

# Cattle Embryo Transfer Procedure An Instructional Manual For The Rancher Dairyman Artificial Insemination Technician Animal Scientist And Veterinarian

Increasing the Reproductive Performance of Cattle Through Nonsurgical Embryo Collection and Transfer  
 A Review of Techniques and Applications  
 Embryo Transfer in Beef Cattle  
 Manual of the International Embryo Transfer Society  
 Methods in Mammalian Reproduction  
 Manual for Embryo Transfer  
 Laboratory Production of Cattle Embryos  
 January 1990 - October 1992  
 Bovine Embryo Transfer Procedures  
 Papers  
 6-10 August, 1984  
 Bovine Embryo Transfer  
 Seminar on Egg Transfer in Cattle in the EEC Programme of Co-ordination of Research on Beef Production  
 A Handbook and Laboratory Manual for Students, Herd Operators, and Workers in the AI Field  
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## HAROLD BRAIDEN

### Increasing the Reproductive Performance of Cattle Through Nonsurgical Embryo Collection and Transfer National Academies Press

The dynamic environments, varying production practices, and general biological uncertainty associated with bovine reproduction makes informed, strategic decision making regarding the implementation of bovine reproductive technology a great challenge for producers. One might also argue that traditionally, ET's primary focus of genetic improvement has greatly overshadowed any consideration of short to mid-term financial gain. To accomplish the objective of creating an

economic risk analysis tool for user-defined embryo transfer (ET) programs, a circumstantial, stochastic prediction model utilizing @Risk© software to generate comparable economic values as an aid in the ET decision making process has been created. More realistic than the use of means in deterministic models, distributions defining the biological uncertainty for a multitude of reproductive outcomes are estimated through extensive literature review and limited industry sources. Applying the Latin Hypercube variation of Monte Carlo simulation, a sample value from the descriptive distribution associated with each stochastic variable is included in an iteration of the simulation. Through large numbers of iterations with dynamic combinations of variables, the process culminates in a distribution of possible values for the net present value (NPV), annuity equivalent net present value (ANPV), and return on investment (ROI) associated with the model described scenario of in-vivo derived (IVD) or in-vitro produced (IVP). Finally, using the distributions of NPV, ANPV, and ROI a decision maker can assess the economic risk linked to a user-defined ET

program. To further complicate matters, cattle producers are now presented with a choice between two primary methods of ET. IVD ET describes the traditional method of ET that involves follicular stimulation and insemination of a donor female followed by the collection of fertilized embryos from the uterus. IVP commonly refers to the method of generating transferable embryos by collecting oocytes by ovarian aspiration; in-vitro fertilization of the collected oocytes; and incubated maturation of the fertilized oocytes. Encompassed within the two methods of ET exist several different sub-techniques, principally regarding the exception or inclusion of follicular synchronization and/or stimulation before ovum pick-up (OPU) in IVP procedures. Ultimately, operators must decide whether ET programs, of any type, serve as an economically viable means to increase rate of genetic improvement or take advantage of marketing opportunities. Although several economic value predictors for ET programs already exist (Beltrame et al. 2010), the opportunity remains to create more applicable models for Bos taurus beef production and varying

marketing avenues in the U.S. This circumstantial, stochastic simulation model can serve as an aid in the ET decision making process by generating output that allows for the financial risk and sensitivity analysis of a user-defined ET program.

[A Review of Techniques and Applications](#) CRC Press

[Cattle Embryo Transfer Procedure](#)An Instructional Manual for the Rancher, Dairyman, Artificial Insemination Technician, Animal Scientist, and Veterinarian

[Embryo Transfer in Beef Cattle](#) John Wiley & Sons

Human reproductive cloning is an assisted reproductive technology that would be carried out with the goal of creating a newborn genetically identical to another human being. It is currently the subject of much debate around the world, involving a variety of ethical, religious, societal, scientific, and medical issues. Scientific and Medical Aspects of Human Reproductive Cloning considers the scientific and medical sides of this issue, plus ethical issues that pertain to human-subjects research. Based on experience with reproductive cloning in animals, the report concludes that human reproductive cloning would be dangerous for the woman, fetus, and newborn, and is likely to fail. The study panel did not address the issue of whether human reproductive cloning, even if it were found to be medically safe, would be "or would not be" acceptable to individuals or society.

[Manual of the International Embryo Transfer Society](#) Springer Science & Business Media

[Factors Affecting Calf Crop](#) summarizes the latest information available from leading cattle physiologists and geneticists regarding factors known to influence the production of live calves at weaning. You get practical information on management techniques for improving reproduction efficiency in the herd. You'll also learn about the functioning of the reproductive system and how this may affect reproductive processes in the cow herd. Managers will benefit from a clearer understanding of the factors known to limit efficient reproduction, while veterinarians and other professionals who advise cattlemen will appreciate the substantial reference material and color photographs for defining cow condition scores. Color photographs are also used to illustrate the discussions of testicular thermographies and their applications. Other chapters in the book cover developments in improving reproductive performance of the replacement heifer, the brood cow, and the bull. Topics on reproduction include physiology/endocrinology, the use of growth promotants, genetics and physiological and economic considerations in selecting the age to breed heifers, heritability of fertility, length of the breeding season, parturition and postpartum nutrition, nursing by the calf, cloning of embryos, and much more.

