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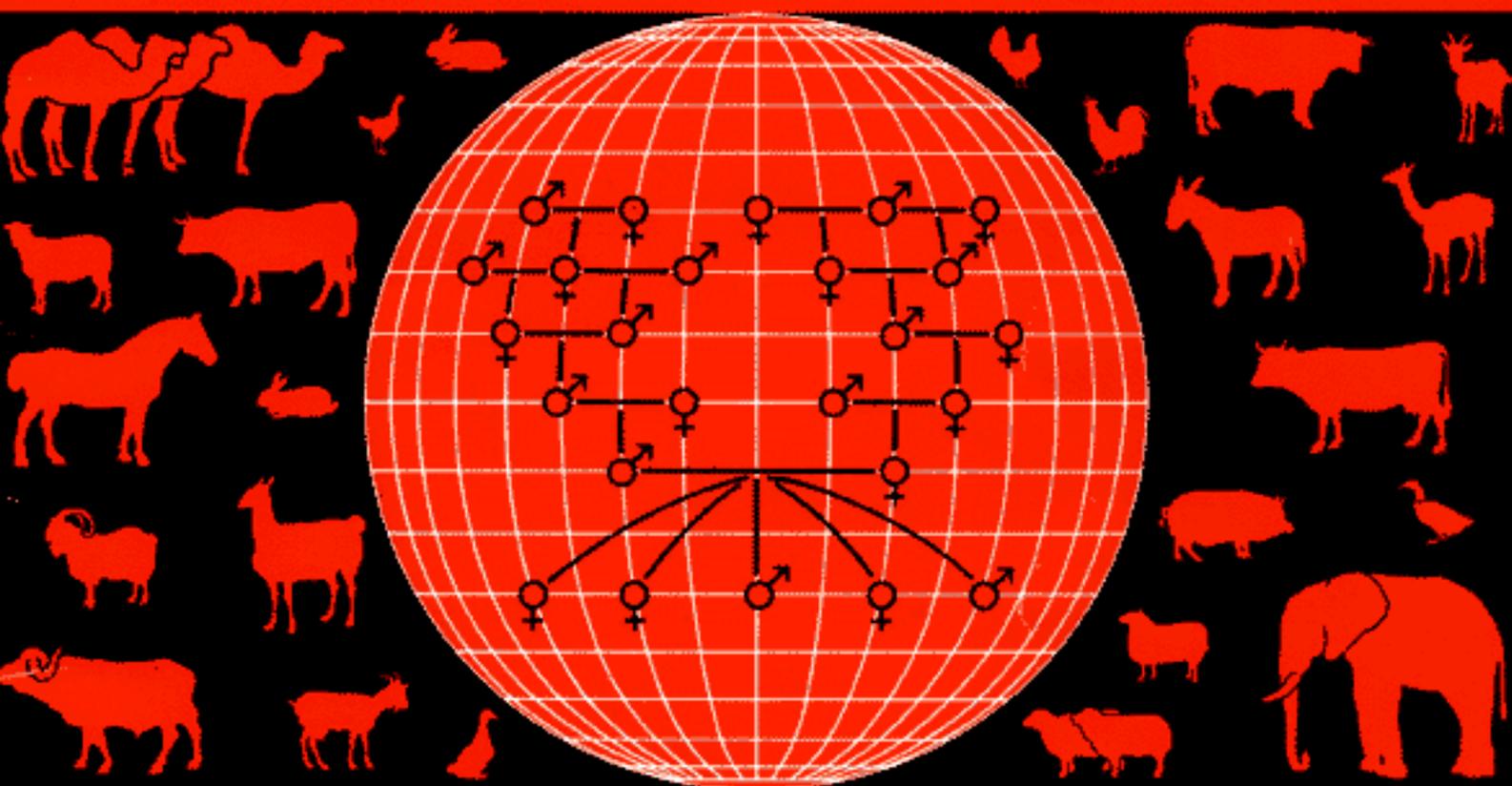
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# ANIMAL GENETIC RESOURCES INFORMATION

## BULLETIN D'INFORMATION SUR LES RESSOURCES GÉNÉTIQUES ANIMALES

## BOLETIN DE INFORMACION SOBRE RECURSOS GENETICOS ANIMALES



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## FOREWORD

Domestic animals are one of the world's most valuable resources. Without them mankind would be immeasurably poorer fed and clothed, and in many countries man would have to engage in much extra physical work. Additionally, domestic animals provide a variety of recreations.

Today, science offers many opportunities for rapid genetic changes in domestic animal breeds including not only the use of quantitative genetics for breed improvement, crossbreeding and the creation of composite breeds, but also an increasing variety of reproductive techniques such as artificial insemination, embryo transfer, cryogenic storage and others still in the development stage.

However, the benefits of improved production are inevitably accompanied by threats of lost genotypes. It is the view of the Food and Agriculture Organization of the United Nations and the United Nations Environment Programme that responsible decisions to conserve and to utilize our animal genetic resources must be based upon knowledge. Therefore, in addition to other joint activities in this area, FAO and UNEP have launched this new publication with the aim of facilitating the spread of knowledge on animal genetic resources among all who live and work with this invaluable heritage.

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Animal Genetic Resources Information is published under the joint auspices of the Food and Agriculture organization of the United Nations (FAO) and the United Nations Environment Programme (UNEP). It is edited in the Animal Production Service of the Animal Production and Health Division of FAO and will appear twice yearly. It is available direct from FAO or through the usual FAO sales agents.

Le Bulletin d'informations sur les ressources génétiques animales est publié sous les auspices conjoints de l'Organisation des Nations Unies pour l'Alimentation et l'Agriculture (FAO) et du Programme des Nations Unies pour l'Environnement (UNEP). Cette publication semestrielle est éditée par le Service de la Production Animale de la Division de la Production et de la Santé Animales de la FAO. On peut se la procurer directement au siège de la FAO ou auprès des dépositaires et agents habituels de vente de publication de l'Organisation.

El Boletín de Información sobre Recursos Genéticos Animales se publica bajo los auspicios de la Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO) y del Programa de las Naciones Unidas para el Medio Ambiente (UNEP). Se edita en el Servicio de Producción Animal de la Dirección de Producción y Sanidad Animal de la FAO y aparece dos veces al año. Se puede obtener directamente de la FAO o a través de sus agentes de venta habituales.

**Editor-Editeur: John Hodges**

### **Acknowledgement**

The editor would like to thank Mr. I.L. Mason for his contribution to the production of this issue.

### **Remerciements**

L'éditeur tient à remercier M. I.L. Mason pour sa contribution à la rédaction de ce numéro.

### **Agradecimientos**

El editor desea agradecer al Sr. I.L. Mason por su valiosa contribución en la producción de este número.

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ANIMAL GENETIC RESOURCES INFORMATION will be sent free of charge to those concerned with the conservation, management or utilization of domestic livestock. Anyone wishing to receive it regularly should send their name and address to The Editor, at the address on page viii.

BULLETIN D'INFORMATION SUR LES RESSOURCES GENETIQUES ANIMALES sera envoyé gratuitement aux personnes intéressées par la conservation, l'élevage ou l'exploitation du bétail domestique. Les personnes souhaitant recevoir cette publication régulièrement voudront bien faire parvenir leurs nom et adresse à l'éditeur, à l'adresse indiquée en page viii.

BOLETIN DE INFORMACION SOBRE RECURSOS GENETICOS ANIMALES sera enviado gratuitamente a aquellos quienes sean interesados en la conservación, gestión a utilización del ganado domésticos. Si se desea recibirlo regularmente, se ruega comunicar nombre, apellido y dirección al Editor a la dirección indicada en la página viii.

