

NEWS ITEMS

FAO/UNEP ANIMAL GENETIC RESOURCES DATA BANKS - A PROGRESS REPORT INTRODUCTION

- 1 This note summarizes the work started during 1983 for the creation of 3 Regional Data Banks to hold characterizations of animal genetic resources in Africa, Asia and Latin America. It also looks forward to the work ahead, and outlines the likely steps needed to achieve a unified system offering maximum value to users in the future.
2. The creation of data banks for animal genetic resources in Africa, Asia and Latin America was recommended by the FAO/UNEP Expert Consultation in Rome in 1980, and was subsequently included for funding in the joint FAO/UNEP project for Animal Genetic Resources Conservation and Management, and in the FAO Regular Programme Budget.
3. Work started in 1983, when FAO decided to establish Pilot Trials separately in each of the three regions, to gain experience in preparing characterizations of indigenous breeds of livestock and poultry. These trials aim also to define a routine for collecting original data from both published and unpublished reports, and for the extraction from them of the essential information for preparing the characterizations of individual breeds. No attempt is being made in the pilot trials to buy or to set up special computing equipment. The emphasis is upon the exploration of a technique and standard format to produce the breed characterizations together with estimates of the time and staff skills needed for this task.
4. FAO has arranged a contract with the Commonwealth Bureau of Animal Breeding and Genetics for hard copy abstracts to be provided for the pilot trials for the local breeds being studied.

TIME FRAME

5. During 1983, contracts for 1 year were signed by FAO with institutions in three countries of Asia (Malaysia, Sri Lanka and Thailand), in two countries of Latin America (Venezuela and Mexico) and with the Interafrican Bureau of Animal Resources (IBAR of OAU) in Africa. The results from these trials will be available for regional evaluations in the autumn of 1984. The best experiences will then be used to design a unified global format for the characterizations. It will also be necessary to plan the locations of the Regional Data Banks. There will be many factors to take into account in making these decisions, and the regional organizations working closely on this project (IBAR/OAU; SABRAO; ALPA) will make essential inputs. It will also be appropriate during 1985, to investigate equipment options to be used for the data banks, in the light of the agreed format and routine which will, by then, be decided. Trials with possible equipment will be needed to gain experience of different types suited to the work with Animal Genetic Resources Data Banks.
6. It is therefore foreseen that at the end of 1985 sufficient experience will have been gained to establish the Regional Data Banks and to expand the programme to include many more breeds and countries.

TECHNICAL ASPECTS

7. At the meeting of the Joint FAO/UNEP Expert Panel in October 1983, the Panel made some technical recommendations regarding the Animal Genetic Resources Data Banks. In summary they are:
 - a. Highest priority should be given to the identification and characterization of genetic resources and their adaptation; Regional Data Banks are a key part of this. The

Panel commended FAO for initiating this work with thorough studies of methodology to ensure that a globally compatible system, using a common format, is created.

- b. Regional Data Banks should be established as soon as the methodological studies are complete.
 - c. Descriptor lists for each species should be created.
 - d. A uniform system of criteria should be developed for indicating the value of information included in the data bank.
 - e. Competent scientific screening and compilation of all data entering data banks should be ensured, so that garbage is excluded.
8. In addition to the regional methodological studies already described above, FAO is currently arranging for scientists to undertake the creation of Descriptors.

DESCRIPTORS

9. Descriptors (of species or environments) are a series of items with defined meanings, which are universally used to prepare data bank characterizations of:

- i. Breeds of a given species, covering the phenotypic and genetic parameters of the breed.
- ii. Environments in which breeds of a given species are found, covering the natural and artificial features relevant to genetic analysis, including such items as climate, topography, endemic disease risk, feed and water supply and management systems.

10. The purpose of descriptors is to facilitate valid comparison, classification or enumeration of breeds within a species in the context of the environments existing in different countries and regions of the world.

11. Plant breeders and geneticists who already have experience in data banks have created their own lists of descriptors for some domestic plants. Animal geneticists have a smaller task, for there are relatively few species of animals which have been domesticated. A descriptor list will be needed for each animal species. Without the universal use of a common descriptor list, attempts to achieve a globally compatible system will fail, and regional data banks will have limited value.

12. Leaders in each of the pilot studies are now engaged in designing their own descriptor list for each species. The lists from each region will be brought together at the end of the trial period, when a small group for each species will be set up by FAO, with the task of designing the definitive list for the species. This is felt to be a preferable method during the pilot trials, rather than using an arbitrary list drawn up by one person, which would have placed limits on the experiences in the trials.

