



Australian Government

Department of Education, Employment and Workplace Relations

ACMATE507A Manage the parturition of transgenic mice or rats

Revision Number: 1

ACMATE507A Manage the parturition of transgenic mice or rats

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the process of stages of natural and caesarean births and management of transgenic mice or rat pups. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
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Application of the Unit

Application of the unit	The unit has been specifically developed for animal technicians working in research and teaching facilities that require transgenic laboratory animals for scientific purposes where it may be necessary to monitor natural birth or perform caesarean sections and rear offspring for transgenic programs. Animal technicians performing surgery on animals operate under and must comply with the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes, relevant state/territory legislative requirements as well as protocols, policies and procedures set down by the Animal Ethics Committee (AEC) within their institution. In addition to legal and ethical responsibilities, all units of competency in the ACM10 Animal Care and Management Training Package have the requirement for animals to be handled gently and calmly. The individual is required to exhibit appropriate care for animals so that stress and discomfort is minimised. <i>Note: Scientific purposes refers to 'all those activities that require approval from an Animal Ethics Committee (AEC) and are performed to acquire, develop or demonstrate knowledge of techniques in any scientific discipline, including activities for the purposes of teaching, field trips, environmental studies, research, diagnosis, product testing and the production of biological products'.</i>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for procedures and maintain documentation	1.1. Institutional policies, procedures and protocols as set down by the AEC and relevant legislative requirements, including occupational health and safety (OHS), are complied with at all times 1.2. Regulatory and project documentation requirements are identified. 1.3. Project reproductive and breeding program objectives are verified. 1.4. Records are revised, reviewed, maintained and updated in accordance with institutional policies and procedures.
2. Monitor natural birth of transgenic offspring	2.1. Signs of parturition are identified. 2.2. Birth is monitored and decision is made to foster pups or leave with birth mother depending on project requirements and mother and offspring reactions. 2.3. Mother and offspring are housed and monitored to minimise stress to animals.
3. Perform caesarean procedures	3.1. Need for caesarean section is justified and AEC approval verified. 3.2. Equipment, including personal protective equipment and medications, are prepared. 3.3. Female is euthanased by cervical dislocation or sedated and euthanased. 3.4. Caesarean procedure is conducted. 3.5. Pups are collected, identified, checked and monitored. 3.6. Birth mother is euthanased (if not previously) and carcass disposed of in accordance with legislative requirements.
4. Foster pups onto clean mother	4.1. Clean or dirty status of the mother is verified and handling and treatment areas of each group are separated according to biosecurity requirements 4.2. Foster mother is selected and prepared prior to caesarean surgery of birth mother. 4.3. Area for fostering is selected and prepared to ensure minimal stress to foster mother and pups. 4.4. Pups are allocated to foster mother and bonding monitored.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- apply animal care and ethics committee classification system to determine procedures that require approval
- calculate dosage, administer drugs, including anaesthetic, and monitor response in accordance with project protocols and workplace standards
- check animals' physical condition vital signs and monitor for signs of progress or deterioration in condition or health of animals
- employ safe and environmentally responsible organisational systems and procedures when handling animals, materials and equipment
- identify sex, age, reproductive and parturition status of male and female animals
- maintain the highest standards of hygiene and infection control at all times to reduce the risk of infection and cross-infection
- prepare and maintain appropriate records relevant to breeding and technical procedures using relevant institutional electronic and/or manual systems
- prepare and use equipment and materials correctly and in accordance with manufacturers' specifications
- literacy skills to read, interpret and apply institution policies and procedures, including OHS, infection control, containment and exclusion and waste management; critically analyse material and record information collected accurately and legibly
- oral communication skills/language to fulfil the job role as specified by the institution, including questioning, active listening, asking for clarification and consulting with or seeking advice from research group team members, senior or more experienced staff or other relevant persons
- numeracy skills to estimate, calculate and record routine and more complex workplace measures
- interpersonal skills to work with others and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities
- problem-solving skills to use available information and resources including recording information and prioritise daily tasks.
- use personal protective clothing and equipment correctly
- use safe manual handling techniques and/or equipment
- use safe waste handling and disposal procedures.

Required knowledge

- anatomical and physiological terminology and glossary of terms
- anatomical structures and physiological features of mice and rats related to the reproductive system and parturition

REQUIRED SKILLS AND KNOWLEDGE

- aseptic techniques
- biosecurity requirements for clean and dirty status handling and treatment areas
- common diseases, ailments, injuries and other impacts on animal health and wellbeing and characteristics of healthy, sick or distressed animals
- communication procedures and systems, and technology relevant to the institution and the individual's work responsibilities
- comprehensive understanding of genetics, including principles, common terminology and nomenclature
- equipment and drugs commonly used for euthanasia
- institutional policies and safe work procedures, including OHS and emergency procedures
- methods used to perform caesarean procedures in mice and rats
- mouse and rat breeding procedures and their species specific requirements
- principles of animal welfare and ethics
- relevant codes of practice, including the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes
- relevant state or territory legislation and regulations relating to the practice of veterinary science, OHS and animal welfare and research, including the Office of the Gene Technology Regulator
- relevant state or territory legislation covering the use of therapeutic and controlled substances
- reproductive cycles
- techniques used to start the breathing process in pups
- techniques used to foster pups onto foster mothers
- workplace hygiene standards, disinfectants, cleaning agents, cleaning techniques and cleaning equipment and materials.

