UNIVERSITY OF RWANDA

FARM AND BIOLOGICAL ASSETS MANAGEMENT POLICY

Approved by UR Board of Governors meeting of Wednesday, 1st June 2016

Executive summary

In the wake of establishment of the University of Rwanda (with Law No 71/2013 of 10/09/2013) as a singular, multi-campus institution, operating from departments and schools that make up 6 Colleges, the institution is challenged to provide opportunities for all students pursuing a variety of programs, both through classes and other learning-research resources, at designated campuses. Among key resources, agricultural farms are emerging as a significant facility in terms of specific nature and diversity of its assets-including biological assets (animals and plants) as well as its prominent production potential. Hence, farm management issues are logically important for several reasons, calling for the establishment of a farm management policy to provide updated guidelines and working framework at institutional level (UR).

The Policy proposes a wide set of necessary operating procedures, harmonized at UR level and guidelines on proper management and specific farm practices. Therefore, the Policy is expected to allow Farm Managers and UR User Units to meet the basic management requirements of the animals/plants, based on scientific and industry standards, for the validity and effectiveness of research and teaching activities and outputs. In addition, the policy guidelines will permit a timely collection of information to allow informed decision making by relevant UR managers.

The objective of the policy is to ensure a sustainable management of UR agricultural and biological assets for an efficient use in various academic activities, in the most acceptable standardized scientific, financial, safe and ethical ways. Specifically, the policy is aiming at ensuring the following;

- Efficient allocation of resources to different **"UR User Units"** for teaching, research, community outreach, etc,
- Meeting standards in biological stock management and wellbeing of animals, for the validity and effectiveness of research and teaching activities/outputs,
- Ensure an optimized productive capacity and cost effectiveness of UR agricultural and laboratory farms,
- Ensure a sustained income generation and moderation of UR budget exposure,
- Ensure the health and safety of farm/animal and animal care personnel,
- Offer a safe hub for conservation, both *in situ* and *ex situ* of indigenous and endangered genetic resources (Species).

The policy proposes a framework and covers various subjects, ranging from the general guidelines on improved "Farm Management" to specific framework towards "Biological Assets Management," and the "Disposal of Biological Assets" and it's bounded "Biosecurity" issues. The Policy shall be applied to all UR farms and farm resources, including laboratory, animal farms, fishponds and other aquatic resources, greenhouses and forests.

Table of content

LIST OF ABBREVIATIONS ACRONYMS

A &R	: Animal identification and registration
AHI	: Animal health information
AT	: Animal traceability
BSE	: Bovine spongiform encephalopathy
CC	: College council
DF	: Director of Finance
DVM	: Doctor of veterinary Medicine
FACP	: Farm Annual Cropping Plan
FAMBP	: Farm Annual Mating and Breeding Plan
FAMHP	: Farm Annual Mating and Breeding Plan
FANFP	: Farm Annual Nutrition and Feeding Plan
FAO	: Food Agriculture organization
FAPB	: Farm Annual Plan and Budget
MININFRA	: Ministry of Infrastructure
REMA	: Rwanda Environment Management Authority
ToR	: Terms of references
UR	: University of Rwanda

LIST OF TABLES

LIST OF ANNEXES

CHAPTER 1: INTRODUCTION

1.1. Background of University of Rwanda

Upon its establishment, by the Government of Rwanda through the law no 71/2013 of 10/09/2013, the University of Rwanda (UR) is intended to be known for its innovative approaches to teaching, learning, research and connections with the community and with the nation's vision for development.

Vision:

By 2020 the UR will have educated the next generation of leaders in Rwanda who are prepared and dedicated to building a more just and sustainable world.

Mission:

The UR will support the development of Rwanda by discovering and advancing knowledge, committed to the highest standards of academic excellence, where students are prepared for lives of service, leadership and solutions.

Objectives:

- Develop interdisciplinary, problem-based academic programmes aligned with Rwanda's development needs,
- Integrate IT-based resources from around the world,
- Ensure students have the leadership, entrepreneurship and management skills needed to create employment,
- Prepare students for service to their communities and country through applied service learning programmes nationally and internationally,
- Create applied, evidence-driven, research Centres focused on problem solving, aligned with Rwanda's development needs,
- Develop continuous education programs for upgrading skills and knowledge.

1.2. Justification for UR Policy on farm and biological assets management

To reach its objectives, the UR works under the singular, multi-campus institution concept, operating from departments and schools that make up 6 Colleges, namely:

- College of Arts and Social Sciences (CASS),
- College of Agriculture, Animal Sciences and Veterinary Medicine (CAVM),
- College of Business and Economics (CBE),
- College of Education (CE),
- College of Medicine and Health Sciences (CMHS),
- College of Science and Technology (CST)

As such, the institution must provide opportunities for all students to pursue a variety of programmes, both through classes and other learning-research resources, at designated campuses.

Among key resources, agricultural farms are emerging as resourceful facilities in terms of specific nature and diversity of its assets-including biological assets (animals and crops) as well as attaining its production potential. Hence, farm management issues are logically important for several reasons, calling for the establishment of a farm management policy to provide updated guidelines and working framework at institutional level (UR).

This Policy will provide necessary operating procedures-harmonized at UR level-and guidelines on proper management and specific farm practices. Hence, the Policy is expected to allow farm managers and UR User Units to meet the basic management requirements of the animals/crops, based on scientific and industry standards, for the validity and effectiveness of research and teaching activities and outputs. In addition, the policy guidelines will permit a timely collection of information to allow informed decision making by relevant competent relevant authorities.

1.3. Definitions of key terms

01 Key technical terms are defined as follows:

1. **Animal:** Refers to all vertebrates that are reared in a farm for economic benefits.
2. **Animal husbandry**: any operations aiming at animal production for a targeted interest.
3. **Animal husbandry officer:** a person with a Bachelor's Degree in general animal husbandry from a recognized university or a higher learning institution.
4. **Agricultural activity:** the management by an entity of the biological transformation of biological assets for sale, into agricultural produce or into additional biological assets.
5. **Agricultural produce:** the harvested product of the entity's biological assets.
6. **Agronomist:** An expert in soil management and field-crop production.
7. **Biological asset:** a living animal or plant of economic importance;
8. **Artificial insemination:** A technique used for inserting the semen into the female reproductive tract by artificial means.
9. **Biological transformation:** comprises the processes of growth, degeneration, production and procreation that cause qualitative or quantitative changes in a biological asset.
10. **Breed:** A population of animals which produces progeny possessing a high degree of genetic stability as evidenced by identifiable uniformity in phenotypes and performance.
11. **Crop:** A cultivated plant that is grown commercially.
12. **Disease:** refers to symptoms or body changes or one of the two that may indicate either an infection or abnormal body function.

13. **Domestic animal**: Any animal kept on land, in water, forest or any wild animal locked up in a given area. Refers to all mammals, birds, fish and bees.
14. **Farm**: A site or premises where livestock/plants are kept.
15. **Farm management:** Farm management is the science (and art) of optimizing the use of resources in the farm component of farm-households, and of achieving the optimal functioning of these systems in relation to specified objectives.
16. **Firewood:** Wood used for fuel.
17. **Forest:** A land with a minimum 10 % tree crown coverage (or equivalent stocking level), or formerly having such tree cover and that is being naturally or artificially regenerated or that is being afforested. Or an area of land that is at least 0.05 ha in size, which has a tree crown cover of more than 6 %, and trees have the potential to reach a minimum height of 2 m at maturity. A tree is understood as a perennial plant with a single main stem and usually developing branches at some height.
18. **Forestry management plan:** A forest management plan is a guide and a tool to help make decisions, look at options, and plan for the future. It includes goals and objectives, a detailed property description and resource inventory, and a list of management recommendations with an activity schedule.
19. **Quarantine:** Refers to measures taken to follow-up livestock entered in a given area of the country so as to know exactly their health status and to stop the disease from spreading.
20. **Species:** A group of related animals or plants belonging to the same biological classification which can freely interbreed to produce fertile progenies.
21. **Timber**: It is a piece of wood cut from the trunk which can be used for constructing houses, boats, furniture, etc.
22. **Tree:** Woody perennial having generally one main stem and capable of reaching at least 7 meters at maturity. Or any perennial plant of at least 6 meters tall at maturity, having a stem and an upper part consisting of branches and leaves.
23. **UR User Unit**: UR academic and/or administrative unit, requiring UR Farm services; e.g. College (s), School (s), Department (s), Project (s), UR recognized Association (s) and/or club (s), etc.
24. **Veterinary Doctor:** a person with a Bachelor's Degree in veterinary medicine from a recognized university or a higher learning institution;
25. **Veterinary Profession:** A profession relating more particularly to the following:
    a. Curative and preventive veterinary medicine;
    b. Animal reproduction;
    c. Veterinary pharmacy practice and use of inputs and livestock equipments;
    d. Hygiene and quality of animal products;
    e. Wild animal medicine.
26. **Woodlot:** Land not defined as "Forest", spanning more than 0.5 ha; with trees higher than 5 m and a canopy cover of 5 % - 10 %, or trees able to reach these thresholds; or with a combined cover of shrubs, bushes and trees above 10 %. It does not include land that is predominantly under agricultural or urban land use.

