



Operationalization of newly-built facility for experimental animals at the University of Split

KK.01.1.1.02.0026

Co-financed by European Union, EU Regional Development Fund.

- Call: Investment in the reorganization of processes and infrastructure in the field of research, development and innovation.

Total project value: 19.214.337,50 HRK (~2.5M€)

Total EU Grants: 17.996.047,92 HRK (~2.4M€)

Project Implementation Period: February 2019 - April 2021

Applicant/Project user: University of Split

Project partner: University of Split, School of Medicine

Web:



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Projekt "Stavljanje u funkciju novoizgrađene nastambe za pokusne životinje na Sveučilištu u Splitu"

**Reorganization of processes:
Facility Management**

Workshop

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Jan 13, 2021

The workshop will be recorded



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Housekeeping

- Please can you mute your microphones unless you want to speak to reduce background noise!
- There will be plenty of time for questions
 - ask during the talk
 - wait until the end of the session to ask them
 - use the chat function at the bottom of the screen
 - use the raise hand function
- Please bear with us – the technology doesn't always work as planned!



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Aim and learning outcomes

The aim of the session is to understand how an animal unit is organised to maintain an appropriate environment for the animals held, and to facilitate the conduct of scientific procedures in accordance with the three Rs.



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Outline of the session

- Introduction
- Design considerations
- Management considerations
- Other considerations
- Summary
- Questions



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Introduction

- Facility management programme should
 - facilitate research
 - maintain the health of the animals at an appropriate standard.
- The management will vary depending on the facility – one size does not fit all.
- Factors to consider
 - staffing
 - husbandry
 - equipment maintenance
 - animal procurement
 - movement of animals into and around the facility.



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Introduction

- EU Directive 2010/63 requires that animals held in conditions that cater for their physiological and ethological needs.
- Only animals that are physiologically and behaviourally healthy should be used for scientific procedures.
- A well designed and well managed animal facility provides standardised, high quality animals.

• **Bad animals = bad science.**



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Design considerations

- Depends on many factors
- Animals
 - Caging, bedding, food, water?
 - Social needs, environmental enrichment, stocking density, breeding?
 - Ventilated cages or static cages? Solid or grid floors?
 - Cage change stations, cage washing equipment?
- Procedures
 - Procedures, necropsy, quarantine, surgery suite, labs, storage, cage wash and autoclave etc
- Staff
 - Change areas, offices, hand washing and toilet facilities, tea room, laundry,
 - Dedicated clothing and PPE



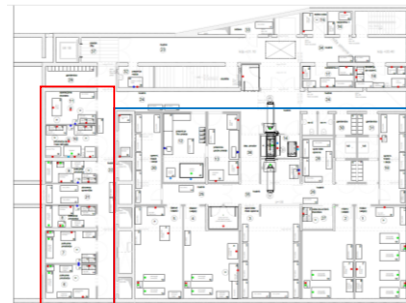
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- Inadequate facilities and equipment impact negatively on animal health and welfare, and on scientific outputs.
- Good animal facility design and management are important for effective implementation of the three Rs.



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Management considerations

- Animals are completely reliant on human caretakers
- Facility must cater for their needs
- Defects must be identified and remedied immediately
- Considerations
 - Staff
 - Bioscurity



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Staff

- Several job roles within a facility
- EU Directive 2010/63 requires specification of
 - person responsible for ensuring compliance
 - persons responsible for overseeing care and welfare (in UK = NACWO);
 - ensure that the staff dealing with animals have access to information (NIO);
 - responsible for ensuring that staff are trained and supervised until competent (NTCO);
 - designated veterinarian (NVS).
- AAALAS identifies **18 different job roles in an animal facility**
- In addition, there will be research staff



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Job Title	Job Description
Director	Has responsibility for overall facility operations
Assistant/Executive director	Assists director, may have direct supervisory responsibilities for one or more components of facility operations.
Manager	Ensures SOPs are current and accurate, and that occupational safety procedures for animal care are followed. Manages personnel actions in a timely, training and discipline.
Administrative/Business manager	Works with the director to prepare budgets and provide monthly reports. Oversees purchasing of laboratory animal facility supplies, sets per diem costs, other administrative duties.
Supervisor	Provides the day to day supervision of laboratory animal care personnel. Prepares schedules for work assignments, and animal husbandry. Trains and directs personnel in procedures.
Facility maintenance	Provides advice on animal health and welfare to research scientists
Facility compliance manager	Manages regulatory compliance processes, including leading corrective and preventive actions, establishes and administers quality assurance programs.
FAIR coordinator	Facilitates activities of the Animal Welfare Body.
Facility operations	Oversees, coordinates, and provides training for animal care staff, including, but not limited to, animal husbandry, animal health, animal welfare, animal care, and laboratory animal facility operations. Provides training, consultation, and support to research scientists.
Research technician	Provides assistance to researchers by performing specific technical procedures of the research project.
Animal health care technician	Provides support to the veterinary staff in diagnostic procedures, provides pre- and post-operative care to animals, and assists in surgery. Operates and maintains equipment. Administers treatments.
Senior heart laboratory animal technician	Provides husbandry of animals in more specialized areas of the animal facility, to include barrier and bioisolation areas.
Midlevel laboratory animal technician	Provides basic daily husbandry of laboratory animals, to include non-restricted areas, such as animal identification, selecting biological samples, and administering medications.

