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## **Environmental impacts of pig production systems relying on European local breeds**

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**Outlook on local pig breeds as drivers of high quality pig production-ambitions in project TREASURE**

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Project's idea is a new paradigm of pig production systems and development of sustainable pork chains based on European local pig breeds which are held in less intensive systems, use locally available feeding resources and are adapted to local agro-climatic conditions. Local pig breeds provide products with typical, generally high sensory quality and regional identity searched by consumers. Despite revived interest, these breeds are mainly untapped and often remain endangered. The few successful examples in Europe demonstrate that the best conservation strategy is to ensure breed is self-sustaining resulting from good valorisation of pork products. As their productivity is low, local pork chains can become sustainable only when their genetic potential is benefited, production systems optimised and their products viable on the market. To enhance sustainability of pork chains based on local breeds, it is essential to gain scientific proofs of their genetic singularity, productive potential and product qualities, to develop genetic tools for authentication and breeding, to optimize pig nutrition and management (enhance welfare, use of local feeding resources), to evaluate their environmental impact, to assess consumers' attitudes, acceptability and purchase intentions, and to develop adapted marketing strategies. In addition, project promotes knowledge exchange and building of functional networks among regions esp. by means of creating an 'umbrella' trade mark as exploitation booster. These challenges are addressed by the project and will be presented. Funded by European Union's H2020 RIA program (grant agreement no. 634476).

**Environmental impacts of pig production systems relying on European local breeds**

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Traditional pig productions systems, relying mainly on local pig breeds and outdoor rearing, have been poorly investigated so far in terms of environmental impacts. The few existing studies did not account for possible sequestration of carbon and emissions consecutive to grazing. Twenty-five farms of Gascon breed in France (FR), 8 with Mora Romagnola breed in Italy (IT), and 15 of Krškopolje breed in Slovenia (SI) were evaluated while accounting for the emissions from pasture intake and the potential for carbon sequestration. Pig production system in SI presented the lowest impacts per kg of live weight, due to better feed conversion ratio caused by indoor production and due to lower impacts of feeds – most diets were based on grains, vegetables, tubers and roots produced on farm. Among the systems, acidification potential (AP) was 13% higher in IT than the average for FR and SI, due to higher dietary crude protein content (+9% than the average), while the eutrophication potential (EP) was 27% higher in FR system than the average, as a result of higher phosphorus content of feeds (+28% than the average). When the potential of carbon sequestration was taken into account, the GWP impact was reduced 4% on average. Conversely, when accounting for the emissions from pasture intake the GWP was increased by 2%, mainly when a high digestible grass was considered. The use of high digestible grass provided lower AP and EP impacts than low digestible grass. The large variability between farms in terms of environmental impacts suggests that the margins for improvement of local breeds' production rely on improvement of feed composition and supply, and origin of feed ingredients. There is a great need for better estimation of digestibility of grasses and of carbon sequestration, in order to reduce the uncertainties associated with the environmental impacts evaluated of outdoor pigs' systems. Funded by European Union's H2020 RIA program (grant agreement no. 634476).