1.4. Goals and Objective of UR farm management policy

1.4.1. UR farm goals

02 The primary purpose of UR farms is to support academic teaching, by collaborating with all School and Department research projects and showcasing innovations to surrounding communities, for agriculture and livestock promotion.
03 Subsequently, UR farms serve as a supplement to institutional budget support by generating income, as result of farm activities, but not to the detriment of academic and research programs.

1.4.2 Objectives

04 The overall objective of the Policy is to ensure development and a sustainable management of UR agricultural and biological assets for an efficient use in various academic activities, in the most acceptable standards, scientific, financial, safe and ethical ways.

05 Specifically, the policy aims at ensuring the following;

- Efficient allocation of resources to different **UR User Units** for teaching, research, community outreach, etc.
- Meeting standards in biological stock management and wellbeing of animals, for the validity and effectiveness of research and teaching activities/outputs.
- Ensure an optimized productive capacity and cost effectiveness of UR agricultural farms.
- Ensure a sustained income generation and moderation of UR budget exposure.
- Ensure the health and safety of farm/animal and animal care personnel.
- Offer a safe hub for conservation-both *in situ* and *ex situ*-of indigenous and endangered genetic resources (species).
- Serve as model demonstration farms for the community.

1.5. Application and scope of the policy

06 The Policy applies to all UR farms and farm resources, including crops and animal farms, fishponds and other aquatic resources, greenhouses and forests. This policy will help decision makers, top managers and staff to obtain guidelines and regulations on how to use farm resources.

CHAPTER 2. POLICY INSTRUMENTS

07 Significant policy and legal achievements are needed, at UR and country level, in a continuous support to the management of UR farms and biological assets. The list is extended to regional and international instruments, as follows;

a. Key policy Instruments *Policies, laws, tools, regulations, guidelines* in Rwanda

i. Vision 2020: Republic of Rwanda [The Government of Rwanda (GoR), 2000].
ii. Rwanda Forestry policy and law of 2010.
iii. Law N° 38 of 23/09/2013, establishing creation and organization of the University of Rwanda [Official Gazette of the Republic of Rwanda, September 2013].
iv. Law N° 32/2002 of 06 November 2002, with regard to animal identification, Official Gazette date on 06th November2002 [The Government of Rwanda].
v. Law N° 54/2008 of 10/09/2008, determining the prevention and fight against contagious diseases for domestic animals in Rwanda [The Government of Rwanda].
vi. UR Revised Organizational Structure [University of Rwanda, 19th August 2015].
vii. UR-PGS Research Scrutiny and Ethics Clearance Committee (For experiments involving human and animal contact handling).
viii. UR farm Selling Committees (UR Campuses).
ix. Decisions and guidelines issued by the college.
x. Law on agricultural chemicals use in Rwanda (pesticides and fertilizers).
xi. Land laws of Rwanda.
xii. Any other guidelines that will come into effect during the implementation.

b. *International Treaties and Agreements*

i. EAC Protocol on Environment and Natural Resources Management.
ii. The Convention on Biological Diversity (1992).
iii. The Convention on Biological Diversity Strategic Plan for Biodiversity 2011-2020 (2010) and ***CBD Guidelines*** *[Addis Ababa, 2002 (2004); Nagoya Protocol-ABS (2010); Cartagena Protocol on Biosafety (2003)-Rwanda is signatory country member (Rwanda Clearing House Mechanism-CHM); WIPO-Rwanda is member state, since 1984].*
iv. Good Agricultural Practices (GAP – FAO).
v. International treaty on germplasm conservation.
vi. Manual of Diagnostic Tests and Vaccines for Terrestrial Animals 2015 (http://www.oie.int/en/international-standard-setting/terrestrial-manual/access-online/).

CHAPTER 3. GENERAL GUIDELINES

3.1. Managerial frame

3.1.1. Administrative Structure of UR Farm (s) *(See Annex1)*

08 As the University of Rwanda (UR) works under the singular, multi-campus institution concept, operating throughout 6 Colleges, the proper management would be effective at UR Campus level. The farm management shall then be effective, as one single Unit Structure, for one or more UR Farm (s) in proximity of concerned UR Campus.

09 Each UR farm unit shall be managed by the Farm Manager (1), and shall comprise of the following key staff: Agronomy Officer (1), Veterinary/ Zootechnician Officer (1) and Cashier (1). Supporting staff (e.g. Casual workers, data collectors, farm attendant) shall be recruited on contract-merit, based on needs assessment submitted by the Farm Manager, detailing the ToRs for the requested staff (s).

The responsibilities of the Farm manager shall be as follows;

- To supervise and manage UR farm workers.
- Planning for funding and production to maintain farm progress.
- Marketing of the farm's products and developing strategies for increasing farm revenues.
- Monitoring plant and animal health
- Keeping financial records
- Maintaining the stock
- Collaborating with schools.
- Liaise with UR farm user units in having structures and activities in place that will make teaching of practical agriculture possible.
- Perform any other official duties as may be assigned by superiors.

10 Specialized personnel shall be appointed for identified specific tasks/activities as required by UR User Unit (s) by the User Unit Manager or requested by the hosting Farm Manager, based on need assessment. This concerns staff normally employed by UR (s); e.g. Agro-Forestry Officer (s), Veterinary Officer (s), Agronomist and Aquaculturist (s), Asset evaluators, Business designers, Entomologist etc. To meet specific needs and requirements of laboratory animal farm facilities, the services of a trained laboratory attendant (1) shall be required.

The policy will promote students' placement in farming activities whenever necessary and wherever applicable.

11 Request for appointment of specialized staff on a specific task/activity (s), shall be addressed to the concerned specialized schools and units by the farm manger through his/her supervisor. To each request shall be attached a ToR approved by the proposed technical team.

For some emergency activities (e.g.; dystocia, intoxication, disease outbreaks or other hazards), the appointment of a specialized staff shall be effective upon request from the Farm Manager. The request shall be directly addressed to concerned staff with a copy to College Principal/Campus Coordinator.

13 The UR farm manager shall be reporting to College finance unit for financial matters and to the Principal or Campus Coordinator or Campus Coordinator for technical matters, on a monthly basis and any time the reports are required.

3.2.2. Planning and implementation of farm activities

14 Planning and execution of all farm activities are the entire responsibility of UR Farm Manager (s), in line with the UR Campus (es) objectives and targets, on financial year.

15 Therefore, upon consultations with **UR User Unit** (s) and the Office of the hosting UR Campus Planning Unit and DF, the Farm Manager (s) prepares the **Farm Annual Plan and Budget (FAPB)** draft, and ensures a timely review by the College Council (CC) or UR Campus Council before its consolidation and approved by UR management.

16 For consistency, the **FAPB** would comprise the following important tools:

i. **Farm Annual Mating and Breeding Plan (FAMBP)** for animals; detailing the mating plan and the prediction of population growth during the specific financial year. The plan must take into consideration the actual farm carrying capacity, in order to keep animals in good nutritional conditions and preserve the healthy environment of the farm.

ii. **Farm Annual Nutrition and Feeding Plan (FANFP)** for animals; detailing the animal nutritional requirements and feeding plan, with specification on "**Actual Physiological Needs**" and "**Feeding Frequency**" for different categories of animals (species, age, production and reproduction states). The **FANFP** shall be drafted based on **FAMBP** information, and the actual carrying capacity of the farm (s)-as a complement to pasture and/or fodder production where applicable.

iii. **Farm Annual Hygiene and Health Plan (FAHHP)** for animals; detailing hygienic and sanitation requirements, vaccination plan and other disease-hazard prevention operations (treatments against all kind of parasites and vectors, dehorning, hoof and beak treatment, etc). The **FAHHP** shall be drafted based on

FAMBP information, and the actual farm health status. Health hazards-epidemics and disease outbreaks-would be taken into account, following instructions from relevant health authorities,

iv. **Farm Annual Cropping Plan (FACP)** for all kind of crops, including mushrooms, silkworms and forests; detailing available land-space for cropping, adequate quantity of inputs (including labor requirements) and post-harvest handling,

v. **Agricultural inputs pan:** Detailing the quantities and timeliness of purchase of inputs to ensure maximum utilization and efficiency of UR farm operations.

vi. **Land use plan:** Land-use planning is the systematic assessment of land and water potential, alternatives for UR farm land use and economic and social conditions in order to select and adopt the best land-use options. Its purpose is to select and put into practice those land uses that will best meet the needs for research, innovation, community outreach, teaching and learning while ensuring sustainability. The driving force in planning is the need for change, the need for improved management or the need for a quite different pattern of land use dictated by changing circumstances.

vii. **Marketing and selling plan:** pricing strategy, quality assessment inspection, packaging, disposal and sale of by-products derived from the farm.

viii. **Environmental management plan and waste disposal.**

ix. Other specific and highly technical Farm Plans, e.g.; Fishponds, water resources, greenhouses shall be done in consultation with hosting/relevant **UR User Unit (s)**, as per appropriate technical and management dispositions.

x. Forest management plan shall include the inventory of scattered trees, woodlots and forest stocks.

