description and historical background for each species described Discusses successes and failure as well as future challenges in reproductive technologies

????????????This book addresses the impacts of current and future reproductive technologies on our world food production and provides a significant contribution to the importance of research in the area of reproductive physiology that has never been compiled before. It would provide a unique opportunity to separate the impacts of how reproductive

technologies have affected different species and their contributions to food production. Lastly, no publication has been compiled that demonstrates the relationship between developments in reproductive management tools and food production that may be used as a reference for scientists in addressing future research areas. During the past 50 years assisted reproductive technologies have been developed and refined to increase the number and quality of offspring from genetically superior farm animal livestock species. Artificial insemination (AI), estrous synchronization and fixed-time AI, semen and embryo cryopreservation, multiple ovulation and embryo transfer (MOET), in vitro fertilization, sex determination of sperm or embryos, and nuclear transfer are technologies that are used to enhance the production efficiency of livestock species.

Based on the first scientific conference convened at the Library of Alexandria, 'Biotechnology and Sustainable Development: Voices of the South and North', which was held in Alexandria, Egypt, in March 2002, this book contains overviews of agriculture, health, ethics and the environment. It discusses how dramatic improvements in food security, health, and lifestyle could accrue to the poor people of developing countries through the applications of new technologies.

The determination of when, how, how often and with whom an animal breeds is moving rapidly away from evolutionary pressures and towards human purposes: these include the breeding of around 50 billion mammals and birds for food production annually, the breeding of pedigree dogs and cats, racing dogs and horses, specialised laboratory animal strains and the use of reproductive science to conserve endangered species or breeds and to limit unwanted populations of pests and non-native species. But the ethics and sustainability of this takeover of animals' reproductive lives have been insufficiently examined by either professionals or the public. This book discusses the methods, the motivations and the consequences of human intervention in animal breeding in terms of animal health, behaviour and well-being. It explores where we are now and the choices ahead, and looks to a future where we have more respect for animals as sentient beings and where we could loosen the reins of reproductive control.

New Technologies in Animal Breeding looks at new reproductive technologies in breeding domestic animals, such as sex selection, frozen storage of oocytes and embryos, in vitro fertilization and embryo culture, amphibian nuclear transplantation, parthenogenesis, identical twins and cloning in mammals, and gene transfer in mammalian cells. It summarizes the state-of-the-art and offers perspectives on future directions for several animal industries of great importance in food production, including artificial insemination, embryo transfer, poultry breeding, and aquaculture. Organized into five sections encompassing 14 chapters, this book begins with an overview of animals in society and perspectives on animal breeding. It then discusses the animal industries that are heavily dependent on reproductive technology, including those engaged in cloning, selfing, aquaculture, artificial insemination, and embryo transfer. It also explains the developing technologies as well as their potential applications and impacts on animal production, along with special economic considerations, such as the benefits of reproductive management,

synchronization of estrus, and artificial insemination of beef cattle and sheep. The final chapter considers biomedical and agricultural research, implementation of new technologies in animal breeding, and research in animal reproduction. This book is an essential reference for scientists and researchers interested in animal science and animal reproduction.

Building on the successful structure of the first edition, the second edition of Reproductive Technologies in Farm Animals has been totally updated and revised to provide an up to date account of the key techniques employed in manipulating reproduction in farm animals, including beef and dairy cattle, pigs, sheep, goats, buffaloes, camelids, horses and poultry. A classic introductory text to the subject, the book is based on a comprehensive review of the current literature. This text remains key reading for students in animal science, agriculture, veterinary medicine and biology, and veterinary practitioners and farmers who wish to keep updated on developments in techniques that may be useful in their daily practice.

This introductory level textbook covers the welfare and environmental implications of producing cattle as well as traditional subjects such as nutrition, reproduction and housing. Its broad, international coverage includes feedlot systems, transport, subsistence farming systems and the contribution of cattle production systems to land, air and water pollution. It is an invaluable resource for undergraduate students of animal science, veterinary medicine and agriculture, as well as diploma and certificate courses and industry personnel.

