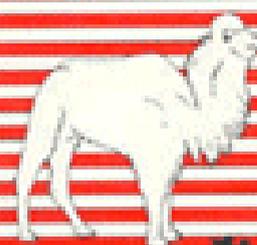


Animal genetic resources of the USSR

FAO
ANIMAL
PRODUCTION
AND HEALTH
PAPER

65



FOOD
AND
AGRICULTURE
ORGANIZATION
OF THE
UNITED NATIONS

FAO ANIMAL PRODUCTION AND HEALTH PAPER

Animal genetic resources of the USSR

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 1989

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ISBN 92-5-102582-7

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PREFACE

The proposal for a book on the Animal Genetic Resources of the USSR was made at the 1980 FAO/UNEP Technical Consultation on Animal Genetic Resources in Rome where about 100 member countries were represented. It was widely felt that information on the extensive livestock populations of the Soviet Union would be of great interest to many other nations. To date, there is no comprehensive publication in English covering this vast and important topic. It is therefore with pleasure that I write this foreword marking the end of 4 years work by many different individuals and organisations.

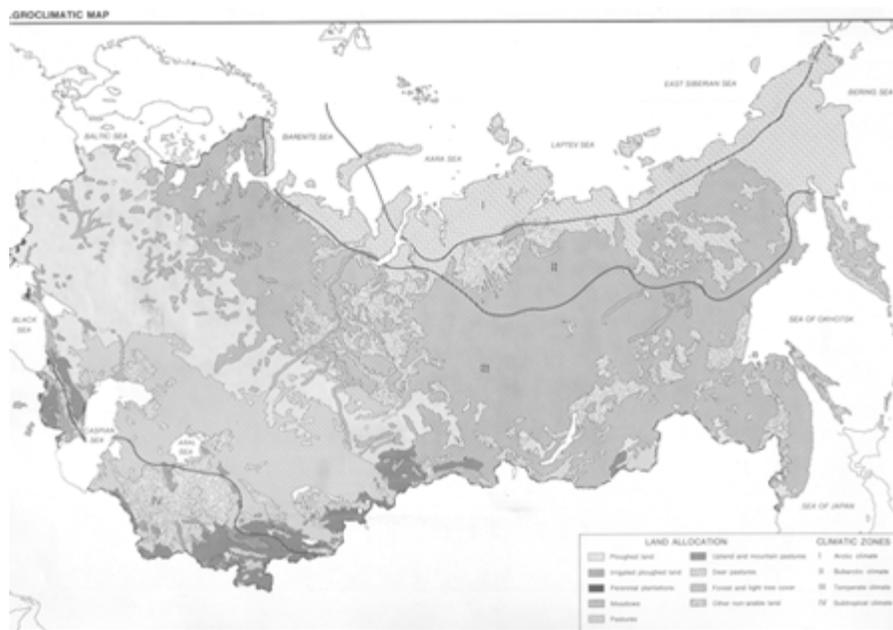
The USSR has many diverse topographical, climatic and cultural settings which have affected the development and use of domestic animals over long periods of time. The book presents a wealth of information covering 17 species and more than 100 breeds. Some breeds are clearly related to those of neighbouring countries in Europe, the Near East and Asia; others are very different and are found only in the USSR including the new synthetic breeds developed by Soviet scientists in the last 50 years. The book will therefore be of interest to many people in addition to those seeking directly to increase world animal production, and will include those concerned with conservation, biological sciences, education and research, social, cultural and economic fields.

On behalf of FAO I thank the many people who have contributed to its completion and commend it to the wide readership which will certainly receive it with pleasure and profit.

H.A. Jasiorowski Director, Animal Production & Health Division

Maps





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EXPLANATORY FOREWORD

This monograph "Animal Genetic Resources of the USSR" has been produced jointly by the Food and Agriculture Organization of the United Nations, the Centre for International Projects, Moscow and the USSR All-Union Academy of Agricultural Sciences. The funding has been provided principally by the United Nations Environment Programme (UNEP). The text was written specifically for this book by 25 leading Soviet scientists and specialists in agriculture in the USSR where the first translation into English was made. FAO then undertook the technical and English editing, followed by a period of consultation and revision with the Soviet authors and editors. The photographs which add so much to the understanding of livestock were specially commissioned for this publication.