17 In order to cater for eventual incidentals, in activity plan and/or allocated budget, a reasonable emergency budget will be considered in planning.

3.2.3. MONITORING AND EVALUTAION

18 Monitoring and Evaluation of farm activities shall be done in conformity with UR rules and regulations. The UR/College Planning Specialists shall bear responsibility of organizing and carrying out M&E activities on a continuous and regular basis, in collaboration with UR Farm Manager (s).

3.2.4. Reporting

19 The report should comprise both the "Technical" and "Financial" components. This shall mainly include the amount of executed activities, current status of biological assets (categories and number of animals' space occupied by crops, produce, health and environment status, etc.), occurring incidentals and management shortcomings.

22 For consistency, it will be compulsory for all UR farms to use the same reporting template, for a coherent M&E. At this end, the UR Planning Specialist (s) shall assist Farm Managers to design such management tool.

3.2.5. Specific consideration to academic, research and community outreach

23 Activities related to teaching and research shall be considered with undeniable priority, during the Farm Annual Planning as well as the implementation process of UR farm activities.

24 Therefore, prior to the Farm Annual Plan and Budget drafting, the UR Farm Manager (s) must invite all UR User Unit (s) in writing, to join the planning exercise. The invitation must be sent to all User Units and a budget seminar held at least three (3) months ahead of the following financial year.

25 Concerned UR User Unit (s) and partners shall timely plan academic research, innovation and-community outreach activities and get the plan (s) approved by Departmental Council (s) and School Council (s).

26 UR User Unit's Plan (s) shall comprise all relevant academic, research and community engagement endeavors (Student internship, implementation of research and/or development projects, teaching and field activities, demonstration plots/practices, etc.), as requested by UR relevant authority.

27 Once approved, academic innovation and research-community outreach plan (s) will be submitted by the Dean of School to concerned UR Farm Manager (s), with copy to UR/College Planning Specialist and DF, for further planning process.

28 The submission of UR User Unit's plan(s) to Farm Manager(s) should be effective at least **two (2) months** ahead of the end of UR planning process, of the following financial year to allow appropriate compilation and allocation of required resources (Plots, greenhouse space, animals, water and forest resources, et.) and inputs, by the UR Farm Manager(s).

29 Resources shall be allocated to activities that have been planned in a timely manner. The allocation of farm resources shall then be done on a **"First come, first served"** basis, in order to promote timely delivery.

30 For any research conducted on farm, the concerned farm User Unit (s) shall prior to submission of request for farm resource (s)-apply for research and ethic clearance (See UR Research Scrutiny and Ethic Clearance Committees, College or UR DRPS levels). Upon successful research clearance, the request shall then be considered by UR Farm Manager (s).

3.2.6. Requesting UR farm facility-service

31 In all circumstances, the primary role of UR Farms shall be teaching, research and community outreach, and this concept shall be undeniably recognized.

32 UR Farm resources and/or services (Land, animals, crop-plots, seeds, equipment, records/documents, manpower, etc.), may be subjected to regular request (s) from all inquiring UR User Unit (s), for various teaching-research or community outreach activities/programs, on availability basis. The priority in allocating resources shall be given to existing planned activities.

33 Subsequent requests should be addressed to UR Farm Manager (s) by the requesting UR User Unit (s) Manager at least 10 working days before the execution of requiring activity/task. Appropriate Request Forms shall be used. The forms shall indicate the date of request, purpose of use clearly stated, the requesting UR User Unit (s), the solicited UR Farm (s), the nature and quantity of requested resource (s), the required procedure (s) and/or protocol (s) for ensuring necessary animal wellbeing and biosafety (handling, where applicable), as well as the estimated cost for reporting purposes.

34 The Head of Department shall endorse all teaching related requests, and executed activities shall be reported as part of the monthly Farm Report by the Farm Manager. For other requesting User Units (other than Department), the corresponding Dean of School shall approved the requests.

35 All products derived from the farm shall be property of the campus where the farm is based. In case of external farm users, this will be on mutual agreement between the external partner and campus.

CHAPTER 4. GUIDELINES ON REGULAR FARM MANAGEMENT

4.1. Animal/Plot Identification and Recording

36 Animal/Crop recording shall form the basis for improving animal productivity through better farm management. It is expected to provide information that will allow UR Farm Manager (s) to take action to improve the productivity and health of farm animals, food safety, and to enhance the quality of their products.

37 In order to achieve the above purposes, the animal recording system shall comprise of four key components. These are:

a. Animal identification and registration (**I&R**) [(1)];
b. Animal traceability (**AT**) [(2)];
c. Animal health information (**AHI**) [(2)] and;
d. Performance recording (**PR**) [(1), (3)].

Similarly, the inventory of crops/trees on farms shall be done by recording the following information:

a) Species
b) Varieties
c) Date of planting
d) Diseases and pest status
e) Yield estimate/productivity

38 The animal identification and registration (**I&R**) component shall form the core of the system, as it provides information to support the other components.

---

(1) **ICAR standards, rules and guidelines:** *The ICAR International Agreement of Recording Practices, which contains voluntary standards, rules and guidelines concerning all aspects of animal recording* [http://www.icar.org/pages/recording_guidelines.htm],

(2) **OIE guidelines on identification and traceability of live animals:** *General principles on identification and traceability of live animals, adopted by the OIE/ Terrestrial Animal Health Standards Commission in 2007, as official OIE standards* [http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_1.4.1.htm.],

(3) **FAO secondary guidelines: Animal recording for medium input production environments:** *Secondary guidelines for development of national farm animal genetic resources management plans – animal recording for medium input production environment (1998); Guidelines from CGRFA/WG-AnGR-8/14/ Inf.6 (October 2014)*[http://www.fao.org/AG/AGAInfo/resources/en/pubs_gen.html]

39 Animal/Crops/Trees identification and registration shall refer to identification and registration of premises-Keeper-owner (UR Farm), Bloc (s), Box (For pre-weaning animals, poultry, rabbits, laboratory animals, and other small stock) and animals (Limitation to large animals).
Field plots shall be partitioned and users of different parts of the land shall be clearly identified and type of research projects clearly specified in research books. For proper land management, allocation of crops to plots will be based on rotational system and specificity/nature of the project in collaboration with the UR user unit and farm manager.

4.1.1 General guidelines

40 In regards to identification and registration of animals, the following will be taken into account;

a. Whether it is required to identify animals individually or by group, they need to be identified with a device and an identification code (ID code) that is appropriate both for the species and the purpose for which it is applied;
b. For some species such poultry, it may be sufficient to identify animals with a group code representing the premises of origin and to register all group movements;
c. For others, such as cattle and pigs, a unique lifetime identification code may be required for each animal to record its movement details or to control its performance;
d. The ID-code links the animal to the premises where it is kept;
e. While identifying an animal, certain data need to be collected and maintained at the premises and in the database.

41 Plastic ear tags are currently the most commonly used method of identification, and shall be recommended for use in UR Farms. They are cheap but may be lost; loss rate should not exceed five percent per year. The use of two identical plastic tags per animal, one in each ear enables an animal to be identified even if it loses one tag; the probability of losing both tags is extremely low.

42 Ear tags can be removed and replaced easily. For this purpose, identification devices shall be tamper-proof or at least tamper-evident. In addition, identification devices shall not pose risks to animal welfare during the lifetime of the animal.

4.1.2. Registration of animals

43 The data that shall be collected at the time of registering an individual animal, preferentially at birth, and these shall include:

a. ID Code,
b. Date of birth,
c. Sire and Dam ID (**Pedigree information**), and
d. Breed.

44 Certain additional data may be collected if I&R supports other animal recording system's components. For example, details of animal movements, including the date, are required for animal traceability systems; health status and individual restrictions are required for animal health information systems.

4.1.2. Animal traceability (AT)

45 In this case, traceability refers to the ability to trace animal products along the value chain. When developing an AT system, it shall therefore be essential to identify the desired objectives of such a system before defining its individual elements.

46 Depending upon the objective, specific requirements shall be recorded, including the sire ID, dam ID (this is important for tracing vertically transmitted diseases such as Bovine Spongiform Encephalopathy (BSE), Brucellosis, etc.), the health status and vaccination history of the animal and information concerning treatments.

4.1.3. Animal/plant health information (AHI)

47 Animal and plant health information systems shall be adopted and applied within the UR Farms, as a tool to fulfill specific objectives.

