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Diversifying diets and scaling the potential of underutilized crops for sustainable and resilient food systems: insights from the DIVERSICROP action

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Agrifood systems are under pressure from multiple, interlinked challenges such as climate change, declining biodiversity and increasing expectations for secure, high-quality and sustainable food production. Together, these issues underscore the necessity of shifting toward more resilient and diversified food systems that support ecosystem preservation and meet long-term societal objectives. Underutilised crops represent a promising yet underexploited resource for improving dietary diversity, strengthening food security and enhancing agrobiodiversity across Europe. This paper combines insights from the DIVERSICROP action to explore the potential of peas, chickpeas and rye as nutrient-dense, environmentally resilient and culturally relevant crops whose role in modern diets remains limited. Evidence from recent research demonstrates that peas are rich in high-quality protein, dietary fibre, vitamins, minerals and bioactive compounds with antioxidant and anti-inflammatory properties. Chickpeas provide valuable protein and micronutrients, with processing techniques such as soaking, fermentation and cooking helping to reduce antinutritional factors and improve nutrient bioavailability. Rye contributes high levels of dietary fibre and functional compounds associated with digestive and cardiovascular health, while supporting resilient cereal production systems. Beyond nutritional and agronomic benefits, the successful integration of underutilised crops requires coordinated action across social, economic and institutional dimensions. Awareness-raising activities, capacity-building initiatives and interdisciplinary collaboration are essential for equipping stakeholders with the knowledge and skills needed to support diversification. Partnerships among farmers, producers, consumers, researchers and policymakers can create enabling environments for innovation, while targeted communication strategies help address misconceptions and highlight culinary versatility and health benefits. Mechanisms such as farmer incentives, educational programmes, public procurement, school feeding schemes, and improved market access are critical for scaling adoption. To translate scientific knowledge into practical dietary solutions, the DIVERSICROP network is developing a collaborative European cookbook that combines traditional and innovative recipes featuring these crops, linking nutritional science with culinary heritage and sustainability. At the same time, digital innovation, particularly artificial intelligence, offers new opportunities to accelerate this transition by supporting knowledge transfer, identifying context-specific sustainable practices, and enabling data-driven decision-making across value chains. Aligned with global biodiversity and climate commitments, this work moves beyond individual project outcomes to outline a strategic pathway for mainstreaming underutilised crops. Integrating biodiversity, policy frameworks, culinary innovation and digital tools can unlock their full potential, contributing to healthier diets, empowered rural communities, and more resilient and sustainable agri-food systems.