The monograph follows a uniform layout in each chapter. Description of breeds within each species include the following: taxonomic group, origin, history, area of distribution at January 1980, environmental conditions, population dynamics, biological features, production traits, biochemical polymorphisms, breed structure, breeding centres, conservation herds and programmes for breed improvement and preservation. Major species are represented by improved, indigenous, rare and endangered breeds and for each, the most valuable qualities are emphasized. The material used derives from state herdbooks, lists of progeny tested sires, and registers of high producing animals. To be registered in a herdbook, animals must meet certain requirements of pedigree, breed characteristics, live weight, type, constitution, productivity and breeding value. These data are given for all improved breeds. The description of each breed is illustrated by outstanding individuals. Photographs show the conformation and sexual dimorphism of animals. . Sketch maps indicate the principal areas of occurrence of each

species or breed.

In general, the shading shows continuous and the triangles discontinuous distribution. The circles are intended only to draw attention to the triangles.

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TERMINOLOGY

Organizations

GKNT = USSR State Committee for Science and Technology

VASKhNIL = V.I. Lenin All-Union Academy of Agricultural Sciences

Administrative Divisions

RSFSR = Russian Soviet Federated Socialist Republic (or Russian Federation)

SSR = Soviet Socialist Republic

ASSR = Autonomous Soviet Socialist Republic

territory = Russ. krai

region = Russ. oblast'

province = Russ. guberniya (obsolete)

district = Russ. raion

area or zone = Russ. zona

Breeding Terms

breeding centre = Russ. plemennoi zavod (plemzavod)

conservation herd = Russ. genofondnoe stado

germ plasm = Russ. genofond

improved breed = Russ. zavodskaya poroda (or kulturnaya poroda) i.e. one suitable for intensive production

taboon = Russ. tabun, a herd or drove of horses on free range

udder index = percentage of milk produced by the forequarters

Fleece Terms

blocky staple = Russ. shtapelnoe runo

breaking length of wool = the theoretical length of wool which would break under its

own weight when suspended from one end

fleece hangs in pointed locks = Russ. kosichnoe runo

guard hair = Russ. ost'

kemp = Russ. mërtvyi volos (dead hair)

lambskin or fur = Russ. smushka

pelt = Russ. shuba

sheepskin = Russ. ovchina

tan = Russ. ryzhyi

tippy staple = Russ. shtapelno-kosichnoe runo

true wool = Russ. pukh i.e. down or undercoat

yolk = Russ. zhiropot i.e. sweat or suint plus sebum or fat

INTRODUCTION

In the contemporary world the provision of food and adequate levels of nutrition for the ever-increasing world population are important economic, social and political problems. Agriculture has been and will remain the principal source of human food. In the years to come it is important not only to increase energy intake but also to provide a balanced diet. Livestock production is one of the most valued components of human diet and the rational use of farm animals is gaining importance.

The USSR has a great diversity of climatic zones. For example, there are mountainous regions with rough terrain and seasonal forage supplies. Vast areas lie in the north with low temperatures and insufficient sun in winter and myriads of blood-sucking insects in summer. Hot continental climates prevail in Central Asia and Transcaucasia where animals are subject to blood protozoan diseases. The Soviet Union features a great variety of breeds of farm animals with 52 breeds and breed groups of cattle, 30 of pigs, 90 of sheep and 50 of horses. Of different types and purposes these breeds are adapted to a variety of climatic, topographical and geographic zones in the country.

The livestock industry uses various techniques for breed improvement and breed formation. The indigenous animal genetic resources have been studied in all regions of the country and the characteristics of indigenous populations defined. Although not noted for high performance, these animals showed good adaptation to local environmental and feed conditions. On this basis, crossbreeding programmes were initiated to form new breeds and types to combine the genotypes of high producing breeds and local populations. Almost all animal production in the USSR has been built on these principles. Populations of Simmental, Red Steppe, Black Pied and other cattle breeds, Large White pigs and Finewool sheep were produced by replacement crossbreeding (grading up). The process is exemplified by the dairy cattle breeds based on the Swiss Brown. Crossing this breed with local populations and intense selection have resulted in new breeds - Kostroma, Lebedin, Ala-Tau, Caucasian Brown and Carpathian Brown. Also there are now large populations of dairy cattle in Central Asia bred from crosses between Swiss Brown cattle and local zebu. Another example is the Bushuev breed which features rather high productivity, resistance to blood protozoan diseases and adaptability to a hot and extreme continental climate.