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## INTRODUCTION

The second recommendation of the FAO and United Nations Environment Programme Technical Consultation on Animal Genetic Resources Conservation and Management (Rome, June 1980) reads as follows:

“FAO/UNEP are requested to arrange for the preparation and distribution of an international newsletter on the conservation and management of farm animal genetic resources. The newsletter should provide information about training programmes, techniques, activities and developments; should contain a correspondence section; and should be a means of stimulating cooperation on a worldwide basis”.

The Working Group which met after the Consultation in order to discuss the implementation of the recommendations commented as follows:

“The Working Group would like FAO/UNEP to prepare and distribute a newsletter, similar to that published by the IBPGR. The newsletter should contain material in one of three languages (English, French or Spanish) with summaries in the other two languages. The newsletter should be published as soon as editorial and financial resources are available, perhaps on a quarterly basis, in order to stimulate interest and activity at national and regional level. The importance of good quality articles, particularly in the early issues, was stressed.”

The present publication (AGRI) is the first issue of the newsletter. The Editor would like to thank all those who have sent contributions, and now appeals for a continuous flow of articles. Since it is a newsletter we are particularly interested in receiving news items about meetings, other activities in the field of documentation, conservation and evaluation, and new publications.

In an early issue we should like to publish a list of national organizations specifically concerned with the conservation and management of animal genetic resources and information is particularly requested in this field.

AGRI will also be used as a vehicle for updating and publishing the information collected earlier for the Inventory of Special Herds. This was issued as a draft report but was never published because of its incompleteness. It is now considered more appropriate to publish information on conservation country by country and to include all the conservation activities and not only accounts of the special conservation herds.

FAO/UNEP follow-up action to the other recommendations of the Consultation is summarized in the first article. We would like in later issues to record the activities in individual countries whether by governments or by non-governmental organizations. Both groups and individuals are encouraged to send in regular reports and news items. It is only by such cooperation that AGRI can be made a success by fulfilling its function of stimulating action and maintaining contact between all those concerned with farm animal genetic resources.



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## GUIDE TO CONTRIBUTORS

Animal Genetic Resources Information will be pleased to receive contributions up to 3000 words long in English, French or Spanish. If accepted they will be published in the original language with summaries in the other two. Reports, news and notes about meetings, conservation and evaluation activities, and techniques, would be appreciated. Manuscripts should be typed in double space and accompanied by a summary of not more than 5 percent of the original length. Photographs are acceptable but only high quality black and white prints. AGRI will also review new books on animal genetic resources. Correspondence is invited.

All contributions should be addressed to:

The Editor, AGRI, AGAP, FAO,  
Via delle Terme di Caracalla,  
00100 Rome, Italy.

Le Bulletin d'information sur les ressources génétiques animales souhaite recevoir des articles en anglais, en français ou en espagnol, de 3000 mots au maximum. Les communications publiées paraitront dans la langue originale avec des résumés dans les deux autres langues. Les rapports, informations et notes concernant les réunions et les activités de conservation et d'évaluation et les techniques seraient particulièrement appréciés. Les manuscrits devront être dactylographiés en double interligne et accompagnés d'un résumé ne dépassant pas cinq pour cent de la longueur de l'original. Le Bulletin accepte les photographies à condition qu'il s'agisse de bonnes épreuves en noir et blanc. Le Bulletin rendra également compte des ouvrages nouvellement parus sur les ressources génétiques animales. Un échange de correspondance est le bienvenu.

Adresser toutes les contributions à l'adresse suivante:

L'Editeur, AGRI, AGAP, FAO,  
Via delle Terme di Caracalla,  
00100 Rome, Italie.

El Boletín de Información sobre Recursos Genéticos Animales recibirá con mucho gusto colaboraciones de hasta 3000 palabras de extensión en español, francés o inglés. Si son aceptadas, las contribuciones se publicarán en el idioma original junto con resúmenes en los otros dos idiomas. Interesa recibir informes, noticias y notas sobre reuniones, actividades de conservación y evaluación, y cuestiones técnicas. Los originales deberán presentarse mecanografiados a doble espacio y acompañados de un resumen que no supere el 5 por ciento de la extensión original. Se aceptan fotografías, pero únicamente en blanco y negro y de buena calidad. AGRI también publicará reseñas de libros sobre recursos genéticos animales. Se solicita correspondencia.

Todas las contribuciones deberán dirigirse a:

El Editor, AGRI, AGAP, FAO,  
Via delle Terme di Caracalla,  
00100 Roma, Italia.

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# FOLLOW-UP ACTION BY FAO/UNEP TO THE RECOMMENDATIONS OF THE TECHNICAL CONSULTATION ON ANIMAL GENETIC RESOURCES

ROME, JUNE 1980

## SUMMARY

Phase II of the FAO/UNEP Project "Conservation of Animal Genetic Resources" provides support for the following:

1. Publication of Animal Genetic Resources Information.
2. Surveys of indigenous breeds of livestock in the USSR.
3. Establishment of pilot data banks in Africa, Asia and Latin America.
4. Development of pilot conservation schemes for selected indigenous breeds.
5. Training in conservation methodology.

In addition an FAO/UNEP Expert Panel on Animal Genetic Resources will be established.

## RESUME

La phase II du projet conjoint FAO/PNUE intitulé "La conservation des ressources génétiques animales" prévoit un appui aux activités suivantes:

1. Publication d'un bulletin d'information sur les ressources génétiques animales.
2. Série d'enquêtes sur les races indigènes de bétail de l'URSS.
3. Création de banques pilotes de données en Afrique, en Asie, en Amérique latine.
4. Elaboration de programmes pilotes de conservation de certaines races indigènes.
5. Formation en matière de méthodologie de la conservation des ressources génétiques.

Le projet prévoit également l'organisation d'une consultation d'experts FAO/PNUE sur les ressources génétiques animales.

## RESUMEN

La fase II del proyecto FAO/PNUMA "Conservación de los recursos genéticos animales" presta apoyo a las actividades siguientes:

1. Publicación de Información sobre Recursos Genéticos Animales.
2. Estudios de razas indígenas de ganado en la URSS.
3. Establecimiento de bancos experimentales de datos en Africa, Asia y América Latina.
4. Elaboración de planes experimentales de conservación de determinadas razas indígenas.
5. Capacitación en materia de metodología de la conservación.

Además se creará un Cuadro de Expertos FAO/PNUMA sobre Recursos Genéticos Animales.

This Consultation was effectively the climax to Phase I of the FAO/UNEP project on Conservation of Animal Genetic Resources. It reviewed the work achieved, not only by the project but also by regional and national organizations, and made recommendations for future action. The project was completed by the publication of the Report of the Consultation in 1980 and of the Proceedings in 1981.

FAO and UNEP have now initiated Phase II of the project which will carry out some of the recommendations of Phase I. There are six principal parts to the project which are described separately below.

## **1. PUBLICATION OF ANIMAL GENETIC RESOURCES INFORMATION**

## **2. SURVEYS OF INDIGENOUS BREEDS OF LIVESTOCK IN THE USSR**

There is a wealth of interesting breeds in the USSR and a developing programme for their conservation. Unfortunately too little is known outside the USSR about the breeds or their conservation because nearly all the relevant publications are in Russian. The aim of this part of the project is, by cooperation between FAO/UNEP and the Soviet authorities, to survey the local breeds and produce a monograph which will be published in both Russian and English.

## **3. PILOT DATA BANKS FOR ANIMAL GENETIC RESOURCES IN AFRICA, ASIA AND LATIN AMERICA**

Consultants are completing feasibility studies and preparing plans for the establishment of these data banks. They will include the enumeration of breed populations and population structure as well as the generation of some data on productive and adaptive characters. The consultant will develop procedures for collection, processing, storage and dissemination of information but the actual collection of information and its storage in data banks will be undertaken by cooperating institutions.

