HCERES

High Council for the Evaluation of Research and Higher Education

Research units

HCERES report on research unit:

UMR Herbivores

UMR H

Under the supervision of the following institutions and research bodies:

Institut National de la Recherche Agronomique - INRA

Vetagro Sup

Evaluation Campaign 2015-2016 (Group B)

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

In the name of HCERES,[1]

Michel COSNARD, president

In the name of the experts committee,[2]

Dunixi GABINA, chairman of the committee

Under the decree No.2014-1365 dated 14 november 2014,

[1] The president of HCERES "countersigns the evaluation reports set up by the experts committees and signed by their chairman." (Article 8, paragraph 5)

[2] The evaluation reports "are signed by the chairman of the expert committee". (Article 11, paragraph 2)

Evaluation report

This report is the sole result of evaluation by the expert committee, the composition of which is specified below.

The assessments contained herein are the expression of an independent and collegial reviewing by the committee.

Unit name:	UMR 1213 Herbivores
Unit acronym:	UMR H
Label requested:	UMR (retructuring)
Current number:	1213
Name of Director (2015-2016):	Ms Isabelle VEISSIER
Name of Project Leader (2017-2021):	Ms Isabelle VEISSIER

Expert committee members

Chair: Mr Dunixi GABINA, Instituto Agronómico Mediterráneo de Zaragoza – CIHEAM

Experts:

Mr Fabrizio CECILIANI, Università degli Studi di Milano, Italy

Mr Wouter HENDRIKS, Wageningen University, The Netherlands

Mr Ghislaine HILBERT, Inra, Bordeaux

Mr Philippe POLOME, Université Lumière Lyon 2

Mr Didier STILMANT, Walloon Agricultural Research Centre CRA-W, Belgium

Mr Beat WECHSLER, Centre for proper housing of ruminants & pigs, Switzerland

Scientific Delegate representing the HCERES:

Mr Serge DELROT

Representatives of supervising institutions and bodies:

Ms Françoise MEDALE, Inra (Scientific Division PHASE)

Mr Thierry ROGER, VetagroSup

Mr Alban THOMAS, Inra (Scientific Division SAE2)

Head of Doctoral School:

Mr Jean-Marc THOMAS, Doctoral School n° 65: “Health, Agronomy and Environment”

1 • Introduction

History and geographical location of the unit

The Research Unit on Herbivores (URH) was created in 1999 by merging 4 research units from the Animal Physiology and Livestock Systems (PHASE) scientific division of Inra, all located at the research centre of Clermont-Ferrand–Theix. The URH included several research teams and an experimental animal facility, all dedicated to the study of farmed ruminants (mainly cattle and sheep). In 2009, the research unit on farming economics from the Inra scientific division of Social sciences, Agriculture and Food, Rural Development and Environment (SAE2), joined the URH. This combined animal science and economics, addressing not only issues related to biology but also to production systems. In 2010, further development involved the creation of a joint research unit with the Institute of Higher Education and Research in Food, Animal Health, Agricultural Science and the Environment (VetAgro Sup). A common project was designed combining research and education and the work started in 2011. The project was approved by Inra, VetAgro Sup and the Joint Research Unit on Herbivores (UMR 1213 Herbivores) and was officially signed in January 2012.

Management team

Director of the unit: Ms Isabelle VEISSIER

Deputy director: Ms Isabelle CASSAR-MALEK

HCERES nomenclature

UMR

Scientific domains

Domaine : SV

Sous-domaine : SVE_2

Sous-domaine principal : SVE2_LS9

Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	2	2
N2: Permanent researchers from Institutions and similar positions	58	57
N3: Other permanent staff (technicians and administrative personnel)	74	73
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	11	
N6: Other contractual staff (technicians and administrative personnel)	32	
N7: PhD students	17	
TOTAL N1 to N7	**194**	
Qualified research supervisors (HDR) or similar positions	28	

Unit record	From 01/01/2010 to 30/06/2015
PhD theses defended	30
Postdoctoral scientists having spent at least 12 months in the unit	
Number of Research Supervisor Qualifications (HDR) obtained during the period	30

2 • Overall assessment of the unit

Introduction

The technical and scientific expertise of UMR 1213 Herbivores covers genomics, metabolism, digestion and nutrition, behaviour, animal production, and farm economics. Research is conducted at the level of genes, tissues and organs, whole animals, herds, and farms. Research targets are farmed herbivores (cattle, sheep, and to a lesser extent goats and horses) and their farming systems. Research combines system testing, observations on animals and farms, and analytical approaches while data exploitation involves descriptive analyses and predictive modelling. The scientific strategy proposed in 2011 focused on the evaluation and the improvement of the sustainability of herbivore farming systems. Research aimed at designing sustainable farming systems for herbivores, seeking to reconcile production efficiency, product quality and socio-economic viability with environmental protection and valorisation, and animal welfare. Overall, this strategy was positively received by the reviewing panel in 2011 although it was found to be too broad and recommendations were made to focus on specific issues.

As a consequence, in 2011, the scientific staff of the unit was invited to define the research project more precisely. A new strategic document was produced to guide the future objectives of the unit: to propose sustainable and adaptable farming systems and practices. Rather than the increase of productivity, the overall goal is to improve the use of resources (especially feedstuffs) by identifying trade-offs between feed efficiency, limitation of nitrogen (N) excretion and GHG (green house gases) emissions, product quality, and animal welfare and health. Grass-based farming systems are specially targeted, to make their management more efficient and to use animals' adaptive capacities.

