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## **A conceptual framework to promote integrated health management in monogastrics**

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**Research prioritisation and coordination to face animal health challenges in modern farming**

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Animal diseases can cause serious social, economic and environmental damage, impact on animal welfare and in some cases directly threaten human health. Intensive livestock production raises new challenges and needs adapted answers. The available control tools are often inadequate to effectively deal with animal populations in such systems. While research is fundamental to ensure the development of adequate disease prevention and control means, the level of funding in this area is currently low. However, more could be achieved, even with the current level of investment, through the coordination of research efforts and the sharing of results. To achieve this, an international forum of R&D programme owners/managers and international organisations was established to improve research collaboration and work towards common research agendas and coordinated research funding on major animal diseases, including zoonoses. The STAR-IDAZ International Research Consortium on animal health and its associated EU-funded secretariat (SIRCAH) aims to coordinate over \$2.5 billion in research funding from the network's partners – which includes public and private funding bodies. The World Organisation for Animal Health (OIE) is member of the Consortium's Executive Committee and hosts its scientific secretariat. A prioritisation exercise to identify relevant diseases lacking adequate control tools was conducted in every continent. Interestingly, similar priorities emerged for Americas, Europe and Asia/Australasia, reflecting the global scale of challenges for intensive livestock production. Working groups are now being implemented on each of the priority diseases, in order to perform research gap analyses and draw research roadmaps, to serve as a basis for the common research agendas. An overview of the implemented methodology and of the first roadmaps will be presented.

**A conceptual framework to promote integrated health management in monogastrics**

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Reduce the use of antimicrobial compounds in livestock production is necessary to limit antimicrobial resistance development and to protect the health of animals, humans and ecosystems. This complex task may only be accomplished via the implementation of a systemic approach, which takes into account the management of animal health as a whole, avoiding simplistic strategies. To that purpose, 15 scientists working on different domestic monogastric species (pig, poultry, rabbit) formed the consortium 'RIMEL'. We propose an interdisciplinary conceptual framework for the evaluation and management of animal health. This conceptual framework listed 11 fundamentals of animal health organized in two main dimensions. The first one, physical health, refers to the association of barriers (skin, mucosae and microbiota) and defenses (innate and acquired immunity, and nervous and endocrine systems). The second one considers the psycho-social health (mother-young interactions or amongst relatives, the expression of the innate behavioral repertoire, and the respect of circadian rhythm). We identified critical periods for health in each species related to the maturation dynamics of each fundament. Then, we associate these fundamentals with various indicators of health status (zootechnical performance, behavior, metabolic or hormonal markers, etc.). Finally, the framework takes into account more than 30 practices applied in the long- or in the short-term to drive health in livestock systems (genetics, reproduction strategy and renewal management, feeding, hygiene and prophylaxis, living environment, etc.). We organized all the elements to describe the biological relays, to distinguish levers and risks, and to build a representation that took into account the lag between actions and results on a targeted population. This framework is a tool to (1) help and structure research on integrated management of animal health (2) characterize and analyze existing systems, (3) design and evaluate innovative practices and systems. Our ultimate goal is to support the transition of animal production towards systems with low antimicrobial inputs.