"Veterinary Reproduction and Obstetrics has been the standard reference textbook for veterinary students for many years, as well as for students of animal science and related disciplines; in addition it has also been a useful reference source for the practicing veterinary surgeon. The new edition builds on the success of the previous edition covering normal reproduction and reproductive disorders and diseases in the common and less common domesticated species (llamas, alpacas, camels). The book has been completely revised with full colour throughout to include recent developments in reproductive biology and endocrinology, as well as the new knowledge on the causes and treatment of reproductive disease." "This is a reference text that has been refreshed well and warrants a place on practice bookshelves." - Veterinary Record, Feb 2011 Classic text reference Covering all aspects of reproduction and obstetrics in all common and less common domestic species Only book covering full range of domestic animals Practical clinical approach throughout Thorough updating throughout to reflect changes in practice since the last edition New authors and contributors to ensure contemporary and international approach (contributors from Finland, the Netherlands, USA, Denmark and New Zealand) Full colour throughout

During the past twenty-five years, biotechnology has revolutionized agricultural research. The enormous potential, together with a landmark decision by the US Supreme Court to allow the patenting of genetically-engineered organisms has encouraged private sector companies to invest in research programmes. This book (first edition in 1998) is now fully revised and updated, with five completely new chapters. It presents definitive information on intellectual property law in a simplified form.

This two-volume textbook provides a comprehensive overview on the broad field of Animal Biotechnology with a special focus on livestock reproduction and breeding. The reader will be introduced to a variety of state-of-the-art technologies and emerging

genetic tools and their applications in animal production. Also, ethics and legal aspects of animal biotechnology will be discussed and new trends and developments in the field will be critically assessed. The two-volume work is a must-have for graduate students, advanced undergraduates and researchers in the field of veterinary medicine, genetics and animal biotechnology. This first volume mainly focuses on artificial insemination, embryo transfer technologies in diverse animal species and cryopreservation of oocytes and embryos.

This book contains the proceedings of the first International Meeting on Mammalian Embryo Genomics, held in Quebec City, Canada, on July 20, 2002, which brought together a group of internationally recognised scientists in the genomics field. The objective was to coordinate activities in the field.

Human Assisted Reproductive Technology: Future Trends in Laboratory and Clinical Practice offers a collection of concise, practical review articles on cutting-edge topics within reproductive medicine. Each article presents a balanced view of clinically relevant information and looks ahead to how practice will change over the next five years. The clinical section discusses advances in reproductive surgery and current use of robotic surgery for tubal reversal and removal of fibroids. It looks into the refinement of surgical procedures for fertility preservation purposes. Chapters also discuss non-invasive diagnosis of endometriosis with proteomics technology, new concepts in ovarian stimulation and in the management of polycystic ovary syndrome, and evidence-based ART. The embryology section discusses issues ranging from three-dimensional in-vitro ovarian follicle culture, and morphometric and proteomics analysis of embryos, to oocyte and embryo cyropreservation. This forward-looking volume of review articles is key reading for reproductive medicine physicians, gynecologists, reproductive endocrinologists, urologists and andrologists.

Thanks to enormous scientific efforts of the last decades, in vitro fertilization (IVF) and in vitro production (IVP) have now been introduced successfully in the practice of human infertility treatment and cattle breeding programs. This comprehensive book allows us to bridge the knowledge from both biomedical and veterinary fields of research. For the first time, studies concerning the human embryo as well as embryos from domestic species are brought together. The central theme of the book is "the assessment of mammalian embryo quality". In 15 chapters, written by well-known scientists, different aspects of the assessment of mammalian embryo quality are summarized. Non-invasive and invasive techniques to evaluate embryo quality are separated in two parts. In addition the book is provided with appendices on practical aspects and, thus, the book should be present in each laboratory for IVF and IVP.

Following on from earlier titles in this series, this volume presents further material generated by the World Bank/ISNAR/Australian government biotechnology study. It covers the present status and future prospects for the application of biotechnology to solve agricultural and environmental problems in a number of developing countries. Particular focus is given on to developments that have taken place over the last decade.

In the past half century great progress has been made in the reproductive management of farm animals, both mammals and birds.

This book aims to review developments and indicate which reproductive technologies can be used commercially or in research. It begins by discussing artificial insemination and how this has recently been refined in semen sexing technology. Embryo transfer, in vitro embryo production technology and the control of oestrus and ovulation are then reviewed. Subsequent chapters consider the control of postpartum ovarian activity, seasonal breeding, multiple births and litter size, pregnancy testing, parturition, and the onset of puberty. The author then describes more recent developments in cloning and the production of transgenic animals, before a final chapter on suppressing reproductive activity.

