

# THE ROLE OF POLISH RED CATTLE IN SUSTAINABLE DEVELOPMENT OF MOUNTAINOUS REGIONS IN POLAND

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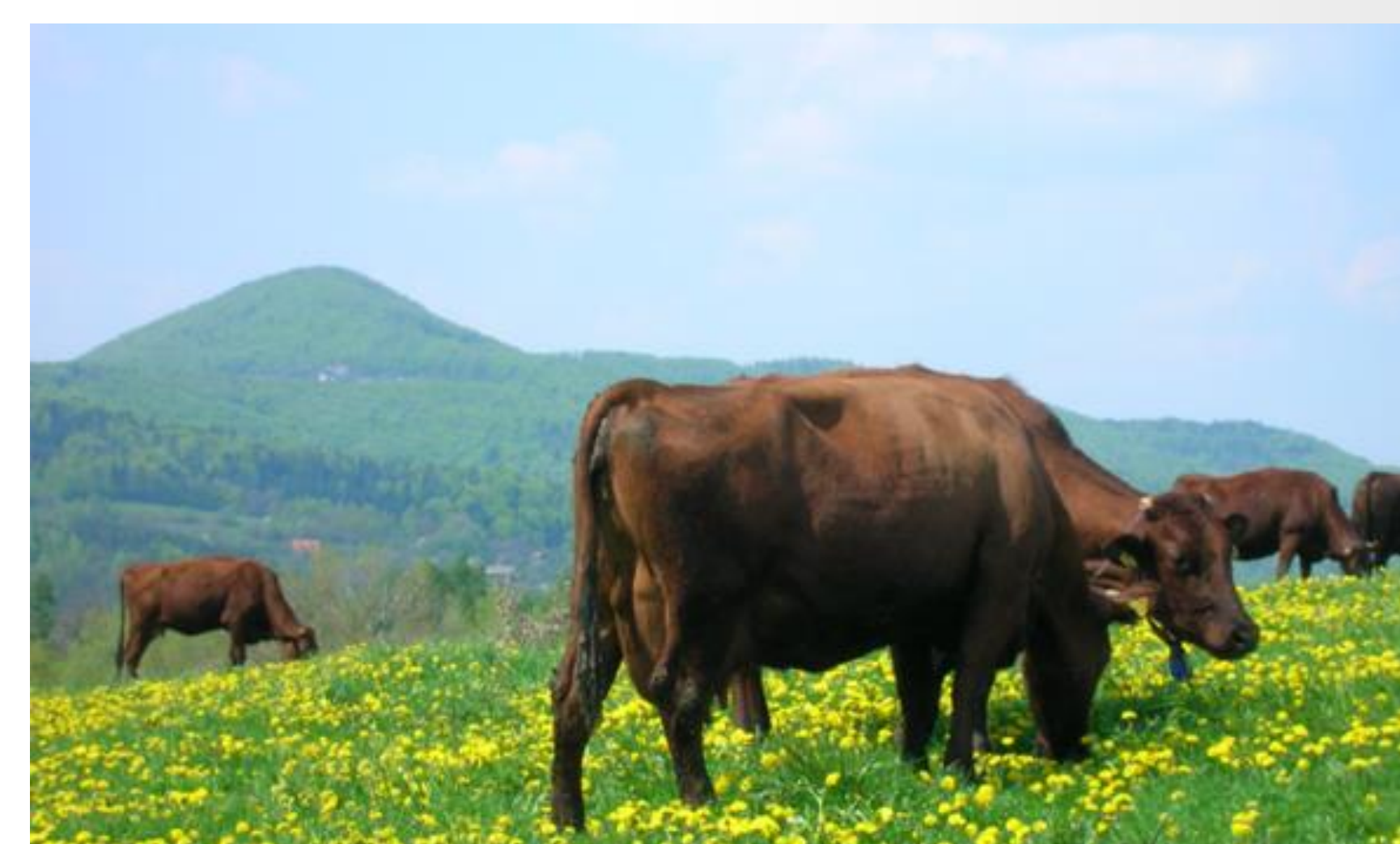
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## INTRODUCTION