48 For each suspected and confirmed case of a disease, the minimum data elements that shall be collected, as adapted to various species, shall include the following:

- **a.** The disease in question (sometimes the identification of the strain or the subtype/serotype can be fundamental);
- **b.** The location of the disease outbreak (the ID code of premises involved, with related geographic coordinates);
- **c.** The species of animals affected (demographic data on infected premises);
- **d.** The time and date on which the disease first occurred (date of first clinical signs, date of first suspicion, date of confirmation);
- **e.** How the infection has been detected, and what initially raised suspicion;
- **f.** Which control measures have been put in place to limit the spread of the disease;
- **g.** The results of epidemiological investigations, both to identify the origin of the infection and any other premises that may have been exposed to the infection.

Plant Health information: plant Health information system shall be adopted within the UR farms, as a tool to fulfill different objectives. For each suspected case of disease or pest, the following information that shall be collected:

- **h.** The disease or pest in question, symptoms identified, strains identified,
- **i.** Extent of disease, incidence and severity of disease, area affected
- **j.** Varieties affected,
- **k.** Dates on which disease or pests occurred,

l. Visual symptoms of diseases identified,
m. Which control measure are put in place to limit the spread of disease/pest
n. Data on the causal agent/host of disease.

4.1.4. Animal /Plant performance recording (PR)

49 Performance recording will involve the objective and systematic measurement of various indicators of animal and plant performance. Data such as animal/plant physical characteristics, parentage and relevant events, may also be collected. A list of recommended measurable traits (non-exhaustive) is available in **Annex 2.**

4.2. Breeding (mating) and culling animals

4.2.1. General guidelines

50 Farm animals are raised for producing products such as meat, milk, eggs, etc. In order to be most productive and profitable, the animals must be bred with appropriate ages and sizes, to maximize production and minimize dystocia and other health problems.
To accomplish this, most groups of animals shall be separated by age and sex, at least seasonally or annually for non-seasonal animals.

51 Separation of animals by age and sex should be done to manage reproduction (preferentially using artificial reproduction), allowing specific genetically superior animals to be used for breeding and mated to other animals that have been selected by proven scientific methods and genetic evaluation.

52 Animals that do not meet the minimum criteria for size, production or health, will be culled from the herd or flock.

4.2.2. Genetics and Nomenclature

53 Genetic characteristics are important in regard to the selection and management of animals for use in breeding colonies and in biomedical research. Hence, pedigree information should be systematically recorded, to allow appropriate selection of breeding pairs and of experimental animals that are unrelated or of known relatedness. For plants, breeding programmes shall accurately record the genotype of parents, F1 and subsequent generations, and records/data shall be carefully maintained for reference whenever required. Clear protocols shall be followed for crops with high heterogeneity such as maize. Seeds for parents and hybrids should be conserved for future use.

54 For all categories of animals, founding populations should be large enough to ensure the long-term heterogeneity of breeding colonies and necessary genetic variability, needed for further selection purposes.

4.3. Nutrition and watering

4.3.1. General guidelines

55 Farm animal nutrition is the basis of good animal management. Therefore, individual nutrient and intake requirements for each species of farm animal raised on the UR farms shall use documented, research and established guidelines. Similarly use of fertilizers is paramount in the process of crop productivity and type as well as amount of fertilizer applied shall be recorded. As such historical information of soil fertility status should be known to allow data collection over a relatively long period. For long-term experiments, systematic and secured data storage mechanisms should be envisaged (CD, DVD, documentary films, etc).

56 Each animal species has different feed requirements based on their digestive system (ruminant versus monogastric) and also their age, production and reproductive status. It is therefore imperative that the animals on each farm are provided with feed appropriate to their digestive systems, species, production level and requirements. For crops, fertilizers shall be applied at specific stage of plant phenology, and at recommended rates. Different fertilizer application rates shall be tested for refinement of fertilizer recommendation. Crop response shall be recorded in form of plant growth, development and yield. Agronomic and economic returns will be estimated using clear and scientifically verified indicators.

57 Animal feeds shall provide inappropriate quantities, qualities, and feeding frequencies that will optimize the performance and health of the animals. Fertilizers may vary in quantities and qualities and applied at different rates and frequencies with the aim of optimizing crop productivity.

58 Feeding files will be designed and posted on each animal box-bloc, with strict consideration of animal categories; by age, sex, physiological needs, health and production status, etc. Individual files shall be kept for lactating dairy cows, furrowing sows as well as sick and injured animals. Agronomic studies will be conducted following indicated designs, allocating specific treatments to individual plots. Appropriate parameters will be measured while evaluating the effects of treatments on tested crops. Each plot will be having a recording fiche for proper historical data record.

59 The feeding files shall indicate the actual nutritional requirement for the animal (s) and/or group of animals, the composition of the distributed animals (including feed additives and eventual supplementations), the date of feed manufacturing (processing), as well as the feeding frequency per day. The Department of Animal Production of UR CAVM shall be well resourceful to assist in this endeavor. For crop performance records, the protocols shall be developed and provide information on plant test, date of fertilizers and pesticide application, as well as frequency of application.

60 Feeding animals should be done upon consideration of specific treatments of nutrient requirements (See National Research Council Committee on Animal Nutrition-NRC 1977, 1978, 1981a, b, 1982, 1983, 1984, 1985a, b, 1986, 1988, 1989a, b, 1994, 1995).

4.3.2. Specific considerations for regular feeding

61 To ensure proper farm management and smooth running of activities farm inputs shall be regularly available on UR Farms.

62 To this end, it is strongly recommended to have a functional feed processing unit, at least on every UR Campus hosting UR Farm (s). Such small units comprise of a grain blender and a mixer and shall be purchased and maintained as per the farm annual plan.

63 Alternatively, tailored feed processing equipment shall be locally designed and assembled by UR staff/students, in a research-industry fashion. Interested/indicated Department (s) shall be allocated essential resources (budget, human resources, workshops, etc) for this UR invention. The related IPRs should then be negotiated between UR and Research Industry Team.

64 Other inputs (raw materials and feed additives) shall be normally purchased and wherever possible, produced on UR farm as part of the Farm Annual Nutrition and Feeding Plan (FANFP), from the UR ordinary budget.

65 To maximize the benefits of having feed processing facility at UR farms, the processing of animal feeds shall be done, on request from UR Farm Manager (s), by students from concerned Departments (Animal Production, Veterinary Medicine, etc), as part of their academic training (teaching, research, internship). This timely processing shall avoid long storage periods, exposing feeds to unwanted feed quality deterioration and spoiling, especially by aflatoxin contamination[1]. Appropriate feeding guidelines and standards shall be consulted for this activity. Storage facilities shall be available on UR campuses to ensure grains are properly conserved. Guidelines for grain, pulse and tuber storage should be strictly followed putting more attention on post-harvest practices recommended for agricultural products. Seed produced and conserved for the next season shall be kept in appropriate conditions to ensure its viability.

66 Consistently, UR farm animals shall be fed palatable, non-contaminated, and nutritionally adequate food daily according to their particular requirements unless the protocol in which they are being used requires otherwise.

4.3.3. Specific considerations for water availability

67 The policy recognizes the extreme need for water, in quality and quantity, for diverse farm purposes. It is essential that cheap and regularly available water supply becomes a pre-requisite for normal operations of any UR Farm, for animal crop, and nursery watering as well as all sanitary purposes.

68 To ensure regular supply of water, all UR Farms shall be equipped with water harvesting systems, allowing water filtration and storage in appropriate reservoirs. Underground reservoirs present superior advantages, to keep huge quantity of water with very low exposure to evaporation, allowing regular water supply throughout all seasons.

4.4. Weed control and use of fertilizers

69 Weed control and fertilization schedules should be part of Farm Annual Planning, as advised by the Farm Manager (s).

70 In some specific conditions (research and demonstration plots), the application of fertilizers shall be recommended after thorough soil analyses, to avoid soil deterioration (biological, chemical and physical properties) and/or exposure to environmental pollution.

71 For generalized fertilization schedules, the UR Farm Manager (s) and UR User Unit (s) shall consult the "National Fertilizer Policy" for compliance.

4.5. Health management

4.5.1. Sanitation

72 Sanitation, the maintenance of conditions conducive to health and wellbeing of both humans and animals shall be the basis of the UR farm health protocol/plan (See FAHHP), which shall be kept at farm level and well monitored for health records, throughout the financial year. Its content should be clear enough, for appropriate interpretation (s) in a case of disease outbreak or other major health shortcoming event.

73 The sanitation plan shall involve regular schedules for cleaning, and disinfection.

4.5.2. Waste management

74 Conventional, biological, and hazardous waste shall be removed and disposed of regularly and safely (NSC, 1979) as per REMA guidelines and procedures.