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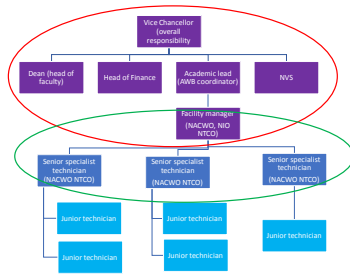


Animal facility management structure

- Animal facilities are expensive
- Animal facilities need regular and frequent maintenance
- Breakdowns have consequences for animals and science
- Management team must reflect this – need input from high level managers



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Training

- Comprehensive staff training programme is essential
- Initial training and competence assessment
- Ongoing reassessment of competence (skills)
- Refresh knowledge regularly
- Comprehensive training and competence records required



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Communication

- Many people involved in running an animal facility
- Effective communication vital
 - between unit staff
 - between unit staff and research staff
- Methods
 - Management meetings
 - User group meetings
 - BRU mailings
 - Intranet sites
 - Face to face communication
- Include in induction training



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Biosecurity

- Critically important
- Essential for animal health and scientific integrity
- Unknown pathogens cause variability and confound results
- Biosecurity is the combination of measures taken to prevent, contain, and identify known or unknown micro-organisms to protect animals in research
- Biosecurity is an essential component of quality assurance in animal research.



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Principles of biosecurity



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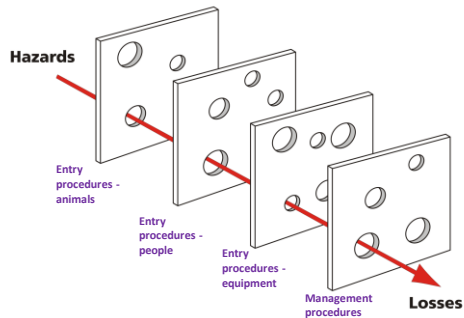


Prevention

- Steps taken to keep microbes from entering a facility, and stop it spreading if it enters.
- Entry procedures
 - Animals
 - People
 - Equipment, consumables
 - Air
- Management procedures
 - Traffic patterns
 - Sanitation and maintenance
 - Waste management
- No procedure is 100% effective – each one reduces the risk



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Prevention – entry procedures: animals

- Biggest risk is other animals
- Sources
 - In house breeding
 - Commercial suppliers
 - Other research institutions
- Strict rules on animal supply usual – do not use unverified sources
- Transport – sterile packaging, vehicles decontaminated
- Receiving animals – environmentally controlled quarantine area
- Check integrity of boxes on arrival



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Prevention – entry procedures: people

- Passive transfer on clothing or shoes
- Reverse zoonoses
- Change clothes on entry
- Shower
- Exclusion times – 24h to 7 days
- No entry for staff with respiratory disease e.g. NHP, ferrets
- Ban on keeping pets of same species



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Prevention – entry procedures: equipment etc

- **Anything coming into facility must be sterilised on entry**
- Includes equipment, bedding, food, water, biological materials
- Autoclave, irradiation, EO, VHP, other disinfectant
- Food - purchase pre sterilised if needed, package decontaminated on entry (e.g. by VHP)
- Water – autoclave, acidification, ultrafiltration (e.g. RO). Automatic watering systems need regular flushing and microbial monitoring.



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Prevention – entry procedures: air

- Difficult to control
- HEPA filtration common – filtered air at correct temperature and humidity
- AHU must be able to provide sufficient air of appropriate quality
 - 15-20 air changes/hour
 - IVC racks may have their own AHU or use room air



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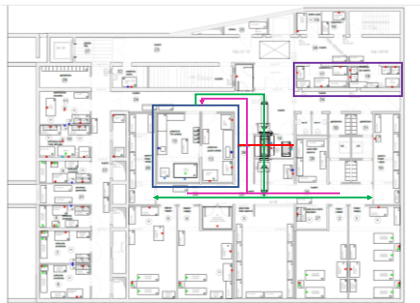


Prevention – management procedures: traffic patterns

- Movement around the facility is critically important – design is only one component
- Need SOPs and workflows – all staff must follow these
- Most facilities centred on cage wash: cages/equipment moves out from clean side, traffic pattern should minimise cross contamination
- Service highest health rooms first
- Finish with quarantine/contaminated rooms



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Prevention – management procedures: sanitation and maintenance

- To fit needs of facility
- Daily, weekly, monthly, quarterly and annual tasks
- Sanitisation
 - walls, floors, drains, ceiling, doors, light fittings, filters etc
 - Keep records of sanitation procedures
 - Verify effectiveness, e.g. bioluminescence meter, bacteriology
- Maintenance
 - Routine preventive maintenance for some equipment
 - Internal, or external contractors
 - Maintenance tasks on predetermined schedule
 - Some equipment needs particular maintenance e.g. those with HEPA filters



