
Overview

This standard covers the use of Genetically Altered (GA) animals in scientific research. It includes the skills and knowledge required to produce and maintain breeding colonies of GA animals in a Home Office designated establishment and perform the associated regulated and non-regulated procedures.

You will need to understand the different methods of producing GA animals, relevant to your working role.

You will also be familiar with the background reasons and ethical considerations for using GA animals in scientific research, and have an understanding of all aspects of breeding, maintenance, genetic monitoring and cryopreservation of laboratory colonies.

This standard is for licensed animal technologists who produce and maintain the production of GA animals in Home Office designated establishments.

It is essential that you work strictly within the limits of both your personal licence and the relevant project licence.

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Performance criteria

You must be able to:

- P1 use safe practices and appropriate personal protective equipment when carrying out scientific or technical activities
- P2 maintain appropriate levels of hygiene and bio-security
- P3 produce and maintain a line of GA animals from founder stock or first generation animals
- P4 take samples for DNA analysis using the least invasive method appropriate for scientific analysis
- P5 evaluate and interpret DNA test results
- P6 check the physical condition of the animals, their readiness for breeding and prepare the animals in the appropriate manner
- P7 select the most appropriate method to breed and maintain a colony of GA animals to meet the scientific requirements of a research project focusing on reduction in animal wastage
- P8 maintain the health and condition of GA animals throughout their reproductive cycle
- P9 maintain the health and welfare of animals by providing special care, veterinary prescribed treatments and any special dietary requirements as appropriate
- P10 select and prepare accommodation for the breeding animals and offspring
- P11 transport animals safely and securely to another location within the establishment or externally
- P12 keep accurate and up to date records as required by relevant legislation and the organisation
- P13 deal with waste safely and correctly in accordance with legislation
- P14 conduct all activities within the provision of your personal licence and the project licence
- P15 comply with legislation relating to the care and welfare of animals in a Home Office designated establishment
- P16 carry out all work in accordance with relevant environmental and health and safety legislation, risk assessment requirements, codes of practice and company policies

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Knowledge and understanding

You need to know and understand:

- K1 the importance and correct use of personal protective equipment for scientific or technical activities
- K2 the importance of maintaining appropriate levels of hygiene and bio-security and how this can be achieved
- K3 all the stages from DNA to protein production within the cell and the definition of:
 - K3.1 chromosome,
 - K3.2 gene,
 - K3.3 DNA,
 - K3.4 RNA,
 - K3.5 amino acid,
 - K3.6 protein
- K4 definitions of genotype, homozygous, heterozygous, wildtype and hemizygous
- K5 definitions of phenotype, lethal genes, mutation
- K6 definitions of gene segregation in relation to Mendel's law
- K7 methods for producing GA animals by pro-nuclear injection, embryonic stem (ES) cells and mutagenesis
- K8 the following terminology:
 - K8.1 pseudo pregnant,
 - K8.2 recipient female,
 - K8.3 donor female,
 - K8.4 superovulation,
 - K8.5 founder stock,
 - K8.6 transgenic,
 - K8.7 mutagenesis,
 - K8.8 knock in and knock out,
 - K8.9 conditional and reporter lines
- K9 the justification for using GA animals and the role of the Ethical Review Process (ERP) in cost benefit analysis
- K10 principles of the 3Rs in relation to the production and maintenance of GA animals
- K11 why it is necessary to genotype progeny and how to evaluate results
- K12 possible reasons why genotyping results may not conform to expected mendelian ratios
- K13 breeding animals to include procedures for dealing with animals at birth, weaning and selection of future breeding stock (FBS) from genotyping results
- K14 appropriate accommodation for breeding animals and offspring
- K15 the environmental and husbandry conditions required for breeding animals

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- K16 the importance of effective communication with scientists (internal and external) and colleagues when breeding and/or transporting animals
- K17 the identification of any environmental concerns and reporting structure
- K18 additional welfare considerations that may be required in breeding and maintaining GA lines
- K19 reasons for cryopreservation and re-derivation in GA lines
- K20 how to identify problems when managing a colony of GA animals, and what action must be taken
- K21 legislation for transporting and packing animals including completion of documentation and where relevant the use of a mouse passport
- K22 the requirements of current legislation relating to the production of GA animals, relevant licences, codes of practice, humane end points, severity limits, welfare score sheets
- K23 the requirements under current health and safety and environmental protection legislation for maintaining and disposal of GMO animals, Genetically Modified Organisms (contained uses)
- K24 conduct all activities within the provision of your personal licence and the project licence
- K25 your responsibilities for the care and welfare of animals in a Home Office designated establishment under relevant animal welfare legislation, European directives and UK codes of practice
- K26 your responsibilities under relevant environmental and health and safety legislation, codes of practice and company policies

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Suite Animal Technology

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