The African data bank will be developed in cooperation with the Inter-African Bureau of Animal Resources (IBAR) of the Organization of African Unity. It will concentrate to begin with on selected East, West and Central African countries.

The Asian data bank will include India and southeast Asia and will work in close cooperation with the Society for the Advancement of Breeding Researches in Asia and Oceania (SABRAO) and with the proposed Institute of Animal Genetics and Bureau of Animal Genetic Resources in India. SABRAO has already started work in this field and some account of its recent conference is given in a later article in this issue (see page 31).

The Latin American data bank will work in cooperation with the Asociación Latinoamericana de Producción Animal (ALPA) and national and regional institutions.

## **4. PILOT SCHEMES FOR THE CONSERVATION AND IMPROVEMENT OF SELECTED INDIGENOUS BREEDS**

Cattle breeds suggested for the initial schemes are: Kenana and Butana (Sudan), Dwarf Shorthorn (West Africa), and the Sahiwal (Pakistan, India and Kenya). The development of pilot conservation and management programmes will be undertaken in cooperation with national institutions. The Kenana/Butana will be tackled first since a conservation plan already exists for this breed but needs support for implementation.

Plans for the Dwarf Shorthorn are in the pipeline. They are closely tied up with those for the other trypanotolerant breeds in West Africa, including the N'Dama. It is hoped that in a future issue we can publish an account of current activity in the breeding of trypanotolerant cattle.

As for the Sahiwal there is considerable activity in India (see Nagarcenkar, page 13) and in Kenya (see Trail, page 17). Plans are in hand for investigating the possibility of linking conservation and improvement programmes for all three countries.

## **5. TRAINING IN CONSERVATION METHODOLOGY**

Short term training in the methodology of animal genetic resources conservation will be provided for selected scientists from the developing countries. Consideration is being given to a first training course in Hungary to be followed by others periodically. Either a formal course will be organized in cooperation with the National Bureau for Protecting Environment and Nature, or the selected scientists will be given the opportunity to undertake study tours to institutions involved in practical conservation programmes.

## **6. EXPERT PANEL ON ANIMAL GENETIC RESOURCE CONSERVATION**

FAO and UNEP will set up an Expert Panel of eminent scientists together with representatives of FAO and UNEP and other collaborating organizations. This panel will meet periodically, with the first meeting in Rome in autumn 1983. It will consider scientific aspects and advise on critical issues relating to animal genetic resources.



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# SHEEP GERM PLASM IN ETHIOPIA

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## SUMMARY

Four of the many Ethiopian sheep breeds are described. These four breeds have evolved in different ecological zones, the Adal and the Somali Blackhead breeds in the lowland up to an altitude of 1100 m, the Horro in the middle altitude from 1400 to 2000 m, and the Menz in altitudes higher than 2500 m. Available estimates on their performance are reported.

## RESUME

Cette note décrit quatre des nombreuses races ovines éthiopiennes qui se sont constituées dans des zones écologiques différentes, les races Adal et Somalienne à tête noire dans les régions où l'altitude ne dépasse pas 1100 m, la race Horro en moyenne altitude (de 1400 à 2000 m) et la race Menz au-dessus de 2500 m. La note fournit les informations disponibles sur les performances de ces différentes races.

## RESUMEN

Se describen cuatro de las muchas razas de ganado ovino de Etiopía. Estas cuatro razas han crecido en diferentes zonas ecológicas; las razas Adal y la Somali Blackhead en tierras bajas hasta una altitud de 1100 m, la Horro a una altitud media de 1400 a 2000 m, y la Menz a altitudes superiores a 2500 m. Se comunican las estimaciones disponibles sobre su rendimiento.

## 1. INTRODUCTION

Ethiopia with its approximately 24 million sheep and its great variation in climate and topography represents a good reservoir of sheep genotypes. These sheep fall into many breeds/types whose habitat covers the full range from the tropical to the temperate environments. Eleven of these breeds have been named (Ethiopia 1974) but few of them have been studied and characterized.

According to Epstein (1954) the present fat-tailed Ethiopian breeds of sheep must have replaced the original African long-thin-tailed sheep by immigrations from Asia through the Bab el Mandab Straits.

With FAO Project ETH/78/004. Present address: Department of Animal Production, Faculty of Agriculture, Ain Shams University, Shubra Al-Khaima, Cairo, Egypt.

In 1975 the Ethiopian Institute of Agricultural Research (IAR) initiated a programme to identify major sheep breeds in the country, establish flocks from these breeds and study them in order to determine appropriate utilization and improvement schemes. Three sheep breeds have so far been included in this programme, the Adal, the Somali Blackhead and the Horro. The present description deals with these three breeds and a fourth one, the Menz, which is maintained by the Ministry of Agriculture. An FAO Study Group convened in 1966 considered the work on animal genetic resources as involving three main activities, namely evaluation, conservation and utilization (FAO 1967). The work reported here entails identification and evaluation and to some extent utilization. These breeds, to the best of the author's knowledge, are in no danger of extinction. No crossbreeding is practised with Adal, Somali Blackhead or Horro sheep in Ethiopia. However, there is and has been crossbreeding, largely undocumented, with the Menz sheep within an experiment station.

## 2. ADAL BREED

### 2.1 Description

The Adal sheep are fat-tailed and of relatively small size. Adult sheep range in weight from 20 to 38 kg. Both sexes are hornless. Ears are vestigial and the eyes are protruding. A dewlap and thick layers of fat on the brisket are frequently present. The tail which is very fat has a wide base and reaches below the hocks. The body is covered with short coarse hair of predominantly solid blond colour ranging from shaded white to light brown, with very few exceptions of spotted colour patterns and dark brown animals. The average height at shoulders is  $66 \pm 0.7$  and  $61 \pm 0.7$  cm for adult rams and ewes respectively. Figures 1a and 1b depict an adult male and female respectively.

The IAR experimental flock of 300 ewes was established in 1975 by purchases from local markets. During each mating season 12-18 rams were used. For the first three mating seasons one half of the rams were culled on the basis of their progeny performance in post-weaning daily gain with replacement made from as many divergent local markets as possible to widen the gene pool of the flock. After the third mating season the flock was closed. The management of the flock was described by Galal and Awgichew (1982). Their study of genetic parameters showed that the heritabilities of body weights and post-weaning daily gain were less than 0.15 except in the case of yearling weight for which the estimate was 0.34.

All the results shown in Table 1 for this breed were obtained from the flock maintained at IAR Melka Werer research station. The station represents a tropical semi-arid environment and it falls within the habitat of the breed.

### 2.2 NATURAL HABITAT

The home of the breed is the Middle Awash Valley in eastern Ethiopia, extending as far as the city of Dire Dawa in the east and as far as the town of Bati in the north. The habitat rawes in

altitude from 300 to 1100 m between 400E and 420 E longitude and 9 0 N and 11-N latitude. The rainfall is erratic and ranges from 300 to 700 mm. The vegetation is mainly of a sub-desert range type consisting of a sparse cover of low shrubs and closed thickets of bush cover (*Acacia millifera*, *A. senegal*, *A. tortizis*, *Commiphora* spp. and *Avera* spp. plus associated grasses like *Aristida* spp. , *Chloris*, *Enteropogan*, *Panicum* and *Cynodon*) (Ibrahim 1975). Thornbush vegetation types grade into various kinds of savanna in the upper ranges of rainfall and altitude. The region is drought prone. The dwellers of the region who are semi-nomadic move their livestock, sheep, goats, cattle and camels in search of grazing and water.