Bovine Reproduction is a comprehensive, current reference providing information on all aspects of reproduction in the bull and cow. Offering fundamental knowledge on evaluating and restoring fertility in the bovine patient, the book also places information in the context of herd health where appropriate for a truly global view of bovine theriogenology. Printed in full color throughout, the book includes 83 chapters and more than 550 images, making it the most exhaustive reference available on this topic. Each section covers anatomy and physiology, breeding management, and reproductive surgery, as well as obstetrics and pregnancy wastage in the cow. Bovine Reproduction is a welcome resource for bovine practitioners, theriogenologists, and animal scientists, as well as veterinary students and residents with an interest in the cow.

Helping IVF laboratories and clinics to maintain the highest success rates possible, this is essential reading for every IVF laboratory.

This book is a comprehensive reference work on the current status of biotechnology of the major temperate, subtropical and tropical fruit and nut crop species of the world. It is a replacement of *Biotechnology of Perennial Fruit Crops* (eds Hammerschlag and Litz, CABI, 1992) and includes coverage of more fruit as well as nut crop species. Each chapter contains a general introduction to the particular plant family, with an overview of the economic significance and potential of biotechnology for fruit and nut species within the family, before examining individual species in more detail.

When considering the physiological systems of the body, the degree of species variation within the reproductive system compared to other systems is remarkable. Furthermore, it is essential that researchers, educators, and students alike remain aware of the fundamental comparative differences in the reproductive biology of domestic species. Written by renowned scientists in their respective fields, *Comparative Reproductive Biology* is a comprehensive reference on the reproductive systems of domestic species. The book offers both broad and specific knowledge in areas that have advanced the field in recent years, including advances in cell and molecular biology applied to reproduction, transgenic animal production, gender selection, artificial insemination, embryo transfer, cryobiology, animal cloning and many others. This seminal text includes topics in animal reproduction that are usually only found as part of other books in animal science such as anatomy, histology, physiology, radiology, ultrasonography, and others. Comprehensive reference of the reproductive systems of domestic species. Written by a team of top researchers. Richly illustrated throughout, including 12 pages of color images.

This comprehensive, step-by-step laboratory training manual brings all the elements for a successful embryo transfer program

together in a simple, organized, illustrated format. For the last several decades, artificial insemination has allowed genetic progress to be achieved relatively quickly through the widespread and efficient use of frozen semen. As a result of the advancement of embryo transfer (ET) techniques, cows can produce many offspring. A more rapid genetic gain is achieved which complements an artificial insemination program.

PRINT/ONLINE PRICING OPTIONS AVAILABLE UPON REQUEST AT e-reference@taylorandfrancis.com Containing case studies that complement material presented in the text, the vast range of this definitive Encyclopedia encompasses animal physiology, animal growth and development, animal behavior, animal reproduction and breeding, alternative approaches to animal maintenance, meat science and muscle biology, farmed animal welfare and bioethics, and food safety. With contributions from top researchers in their discipline, the book addresses new research and advancements in this burgeoning field and provides quick and reader-friendly descriptions of technologies critical to professionals in animal and food science, food production and processing, livestock management, and nutrition.

Veterinary Embryology, 2nd Edition, has been updated to reflect the many changes that have developed in the field; the text has been fully revised and expanded and is now in full colour and many pedagogical features and a companion website have been developed. A new edition of this highly successful student textbook, updated to reflect the latest developments in the field of embryology, with the inclusion of four new chapters Written by a team of authors with extensive experience of teaching this subject Short concise chapters on key topics describe complex concepts in a user-friendly way Additional tables, flow diagrams and numerous hand-drawn illustrations support the concepts presented in the text

Azores live in much from agriculture, mainly from cattle production, counting 249,000 cattle across the archipelago, being the major source of milk and red meat. To improve economic production, and the efficiency of explorations, embryo's production are very important, as it allows multiplying the number of descendants of a cow's elite from, reaching a twenty calves per year per cow. In the other hand, females in puberty can be used even without having gestational age. The present book provides a detailed research on in vitro production of bovine embryos, studying the changes occurred in the oocyte morphology during its maturation, the stages of embryonic development after fertilization and the developmental kinetics of the in vitro produced embryos. This book "Cryopreservation of immature bovine oocytes" can be considered as a laboratory guide for most sufficient procedures for in vitro technique to produce bovine embryos in vitro, as well as techniques involving freezing of bovine oocytes followed by maturation and IVF after oocyte's thawing.

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