FOOD SAFETY UNIT

BIOSECURITY MANUAL FOR THE EXPERIMENTAL APIARY MANAGEMENT

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Premise

This Manual has been drawn up by all the Managers of Research and Teaching of the Department of Veterinary Medicine (DIMeV).
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This document is addressed to all structured personnel (teachers and researchers, technical personnel) and non-structured personnel (teaching support personnel such as scholarship holders, doctoral students and research fellows, students, undergraduates, trainees, undergraduate students, occasional visitors, etc.) of the DiMeV who, in approaching their work and training path, must know the possible risks associated with the practical teaching and research activities carried out in the Food Chemistry Laboratory.
In relation to the specificity of the activities envisaged, the peculiarity of individual skills and the subdivision of the distinct tasks and operations, it is necessary to define the specific risks associated with the activities carried out, the operating procedures to be adopted to minimize and prevent them and the measures, intended as correct practices, to be implemented and followed to manage these risks.

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1. Apiary location

The experimental apiary of the Department of Veterinary Medicine is in an area used as a garden adjacent to the entrance of the Section of Food Safety, which borders an uncultivated farm where there is a natural vegetation of different nectar species.
The apiary, positioned to the south-west, is shaded by a fixed structure to avoid high summer temperatures; the apiary has a variable number of hives (15/20), resting on a metal support and spaced from the ground for 30/40 cm.
The walking path, runs along the hives on the opposite side of the bee's flight path, allows the operator to perform the bee techniques according to the rules of good practice.
The plants in the garden surrounding the apiary have been selected in order to allow a seasonal rotation of nectareous flowers. The ground dedicated to the apiary is steep and, in some places, has rocky bumps; the branches of trees and shrubs create a dense network of vegetation. The water supply is guaranteed by the presence of a fountain adjacent to the apiary.
Close to the apiary, a closed glass structure has been created that allows students to participate in exercises on species recognition and the main apistic techniques in total safety. The structure can also be used by external visitors (schools, participants in training courses in beekeeping) who request written permission from the Department.
Access to the apiary is allowed only to the responsible teachers and students/ PhD students/ technicians, only if accompanied by a manager.

2. Apiary inspection and control visits

The apiary requires constant monitoring at various times of the year, particularly during:

- spring/summer for the control of the brood nest size, the predisposition to the productive activity, the frames replacement, cleaning of the inspection drawers, control of pathologies and placing or removing the melarium.
- autumn/winter to carry out parasitic treatments, experimental tests for the control of varroa mite, or other diseases, the support feeding and the control of pathologies.

Periodic monitoring shall require:

- the use of personal safety devices (masks, gloves, etc.),
- smoker, for which, only natural materials (wood, dried grass, uncoloured cardboard, etc.) are used.

3. Collection swarms of bees

During the period of the swarming of the bees (February/March/April) the families are collected with different tools depending on the positioning of the swarm. Operations must be carried out using personal safety devices (masks, gloves, etc.).
Shears, electric chainsaw, and ladder are used for the collection of swarms placed on the branches of trees or hedges. The collected swarms must be promptly inserted into the swarm holder or are placed directly in the hive with a number of frames appropriate to the size of the swarm.
The new families of bees collected must be constantly monitored for about 30/40 days to check the presence of the queen, mark it depending on the expected color for the current year, check the brood, check for the presence of any pathologies.

4. Honey extraction lab

The honeycombs with operculated frames are carried to the honey extraction lab adjacent to the experimental apiary for the honey extraction.
Within 1/2 days from the harvest, the honey extraction is carried out follow these phases:

1. uncapping of frames through dedicated tools (fork and/or de-percolator knife)
2. centrifugation of uncapping frames using radial centrifuge with different speeds
3. filtration on filters with different diameters
4. Decanting honey in maturing tanks
5. packaging of mature honey in glass jars of different capacities.
6. Storage

5.Wax Solar Melter

Some uncapped frames or parts of these wax shaped are placed in the wax solar melter, located next to the experimental apiary, in order to recover the wax and make it available to colleagues, beekeepers, or anyone who requests it for various purposes.

6. Chemical risk

The smoke produced from natural material not treated with chemical substances by the smoker, if in excess, could cause damage from inhalation of combustion products and eye burning.

7. Biological risk

In case of important diseases such as the American Plague, the complete hive is eliminated with fire, avoiding treatments with antibiotics. In the case of diseases such as the European Plague, the hives are disinfected with a blue flame. Another necessary operation is to ensure the integrity of empty melamine boxes, to be reused for the following season, from the visit of unwelcome guests, such as infestations, wax moths, rodents etc.
The diseases that affect the hive are not transmissible to humans, so the risk that can involve the work in the apiary is due exclusively to the sting caused by bees, which is a cause of painful injuries and sometimes can lead to anaphylactic shock.
Therefore, in case of proven sensitivity to bee venom it is necessary to avoid risky situations: if you are stung by bees, it is necessary to completely extract the sting avoiding squeezing the venom glands and disinfect with 15% ammonia. If you are in the presence of a sensitive organism, operate with a targeted therapy (cortisone).