The Adal sheep, having evolved under such harsh environmental conditions, are hardy and somewhat small in size. They suffer far less in mortality during periods of drought than cattle.

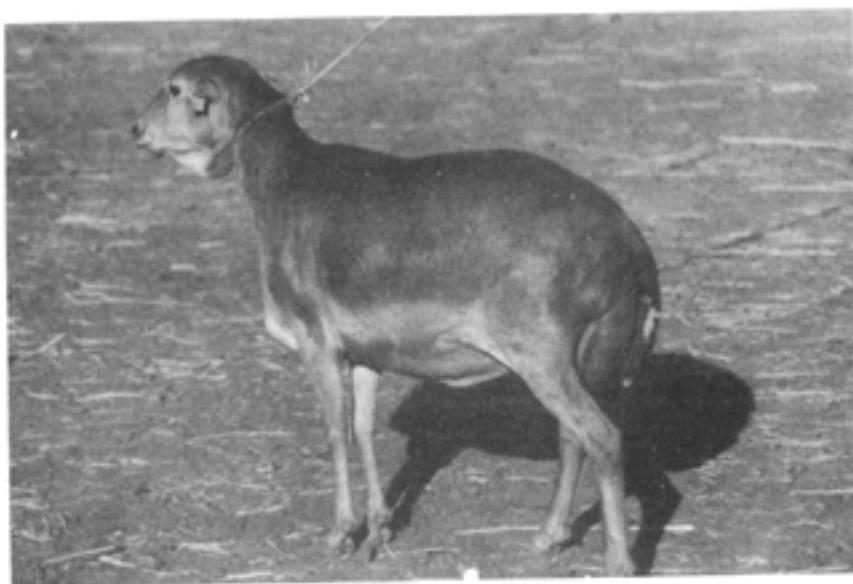


Fig. 1

Adal ram and ewe

### 3. SOMALI BLACKHEAD

This is probably the most internationally known East African breed of sheep.

**TABLE 1**  
*SUMMARY OF PERFORMANCE OF DIFFERENT BREEDS\**

Mean (standard error)	Trait	Adal		Somali
		Horro	Menz	
Birth weight kg	2.5(0.04)	2.7 (0.1)	2.9 (0.03)	2.2 (0.11)
Weaning weight (90 days) kg	13.0(0.5)	14.2 (0.5)	15.0 (0.2)	10.9(0.8)
6-month weight kg	18.4(0.5)	17.7 (1.0)	19.7 (0.3)	na
Yearling weight kg	25.8(0.2)	24.8 (0.7)	33.5 (1.3)	na
Ewe mature weight kg	31.6(0.4)	31.7 (0.6)	38.2 (0.8)	29.5 (0.8)
Weaning survival	0.93	0.94	0.93	na
Conception rate	0.78	0.63	0.87	na
Lambing percentage	105	104	157	109
12-week milk yield 1	26.3(0.6)		17.8 (1.5)	na
Fleece weight (annual shearing) kg	0	0	0	0.45

\* Estimated from flocks kept on experimental stations na = not available

#### 3.1 DESCRIPTION

The breed is distinguished by the black colour of the head and the neck and the white colour of the body and limbs (Figs. 2a and 2b). Sometimes the neck is dark brown. The body is covered with short stiff shiny hair. Both rams and ewes are hornless but sometimes the former have rudimentary horns or scurs that are dark in colour. The hooves are also dark in colour. The head is small and rather short, somewhat high and broad towards its posterior end. The forehead is strongly convex and with skinfolds. The nose is usually straight but tends to the Roman type in some animals. The cheeks are laden with fat. The ears are short and pointed with usually outward-forward inclination. Most animals have a well developed dewlap that may extend from the chin to the chest with fat deposits under the chin and the chest. The tail shape is very distinct being short and fat with its thin tip sticking straight backward or somewhat hanging down. The rump is fatty. The breed is of similar weight to the Adal (Table 1). Average height at shoulders for mature ewes is  $62 \pm 1.0$  cm.

The Somali Blackhead flock of IAR of about 60 sheep is stationed at Melka Werer. It was initiated by buying breeding animals from divergent sources in the Ogaden from clans that specialize mainly in stud breeding. These clans apply selection mainly for body size and for fattier tail and rump.

#### 3.2 Natural Habitat

The breed is indigenous to the Ogaden in the southeast of Ethiopia. It lies within  $42^\circ - 48^\circ$  E longitude and  $3^\circ - 9^\circ$  N latitude. The breed can also be found as far west as Lake Rudolf in the Gemu Gofa Province of Ethiopia. It is also found in neighbouring Somalia and Kenya.

The altitude of this area is below 1000 m and frequently below 500 m. The climate may be described as dry arid equatorial. The rainfall is erratic and bimodal with an annual average of 200-400 mm. The vegetation is similar to that described for the habitat of the Adal sheep but tends more to the sparse cover of low shrubs characteristic of the lower rainfall and lower altitude areas.

Like the Adal sheep, the Somali Blackhead sheep are hardy and adapted to the dry and drought prone environments.

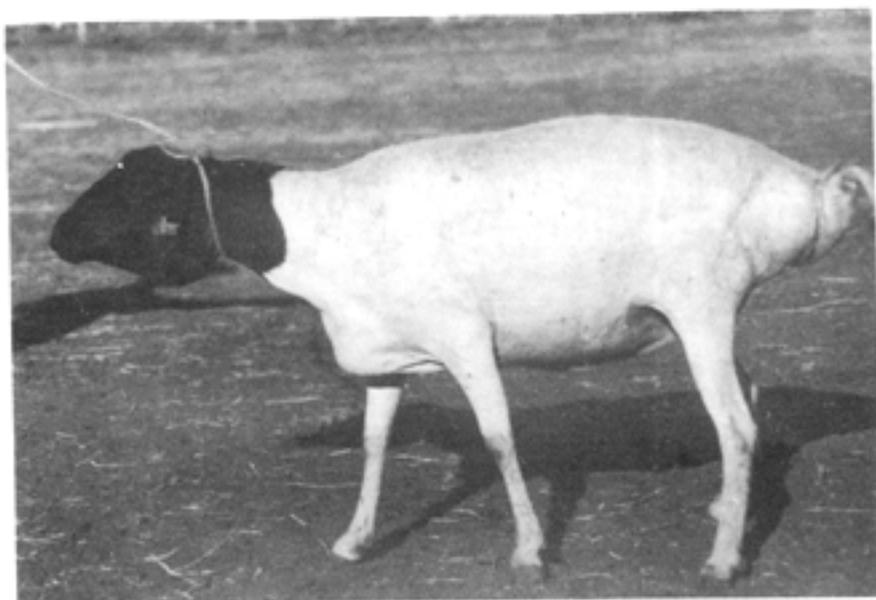


Fig. 2

Somali Blackhead ram and ewe

## 4. HORRO SHEEP

### 4.1 Description

Figures 3a and 3b show an adult ram and an adult ewe respectively.

The Horro sheep are rather uniform in colour, mostly solid tan (very light brown). Exceptionally, they may be creamy white, dark brown, black or spotted. The belly is usually lighter in colour than the rest of the body. The body is covered with short smooth hair. The face has a straight profile but is somewhat convex in the rams. Both males and females are hornless.