13. Descriptors for the environment to describe the adaptation of a breed will also be needed. These probably need not be species specified. In each pilot trial, the people concerned are being encouraged to create their own list of environmental descriptors to meet the needs of their own local conditions. At the same time, FAO is arranging for a separate study of environmental descriptors among specialists in this field. Their findings will also be available when the consultations take place at the end of the pilot trials.

FAO/UNEP REGIONAL CRYOGENIC GENE BANKS

One of the components of the FAO/UNEP Project for Animal Genetic Resources Conservation and Management is the creation of Gene Banks for indigenous breeds of Africa, Asia and Latin America. At the meeting of the Expert Panel in 1983, it was accepted that the most reasonable and economically feasible means of creating and maintaining gene banks in the developing regions of the world is by cryogenic storage, rather than by live animals. There will obviously be exceptions to this generalization, but they are likely to be national rather than regional. FAO and UNEP will provide technical help and guidance when requested for the establishment of national live animal reserves. Meanwhile, however, the main thrust of the programme is the

creation of Regional Cryogenic Gene Banks.

As a first step, immediately after the Expert Panel meeting, FAO arranged a pilot study in Africa to seek resolution to some of the practical problems. It was decided to work with the Gobra breed initially in Senegal. Semen from this indigenous breed is being collected, and frozen, and then moved to other countries to provide opportunity to evaluate some of the problems.

In particular the aims of the pilot study are:

- a. To record and analyse problems of a technical nature in connection with the harvesting of genetic material in the form of frozen semen in circumstances where frozen semen processing laboratories and skilled staff are not available.
- b. To identify problems associated with the certification of disease-free status in semen harvested from males not kept continuously at an AI centre; to propose solutions to these problems; and to create a record system of health tests carried out on the animals and in the herds and regions concerned, to indicate to users in the future the health/disease risk status of the semen.
- c. To make available 1500 doses of semen with the relevant documentation, of donor bulls' identification, performance traits as available, and records of the investigations forming the basis for the declaration of health/disease status of the semen produced.

The work is being carried out by the Laboratoire de Contrôle des Reproducteurs, Maisons-Alfort, France, under the direction of Dr. M. Parez.

BREED DICTIONARY

In 1969 the Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh, Scotland, published the second (revised) edition of "A World Dictionary of Breeds, Types and Varieties of Livestock" which was compiled by I.L. Mason. The first edition had been published in 1951. The dictionary covers ass, buffalo, cattle, goat, horse, pig and sheep. For each breed the English name is followed by area of distribution, uses, relationship to other breeds, colour, horns (and for sheep tail and fleece type), origin, presence of herdbook, names in other languages, synonyms and misspellings, varieties, derived breeds, herdbooks and breed societies in other countries, etymology of the name, status, e.g. "rare" or "nearly extinct".

A third edition is now in preparation. The compiler would be most grateful for any useful information to help in his task. He would be particularly grateful for books, papers or pamphlets describing specific breeds or groups of breeds. But he would also like firsthand unpublished information of the same sort especially if it drew attention to errors and omissions in the second edition. All information should be sent to: I.L. Mason, 8 Ramsay Garden, Edinburgh EH1 2NA, UK.

ANIMAL GENETIC RESOURCES OF THE USSR

In 1980, at the FAO/UNEP Technical Consultation in Rome, on the Conservation and Management of Animal Genetic Resources, it was recommended that FAO and UNEP should seek agreement with the Government of the USSR for an inventory of all breeds of livestock and domestic birds in the USSR. It was pointed out that there are most extensive genetic resources available in the USSR, which are not well documented for use in the West or in Developing Countries. Initiatives have been made, and responded to by the USSR, resulting in a visit to the USSR by the FAO Animal Production Officer (Animal Breeding and Genetic Resources) in June 1984, when plans were finalized and agreed. The work of gathering all the appropriate information is in progress, and Soviet geneticists are writing full descriptions of the breeds and of the environments to which they are adapted. The information will be published by FAO/UNEP in a monograph, with many photographs, maps and tables, in Russian and English, and later it is hoped also to publish in French and Spanish. The monograph will include over 180 breeds of 15

domestic species. The scientific editors of the monograph are Academician L.K. Ernst and Academician N.G. Dmitriev of the All-Union Lenin Academy of Agricultural Sciences; the Soviet coordinator responsible for implementing the project is Dr. S.N. Baibakov of the Centre for International Projects in Moscow; final preparation of the manuscripts, editing and publication will be in the hands of FAO, and funds are being provided by UNEP. It is planned to publish the Russian and English editions by the end of 1985.