For the past contract, UMR1213 Herbivores was made up of 7 research teams, 3 support teams and a directorate. Some teams were organised according to disciplines, economics for Team Farm economics and management (EGEE), ethology for Team Social behaviour and adaptation (ACS) while others are organised according to research subjects (milk and dairy production for Team Nutrition Genomics Lactation (AGL) and muscle and beef production for Team Animal-muscle meat (AMUVI) or biological functions (digestion processes for Team Microbial digestion and absorption (DIMA). In addition, two teams cover a large spectrum: Team Husbandry systems (SYBEL) focuses on farming practices and systems irrespective of the production (milk or meat), and Team Animal-plants relationship and feeds (RAPA) focusing on pasture (roughages, foraging behaviour and management of pastures).

In addition, 4 crosscutting programs (Ecologically intensive ruminant systems: from the study of bottlenecks to multicriterion evaluation; Optimisation of feeding recommendations for beef cattle; Multisensor monitoring; and Adaptive capacities of ruminants) were launched between 2011 and 2012 in order to stimulate the realisation of the unit's project and allow researchers to take risks in order to innovate. Each programme is allocated a budget taken from the shared part of the whole unit budget. This budget does not cover all the costs necessary to carry out the research included in such programmes but acts as 'seed money' to start investigating a new research area and attract further funding.

For the next contract, extensive brainstorming based on internal workshops, seminars, meetings with the stakeholders, Inra divisions PHASE and SAE2 and VetagroSup, led UMR H to re-organize into 5 teams. The aim was to design the new scientific strategy of the unit according to the future context of herbivore farming. Team A (Functioning of tissues to predict animal performances) will result from the merge between AGL and AMUVI; team B (Feeds values, ingestion, digestion, and nutriments is essentially composed by DIMA, with limited staff coming from AMUVI and RAPA; team C Behaviour, health, and welfare corresponds to ACS, with members coming from AMUVI and RAPA; team D Elaboration of performances of animals and herds corresponds to the major part of SYBEL, with minor merges from AGL and AMUVI; finally team E Design and evaluation of sustainable farming systems aggregates EGEE with some members from SYBEL and RAPA.

Global assessment of the unit

Scientific and academic production are outstanding during the evaluated period of 5.5 years (1 January 2010 - 30 June 2015), with 539 scientific articles, 61 invited talks, 722 scientific communications, 19 books, 89 book chapters and 655 technical or other productions.

The number of PhD theses defended during the period is also remarkable (30) although with strong differences between teams, both for the absolute figures (9 for AMUVI and 2 for EGEE and AGL) and for the average per researcher (between 1 and 0.2 for the figures at 30/06/2015). Also, the effort for obtaining Research Supervisor Qualifications (15 during the period) is noteworthy.

The unit's governance is well described and seems well set regarding structures, delegations and communication.

Finally, the future project is well developed, and the expert committee appreciates the strong intellectual effort developed by the unit. Nevertheless, in the "Application" file, there could have been information, such as the new research lines, if any, and the abandoned research lines, if any, which would help in the understanding of the transition between the old and the new structures.

Strengths and opportunities in the context

The SWOT analysis provided by the unit in the "Application" document, on which the experts committee agrees, is summarized and commented below. In addition, a SWOT analysis has been developed by the HCERES committee for each of the seven former teams and for the five new teams.

Strengths

The unit deals with a large diversity of disciplines and approaches and a wide range of organisational levels, from genes to production systems. Research specificities are well established (mountain farming, grass-based farming systems, beef cattle, etc.) and the unit has a highly acknowledged expertise in specific domains such as feed value, methane emissions, animal welfare and product qualities. Research facilities are adequate and the links with educational structures and the economic partners are well established. The internal organisation of the unit regarding the internal communication, management, and the working atmosphere are also well established.

Opportunities

The awareness of society, policy-makers, and stakeholders that alternative farming systems are needed and the assumption that agroecology is a new conceptual approach that shall drive future research are good opportunities for the unit. For this purpose, the unit has a good access to high-throughput techniques such as the omics, and Precision Livestock Farming. Regarding the unit's participation in educational programmes, the National Master under construction on the overall quality of farming systems will also be a good opportunity. Good links are also established with the private sector.

Weaknesses and threats in the context

Weaknesses

Research on farming systems is difficult "per se", as it is difficult to conceptualise and organise, as is the publication of the results. The long-term experiments which are needed in order to obtain robust results incur large costs. Regarding the internal life of the unit, as it is quite diverse, there is a need for a sustained effort to strengthen exchanges between teams (experiments, samples, data, etc.). Also, and although the unit's expertise covers many fields, there is a lack of strong expertise in some areas such as the participatory approaches, ecology, statistics, and veterinary medicine.

Threats

The HCERES committee considers that there may be a main threat for the unit not indicated in the SWOT, that is the continuous decrease in meat consumption in France over the past 10 years. This decrease may be higher in the future due to the recent recommendations for meat consumption from the World Health Organisation, and related to the concern of society about the role of ruminants in GHG production. Nevertheless this decrease in internal consumption could be compensated by the expected increase in world meat demand. The concern of society about experiments on animals could also limit some of the lines of research needing animal surgery (canulated animals, etc.). General reduction of financial means and high competition may be another important threat.

Recommendations

The most important points for the 5 new teams are not general but specific as pointed out in our detailed report. We have summarized and compiled them hereafter. Team A: Increase the number of engineers and technicians; set teaching targets; team B: Increase PhD scholars and actively recruit or train personnel in modelling; team C: Intensify collaboration with other teams of UMR 1213 Herbivores. Contribute increasingly to research projects addressing the welfare of farm animal species other than ruminants; team D: Pay attention to the cohesion of the new team by a strong scientific animation. Make sure that robustness and product quality are correctly managed at unit level; team E: avoid "dilution" of the economists in the new COMETE team and make sure that each one may also develop his/her own research; raise the question of adoption of the concepts of agro-ecology by the other teams.