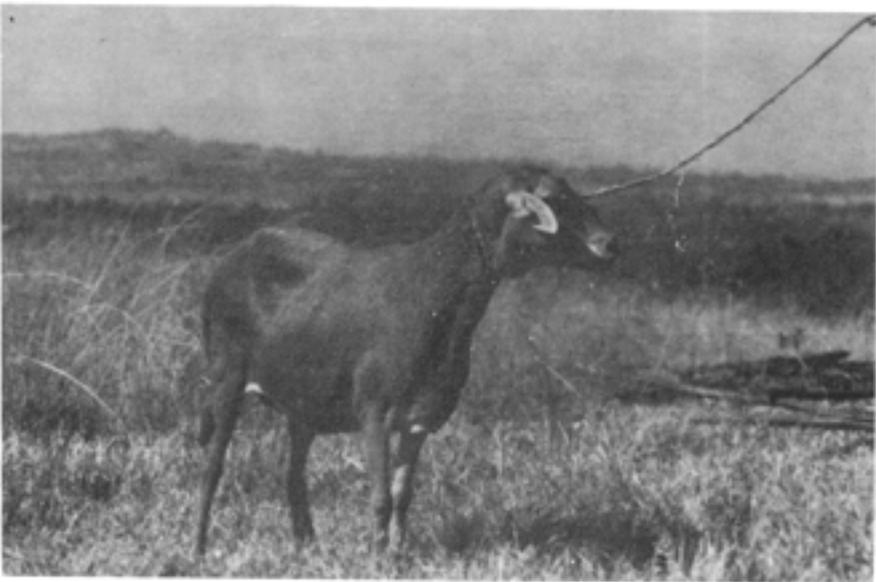
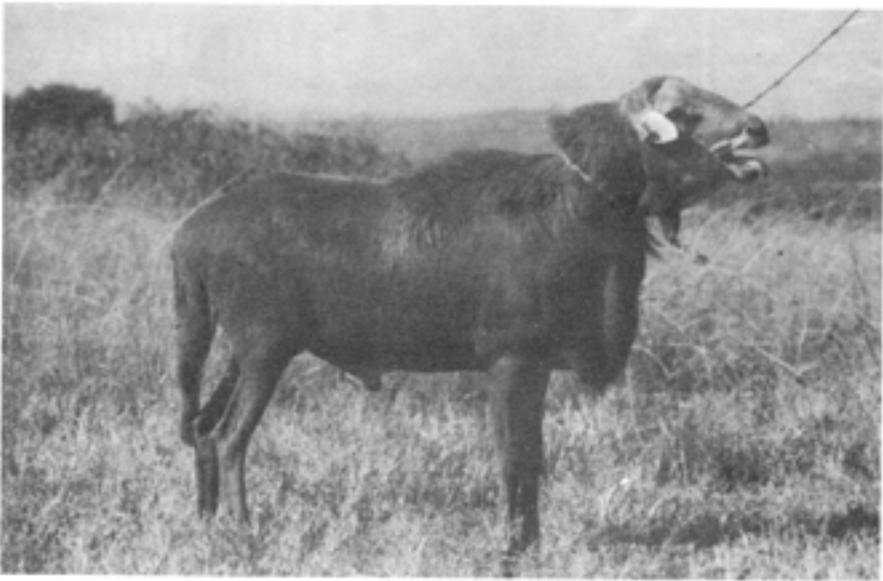


Fig. 3

Horro ram and ewe

The neck is relatively long, without a dewlap, but frequently with deposits of fat below the lower jaw and in the brisket. Wattles are rare. The fat tail is triangular with a relatively narrow base and the pointed end, hanging downward or with a slight twist, reaching just below the hocks. Often the rams have a mane between the head and the brisket and above the neck and shoulder. Body weights and some performances of this breed are shown in Table 1. The mean height at shoulders is  $73 \pm 1.3$  and  $68 \pm 0.8$  cm for adult rams and ewes respectively.

The IAR flock of this breed is maintained at Bako station, some 250 km west of Addis Ababa, which is within the habitat of the breed. The flock was established in 1976 by purchases from different local markets.

## 4.2 Natural Habitat

The Horro breed has a wide distribution in western Ethiopia. It is found in a region extending from the western Shoa Province to at least a north-south line dividing Wellega and Kaffa administrative provinces into two nearly equal halves plus parts of eastern Ilubabor Province. This area lies within 35° - 38° E and 6° - 10° N.

The altitude of the region is 1400-2000 m with a dependable annual rainfall of 1000-1400 mm. Vegetation ranges from broad-leaf savannas to woodland and open wooded grassland to forest types. The dominant grasses in the broad-leaf savannas are *Fyparrhenia* and *panicum* spp. while *Cymbopogon* spp. are also found in the woodland and open wooded grassland.

The most apparent assets of the Horro breed relative to other Ethiopian breeds are its relatively larger size and its prolificacy. The number of lambs born per ewe lambing for 2, 3, 4 and 5 year old ewes is 1.21, 1.64, 1.66 and 1.76, respectively. These characteristics make it fitting to utilize the Horro ewe in a crossbreeding system for lamb production where she may be crossed to rams from fast growing heavy breeds. This could save the one generation of crossbreeding needed to introduce prolificacy into the ewe through crossing with the better known prolific breeds, e.g. Finnsheep. Work at IAR showed that the average ewe could wean 25.4 kg of lamb when the lambs were weaned at the age of 90 days and creep-fed for seven weeks before weaning (Galal *et al* - 1981).

The Horro breed lives at the fringes of trypanosome infested areas, but there is no information available as to whether the breed has any degree of trypanotolerance.

The Adal, Somali Blackhead and Horro breeds show no detectable seasonality in their reproductive behaviour. Work at IAR showed that ewes from the three breeds can give their first lamb at the age of one year but this was most easily achieved in Horro ewes.

## 5. MENZ SHEEP

### 5.1 Description

Menz sheep are among the few woolled sheep in Ethiopia. They have a semi-open fleece made up of locks of coarse hair and a woolly undercoat. The colour is usually black or dark brown, with frequent white spots on the head, neck and legs. Other colours e.g. light brown and roan, also exist. The head has a straight profile and an open face. Rams usually have long twisted horns while ewes are mostly polled. The ears are small with a downward-forward inclination. Dewlap and wattles are absent. The body is compact with a slight forward inclination. The tail is fat and stops halfway to the hocks and has a slight short twist at the end. Both rams and ewes have a very nervous disposition. Their average height at shoulders is 64 ± 1.0 and 58 ± 0.9 cm respectively. Table 1 shows estimates of some performance traits. Figures 4a and 4b show the two sexes of Menz sheep.

In the cold area where Menz sheep are found, the people felt the wool into a local type of cloak called *lbernos*'. The wool is also used in a cottage rug industry.

### 5.2 Natural Habitat

Menz sheep live in a more localized area than the other three breeds mentioned above. They are indigenous to the northern part of the Shoa Province and some parts of Wollo, within 39° - 40° E longitude and 10° - 11° N latitude. The area may be defined in terms of the following locations: Robel, Mountain Abudemade, Hirute, Mahel Meda and Molale. The altitude of the habitat is between 2500 and 3000 m. The climate is severe, with strong cold winds. Frost is frequent during November-January. Rainfall is bimodal, with an annual average of 1100-1360 mm. Much of the area is **grazed** during the **short** rains in March-April. The vegetation is characterized by *Erica* and *LobeLia*. Common **grasses** are *Andropogon*, *Hyparrhenia* and *Pennisetum* spp.