Many sheep breeds have been formed by crossing imported and national breeds. For instance, the Kirgiz Finewool was formed by crossing local fat-rumped sheep with finewool breeds. This method was also employed in the formation of the North Kazakh Merino and Kazakh White-headed cattle; the latter is now being crossed with Charolais and Aberdeen-Angus to produce a new type of beef cattle. Kushum horses, which are triple-purpose, originated from crosses of Kazakh horses with the Thoroughbred and other breeds. Qualitative changes in Soviet animal husbandry were predominantly due to pure breeding of many native and indigenous varieties through systematic selection. This pattern was followed in the formation of such breeds as Kholmogory and Yaroslavl cattle, Romanov, Karakul, Hissar and

Sary-Ja sheep, Akhal-Teke, Lokai, Karabair and Iomud horses, Arvana one-humped camels and others. Many of these breeds subsequently served as improvers. For example, Sary-Ja sheep were used in the formation of the meat-wool Tajik and Alai breeds. Intense selection of the Sary-Ja resulted in the highly productive Ashkhabad intra-breed type.

Distant hybridization can in certain cases, play an important role in the formation of high producing animal populations adapted to extreme environments. Mating of Argali rams with finewool ewes resulted in a unique high producing mutton-wool Arkhar-Merino adapted to mountainous areas. Hybrids have been produced by crossing cattle with American bison, European bison and banteng. Of particular interest for hot climates are cattle x banteng crosses. In horse hybridization the following crosses have been made: domestic horse x zebra species, Przewalski horse x domestic ass, Przewalski horse x Chapman zebra, and zebra species hybrids. Intense investigations continue into horse hybridization. Also under study are mouflon x domestic goat and Barbary sheep x domestic sheep crosses. Accelerated scientific and technical progress in animal husbandry and intensive livestock production in many countries including the USSR are narrowing the diversity of animal breeds and leading to the replacement of many native breeds by those which are specialized and more productive. The extinction of indigenous breeds causes serious genetic loss. This reduction in the number of indigenous breeds should be kept under control. Otherwise, many valuable, rare and unique breeds formed by traditional selection over centuries and in various environments, may vanish. In most cases these local breeds have valuable traits such as high adaptability to extreme environments, viability, longevity, disease resistance, strong constitution and in some cases high quality of products. In the vast areas in the Soviet Union where intensive husbandry is prevented by environmental factors, specialized high-production breeds can hardly survive because of the limited feed resources and extremes of climate. In such regions it is advisable to use well-adapted local breeds and also to try to combine local adaptability with higher production from introduced breeds.

Due to the changes in pig production and the wide use of industrial techniques, meat or meat-lard breeds are spreading throughout the country (Large White, Lithuanian White, Latvian White, Landrace). This is leading to the elimination of native breeds which are predominantly lard and semilard types. This category includes 20 breeds and breed groups in various regions and characterized by valuable productive and unique biological traits. There are 25 native sheep breeds in the USSR. Most of them are the result of centuries-old selection in different parts of the country and primarily in Central Asia and Transcaucasia. All these local sheep breeds are characterized by strong constitution, hardiness, adaptation to mountainous environments, high fertility with good meat, milk and wool production. The wide use of vehicles and mechanization in agriculture, causes little, if any attention to be given to horses, asses and mules. This neglect has caused a drastic drop in numbers of many breeds or even their extinction. Energy saving policies call for the use of work animals for load carrying and draught in those places where it is appropriate. Attention is needed for their preservation and improvement. Today the highly concentrated and specialized poultry industry is based on a small number of breeds, lines and crosses. Over 80 poultry breeds which have not been changed by intensive

selection now fail to compete with the improved breeds and are being removed from production.

All these aspects show the necessity of preserving the germ plasm of indigenous breeds of farm animals in the USSR not only for current selection and breeding work but also for future breeding programmes. The question of preserving animal germ plasm was first raised in the USSR in 1927 by a Soviet geneticist, A.S. Serebryakovski. This problem needs to be comprehensively planned taking into account social, economic, scientific and managerial aspects. General guidelines for conservation of genetic resources have been established. The USSR is establishing semen banks and conservation farms to preserve the germ plasm of national animal breeds. At present the semen banks contain frozen bull semen of nearly all the cattle breeds. As embryo conservation becomes practicable it will facilitate animal genetic resources preservation and parallel the world-known collection of plant seeds made by the Soviet biologist, N.I. Vavilov. The international development of theoretical aspects and practical techniques of animal breeding and selection, advances in artificial insemination and closer contacts between countries are providing increasing access to genetic resources of rare and local animal breeds. This monograph is intended to contribute to improved animal production by giving the reader the most up to date and comprehensive information on the indigenous and improved breeds of the USSR.