8. Biosafety sheets

APIARY LOCATION

RISKS	Consequences/Damage	Prevention measures (procedures)	Protective measures (individual/collective)
Rough terrain	Sliding/fall Fractures, sprains	local knowledge	Footwear with non-slip sole
Bee sting	Injuries, anaphylactic shock	Check for bee venom sensitivity. Targeted therapy (cortisone)	Protective device, mask, gloves
Branches and leaves	Sliding/ falling	Proceed carefully	Footwear with non-slip soles, glasses
Handling of hives	Back pain, sciatica, damage to the osteo-articular system	Handling must be performed by two operators who carry out correct and coordinated movements. Rest breaks	

INSPECTION AND MONITORING OF THE APIARY

RISKS	Consequences/Damage	Prevention measures (procedures)	Protective measures (individual/collective)
Rough terrain	Sliding/fall Fractures, sprains	local knowledge	Footwear with non-slip sole
Bee sting	Injuries, anaphylactic shock	Check for bee venom sensitivity. Targeted therapy (cortisone)	Protective device, mask, gloves
Branches and leaves	Sliding/ falling	Proceed carefully	Footwear with non-slip soles, glasses
Handling of hives	Back pain, sciatica, damage to the osteo-articular system	Handling must be performed by two operators who carry out correct and coordinated movements. Rest breaks	
Smoker	Burns	Pay attention during the operations, always use natural material	Gloves
Handling of honey supers	Back pain, sciatica, damage to the osteo-articular system	If the supers are full of honey, arrange for partial handling of the frames. Rest breaks.	

COLLECTING SWARMS

RISKS	Consequences/ Damage	Prevention measures (procedures)	Protective measures (individual/collective)
Ladder recovery operation with hand tools (shears, hacksaws)	Fall from height, fractures, traumas	1) Check the ground for safe positioning of the ladder; check the condition of the ladder before use. 2) Anchor the ladder to the tree or bush. 3) Do not climb if conditions are not safe. 4) Use scale with CE marking. 5) Do not leave tools in raised places, but always store them in the pockets of the overalls. 6) Do not let other operators stand under the ladder	Footwear with non-slip sole. Protective devices (mask, overalls)
Branches and leaves	Collisions with branches: wounds, eye injuries	Proceed carefully to reach the swarm, taking care to move the branches correctly	Mask and/or glasses
Bee sting	Injuries, anaphylactic shock	Check for bee venom sensitivity. Targeted therapy (cortisone)	Protective device, mask, gloves
Use of shears and hacksaws	Wounds, cuts	Check the maintenance of the tools, operate in stable conditions, and pay attention	Gloves

PLACEMENT AND REMOVAL OF HONEY SUPERS

RISKS	Consequences/Damage	Prevention measures (procedures)	Protective measures (individual/collective)
Rough terrain	Sliding/fall Fractures, sprains	local knowledge	Footwear with non-slip sole
Bee sting	Injuries, anaphylactic shock	Check for bee venom sensitivity. Targeted therapy (cortisone)	Protective device, mask, gloves
Branches and leaves	Sliding/ falling	Proceed carefully	Footwear with non-slip soles, glasses
Handling of hives	Back pain, sciatica, damage to the osteo-articular system	Handling must be performed by two operators who carry out correct and coordinated movements. Rest breaks	

HONEY EXTRACTION LABORATORY

RISKS	Consequences/Damage	Prevention measures (procedures)	Protective measures (individual/collective)
Floor	sliding/falls	Dry Floor	non-slip footwear
Bee Sting	Injuries, anaphylactic shock	Check for bee venom sensitivity. Targeted therapy (cortisone)	Proceed carefully and prevent bees from entering the honey extraction lab.
Handling of honey supers	Back pain, sciatica, damage to the osteo-articular system	Pick up the frames full of honey with correct movements and take work breaks	
Uncapping table	Rollover: injury, trauma	Secure the table well, always operate in stable conditions. Check the maintenance of the tools	Operator clothing suitable for hygiene production, non-slip footwear.
Work utensils (heated forks and knives)	Cuts, wounds, burns	Be careful during the uncapping operations	Operator clothing suitable for hygiene production, non-slip footwear.
Centrifuge	Rollover: injury, trauma	Permanently secure the centrifuge uprights to the floor. Operate in conditions of maximum stability. Lid of the centrifuge must remain closed during operation.	Operator clothing suitable for hygiene production, non-slip footwear
Honey ripener	Trauma, injury	Fix the honey ripener in a stable way. Do not move filled or semi-filled honey ripener	Operator clothing suitable for hygiene production, non-slip footwear.
Packaging/labelling	Fatigue: damage to the musculoskeletal system	Take work breaks	

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DISPOSAL OF INFECTED HIVES

RISKS	Consequences/Damage	Prevention measures (procedures)	Protective measures (individual/collective)
Fire	Burns Damage to the surrounding environment	Knowledge of the place, place the hive near a water source, wet the surrounding land, avoid windy days	

CHEMICAL RISK

RISKS	Consequences/Damage	Prevention measures (procedures)	Protective measures (individual/collective)
Smoke produced by the smoker	Damage from inhalation of combustion products	Operate carefully. Use chemically untreated natural material	

BIOLOGICAL RISK

RISKS	Consequences/Damage	Prevention measures (procedures)	Protective measures (individual/collective)
Bee sting	Injury, anaphylactic shock	Check for bee venom sensitivity.Targeted therapy (cortisone)	Protective device, mask, gloves