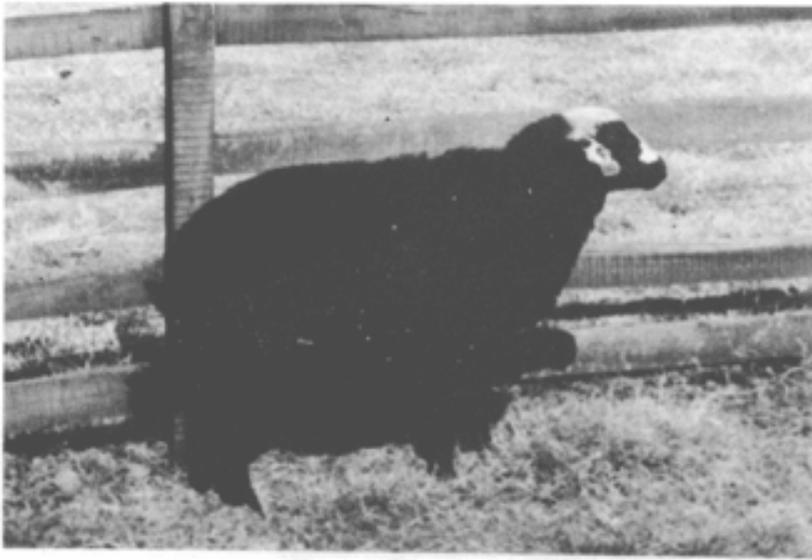


Fig. 4

Menz ram and ewe

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# A MODEL PROGRAMME FOR THE PRESERVATION AND GENETIC IMPROVEMENT OF THE SAHIWAL BREED IN INDIA

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## SUMMARY

Eight institutional herds in northern India with a breedable female population of about 750 are cooperating in a progeny testing programme for improvement of milk production in the Sahiwal breed.

## RESUME

Huit élevages gouvernementaux du nord de l'Inde ayant une population femelle fécondable d'environ 750 têtes ont été retenus pour un programme expérimental visant à améliorer la production laitière de la race Sahiwal.

## RESUMEN

En la India septentrional ocho rebaños pertenecientes a instituciones con una población de 750 hembras de cría cooperan en un programa de pruebas de progenie para mejorar la producción lechera de la raza Sahiwal.

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The Sahiwal is one of the important dairy cattle breeds of the Indian subcontinent. It is well known for its comparatively high productivity among the Zebu breeds in addition to its adaptability to the tropical climate. Its home tract is in the Montgomery district of Pakistan which has been renamed the Sahiwal district. At the time of independence, only a few herds were situated in India mostly at various institutions. Some Punjabi Sikh and Hindu farmers brought along with them their livestock during the migration at partition from the areas which now form Pakistan. It is estimated that today the population of this breed in India is in the range 1000-1100 breeding females (see Fig. 1) . Most of the herds have been operating as closed herds and because of their small size, there has not been any worthwhile genetic improvement. Some of these herds were also used for crossbreeding with European dairy breeds, thus hampering production of replacement stock.

A dialogue was begun two years ago with certain institutional herds to start a cooperative programme for genetic improvement in this breed on a cost sharing basis. Now eight herds in northern India are cooperating in this programme.

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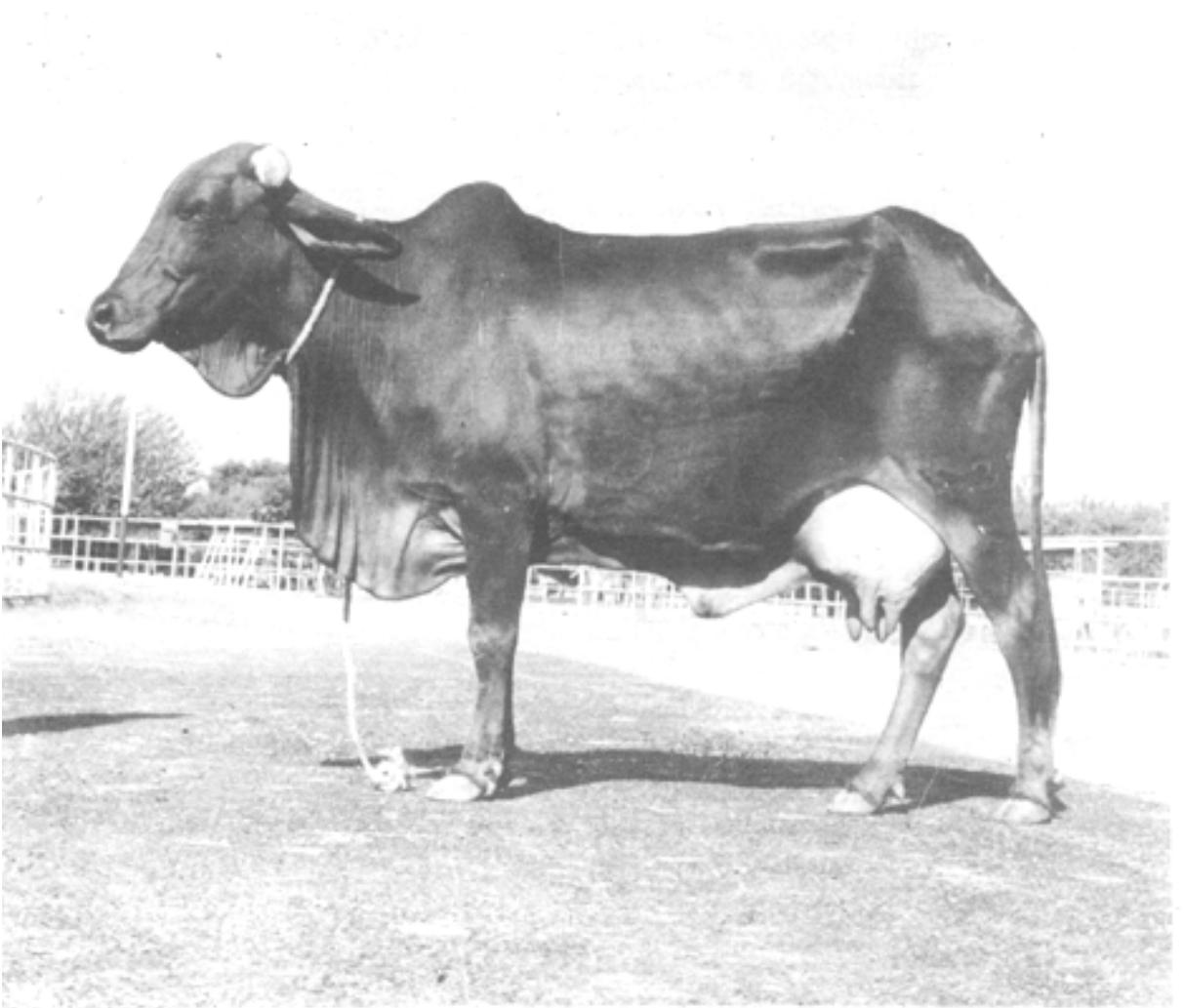


Fig. 1

A Sahiwal cow

Altogether a breedable female population of around 750 animals is presently involved. A detailed analysis of records from five of the cooperating herds showed that the average inbreeding coefficient in one of the herds was nil, whereas in the others it was 5.13, 5.76, 8.89 and 11.80 percent. Body weights at different ages and at first calving were found to be reduced among the inbred animals in certain herds. The average first lactation yield was lower in inbred than in non-inbred animals, and although this difference was not statistically significant for first lactation milk yield, it was for data pooled over seven lactations. In individual herds, yield per day of lactation, yield per day of calving interval, service period and calving interval were also affected by inbreeding.

On the basis of data pooled over these five herds, the average first lactation milk production in 300 days was 1622 kg and the average yield pooled over seven lactations was 1761 kg. The body weight at first calving was 320 kg and the mature weight was 360 kg; average lactation length was 289 days, average calving interval 450 days and average herd life 8.6 years. Investigations on the genetic, phenotypic and environmental trends revealed that in large herds genetic trends estimated were in the right direction but poor environmental trends resulted finally in poor phenotypes. In smaller herds, though genetic improvement was not possible, individual attention to the animals resulted in better phenotypic trends. In two of the herds established fairly early, one at Karnal and the other at Lucknow, the genetic change was observed to be maximal from the path dam to bull. Thus in the absence of a systematic and effective progeny testing programme, maximum genetic progress was observed to be achieved through this path since the male progeny of cows with the highest lactation records (which were generally in their 3rd or 4th lactation), were invariably selected as future breeding bulls. In practice, this resulted in retaining some sons of sires which had negative breeding values as evaluated on the basis of their daughters' performance.