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Prevention – management procedures: waste management

- Must follow regulations
- Different types of waste
 - biological
 - clinical
 - hazardous waste
- GM animal tissues and carcasses



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Identification – facility monitoring

- Rodents available from high health sources
- Health of resident animals must be monitored continuously
- Genetic integrity should be monitored continuously
- Environment should be monitored continuously – temperature, humidity, noise etc
- Sanitation should be monitored continuously
- Researchers should be kept informed of results



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Identification – animal health monitoring

- Defined program of regular physical and laboratory evaluations of animals within a unit
- Morbidity and mortality recording
- Investigation of deaths and illnesses
- Process may involve:
 - Vendor surveillance, clinical and post mortem sampling of animals on study, sentinel animal sampling, screening of biological materials and tissues.



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Identification – animal health monitoring

- Serology, bacteriology, parasitology from carcasses, or environment, faecal samples, fur samples or blood tested using PCR based technologies
- Combination of live sentinels and non destructive PCR based samples effective
- Questions:
 - How many samples?
 - How often?
 - What for?
- No method is 100% effective – depends on prevalence and test used.
- **Health screening cannot guarantee that all animals are free from pathogens**



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Identification – sanitation and supplies

- Must have process for monitoring effectiveness of sanitation
- E.g. cage washer – check temperature of wash cycle daily
- Autoclave – check sterility of product
- Surfaces and equipment – check cleanliness after cleaning
- System for managing stock rotation
- Consider regular audits of facility by AWB



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Resolution

- Biosecurity measures are never 100% effective – breakdown is inevitable
- Must have a plan for dealing with breakdowns
- Define exclusion list – what do you want to keep out?
 - Impact on animals
 - Impact on science
 - Impact on people
 - Ability to eradicate it and keep it out
- FELASA list – some organisms of no consequence, new pathogens being discovered e.g. MKPV



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Typical exclusion list – mice

- **Definite exclusions:**
 - **Viruses**
 - Mouse hepatitis virus
 - Mouse rotavirus
 - Parvoviruses including MVM and MPV
 - Theiler's murine encephalomyelitis virus
 - Lymphocytic choriomeningitis virus
 - Mouse adenovirus types 1 and 2
 - Mousepox (ectromelia) virus
 - Pneumonia virus of mice
 - Reovirus type 3
 - Sendai virus
 - **Bacteria**
 - Helicobacter bills and H. hepaticus
 - Pasteurella pneumotropica
 - Streptococci b-haemolytic (not group D)
 - Streptococcus pneumoniae
 - Citrobacter rodentium
 - Clostridium piliforme
 - Corynebacterium kutscheri
 - Mycoplasma pulmonis
 - Salmonella spp.
 - Streptobacillus moniliformis
 - **Other**
 - Endoparasites (helminths) and ectoparasites
- **Relative exclusions:**
 - Intestinal protozoa
 - Murine norovirus
 - Helicobacter spp. (other than those listed above)
 - Proteus spp
 - Staphylococcus aureus

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Typical exclusion list – rats

- **Definite exclusions:**
 - **Viruses**
 - Parvoviruses: (Kilham rat virus, Rat minute virus, Rat parvovirus, Toxoin's M-1 virus)
 - pneumonia virus of mice
 - Rat coronavirus/Sialodacryoadenitis virus
 - Rat thelovirus
 - Hantaviruses
 - Mouse adenovirus type 1 and 2
 - Reovirus type 3
 - Sendai virus
 - **Bacteria and fungi**
 - Clostridium piliforme
 - Helicobacter spp. if positive, speciation for H. bills is recommended
 - Mycoplasma pulmonis
 - Pasteurella pneumotropica
 - Streptococci b-haemolytic (not group D)
 - Streptococcus pneumoniae
 - Cilia-associated respiratory bacillus
 - Pneumocystis spp.
 - Salmonella spp.
 - Streptobacillus moniliformis
 - **Other**
 - Endoparasites (helminths) and ectoparasites
- **Relative exclusions:**
 - Bordetella bronchiseptica
 - Corynebacterium kutscheri
 - Encephalitozoon cuniculi
 - Klebsiella oxytoca
 - Klebsiella pneumoniae
 - Other Pasteurellaceae
 - Pseudomonas aeruginosa
 - Staphylococcus aureus

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Resolution – managing breakdowns

- Options:
 - Do nothing
 - Treat
 - Isolate, cull selective animals
 - Cull, disinfect and repopulate
- Before deciding which path to take, confirm that the result is real. Repeat the test using a different lab. Do not make decisions on the basis of a single positive result.**



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Other considerations

- Health and safety
 - Pre-employment screening, regular health monitoring of staff by occupational health
- Record management
 - Must be able to determine how many animals are held
 - Record management software systems e.g. ARMIS, Tick@lab



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Summary

- Many factors to consider
- Optimum design helps – but is not the only consideration
- Workflows, SOPS, defined procedures are essential
- All personnel must follow the rules
- Output benefits both animals and science!



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