75 Each farm shall be equipped with a reliable disposal facility, with preference to those offering a second production option; biogas production unit, manure compost production,

etc.

76 There are several options for effective waste disposal, and some unusual operations may require specific handling. Therefore, prior to any operation, appropriate manuals should be consulted to ensure regulatory compliance and safety. On-site incineration and/or burial should comply with approved regulations (REMA, MININFRA). It is highly recommended that UR develops its own policy regarding biological waste management.

4.5.3. Pest Control

77 Programs designed to prevent, control, or eliminate the presence of infestation by pests are essential in an animal environment. A regularly scheduled and documented program of control and monitoring should be implemented, in consideration of established guidelines (OIE, FAO).

4.5.4. Emergency, weekend and holiday care

78 The policy recognizes the fact that animals must be cared for by qualified personnel every day, including weekends and holidays, both to safeguard their wellbeing and to satisfy research requirements.

79 Therefore, emergency veterinary care should be available after work hours, on weekends and on holidays. The UR Farm Manager (s) shall keep in contact with appointed Veterinary Officer (DVM, see section 3.2.1), and maintain necessary records for veterinary care services for appropriate interpretation (s) in a case of disease outbreak or other major health shortcoming event. The additional working hours shall then be remunerated as "Supplementary Hours", as per UR regulations.

80 In the event of an emergency, institutional security personnel and fire or police officials should be able to reach people responsible for the animals. That can be enhanced by prominently posting emergency procedures, names, or telephone numbers of personnel in all UR Farms.

81 In addition, a disaster plan that takes into account both personnel and animals shall be prepared as part of the overall safety plan for animal facilities in UR farms.

82 All UR farm activities and assets shall regularly be entitled to an appropriate insurance, to cover potential incidentals and disasters, which could affect both the personnel and property.

4.5. Management and rearing of young animals

81 Young animals will be raised according to the best management practices recommended, to include animal identification at birth, and the provision of colostrum in adequate amounts to ensure good passive antibody transfer within hours of being born.
82 Animals shall be housed in clean, dry quarters, and will be weaned at an age and size appropriate to the animal' health and wellbeing.

4.6. Management of special Facility-Greenhouse, fishpond and forest

83 Specific guidelines for the management of greenhouses, fishponds, forests and other particular UR agriculture facilities, shall be determined in consultation between the UR User Unit (s) and the Farm Manager as a "Contract of Service" and approved by the hosting College Council or UR Campus Management Council.

84 In the absence of a valid "**Contract of Service**", the management of the special facility (s) shall be the entire responsibility of the UR Farm Manager (s).

CHAPTER 5. GUIDELINES ON BIOLOGICAL ASSETS MANAGEMENT

5.1. Scope

87 The Policy recognizes the necessity to adhere to reliable standards for the management of all "Biological Asset (s)" of UR Farms, and recommends to this end the adoption of the International Accounting Standards IAS 41-Agriculture (2000). The guidance applies to biological assets, agricultural produce at the point of harvest, and government grants received for agriculture activities.

88 IAS 41 makes a distinction between biological assets and agricultural produce. The guidance does not apply to agricultural related land or intangible assets as these items are covered by other accounting guidance (IAS 16, "Property, plant and equipment", IAS 40, "Investment Property").

89 Fore guidance, Table1 displays items included and excluded from the IAS 41 guidance, as recognized by this Policy for UR Farms compliance.

Table 1: Indicative content of assets and products included in IAS 41 guidance

Included	Included	Excluded
Biological assets	**Products**	**Products resulting from processing after harvest**
Sheep	Wool	Yam, threads, carpets
Plantation trees	Felled trees i.e., Logs	Boards, plywood, rubber
Plants and shrubs	Cotton	Threads, cloth
	Sugar cane	Sugar, molasses
	Leaves	Tea, tobacco
Dairy cows	Milk	Ice cream, cheese
Stocker animals	Calves, carcasses	Steak, hamburger
Pigs	Carcasses	Sausages, cured ham, bacon
Chickens and turkeys	Eggs, carcasses	Meat for consumption
Vines	Grapes	Wine
Fruit trees	Picked fruit	Processed fruits

90 Under this Policy, the produce or harvest from a biological asset (See examples in column 3 in Table1) will be transferred to inventory at fair value less costs to sell and thereafter accounted for in accordance with IAS 2 ("Inventories").

91 However, while the produce is still growing or still attached to the biological asset, its value shall form part of the value of the biological asset.

5.2. Inflows and outflows

5.2.1. Procurement

92 Effective procurement affects inventory control by obtaining the right items in the best qualities and correct quantity for the value for money at the right time. Once menus are planned, a list of items to be procured shall be developed so that only items planned for are purchased.

93 Considering the difficulties faced during the procurement of farms items, UR shall use the MoUs with various partners such as local and international companies, universities, institutions and Ministries to acquire some goods and services for farms where applicable. The Price will be based on selling prices that will be contrary to the local market prices. The established MoUs will aid the purchase items of high standards. The University also shall identify potential suppliers for specific research items and critical criteria shall be established for selection of the required items. The review and selection committee shall recommend items based on the current MoUs/Technical specifications to provide critical points for the next decision on delivery. The contract shall be awarded and or renewed on either periodical or seasonal basis.

94 The university will establish exhaustive checklist for the needed items to be procured on local and international firms. The University has the responsibility to ensure that an application for none objection or exemption of taxes is applied where applicable in procurement of goods and services. The university shall provide Debit cards for purchase of items in emergency cases and/or fresh products. The University will put in places guidelines on the use of Debit Cards. However, all purchased items shall be recorded in the campus store for accountability purpose.

5.2.2. Transport

5.2.3. Transformation of biological assets

95 The policy recognizes biological transformation as a natural change in a biological asset. It includes growth of living animals or plants, reduction in output due to age or disease and the production of new biological assets through a managed reproductive programme.

5.2.4. Cash flow management and disclosure (*Inventory-Reporting*)

96 The cash flow model for UR farms shall include all directly attributable cash inflows and outflows and only those cash flows. The inflows shall be the price in the market of the farm products (crops and animal, forest products); the outflows shall be those incurred while raising or growing the asset and getting it to market. For example, direct

labour, feed, fertilizer and transport to market.
The fraction of 30% of income generated as petty cash of farm will be released on request by the farm manager through the line manager.

This request must be done based on report on revenues collected for the period of three months. The report must show the expenses incurred in terms of agriculture inputs, animal feeds, casual workers' salaries, etc used in farm activities and the revenues collected.

The fraction will be calculated on the net income collected after these expenses mentioned above.

The payment of this petty cash cannot exceed the threshold of 500,000 Rwf if 30% requested is above this threshold. This amount can be modified by the UR management any time if needed.

The petty cash will be managed separately with the usual petty cash managed at college/campuses. The management of farm petty cash is done by the cashier of the farm or the tasks can be assigned to the farm manager if there is no cashier in farm. The Cashier manages the Petty Cash which is kept in a locked safe. The Cashier is personally responsible for the money received.

Replenishment of the Petty Cash and Payment

Before the request of petty cash, the farm manager must ensure that all required supporting documents are available and then after forward the request to the line manager (e.g. : campuses manager) for approval. After approval, the request is addressed to the DF for payment authorization. After the above mentioned procedure, the Petty Cashier will affect the payment against the request.

Before any payment, the cashier should ensure that the person receiving the cash signs the voucher, and the voucher should be stamped **"PAID"**.

The cashier should ensure that all petty cash payments are recorded in the petty cash book on daily basis and reported on monthly basis. The record should display, date, serial number of voucher, operation/activity to be paid, and amount paid. The replenishment of the Petty Cash should take effect when the Petty Cash has been spent by 80% of funds received for the previous request.

The line manager carries out unexpected controls of the Petty Cash, at least once per two weeks. These controls are recorded on the cash statement form.

97 If significant additional assets shall be used to support the biological asset, the cash flow model should reflect the economics of this model; otherwise the fair value will be

overstated (e.g. If a farm owns its land, the cash flows should include a notional cash outflow for "rent" of the land to be comparable with the asset of a farm that rents its land from a third party). The fair value of a biological asset shall then be independent of the land on which it grows or lives.

5.2.5. Stock management (Selling centers)

98 The Policy recognizes the "**Market**" as where the asset will be sold. To a certain extent, the sales will be done on actual market, as part of "Public Auction", especially those concerning culled animals, forest products and other important assets.

99 For other biological assets as well their products, as recognized within the IAS 41, sales would be effective at the **"factory/farm gate",** where UR Farm Selling points shall play a preponderant role.

100 The Farm Selling points at UR Farms shall be operated by **"Cashier (s)"**, reporting to College/Campus DF. Besides the selling role, the Farm Selling points represent the closest gate towards community surrounding UR Farms; hence being an evident community outreach entity. Their management shall be improved, and the cashier roles recognized (Post featuring within the UR Structure) and supported, by offering him/her appropriate trainings. He/She shall then report to UR Farm Manager (s).