To obviate such undesirable trends, the above programme was started for the mutual advantage of all cooperating herds. Initially some of these herds were using bulls for natural service, whereas in others AI was being practised. On the basis of screening of around 84 bulls in these various cooperative herds, six have now been selected whose frozen semen has been distributed in order to obtain their progeny in the eight herds shown in Figure 2. The estimated superiority of transmitting ability of these six bulls ranged from 5.26 to 19.77 kg average milk production for 300 days pooled over the herds.



Fig. 2 Locations of the cooperating herds

A set of 13 younger bulls has also been selected, out of which 6-7 depending on their libido, semen quality, freezability of semen, etc.) will finally be selected for the next set to evaluate their transmitting ability on the basis of their daughters' performance. The estimated percentage superiority of these 13 young bulls ranges from 5.32 to 19.77 kg average 300 day milk production. Adequate doses of semen from each of the sires under evaluation are also stored for future use.

This programme is suitable for situations in the third world countries where the herd size is the major limitation to any worthwhile programme of genetic improvement. In the present case the native tract of the breed is elsewhere, thus imposing constraint in not having a large breedable female population in the farmers' herds. The Sahiwal breed, because of its desirable traits, is being utilized widely for improvement of local stock or for initial crossbreeding of the indigenous stock before undertaking upgrading with European breeds of dairy cattle in many warm humid countries of the world. It is known to have been introduced into 17 other countries, besides Pakistan (its native tract) and India. These are: Mauritius, Kenya, Tanzania, Sierra Leone, Malaysia, Philippines, Vietnam, Thailand, Burma, Bangladesh, Sri Lanka, Nepal, Brazil, Jamaica, Trinidad, Australia and New Zealand. Sahiwal semen is now being produced on a large scale at one of the farms established in Queensland (Australia) for export to New Zealand. In the latter country, after contract matings by use of the Sahiwal semen on Jersey and Friesian cows, crossbred heifers are produced for commercial export to southeast Asian countries, namely Thailand, Philippines, Malaysia and Indonesia.

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# CATTLE BREED EVALUATION STUDIES BY THE INTERNATIONAL LIVESTOCK CENTRE FOR AFRICA (ILCA)

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## SUMMARY

This note describes work being carried out by ILCA on evaluation of the productivity of N'Dama, Sahiwal and Boran cattle breeds. Indications of the potential of the N'Dama to increase output from areas of trypanosomiasis risk has led to studies throughout West and Central Africa concerned with aspects of trypanotolerant livestock. Studies on the Sahiwal and many different crosses between Sahiwal and Ayrshires under a range of production systems have allowed suggestions to be made on achieving and maintaining optimal contributions from the Sahiwal breed. Similar ongoing studies on the Boran breed are described.

## RESUME

Cette note passe en revue les travaux du CIEA en matière d'évaluation de la productivité des races bovines N'Dama, Sahiwal et Boran. Comme la race N'Dama semble offrir des possibilités d'accroître la production dans les zones à risque de trypanosomiase, on a mis en place un réseau de stations d'étude du bétail trypanotolérant qui couvre toute l'Afrique centrale et l'Afrique de l'Ouest. Des études effectuées sur la race pure Sahiwal et différents croisements de Sahiwal et d'Ayrshire dans différents systèmes d'élevage ont permis de faire des suggestions sur la manière de tirer le meilleur profit de la race Sahiwal. La note décrit également les travaux similaires entrepris pour la race Boran.

## RESUMEN

En esta nota se describe la labor realizada por el ILCA en lo relativo a la evaluación de la productividad de las razas de ganado vacuno N'Dama, Sahiwal y Boran. Las indicaciones del potencial de la raza N'Dama para aumentar la producción de las zonas expuestas a la tripanosomiasis han dado lugar al establecimiento de una red de estaciones en todo el África Occidental y central que se ocupa de los aspectos del ganado tripanotolerante. Estudios de la raza Sahiwal y muchos cruces diferentes entre Sahiwal y Ayrshires en diversos sistemas de producción han permitido hacer sugerencias para lograr y mantener contribuciones óptimas de la raza Sahiwal. Se describen estudios similares actualmente en curso sobre la raza Boran.

As a byproduct of studies of animal production systems in the different ecological zones of Africa, ILCA has brought together information that could be used in planning the involvement of specific breed types in development situations. At first sight, there appeared to be a considerable body of information available on the performance traits of cattle in Africa south of the Sahara. Indeed, a recent tentative bibliography prepared by ILCA showed over 500 relevant original reports produced during the 30-year period 1949-78. This bibliography was examined from the point of view of the performance of different breed types, for different end products in different production systems, in different ecological zones (Trail 1979). But the results showed that only about 20 percent of the references provided information on three or more performance traits sufficient to allow characterization of breed types through a productivity index. (One such productivity index used was 'weight of calf plus liveweight equivalent of milk produced per unit weight of cow maintained per year'.) Moreover, only 20 percent of the references contained comparative information on two or more breed types. When these two necessary attributes were put together, only 5 percent of the reports provided sufficient data to allow breed comparisons on the basis of a productivity index. This illustrates rather effectively that a considerable amount of past research effort in this field had been wasted. It also shows how important it is to really try and make the maximum use of any relevant information that may have been collected throughout Africa but not yet put to much use.

ILCA has been, and is, involved in a number of comparative breed studies, invariably in cooperation with national organizations or private producers, and sometimes with other international organizations. The initial aim is to build up comparative production information on important cattle groups in Africa so that decisions can be made more easily when breed is shown to be a bottleneck in a particular production system; and so that the many questions directed to TLCA on the value of alternative genotypes for specific production systems in various ecological zones can be better answered.

The FAO/UNEP Technical Consultation on Animal Genetic Resources Conservation and Management made specific recommendations for further studies of indigenous breeds and gave high priority to work on the N'Dama, Sahiwal and Boran breeds of cattle. This was further highlighted in the editorial comment of World Animal Review No. 37.

## **1. N'DAMA**

The N'Dama is the most numerous of the cattle breeds genetically resistant to African trypanosomiasis. The exploitation of such animals is now considered to be an important strategy for improving livestock production. The recent report on trypanotolerant livestock in West and Central Africa (ILCA/FAO/UNEP 1979) emphasized the importance of trypanotolerance by indicating that West African humpless breeds are at least as productive as other indigenous African breeds in areas of low or medium trypanosomiasis risk. In areas of high trypanosomiasis risk, comparative data are not available because only trypanotolerant breeds can exist. This report illustrated the major effects of level of trypanosomiasis risk (for which only rather subjective measurements had been available in the past) and the effect of level of management and nutrition as indicated by ranch or village production systems. Major interactions thus exist between breed type, level of trypanosomiasis risk, and other nutritional, physiological, disease and management factors. ILCA is engaged in coordinating a study over the next 4-5 years involving a network of nationally operated situations throughout several countries of West and Central Africa where work is in progress and where more definitive data can be collected with relatively little additional input. These carefully recorded large-scale situations will automatically contribute considerable information on the importance of genetic improvement of trypanotolerant livestock.