[Methods in Mammalian Reproduction](#) CABI

Animal biotechnology is a broad umbrella encompassing the polarities of fundamental and applied research including molecular modelling, molecular and quantitative genetics, gene manipulation, development of diagnostics and vaccines and manipulation of tissue or digestion metabolism by growth promoters. Although animal biotechnology in the broadest sense is not new, what is new is the level of complexity and precision involved in scientists' current ability to manipulate living organisms. This new book sets out to show that the important ideas in animal biotechnology are exciting and relevant to everyday experience. It represents an important update of the literature for research workers, lecturers, and advisers in animal science, but is also a core text for advanced undergraduate courses in animal science and biotechnology. It will be an essential acquisition for librarians in agriculture and veterinary science.

[Manual for Embryo Transfer](#) [Regina] : Saskatchewan Agriculture Development Fund

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.

[Laboratory Production of Cattle Embryos](#) Springer

updated throughout with new information on sexing embryos, sexing semen, marketing, cloning as well as the basics and economics of this technology. Glossary.

[January 1990 - October 1992](#) John Wiley & Sons

Physiological basis of the ovarian response to PMSG in sheep and cattle; Factors influencing the follicular response of animals to PMSG; Endocrine response and factors which limit the response of follicles to PMSG and FSHL; Repeated superovulation and embryo collection in cattle; Surgical

collection of embryos; Non-surgical collection of embryos; Some aspects of embryo transfer in the cow with particular reference to the non-surgical technique; Embryo transfer procedure in the goat: physiological and procedural differences in superovulation and transfer between sheep and goats; Fertilization and culture of embryos: factors which have a major influence on embryo survival in vitro; Embryo freezing; A geneticist's view of embryo transfer; The case for the exportation of Australian livestock and embryos; Transmission of disease by embryo transfer; Regulation of embryo transfer personnel and facilities.

[Bovine Embryo Transfer Procedures](#) Springer Science & Business Media

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.

[Papers](#) Prentice Hall

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.

[6-10 August, 1984](#) Ottawa: Canada, Department of Agriculture

Material is organized into 5 parts for easy and ready use, broadening the usefulness of the book, making it the most comprehensive, hands-on AI manual available. This manual prepares users for the "real world" by exposing them to the latest technology and techniques used in the reproduction and the practice of artificial insemination (AI) in livestock. Part One provides information on the advantages and considerations of artificial insemination, basic livestock genetics, the anatomy and reproductive processes of the cow and bull, and semen collection methods. It relates statistics on AI usage and general information about NAAB and CSS. Part Two deals with semen characteristics, including evaluation, processing, and extension; freezing and cryogenic storage; and care of the refrigerator unit. The various tests for semen quality are discussed in detail as is custom selection of semen. Part Three explains insemination techniques for dairy and beef cattle, inseminator training, pregnancy determination in cattle, conception rates, and breeding problems. The exercise on "Embryo Transfer and Related Practices" explains the advances and techniques involved in the field. Part Four includes an overview of sire selection, sire health, sire management, AI organization, and career opportunities. Part Five explains the use and techniques for artificial insemination in dairy goats and other farm animals. For herd operators and persons involved in genetic development—of particular use to people interested in livestock improvement. For those who are anticipating careers in some phase of the AI industry.

[Bovine Embryo Transfer](#) Elsevier

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

[Seminar on Egg Transfer in Cattle in the EEC Programme of Co-ordination of Research on Beef Production](#) Unipub

Reproductive wastage is a major inefficiency in all livestock production with embryonic mortality accounting for a major portion of this loss. Accordingly the Commission of the European Communities encouraged the organisation of a seminar on embryonic mortality in farm animals which was held in Brussels on the 11th and 12th of December 1984. This book contains the text of the papers, discussions and final summary presented at that Seminar. As a background to the Seminar, the extent and timing of embryonic loss was described for farm animals. Particular consideration was then given to the various mechanisms and signals, both embryonic and uterine in origin, that are so far known to be involved in the establishment of pregnancy. Possible causes of embryonic death including physiological, endocrinological, genetic and immunological components were outlined and discussed. The final summary contains general conclusions from the Seminar and recommendations for future research work on this topic. J.M. Sreenan M.G. Diskin July 1985. \*\*\*\*\* THE EXTENT AND TIMING OF EMBRYONIC MORTALITY IN THE COW J. M. Sreenan & M. G. Diskin, The Agricultural Institute, Belclare, Tuam, Galway, Ireland ABSTRACT The extent and timing of embryonic mortality in heifers, normal cows and repeat breeder cows has been reviewed.