101 Additionally, a fraction (30%) of income generated by the UR Selling points shall be transferred to an approved UR Farm Account (s) and recognized as **"Farm Petty Cash".** This fraction shall allow direct investment (s) to support regular farm activities and/or incidentals, as well as farm development agenda. The practice would contribute to reduce the occurrence of unwanted bureaucratic hindrances in farm activities, leading to serious loss; e.g. delays in cropping seasons, starving animals (malnourished), inadequate input supply, etc.

5.3. Measurement and fair value

102 The Policy recognizes the current definition of fair value in IAS 41[1] as the amount for which the asset could be exchanged between knowledgeable, willing parties in an arm's length transaction. This represents a market price for the asset based on current expectations.

103 For consistency, established "Farm Selling Committees" at UR Campus levels shall play a pivotal role in adopting the IAS 41 guidelines, for a fair valuation of UR Farm

[1]IAS 41 includes an unofficial hierarchy of valuation measures, similar to those found in IAS 36, 'Impairment of assets', and IAS 39, 'financial instruments: Recognition and measurement'.

biological assets. Whenever necessary, appropriate capacity building/trainings should be organized to equip the UR Selling Committees with adequate insight in this matter.

CHAPTER 6. CARE AND USE OF FARM-LABORATORY BIOLOGICAL ASSETS

6.1. Animal environment housing and management

6.1.1. Physical environment

104 It is important that UR Farms set a standard or model to which other farms aspire, providing an optimal environment for production and minimizing disease. For consistency, guidelines and standards shall be established with the assistance of the Department of Animal Production and Veterinary Medicine of UR CAVM for a wide compliance across all UR Farms. This shall consist of both Microenvironment and Macro-environment aspects.

105 The physical environment provided for farm animals must be appropriate for the species, the production level, age and dietary needs. It must also take into account the need for shelter from the elements as appropriate for each species. Furthermore, the cleanliness of the animal environment on UR Farms shall be of a standard above the small and commercial farms.

6.1.2. Housing and stocking density

106 Animal space needs are complex, and consideration of only the animal's body weight or surface area is insufficient. Therefore, the space recommendations presented here (**Table 2, Table 3and Table 4**), are based on professional judgment and experience and should be considered as recommendations of appropriate cage sizes for animals under conditions commonly found in farms and laboratory animal housing facilities.

Table 2: Recommended space for commonly used group-housed laboratory rodents

Animals	**Weight, g**	**Floor Area/Animal, in^2*a***	**Height.*b* in**
Mice	<10	6	5
	Up to 15	8	5
	Up to 25	12	5
	>25*d*	>15	5
Rats	<100	17	7
	Up to 200	23	7
	Up to 300	29	7
	Up to 400	40	7
	Up to 500	60	7

	>500*d*	>70	7
Hamsters	<60	10	6
	Up to 80	13	6
	Up to 100	16	6
	>100*d*	>19	6
Guinea pigs	<350	60	7
	>350*d*	>101	7

a To convert square inches to square centimeters, multiply by 6.45.
b From cage floor to cage top.
c To convert inches to centimeters, multiply by 2.54.
d Larger animals might require more space to meet the performance standards.

Table 3: Recommended space for rabbits, cats, dogs and birds

Animals	**Weight, kg*a***	**Floor Area/Animal, ft^2*b***	**Height*cind***
Rabbits	<2	1.5	14
	Up to 4	3.0	14
	Up to 5.4	4.0	14
	>5.4*e*	>5.0	14
Cats	<4	3.0	24
	>4*e*	>4.0	24
Dogs*f*	<15	8.0	-
	Up to 30	12.0	-
	>30*e*	>24.0	-
Pigeons*j*	-	0.8	-
Quail*j*	-	0.25	-
Chickens*j*	<0.25	0.25	-
	Up to 0.5	0.50	-
	Up to 1.5	1.00	-
	Up to 3.0	2.00	-
	>3.0*e*	>3.00	-

Table 4: Recommended space for commonly used farm animals

Animals/Enclosure	**Weight. kg*a***	**Floor Area/Animal. ft^2*b***
Sheep and Goats		
1	<25	10.0
	Up to 50	15.0
	>50*c*	20.0
2-5	<25	8.5
	Up to 50	12.5
	>50*c*	17.0
>5	<25	7.5
	Up to 50	11.3
	>50*c*	15.0
Swine		
1	<15	8.0
	Up to 25	12.0
	Up to 50	15.0
	Up to 100	24.0

	Up to 200	48.0
	>200*c*	>60.0
2-5	<25	6.0
	Up to 50	10.0
	Up to 100	20.0
	Up to 200	40.0
	>200*c*	>52.0
>5	<25	6.0
	Up to 50	9.0
	Up to 100	18.0
	Up to 200	36.0
	>200*c*	>48.0
Cattle		
1	<75	24.0
	Up to 200	48.0
	Up to 350	72.0
	Up to 500	96.0
	Up to 650	124.0
	>650*c*	>144.0
2-5	<75	20.0
	Up to 200	40.0
	Up to 350	60.0
	Up to 500	80.0
	Up to 650	105.0
	>650*c*	>120.0
>5	<75	18.0
	Up to 200	36.0
	Up to 350	54.0
	Up to 500	72.0
	Up to 650	93.0
	>650*c*	>108.0
Horses	—	144.0
Ponies		
1-4	—	72.0
>4/Pen	<200	60.0
	>200*c*	>72.0

a To convert kilograms to pounds. multiply by 2.2.
b To convert square feet to square meters. multiply by 0.09.
c Larger animals might require more space to meet performance standards (see text).

6.2. Behavioural management

107 The behavior of farm animals, particularly poultry, swine and cattle must be observed and appropriate measures taken when groups of animals are maintained indoors. This is important to minimize conflict, injury and reduced health and production due to crowding or aggressive behavior. Standard guidelines shall be strictly applied for all UR Farms (OIE, FAO Standards).

6.3. Ventilation, illumination and noise

108 Ventilation: The purposes of ventilation is to supply adequate oxygen; remove thermal loads caused by animal respiration, lights, and equipment; dilute gaseous and particulate contaminants; adjust the moisture content of room air; and, where appropriate, create static-pressure differentials between adjoining spaces. Establishing a room

ventilation rate, however, does not ensure the adequacy of the ventilation of an animal's primary enclosure and hence does not guarantee the quality of the microenvironment. It is therefore recommended to observe the following guidelines on ventilation (**Table 5**) while designing UR Farm's housing.

Table 5: Recommended dry-bulb temperatures for common farm and laboratory animals

	Dry-Bulb Temperature	
Animal	**°C**	**°F**
Mouse, rat, hamster, gerbil, guinea pig	18-26	64-79
Rabbit	16-22	61-72
Cat, dog, nonhuman primate	18-29	64-84
Farm animals and poultry	16-27	61-81

109 Illumination: It is well documented that light can affect the physiology, morphology, and behaviour of various animals. Hence, attention will be put on potential photo stressors, including inappropriate photoperiod, photo intensity, and spectral quality of the required light, during the design and operation of UR Farms.

110 Noise: Noise produced by animals and animal care activities is inherent in the operation of an animal facility. Therefore, noise control shall be considered in facility design and operation. In addition, research to assess various potential effects of noise on an animal shall be encouraged to improve animal welfare and productivity in UR Farms. Considerations would be reserved towards factors such as the intensity, frequency, rapidity of onset, duration and vibration potential of the sound and the hearing range, noise-exposure history and sound-effect susceptibility of the species, stock or strain.

CHAPTER 7. VETERINARY CARE AND INTERVENTIONS

7.1. General guidelines

111 The Policy recognizes the role of veterinary care and intervention requirements to improve the welfare and productivity of UR Farms. Appropriate consideration shall be put on veterinary care and interventions as well as preoperative and postoperative care of farm animals in accordance with the "OIE Animal Welfare standards", especially in regards to the 5 freedoms highlighted below:

a. Freedom from hunger or thirst;
b. Freedom from fear and distress;
c. Freedom from physical and thermal discomfort;
d. Freedom from pain, injury and disease and
e. Freedom to express normal patterns of behavior.

Therefore, the Veterinary Officer at UR Farm (s) shall be a **"Veterinary Doctor"** in full right to exercise a **"Veterinary profession"** and registered and recognized by Rwanda Veterinary Council.

112 The Veterinary Officer shall then be the only person responsible for the veterinary care and intervention (s) at the UR farms. However, under good mentorship conditions, those responsibilities can be delegated to an advanced student (At least from Level 4) in veterinary and/or animal production.

113 The presence of an authorized Veterinary Doctor (Farm Veterinary Officer or the Supervisor) will be required during the time of the mentioned veterinary care and/or intervention.

