



Eveline M. Ibeagha-Awemu
Sunday O. Peters
Appolinaire Djikeng
John E. O. Rege *Editors*

African Livestock Genetic Resources and Sustainable Breeding Strategies

Unlocking a Treasure Trove and Guide
for Improved Productivity



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Editors

Eveline M. Ibeagha-Awemu
Sherbrooke Research and Development
Centre
Agriculture and Agri-Food Canada
Sherbrooke, QC, Canada

Appolinaire Djikeng
International Livestock Research
Institute (ILRI)
Nairobi, Kenya

Sunday O. Peters
Department of Animal Science
Berry College
Mount Berry, GA, USA

John E. O. Rege
Emerge Centre for Innovations–Africa
Nairobi, Kenya



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Editorial Contact: Annette Klaus

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Preface

For Africa, the journey to achieving the aspirations of the African Union Agenda 2063 (Goal 1 on quality of life and well-being, and Goal 2 on health and nutrition) and the corresponding ambitions of the United Nation's Sustainable Development Goals (SDGs: SDG1 on Poverty alleviation, SDG2 on ending Hunger, etc.) must consider livestock production and productivity. Understanding the key types, availability, and use options of the livestock genetic resources in Africa is a first step in taking measures toward sustainable increased productivity and resilience in the face of a myriad of current and future challenges. In this connection, members of the executive committee of the African Animal Breeding Network (AABNet, <https://www.animalbreeding-africa.org/index.html>) started discussions in mid-2019 to explore the landscape and review key drivers and opportunities for establishing breeding goals for adapted and resilient African livestock to meet increasing demand for animal source food, the challenge of climate change, and environmental concerns. As discussions progressed, it became clear that the substantial information gaps on African livestock genetic resources could not be adequately covered, in the depth and breadth we had envisaged, in a single review paper, and the idea to write this book on “African livestock genetic resources and sustainable breeding strategies” was born, and the writing started in earnest in late 2020 involving 83 contributing authors—professionals and experts from animal science, animal breeding, genetics, genomics, and other science disciplines—from 24 countries.

Authored by African livestock professionals representing a wide range of disciplines and focused on an examination of efforts toward understanding indigenous African livestock, their uses and systems of production, improvement challenges, and achievements made to date, this book presents a rich resource, across livestock species, for formulating technical, institutional, and policy interventions going forward and that leverage on rapidly changing technologies and responds to evolving human nutritional needs and other trends.

For thousands of years, natural selection and human activities have generated genetically diverse breeds of domesticated farm animals, which can significantly contribute to the livelihoods of millions of present-day Africans. Indeed, they are a treasure trove. Africa's indigenous livestock are particularly hardy and well-adapted to local production contexts, having developed adaptations to the continent's diverse climatic conditions and environmental pressures. Despite the wealth of desirable genetic traits, some of Africa's

iconic and lesser-known livestock are disappearing at an alarming rate. Despite the increasing recognition of the benefits of this diversity, little has been done to understand and optimally harness the full potential of these genetic resources. This book catalogues the main farm animal genetic resources (cattle, sheep, goat, pig, chicken, dromedary, horse, donkey, buffalo, turkey, duck, and geese) and some non-conventional animal genetic resources (frog, rabbit, snail, and honeybee) in Africa and the opportunities that can be leveraged with available technologies and knowledge for achieving rapid genetic gain and improved productivity. While the structure of the chapters differ considerably, they cover five broad areas in the context of animal genetic resources in Africa: their characterization (to understand the unique genetic composition of what we have, where it might have originated from, and its present-day distribution); conservation; use (efforts and approaches to enhance sustainable utilization, focusing on improving production and productivity, and product quality to meet evolving human needs); technological support (available technological developments that support sustainable livestock improvement); and the institutions and institutional arrangements needed to support their characterization, conservation, and sustainable use.

This book is the first to present as one source, the diversity and uniqueness of African farm animal genetic resources, and the possibilities that new technologies present, which will give a better appreciation of the existing resources to a wide range of users. It is a valuable manual for students, professors, researchers, animal science professionals, livestock farmers and farmer organizations, civil society organizations, non-governmental organizations, business professionals, government agencies, including policymakers, the international development community, and anyone who seeks to understand the uniqueness of African livestock genetic resources, production systems, and strategies for sustainable improvement for the African environment.

Sherbrooke, QC, Canada
Mount Berry, GA, USA
Nairobi, Kenya
Nairobi, Kenya

Eveline M. Ibeagha-Awemu
Sunday O. Peters
Appolinaire Djikeng
John E. O. Rege

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Eveline M. Ibeagha-Awemu
Sunday O. Peters
Appolinaire Djikeng
John E. O. Rege

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