Extensive breeding of indigenous cattle is an important component of sustainable development of agriculture and rural areas. The numerous investigations indicate that the ecological, extensive livestock management systems, based on natural grasslands, allow preserving the primary function of grazing lands which are not intended to go back to bush, but which agricultural and environmental politics would like to keep as a part of a managed ecology. From a social point of view, such systems play an important role in the enrichment of the agricultural landscape, deciding in a considerable degree on the tourist attraction of rural regions. Also, they result in a good health condition of grazing animals, satisfactory reproduction and calves rearing indices as well as in a high biological quality of the obtained products (milk, meat).



## OBJECTIVES

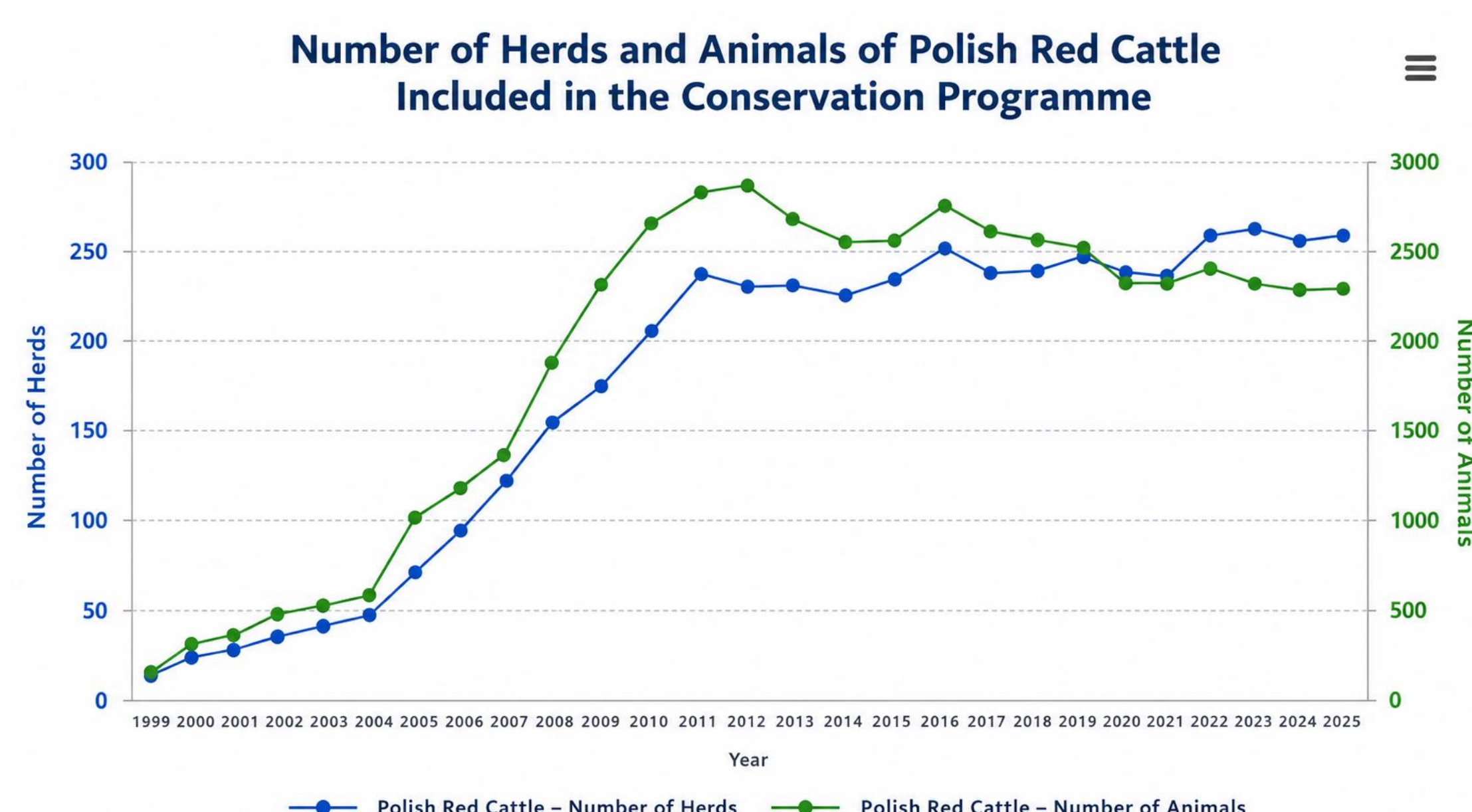
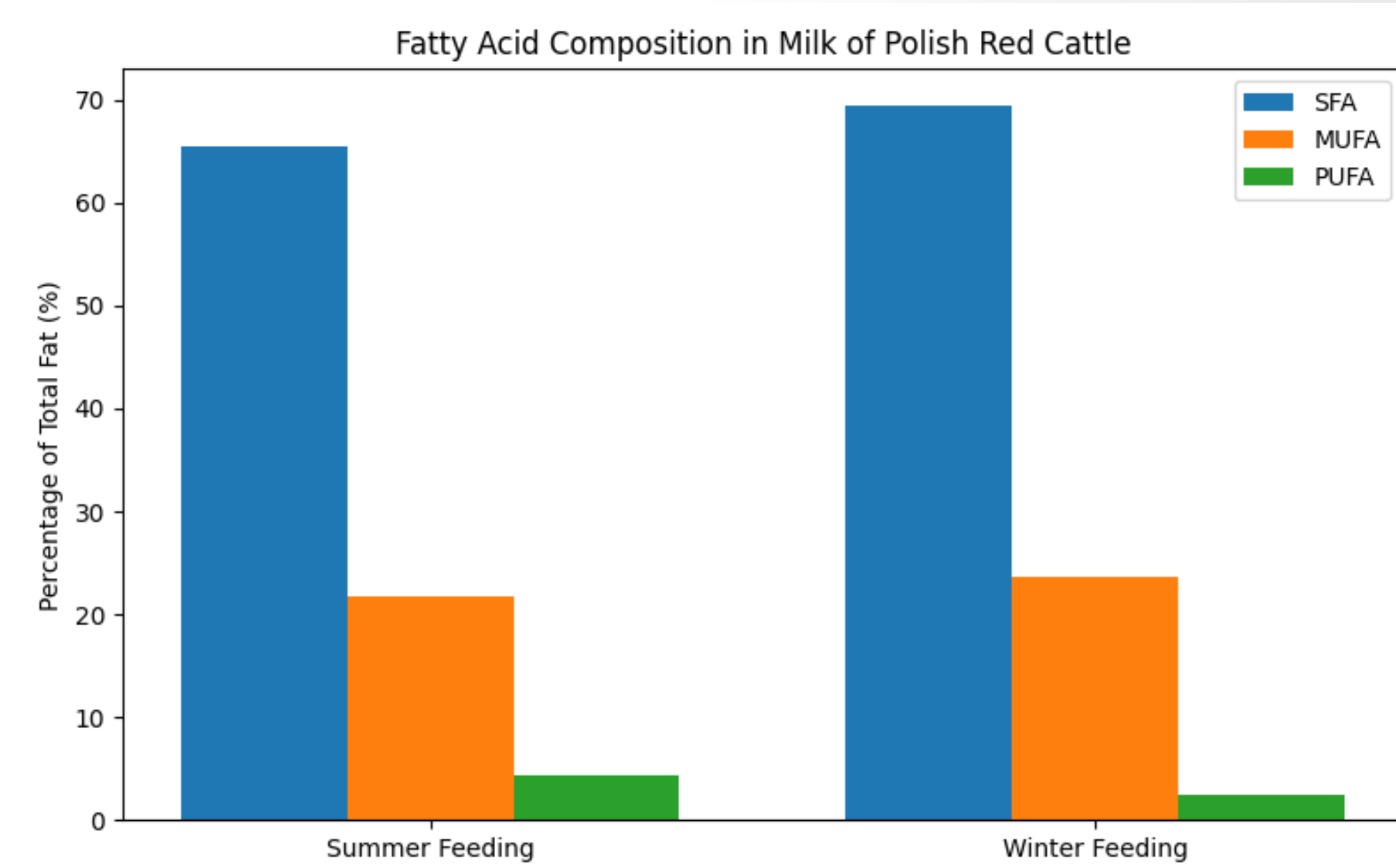
The aim of this study was to highlight the advantages of organic milk production in herds of Polish Red Cattle raised in the mountainous regions of southern Poland. This breed is one of the oldest indigenous cattle breeds in Europe, with a breeding history dating back to the second half of the nineteenth century. During the interwar period, Polish Red Cattle accounted for approximately 25% of the national cattle population, and its share remained relatively high at around 18% until the late 1960s. Due to its unique genetic value, importance for biodiversity conservation, and contribution to traditional and sustainable farming systems, as well as its steadily declining population, the breed was included in the Farm Animal Genetic Resources Conservation Programme in 1999. Despite these conservation efforts, Polish Red Cattle currently represents only 0.39% of the active cattle population in Poland.