ANIMAL GENETIC RESOURCES IN CHINA

A similar recommendation to that mentioned above was also made in 1980 at the FAO/UNEP Technical Consultation concerning the Animal Genetic Resources of China. A first step to meeting this request is in process. The book "Livestock Breeds of China" by Professor Cheng Pie Lieu, which has been published in Chinese by China Academic Publishers of Beijing, is currently being prepared for publication in English by FAO. The translation into English was first made by the author, and the manuscript is being edited on behalf of FAO by Dr. Helen Newton Turner of Australia, who has longstanding contacts with Professor Cheng Pie Lieu. Publication in English is expected in 1985.

TWO NEW PUBLICATIONS FROM FAO/UNEP ON ANIMAL GENETIC RESOURCES

The proceedings of the FAO/UNEP Expert Panel on Animal Genetic Resources Conservation and Management, which was held in October 1983, are now published in two parts as follows:

Part I Conservation by Management, Data Banks and Training. Animal Production and Health Paper 44/1.

Part 2 Cryogenic Storage of Germplasm and Molecular Engineering. Animal Production and Health Paper 44/2.

Copies may be requested from Animal Production and Health Division, FAO Rome, or through FAO Sales Agents.

DEFINITIONS PERTAINING TO ANIMAL GENETIC RESOURCES

The following is a preliminary list and further definitions will be published periodically.

1. CONSERVATION

The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. Thus conservation is positive, embracing preservation, maintenance, sustainable utilization, restoration and enhancement of the natural environment.

(This definition of CONSERVATION originates with the World Conservation Strategy, which was prepared by the International Union for the Conservation of Nature and Natural Resources (IUCN), and the following collaborative organizations: United Nations Educational, Scientific and Cultural Organization (Unesco), the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), and the World Wildlife Fund (WWF).

2. PRESERVATION

That aspect of CONSERVATION by which a sample of an animal genetic resource population is designated to an isolated process of maintenance, by providing an environment free of the human forces which might bring about genetic change. The process may be in situ, whereby the sample consists of live animals in a natural environment, or it may be ex situ, whereby the sample is placed, for example, in cryogenic Storage.

3. CONSERVATION BY MANAGEMENT

That aspect of CONSERVATION by which a sample, or the whole of an animal population is subjected to planned genetic change with the aim of Sustaining, Utilizing, Restoring or Enhancing the quality and/or quality of the animal genetic resource and its products of food, fibre or draught animal power.

4. THREATENED (SPECIES OR BREED)

A term used to describe an animal genetic resource population which is subject to some force of change, affecting the likelihood of it continuing indefinitely, either to exist, or to retain sufficient numbers to preserve the genetic characteristics which distinguish it from other populations. THREATENED is a generic term embracing more precise descriptions such as Endangered, or Vulnerable. (It is also used in the context of the World Conservation Strategy.)

5. GENE BANK

A physical repository, in one or more locations, where the samples of animal genetic resource populations which are being preserved are kept. These may include animals, embryos, oocytes, sperm, DNA, etc.

6. DATA BANK

The fund of knowledge comprising the CHARACTERIZATIONS which describe the genetic attributes of animal breeds or species and the various environments in which they occur; these CHARACTERIZATIONS being stored both as numerics and words in a data/word processing system which provides for the addition of further information, for amendment and for analytical use.

7. CHARACTERIZATION

The numeric/word description of:

- i. the genetic attributes of an animal species or breed which has a unique genetic identity; and
- ii. the environments to which species or breed populations are adapted or known to be only partially or not adapted.

The CHARACTERIZATION is a succinct statement, being the distillation of all available knowledge both previously published or unpublished, which contributes to the reliable prediction of genetic performance in defined environments. It is different from the mere accumulation of existing reports or individual findings on genetic performance on specific occasions.

8. DESCRIPTORS (OF SPECIES OR ENVIRONMENTS)

A series of items with defined meanings for a species and its environments, which are universally used to prepare data bank CHARACTERIZATIONS of:

- i. breeds of a given species, covering the phenotypic and genetic parameters of the breed;
- ii. environments in which breeds of a given species are found, covering the natural and artificial features relevant to genetic analysis, including such items as climate, topography, endemic disease risk, feed and water supply, and management systems.

The purpose of DESCRIPTORS is to facilitate valid comparison, classification or enumeration of breeds within a species in the context of the environments existing in different countries and regions of the world.