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## Typology of the Noir de Bigorre pig farming systems

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## Abstract

Intensive pig production systems are facing economic and environmental challenges that outdoor systems relying on local pig breeds may overcome. The Noir de Bigorre (NDB) pork chain located in South West of France is organized as a cooperative including farmers and processors. NDB products recently obtained national "AOC" label required for Protected Designation of Origin (PDO) registration. Therefore, within the European TREASURE<sup>1</sup> project, a typology of the NDB pig farming systems was constructed for further evaluation of their sustainability. A dataset was built including the 49 active farms involved in the chain. The dataset contained information on farm size, farm grassland and woodland areas, seniority in the chain, number of sows, piglets and pigs produced per year as well as proportion of on-farm produced feed. Principal Component Analysis (PCA) and Hierarchical Clustering (HC) were performed on these data. The first and second axes of the PCA explained respectively 39% and 34% of the variability. HC constructed 4 classes, with class 1: small farms with high seniority in the chain (n=19), class 2: pig breeding farms with small grassland / woodland areas (n=13), class 3: pig fattening specialized farms (n=9) and class 4: large farrow-to-finish farms with lowest seniority in the chain and highest proportion of on-farm feed production (n=8). This typology highlights the structure and the dynamics of the NDB farming systems. The expected evolution includes large farms (class 4, producing the maximum yearly number of pigs allowed in the PDO), with a fattening unit or both farrowing and fattening units. The typology will be useful for further sustainability assessment of the NDB pork chain.

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