## RESULTS

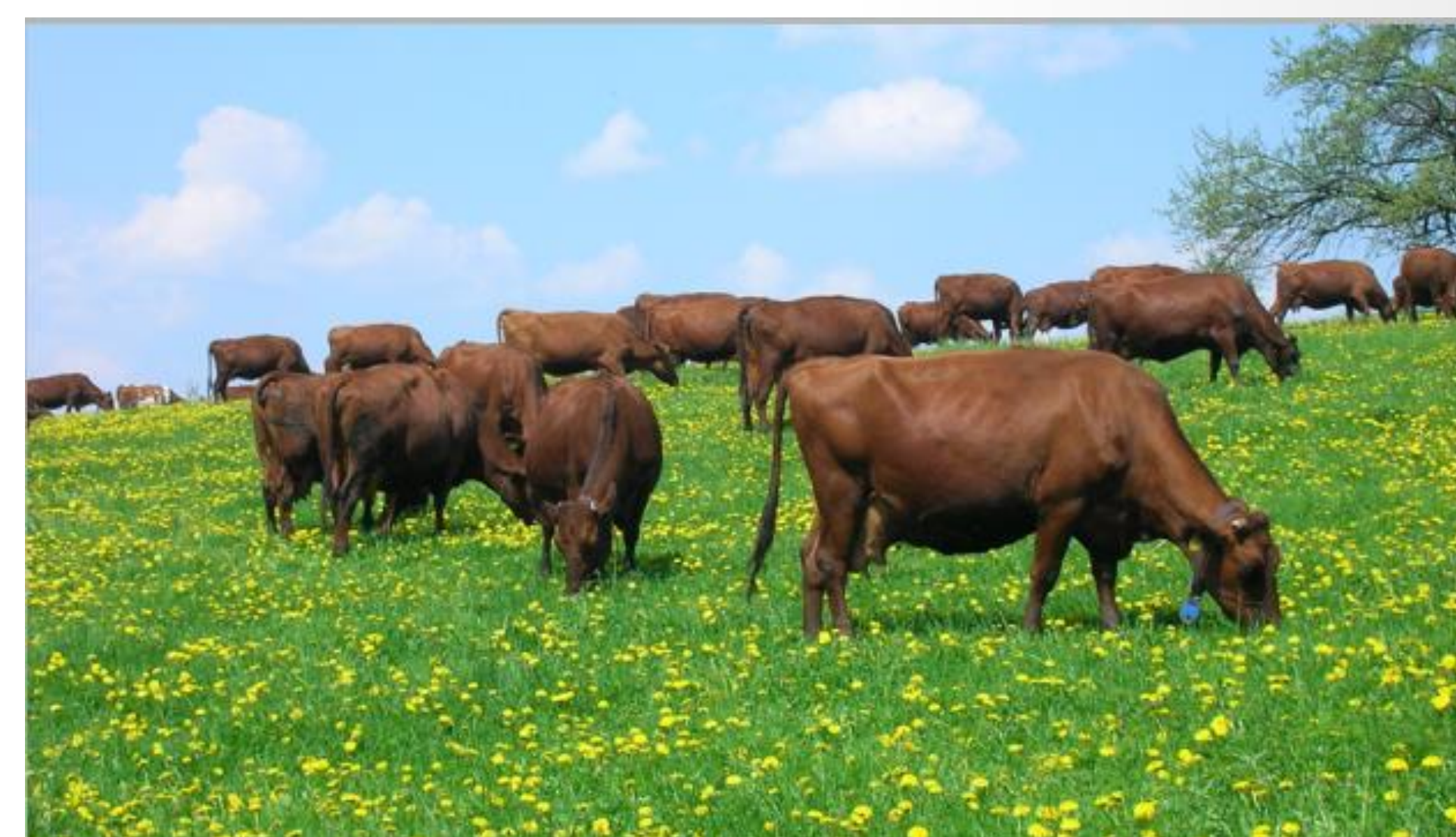
Polish Red Cattle is characterized by high resilience, longevity, excellent fertility, and ease of calving and calf rearing. Well adapted to harsh environmental conditions, the breed efficiently utilizes low-quality pastures and forage resources, recovers quickly after periods of feed scarcity, and performs particularly well in foothill and mountainous regions owing to its strong legs and hard hooves.

