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Management strategies that harness the adaptive capacities of small ruminants to improve herd resilience and efficiency

Presentation of the ADAPT-HERD project

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Abstract. The main effect of climate change on livestock production systems in the Mediterranean area is to induce changes in feed resource availability. In face of constraining and changing environmental conditions, the challenge is to find practical solutions for herd management to minimize farmer's risk. These solutions should be good enough in terms of efficiency (E), to ensure sufficient income, and good enough in terms of resilience (R), to ensure farm sustainability. The objective of the ADAPT-HERD project is to develop simulation tools capable of evaluating the consequences of management strategies at the herd level, under contrasting and varying environments (Egypt, France, Spain and Tunisia). Our approach considers that biological adaptive capacities of small ruminants can be fully integrated within management strategies to improve R and E by: i) using reproduction practices that provide the best match between herd demand and feed supply; ii) managing groups of animals based on their adaptive capacities (targeting interventions) and iii) managing herd demography to adapt animal numbers to future feed resources. The project will implement data acquisition at animal level (fine-grained experiments on adaptive capacities and phenotyping of local breeds) and at production system level (herd management, feed resource, climate and market conditions). Data will be combined and used in computer simulations to explore different climate change scenarios and management strategies and evaluate their effects on herd R and E. Interfacing modelling tools will be a key aspect of the project, fostering knowledge exchange and collaboration, especially with ongoing projects focusing on genetic selection and breeding solutions to improve R&E in small ruminants.

Keywords. Resilience – Efficiency – Climate change – Modelling.