7.2. Animal care and use protocols

114 Guiding protocols should be designed and systematically applied across all UR Farms in regards to animal care and use. It is recommended that the following components be considered in the preparation and review of animal care and use protocols:

- Rationale and purpose of the proposed use of animals,
- Justification of the species and number of animals requested. Whenever possible, the number of animals requested should be justified statistically,
- Availability or appropriateness of the use of less-invasive procedures, other species, isolated organ preparation, cell or tissue culture,
- Adequacy of training and experience of personnel in the procedures used,
- Specific housing and husbandry requirements,
- Appropriate sedation, analgesia, and anesthesia (scales of pain or invasiveness might aid in the preparation and review of protocols),

- Unnecessary duplication of experiments,
- Conduct of multiple major operative procedures,
- Criteria and process for timely intervention, removal of animals from a study, or euthanasia if painful or stressful outcomes are anticipated,
- Post-procedure care,
- Method of euthanasia or disposition of animal,
- Safety of working environment for personnel.

7.3. Physical restraint

115 Physical restraint is here recognized as the use of manual or mechanical means to limit some or all of an animal's normal movement for the purpose of examination, collection of samples, drug administration, therapy, or experimental manipulation. Animals are restrained for brief periods, usually minutes, in most research applications. Animals should be physically restrained briefly either manually or with restraint devices. Restraint devices should be suitable in size, design, and operation to minimize discomfort or injury to the animal.

116 When applicable, animals can be trained, through use of positive reinforcement, to present limbs or remain immobile for brief procedures.

117 When restraint devices are used, they should be specifically designed to accomplish research goals that are impossible or impractical to accomplish by other means or to prevent injury to animals or personnel. The following are important guidelines for restraint[2]:

- Restraint devices are not to be considered normal methods of housing,
- Restraint devices should not be used simply as a convenience in handling or managing animals,
- The period of restraint should be the minimum required to accomplish the research objectives,
- Animals to be placed in restraint devices should be given training to adapt to the equipment and personnel,
- Veterinary care should be provided if lesions or illnesses associated with restraint are observed. The presence of lesions, illness, or severe behavioral change often necessitates temporary or permanent removal of the animal from restraint.

7.4. Multiple major surgical procedures

118 Major surgery penetrates and exposes a body cavity or produces substantial impairment of physical or physiologic function. Therefore, multiple major survival surgical procedures on a single animal are discouraged but may be permitted if

[2] OIE, FAO Guidelines

scientifically justified by the user and approved by recognized regulations (OIE, IACUC). For example, multiple major survival surgical procedures can be justified if they are related components of a research project, if they will conserve scarce animal resources (NRC 1990), or if they are needed for clinical reasons.

7.5. Preventive Medicine-Handling

119 The following shall be considered while handling farm and laboratory animals in UR Farms ;

- Handling of all animals shall be done as expeditiously and carefully as possible in a manner that does not cause trauma, overheating, excessive cooling, behavioral stress, physical harm, or unnecessary discomfort.,
- Physical abuse shall not be used to train, work, or otherwise handle animals,
- Deprivation of food or water shall not be used to train, work, or otherwise handle animals; *Provided, however* that the short-term withholding of food or water from animals by exhibitors is allowed by these regulations as long as each of the animals affected receives its full dietary and nutrition requirements each day,
- During public exhibition (s), any animal must be handled so, there is minimal risk of harm to the animal and to the public, with sufficient distance and/or barriers between the animal and the general viewing public so, as to assure the safety of animals and the public,
- Young or immature animals shall not be exposed to rough or excessive public handling or exhibited for periods of time which would be detrimental to their health or well-being,
- Drugs, such as tranquilizers, shall not be used to facilitate, allow, or provide for public handling of the animals,
- A responsible, knowledgeable, and readily identifiable employee or attendant must be present at all times during periods of public contact,
- If public feeding of animals is allowed, the food must be provided by UR Farm and shall be appropriate to the type of animal and its nutritional needs and diet,
- When climatic conditions present a threat to an animal's health or well-being, appropriate measures must be taken to alleviate the impact of those conditions.

For more specific considerations, UR User Unit (s) shall be providing necessary guidelines.

7.6. Surveillance, diagnosis, treatment, and control of disease, including zoonosis control

120 The surveillance, diagnosis, treatment and control of animal diseases including zoonosis shall be conducted based on the OIE "Manual of Diagnostic Tests and Vaccines

for Terrestrial Animals 2015", the OIE, Guidelines for animal diseases control and on the national Law N° 54/2008 of 10/09/2008, determining the prevention and fight against contagious diseases for domestic animals in Rwanda.

121 When appropriate, the diagnostic facility or in case there is no diagnostic facility at one of UR farms, samples will be submitted to the national veterinary laboratory for more detailed analyses.

122 The policy recognizes the importance of vaccination in the control of many diseases. This important control tool shall comply with the above-mentioned regulations (article 120) and guidelines, especially the national Law N° 54/2008 of 10/09/2008, determining the prevention and fight against contagious diseases for domestic animals in Rwanda.

7.7. Surgery and postsurgical care

123 Surgery is to be performed using appropriate anesthesia in accordance with professionally accepted medical and veterinary practice. Current standards preclude food preparation, eating, drinking or smoking in surgery areas.

7.8. Pain, anaesthesia and analgesia

124 The attending veterinarian (Veterinary Officer or Academic Veterinary Supervisor) must ensure adequate pre-procedural and post-procedural care in accordance with established veterinary and medical practices.

a. **Research, Teaching, and Testing:** All animal activity proposals involving surgery must provide specific details of pre- through post-procedural care and relief of pain and distress. The principal investigator must involve the attending veterinarian or his/her designee in planning the type of care that may be provided.

b. **Use of drugs:** The appropriate use of drugs to relieve pain and/or distress should be specified in the animal activity proposal to avoid possible delays due to investigator concerns that a treatment regime may interfere with the study. The farm veterinarian retains the authority to alter postoperative care if unexpected pain and/or distress occur in an animal.

7.9. Euthanasia

125 Euthanasia shall be recognized as a means of "Humane" destruction of an animal, accomplished by a method that produces rapid unconsciousness and subsequent death without evidence of pain or distress, or a method that utilizes anesthesia produced by an agent that causes painless loss of consciousness and subsequent death.

126 Given the sensitivity of the practice and the ethical requirements to maintain transparency and objectivity, the euthanasia of any animal must be approved by a committee composed by the following persons;

- The UR Farm Veterinary Officer,
- A qualified UR Faculty Veterinarian staff,
- The UR Farm Manager.

The euthanasia may be conducted under the following circumstances;

- Deteriorating clinical or behavioral condition causing extreme suffering to an animal. The clinical condition should not be medically treated to maintain a comfortable and quality life. Should outside opinions of the medical state of the animal be needed, the Farm Veterinary Officer should take necessary steps to consult for a final determination of the animal health statement.
- Any behavior (s) presenting a significant hazard or being beyond acceptable management limits and hence, deemed unsafe to other animals or farm personnel.

CHAPTER 8. BIOLOGICAL ASSETS DISPOSAL

8.1. Population control

127 As animal or crop stock management tool; regular inventory (on a monthly basis by means of Farm Reports) will be kept available at each UR Farm, and population growth shall be monitored and systematically updated in reports.

128 Should any increment in number/population density by at least 10% of the allowed stock rate (animals, fish) or stocking capacity (crops, forests) is reached, a population control mechanism should be initiated without delay. This will prevent severe deterioration of farm environment as well as the wellbeing of existing biology stock.

8.2. Assessment of animal well-being

129 In the case of a general or individual deterioration of health or occurrence of other significant hazard within the farm stock, susceptible to significantly hamper the actual animal wellbeing or leading to disease transmission (animal, crop, forest, etc.), special measures shall be taken to dispose of concerned biological assets.

8.3. Donation

130 Based on UR College Council or UR Campus Management Council decision, or on the basis of existing agreements with tiers entity (MoU, Research-community outreach Agreement, etc.), the donation would be done as a regular way of biological assets disposal. In any case (s), the donation should not affect more than 5% of the existing population stock, in order to keep a normal population base and necessary genetic variability for further breeding.

8.4. Internal transfers-laboratory uses (teaching, research, etc.)

131 Internal transfer for teaching or research-community outreach shall constitute another way of disposing of biological assets, according to guidelines described in **section 3.2.6.**

8.5. Destruction

132 The same guidelines described in section 4.5.2 (Waste Disposal) and section 7.9. (Euthanasia).

8.6. Selling

133 In the cases described in previous points **8.1** and **8.2**, the UR Farm Manager shall make a written request, supported by a technical expertise done by a competent UR Unit, describing the occurring situation, to DF of the hosting UR Campus.

134 The decision to dispose of biological assets shall then be approved by the concerned UR College Council or UR Campus Management Council.

135 In particular circumstances, with regard to section 8.5 (Destruction)and/or other major hazards, the UR Farm Manager shall take the decision, supported by a technical expertise done by a competent UR Unit, to sell of concerned biological assets and report the event to DF as part of regular monthly report.

