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European Ruminant Infrastructure Network (ERIN)



Key external stakeholders:

European Union and Irish Agri-Food research institutes; European & Irish research funders.

Practical implications for stakeholders:

ERIN stems from the acknowledgment that farm animals are nowadays used in research to produce knowledge applicable to many areas including sustainable agriculture, global warming, human food and human health. These issues need to be considered at the European level since they are shared by many, if not all, EU countries. Experimental facilities where such research is carried out are distributed throughout Europe and require specific resources and management.

A European shared infrastructure, in the form of a network of facilities in Europe, would largely benefit an integrated approach to global issues (such as the need to decrease the environmental impact of farming while increasing consumer confidence), to the efficiency of research on animals in Europe (less animals, avoidance of duplication, access to animal models), and to research expertise in Europe (through exchanges of procedures and training of personnel).

Main results:

- More than 3,000 scientific articles are published per year on ruminant research. In Europe, 400 European institutes or universities carry out research on ruminants. Research groups are small, with half of them having less than 10 researchers.
- The five specialised fields that represent current research interests of research managers and how they may change in the future are: animal nutrition (present 45.7%; future 54.3%), dairy science (present 44.3%; future 50.0%), biology of reproduction (present 38.6%; future 48.6%), molecular biology (present 28.6%; future 58.6%) and metabolism (present 27.1%; future 37.1%). In addition, the specialised fields representing biotechnology, animal welfare, metabolism, microbiology, herd management, endocrinology, production systems, molecular genetics, and modelling were considered important by 30 to 40% of research managers and the trends showed an increase compared with present research interests.

Opportunity / Benefit:

A network of research facilities dedicated to research on large animals is thus crucial for coordinating research efforts to match future, increasingly sophisticated scientific developments and to stimulate synergies. It will attract the best scientists and encourage joint experiments, and wider dissemination of the results

Collaborating Institutions:

INRA, MTT, LMU, INIA, NRIAP

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1. Project background:

Science-based innovation support requires excellence in knowledge generation and procurement (research); knowledge transfer (dissemination activity) and knowledge absorption (education and training). This is particularly relevant to the future needs for research on ruminants in view of ongoing developments in specialized techniques and methodologies. Exploiting new research opportunities on ruminants will depend on access to expertise, facilities, techniques, and equipment through collaborative initiatives. One objective of the ERIN project was to collect quantitative information on present needs, future needs (in 3 – 10 years) of experimental animals, equipment, rearing or investigation methods and infrastructures for research on ruminants across Europe. Research managers from all European research organisations were questioned using an internet-based questionnaire.

2. Questions addressed by the project:

- What are the estimated needs for ruminant research in relation to future research areas, and in terms of expertise, animals and equipment?
- What are the future potential of research facilities dedicated to ruminants?
- What are the prospective needs and the supply of facilities with a view to creating an integrated organisation of research facilities likely to match future scientific developments and stimulate synergies in order for European research on farm animals and farming systems to play a leading role?

3. The experimental studies:

ERIN conducted bibliometric analyses from the Web-of-Science, reviewed vision papers and foresight studies, interviewed 70 research managers and members of funding bodies, surveyed research groups and experimental facilities, ran a scenario exercise on possible organisations of the research infrastructure in Europe, and organised a stakeholder conference to discuss the findings of the project.

4. Main results:

More than 3,000 scientific articles are published per year on ruminant research. In Europe, 400 European institutes or universities carry out research on ruminants. Research groups are small, with half of them having less than 10 researchers. The overall collaborations within Europe, and between European groups and partners outside Europe, are extensive; collaborations with Eastern European groups remain limited. Cattle have been and remain the predominant ruminant species studied, followed by sheep and goats, both in terms of number of publications and number of experimental facilities for ruminants. The published articles concern mainly veterinary sciences, agriculture, dairy and animal science, food science and technology.

A quantitative analysis of the interviews with research managers showed that ruminant research is given a high priority at present, and will be in the next 3-10 years, within all organisations. The five specialised fields that represent the present research interests of research managers and how they may change in the future are: animal nutrition (present 45.7%; future 54.3%), dairy science (present 44.3%; future 50.0%), biology of reproduction (present 38.6%; future 48.6%), molecular biology (present 28.6%; future 58.6%) and metabolism (present 27.1%; future 37.1%). In addition, the specialised fields representing biotechnology, animal welfare, metabolism, microbiology, herd management, endocrinology, production systems, molecular genetics, and modelling were considered important by 30 to 40% of research managers and the trends showed an increase compared with present research interests. The two major constraints associated with ruminant research are the cost (present 62.9%; future 68.6%) and the associated funding (present 55.7%; future 62.9%), which were highlighted by the majority of research managers.

The changes that may be made regarding future research objectives for performing research on ruminants, in the next three to ten years, in order of priority are: increased focus on "omics" (74.3%), animal health (61.4%), in-depth analysis of biological processes (57.1%), molecular genetics (55.7%), production efficiency

(51.4%), environmental impact (51.4%), animal well-being (50.0%), food quality (47.1%), economically viable agricultural production (45.7%), food safety (44.3%), support biomedical research (42.9%), advanced imaging tracer techniques (38.6%), genetics and breeding of farm animals (37.1%), economic modelling (32.9%), quality and utilisation of agricultural products (31.4%), metabolic studies (metabolic chambers) (24.3%) and phenomics (21.4%).

The services expected from a shared European infrastructure are knowledge transfer, specific expertise in ruminant research; training of technical staff, students or research staff; definition of procedures for specific measurements or techniques including for the collection of samples; contributing to science-society dialogue; professional management of research projects; collecting and processing samples and data; the use of defined Intellectual Property policies; specific expertise in functional genomics and bioinformatics; “technology watch” on techniques etc. Research managers considered that a European network of ruminant facilities would be beneficial at a Regional, National, European, and International level.

5. Opportunity/Benefit:

A network of research facilities dedicated to research on large animals is crucial for coordinating research efforts to match future, increasingly sophisticated scientific developments and to stimulate synergies. It will attract the best scientists and encourage joint experiments, and wider dissemination of the results

6. Dissemination:

A stakeholder conference to discuss the findings of the project www.erinetwork.eu/erin/conference

Main publications:

Earley, B. 2010. Future needs for research on ruminants www.erinetwork.eu/erin/conference

Earley, B. 2010. European Ruminant Infrastructure Network (2010) Tresearch, Winter 2010.

Earley, B. 2010. ERIN, presentation in Brussels April 2010 to Dr. Christos Profilis at DG Research.

7. Compiled by: Bernadette Earley