[A Handbook and Laboratory Manual for Students, Herd Operators, and Workers in the AI Field](#) CRC Press

This book briefly reviews the history of equine embryo transfer, covering in clinically practical terms the techniques, equipment, and management protocols currently in use. Embryo transfer has become a big business, especially for breeding racing stock (horses and camels), and is therefore a very important aspect of equine practice. Ed Squires and Pat McCue have been involved with the development of embryo collection and transfer procedures since the early 60s and have both contributed important techniques and innovations to the process through their research and clinical experience. This book captures the clinical experience, so far, and applies it directly to equine practice. The book is of great value to general equine practitioners for reference, equine reproduction specialists, animal science at the graduate level (equine track), and breeders.

[Embryo Transfer in Dairy Cattle](#) National Academies Press

Over the past decades, dairy cattle reproduction has presented to farmers with several challenges as a consequence of genetic selection for improved milk production traits. These challenges include suboptimal postovulatory responses for timed artificial insemination synchronization protocols. Another example is the metabolic adjustments the preimplantation embryo may undergo in a high producing cow resulting in a high likelihood of early embryo loss. Nevertheless, this is an opportunity to study alternative options to improve pregnancy rates. Assisted Reproduction Technologies (ART) have the potential to solve several issues the modern dairy cow is facing. The progress in the practice of ART has been satisfactory over the last two decades and our understanding about gametes and embryo biology has substantially improved. Embryo transfers using in vitro produced embryos (IVP) might certainly have an advantage over conventional breeding methods since ovulation, fertilization and early embryonic stages would be bypassed thereby enhancing the likelihood of embryo implantation and hence improved conception rates. However, there are several challenges to producing good quality embryos in vitro due to difficulties in emulating the natural oviduct microenvironments that the preimplantation embryo is experiencing several physiological changes en route to the uterus. The objectives of this work were to review current literature in regard to mammalian preimplantation embryo production in vitro with emphasis in bovine species and to study the effect of metabolic regulators (MR) on embryo development as well as using new methods to recover better quality sperm especially when using sex-sorted semen. Chapter Two is an extensive review of the IVP process in mammalian species with emphasis on the bovine embryo. Metabolic processes during oocyte in vitro maturation, sperm interactions during fertilization and in vitro cultures of different preimplantation embryo stages are reviewed. Special attention was devoted to the metabolic switch from low to high glucose uptake and metabolism occurring at the morula stage. Chapter Three is a systematic study of the effects of conjugated linoleic acid (CLA) isomers on embryos produced in vitro. Inclusion of 100 [mu]M CLA- cis 9, trans 11 during embryo culture 36 hrs before cryopreservation resulted in embryos with higher survival and better developmental rates post-thaw when compared to other groups. Chapter Four presents a study about the effect of phenazine ethosulfate (PES) and 2, 4-dinitrophenol (DNP) on embryo development at the morula stage to

enhance glucose uptake and metabolism to improve embryo developmental rates. Combination of 0.3 [mu]M PES and 10 [mu]M DNP resulted not only in higher embryo development and better quality but also embryos more resistant to cryopreservation procedures. Chapter Five describes a study of the effect of four colloidal-based sperm washes (Percoll, Old Bovipure, New Bovipure and Androcoll-B) on embryo development and quality. The International Embryo Transfer Society regulations strictly indicate that bovine embryos produced in vitro should be originated from sperm that has been recovered by silane-coated silica particles colloids when fractionation methods are used due to the debatable toxic effects of Percoll. Results from these experiments showed that embryos derived from sperm recovered by New Bovipure and Androcoll-B achieved higher blastocyst rates than Percoll and Old Bovipure groups. In addition, as a followup the effects of MR were evaluated on embryos originated from X-sorted semen. Interestingly, PES and DNP supplementation resulted in delayed development and poorer morphology in this embryos compared with untreated counterparts. Glucose uptake threshold may be lower in female embryos and/or they may have a different substrate preference as compared to male embryos. Our contribution to science may provide information for a better understanding of IVP and help shape the direction of future research. More importantly, it may provide the basis for production of better quality embryos originated from genderselected semen with more chance of survival to term, thereby improving conception rates in dairy cattle.

**Reproduction in Cattle** Cattle Embryo Transfer Procedure An Instructional Manual for the Rancher, Dairyman, Artificial Insemination Technician, Animal Scientist, and Veterinarian 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. Cattle Embryo Transfer Procedure An Instructional Manual for the Veterinarian, Beef Cattle Breeder, Dairyman, Artificial Insemination Technician and Animal Scientist Embryo Transfer Procedures for Cattle Training Manual for Embryo Transfer in Cattle

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.

Egg Transfer in Cattle John Wiley & Sons

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.

Embryo Transfer in Farm Animals Interstate Publishers

This book results from a study by a committee of the Institute of Medicine and the National Research Council's Board on Agriculture. The committee examined the scientific foundations of medically assisted conception and developed an agenda for basic research in reproductive and developmental biology that would contribute to advances in the clinical and agricultural practice of in vitro fertilization and embryo transfer. The volume also discusses some barriers to progress in research and ways of lowering them, and explains the scientific issues important to ethical decision making.

*Animal Biotechnology 1* Hoard's Dairyman Books

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.

Embryo Cryogenics : Executive Summary Prentice Hall

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