CHAPTER 9. BIOSECURITY

9.1. Bio-safety fundamentals and definitions

136 The World Health Organization (WHO) Laboratory Biosafety Manual, 3rd Edition defines Biosecurity as institutional and personal security measures designed to prevent the loss, theft, misuse, diversion or intentional release of pathogens and toxins (i.e. protect pathogens from dangerous people).

9.2. Animal experimentation involving hazards

137 In selecting specific safeguards for animal experimentation with hazardous agents, careful attention should be given to procedures for animal care and housing, storage and disbursement of the agents, dose preparation and administration, body-fluid and tissue handling, waste and carcass disposal, and personal protection. Special safety equipment should be used in combination with appropriate management and safe practices.

138 Appropriate guidelines shall be provided alongside the experimentation protocol, by the UR User Unit (s) and partner (s), and submitted as part of methodology to UR Research Scrutiny and Ethic Clearance Committee (s) for approval. Specific recommendations can be found in the CDC and NIH publication: *Biosafety in Microbiological and Biomedical Laboratories* (1993)[3].

9.3. Control of hazards

139 The policy recognizes the importance of adopting necessary good agriculture practices (GAP, FAO), to ensure needed biosafety for safe work in UR Farms (FAO).

140 In addition, UR Farm Management shall promote good practices and behaviour at farm, with a particular regard to smoking and drug use, robbery, violence, abuse of confidence, etc. At this end, a code of conduct should be put in place for compliance by all UR farm users.

[3]As a general rule, it is recognized that safety depends on trained personnel who rigorously follow safe practices. Zoonosis surveillance should be a part of an occupational health program (CDC and NIH 1993).

CHAPTER 10. POLICY IMPLEMENTATIONS

10.1. Role of farm selling committee (s)

141 The roles of the selling committee shall be as follows;

- Development and implementation of a selling plan.
- Provisions of recommendations to the Farm Manager regarding selling prices of all UR farm items.
- Preparing, calling and evaluation of bids for UR items to be auctioned.
- Setting strategies for marketing UR Farm items intended for sale.

10.2. Gender dimension (s)

142 UR Gender Policy shall be considered for all UR Farm endeavors.

10.3 Policy ownership

143 The UR shall be the owner of the Policy.

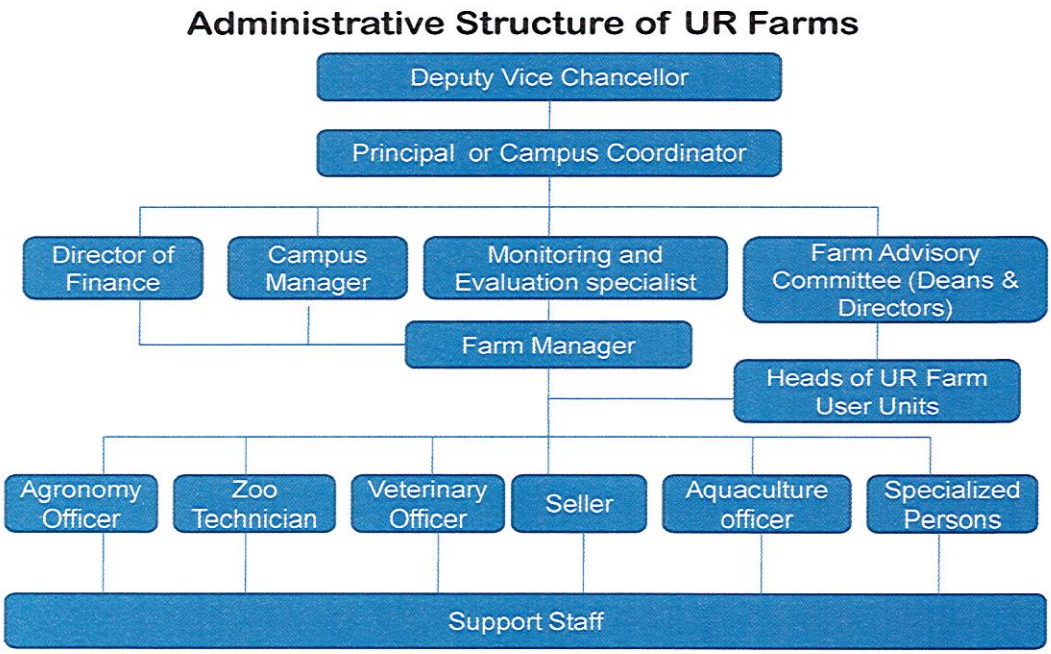
10.4 Policy review

144 The review process of this Policy shall be undertaken every 5 years. However, on an explicit request by the majority of UR Farm Mangers or the UR Senior Manager (s), the review may be envisaged as needs arise.

13. REFERENCES

1. http://umaine.edu/rogersfarm/home/policies-procedures/
2. http://australian-democrats.org.au/policies/balloted-policies/Farm-Management.pdf
3. http://www.fao.org/docrep/w7365e/w7365e05.htm
4. http://www.ehs.ufl.edu/programs/bio/waste/
5. http://hr.ufl.edu/manager-resources/employee-relations/workers-compensation/
6. www.ur ac.rw, visited on 14th January, 2016)
7. www.fass.org/docs/agguide3rd/Ag_Guide_3rd_ed.pdf
8. https://awic.nal.usda.gov/farm-animals
9. http://www.ncbi.nlm.nih.gov/books/NBK54046/
10. http://adlib.everysite.co.uk/adlib/defra/content.aspx?id=000IL3890W.198AWLDOHJ69F3
11. http://www.oie.int/en/international-standard-setting/terrestrial-manual/access-online/
12. http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/A_Guidelines_for_Animal_Disease_Control_final.pdf
13. https://www.aclam.org/
14. http://www.minagri.gov.rw/fileadmin/user_upload/documents/Law_and_Regulations/Official_Gazette_no_20_of_18.05.2009.pdf

Annex 1: Administrative structure of UR Farms



Annex1: A list of recommended measurable traits (non-exhaustive)

Species or Production System	Traits and properties to be recorded		
	Essential	**Desirable**	**Additional**
All systems & species (Basis for all other production systems to follow)	Unique identification Sex Owner Keeper Treatment group Culling and Death Birth date (at least estimated)	Breed Premises Birth date (exact) Dam Sire Birth status (single, twin, etc.) Wean status (raised as single, twin) Calving / lambing ease Culling reason Pregnancy diagnosis Mating information (AI / Natural)	Functional (linear) traits & body measurements Body condition (scores) Sickness diagnoses Fertility tests and diagnoses Health treatment Vaccinations Parasite counts or scores Parasite impact indicators (e.g. FAMACHA scores) Recorder (technician/farmer) Inseminator Diagnostic & Analysis laboratory Feed intake
Dairy Production Cattle Dairy Goats Dairy Sheep	Test day milk yield Dry off date	Fat percentage Protein percentage Somatic Cells per ml Milking times / intervals	Milk Urea Nitrogen Lactose percentage Mastitis diagnosis Locomotion Body weights (calves and production animals) Metabolic disorders Temperament and likability Milking speed / ease of milking Individual or group feed intake
Meat Production (ruminants) Cattle Sheep Goats	Weight at weaning Weaning date	Birth weight or Girth circumference measure Post weaning weights Dam weight at weaning of calf Pre-slaughter weight Scrotum circumference	Pre-weaning weight Dam weight after calf birth Post weaning growth test weights Body measurements Shoulder/hip height, Body length, Pelvic dimensions, Girth circumference Individual Feed intake Real Time Ultrasound Muscle area, Subcutaneous fat, Marbling Carcase and Meat traits Grading, Dressing percentage, Tenderness, Retail meat yield

Fibre Production Sheep Goats	Fleece weight (8-12 months growth)	Fibre diameter Staple length Clean fleece weight (8-12 months growth)	Fibre diameter variation Percentage of fibres over/under desirable diameters
Pig Meat Production	Litter size Litter weight	Individual piglet weight at weaning Number of teats Sow weight	Individual piglet weight at birth Body measurements Real time ultrasound scanning Muscle depth, Marbling, Subcutaneous fat thickness Carcass & Meat properties Dressing percentage, Drip loss, Marbling, Muscle yield Stress susceptibility
Poultry Meat Production	Batch weight at slaughter, mortality, and feed consumption	Individual weight at slaughter Age at slaughter	Individual weight at hatch and at adult age Body conformation Individual feed consumption Carcass (eviscerated) weight Weight of breast and legs Walking ability (or other leg problems)
Egg production	Total egg mass, mortality and feed consumption	Number of eggs per hen Egg weight	Age at first egg Shell strength (breaking force weight or specific gravity) Shell colour Albumen and yolk weight Fertility and hatchability

Prof. Philip Cotton
Vice Chancellor, University of Rwanda