Evidence Guide

EVIDENCE GUIDE	
The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The evidence required to demonstrate competence in this unit must be relevant to workplace operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit. Assessors should ensure that candidates can: • prepare for procedures in accordance with institutional policies and procedures, including AEC and legislative requirements • monitor parturition stages of natural births and monitor pups • plan and conduct caesarean section on full-term pregnant mice or rats • foster pups onto clean mothers and monitor acceptance • review, revise, maintain and update records in accordance with regulatory and project documentation requirements. The skills and knowledge required to manage the parturition of transgenic mice or rats must be transferable to a range of work environments and contexts and include the ability to deal with unplanned events.
Context of and specific resources for assessment	Assessment of this unit is to be practical in nature and will be most appropriately assessed in an animal research facility or an environment that reproduces normal work conditions that has a scientific establishment licence and access to an approved AEC. There must be access to a range of research animals and the relevant information, materials and documentation to enable one to demonstrate competence.
Method of assessment	To ensure consistency in one's performance, competency should be demonstrated, to industry defined standards, on more than two occasions over a period of time in

EVIDENCE GUIDE	
	order to cover a variety of circumstances, cases and responsibilities and over a number of assessment activities. The assessment strategy must include practical skills assessment. Suggested strategies for this unit are: • written and/or oral assessment of candidate's required knowledge • observed, documented and first-hand testimonial evidence of candidate's application of practical tasks • practical simulation exercises that reproduce normal breeding work-related conditions • case study analysis • third-party evidence • workplace documentation • portfolio. This unit may be assessed in a holistic way with other units of competency relevant to the industry sector, workplace and job role.
Guidance information for assessment	Assessment methods should reflect workplace demands (e.g. literacy and numeracy demands) and the needs of particular target groups (e.g. people with disabilities, Aboriginal and Torres Strait Islander people, women, people with a language background other than English, youth and people from low socioeconomic backgrounds).

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Institutional <i>policies and procedures</i> may include:	• institution's quality assurance manual and procedures: • biosecurity • breeding processes • OHS • recycling and re-use guidelines • restraint, handling, euthanasing and disposal of animals • safe handling, storage and thawing of frozen genetic material • standard operating procedures • use, storage and transport of equipment and drugs used during procedures • waste disposal • project objectives and production schedules.
Procedures that require <i>AEC</i> approval may include:	• cloning • creation of transgenic, knock in and knockout lines • random mutagenesis • surgical procedures • any other procedure that may impact on the animal's health and wellbeing.
<i>Relevant legislative requirements</i> may include:	• Australian Code of Practice for the Care and Use of Animals for Scientific Purposes • Federal Gene Technology Act 2000 • National Health and Medical Research Council (NHMRC) guidelines • relevant state or territory legislation and regulations, such as those relating to: • animal research • animal welfare • prevention of cruelty to animals • quarantine

RANGE STATEMENT	
	- the practice of veterinary surgery - the administration and storage of therapeutic and controlled substances.
OHS risks associated with animal technician procedures include:	- animal bites, kicks or scratches - biological hazardous waste and sharps disposal - handling of chemicals and medicines - gas leakage - inhalation of aerosol particles - intraocular contamination - manual handling, including carrying, lifting and shifting - needle pricks and cuts from other sharps - release of infective agents (animal and human) - scalds and burns from sterilising and cleaning equipment - zoonoses.
Breeding program may include:	- information about: - the number of breeders required - selection criteria for breeders and retiring breeders - breeding system to be used: - inbred - outbred - backcross - fostering requirements and identification system to be used - record systems to be used (e.g. computer, cards and books) - data to be collected about: - production rates - parent information - generation development (e.g. litter numbers, numbers born and sex ratios) - sex and weaning rate.
Signs of parturition may include:	- bleeding and discharge - box presentation - grooming - isolation - nest building - restlessness.

RANGE STATEMENT	
Equipment required for caesarean procedures may include:	• anaesthetic equipment and supplies: • anaesthetic machines • anaesthetic trolleys • filters • gas cylinders • incubators • masks • re-breathing bags • soda lime and canisters • scavenging systems • tubes • vaporisers • surgical instruments and equipment: • cautery • forceps • needles • needle holders • resection clamps • scalpels • scissors • sutures.
Personal protective equipment may include:	• appropriate footwear • optical aids • surgical gowns, caps, masks, boots and gloves • theatre clothing.
Medications may include:	• anaesthesia agents: • isoflurane • ketamine • ketamine combination anaesthesia • methoxyflurane.
Clean or dirty status assessment may consider:	• establishing an aseptic animal and room environment • preparation techniques • workplace hygiene standards: • cleaning agents and techniques • cleaning equipment and materials • disinfectants.
Preparation of foster mother may	• consideration of:

RANGE STATEMENT	
include:	• environment • housing and bedding • strain qualities and benefits • temperament.
<i>Area for fostering</i> assessment may consider:	• bedding conditions and qualities • chemicals • environmental conditions and impact of particular changes to environment • housing.

Unit Sector(s)

Unit sector	Animal technology
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		