The combination of grazing on predominantly natural pastures in mountainous and foothill areas and the breed's genetic characteristics results in relatively low milk yields compared with specialized dairy breeds. Average milk production ranges from approximately 4,000 to 4,500 kg per lactation, with a fat content of around 4.5% and a protein content of about 3.5%. Despite its moderate yield, the milk is distinguished by its exceptional nutritional value, health-promoting properties, and suitability for dairy processing.

Numerous studies have demonstrated that milk from pasture-grazed Polish Red cows contains high levels of polyunsaturated fatty acids (PUFA) and approximately three times more conjugated linoleic acid (CLA) than milk from Holstein–Friesian cows. It is also rich in functional proteins, including  $\beta$ -lactoglobulin,  $\alpha$ -lactalbumin, and lactoferrin. These attributes make it an excellent raw material for cheese production, particularly for high-quality ripened cheeses, owing to its favorable coagulation properties, short clotting time, and high thermal stability. In addition, the meat of Polish Red cattle is highly valued for its superior quality and nutritional characteristics.



<https://biobydlo.izoo.krakow.pl/rasy/polska-czerwona>



## CONCLUSIONS

Polish Red Cattle represents a valuable genetic resource, combining excellent adaptation to mountainous grazing systems with the production of high-quality milk and meat. Grazing on natural pastures enhances the nutritional and health-promoting qualities of the milk, which is characterized by a favorable fatty acid profile, elevated concentrations of bioactive compounds, and excellent technological suitability for cheese production.

These characteristics correspond well with the growing consumer demand for natural, high-quality foods produced within sustainable and environmentally friendly farming systems. Owing to their unique nutritional, technological, environmental, and cultural value, products derived from Polish Red Cattle have been included in the Polish List of Traditional Products maintained by the Ministry of Agriculture and Rural Development.

Beyond their production value, Polish Red Cattle play an important role in biodiversity conservation and the preservation of traditional agricultural landscapes and farming practices. This highlights the need for continued support of the breed through genetic resources conservation programmes, ensuring the protection of its unique genetic heritage and its contribution to sustainable rural development.