Trypanotolerance is usually ascribed to the humpless breeds of West Africa. The possibility that genetic resistance to trypanosomiasis might have developed in East Africa has largely been ignored. The terms *Bos indicus* and Zebu are considered synonymous with trypanosusceptibility.

Recently evidence has emerged (Trail *et al.*, in preparation) of genetic resistance to trypanosomiasis on a dairy ranch on the Kenya coast which is under a 'light' challenge from *G. pallidipes* and *G. austeni*. On this ranch, trypanosomiasis is controlled by a chemotherapeutic strategy. The adult breeding animals consist of two types, 2/3 Sahiwal/ 1/3 Ayrshire, and 1/3 Sahiwal/2/3 Ayrshire. Data analysis over a period of 6 years using treatment as an indication of infection showed that the 2/3 Sahiwal needed less than half the number of treatments (0.6 per year) for trypanosomiasis that was required by the 1/3 Sahiwal (1.4 per year). It remains to be determined how the degree of genetic resistance exhibited by cattle in East Africa compares with that of trypanotolerant breeds in West Africa.

## 2. SAHIWAL

There is considerable interest throughout Africa on the use of Sahiwal genes, mainly for crossbreeding in rather harsh dairy situations. Information on pure Sahiwals has been collected by the national authorities in Kenya and in 1962 they established the excellent National Sahiwal Stud which is a source of semen and stock for many other countries of Africa. ILCA recently completed a study with five private breeders who had kept good records on the productivity of Sahiwals and many different crosses between Sahiwals and Ayrshires in a number of different production systems and zones of Kenya (Gregory and Trail 1981; ILCA 1981; Trail and Gregory 1981a; 1981b; 1982). In three higher potential sites the results indicated that in overall productivity, crosses of Ayrshire with Sahiwal were markedly superior to the pure Sahiwal and also superior to the pure Ayrshire. Without question, the pure Ayrshire breed possesses higher genetic merit for milk yield than the Ayrshire x Sahiwal crossbred; but economics do not favour modification of the natural environment to the level necessary to exploit this greater potential for milk production.

The results from the various Ayrshire x Sahiwal crosses strongly indicated that there is an optimum contribution by the Sahiwal to populations where the remainder is contributed by the Ayrshire. Milk production tended to be lower in breeding groups where the contribution by the Sahiwal exceeded 50 percent. Because of differences in both climate and nutrition, it is likely that the optimum contribution by the Sahiwal for the three situations ranges from 25 percent to 50 percent. This cannot be achieved and maintained by a two-breed rotation crossbreeding system because there is wide fluctuation (from 67 percent to 33 percent) in the genes contributed by the breed of the sire and by the breed of the maternal grandsire from one generation to the next. The results strongly suggest that the best way to achieve and maintain the optimum contribution by the Sahiwal breed will be to form composite breeds using the Sahiwal and exotic breeds of *Bos taurus* cattle. Each should contribute suitable percentages to the foundation to achieve the optimum additive genetic composition for the climatic conditions and nutritional levels than can be maintained.

In two lower potential sites, the marked superiority of the Sahiwal to the Small East African Zebu, and its similar productive capacity to the Boran, showed that it is well adapted for both beef and milk production in these environments.

## 3 BORAN

In the beef production field there is again considerable interest in the Boran in many countries of Africa, and ILCA is at present working with a number of commercial breeders to evaluate the productivity of the Boran in different ecological zones and in combination with genes from other breeds. Eleven breeders were identified throughout Kenya who had maintained production records on their Boran herds over a number of years. Components of these record sets were abstracted and analysis began at the end of 1980. This study will provide considerable information on performance traits of Borans and their crosses with many other breed types under a range of management levels and ecological conditions.

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# EUROPEAN FRIESIANS - THE CANADIAN AND AMERICAN INVASION

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## **SUMMARY**

The use of Holstein cattle genes from Canada and the United States is increasing in European Friesians. Estimates of the rate of change are given.

## **RESUME**

L'utilisation de gènes de bovins Holstein provenant du Canada et des Etats-Unis est en augmentation dans la race Frisonne européenne. Des estimations de la rapidité de ce changement sont données.

## **RESUMEN**

El empleo de genes de ganado Holstein proveniente de los EEUU (Estados Unidos de Norte America) y Canada esta aumentando en los Friesians europeos. Se señalan estimaciones del rango del cambio.

In Europe as a whole there are approximately 100 million dairy cows. Since the beginning of this century, the Black and White Friesian breed has spread from its origins in the Netherlands and Northern Germany to the point where it now constitutes more than half of the total population. Within the past decade a wave of introduction of genetic material from the North American Holstein-Friesian population has been taking place. Similar gene infusions from North American Red and White Holsteins have been taking place in some European Red and White populations, and from North American Brown Swiss into European Brown Alpine populations. The purpose of this note is to document the current pace of Holstein-Friesian infusion into some of the European Friesian populations.

The main reasons for the massive gene transfers which are taking place can be found in the changing economic circumstances of dairy production in Europe. With secure prices for milk, a gradually decreasing cost of concentrate feed, and a steady increase in most other costs associated with milk production, there has been a tendency to concentrate on specialized milk production at ever increasing feeding levels. This has led to a relative decline in the interest of the beef aspect, and an increasing interest in milk producing ability and secondary dairy traits, such as udders, temperament and legs. Many early trials, confirmed by the large scale FAO trial nearing completion in Poland (Stoltzman et al. 1981) have all indicated that North American Holsteins have close to 20 percent higher milk producing ability than the original European Friesian populations. There is little evidence of heterosis, and in many cases the Holsteins have demonstrated better secondary dairy characteristics than local Friesians.

The effects of this rapid progress of breed substitution are extensive. It accelerates the rate of genetic change in milk production, and the specialization of the cow population for dairy function. It reduces the amount of beef produced by the dairy herd since the growth in milk output per cow will inevitably have to be accompanied by a reduction in cow numbers. It also reduces the quality of beef produced, both in culled cows and in surplus animals reared specifically for beef production. This reduction in quality is most noticeable in aspects of carcass conformation, and may not be so marked where meat is processed.

One measure of the rate of penetration of North American Holstein genes into European Friesian populations can be obtained from the percentages of Holstein genes in young bulls accepted for progeny testing in the different countries. Figures for some Western European countries are given in Table 1. Because of the strong emphasis given to milk production, the proportion of Holstein genes in the bulls ultimately selected is usually higher than that in the bulls admitted to test. The net result of this tendency is that, for the main national Friesian populations of Western Europe, a conversion to North American genotypes will have been largely completed within a decade. The trend is strongest in Italy, Western Germany, Denmark, France and Switzerland. The pace is rather slower in the UK and Ireland, Scandinavian countries and in Eastern Europe.

**TABLE 1**  
**PERCENTAGE OF HOLSTEIN GENES IN YOUNG BULLS ENTERING AI PROGENY TESTING IN SOME EUROPEAN FRIESIAN POPULATIONS**

Country	Year	No. of bulls tested	of Holstein genes
Ireland	1980	40	8
UK <sup>1</sup>	1980/81	107	26
France	1979	500	80
Belgium	1980	17	75
Netherlands	1980	266	24
FR Germany <sup>2</sup>	1977	108	72
Denmark	1980	201	53
Sweden	1980	65	16
Switzerland	1980	20	91
Italy <sup>3</sup>	1980	311	90

Source: *European Association of Animal Production (1982)*

<sup>1</sup> Figures for the UK refer to proven bulls in use

<sup>2</sup> Figures for the FRG relate to Schleswig-Holstein

<sup>3</sup> Figures for Italy refer to progeny-tested bulls catalogued by the Italian Friesian Breeders' Association

The pattern of increase of Holstein use in artificial insemination has been similar in most countries. From small beginnings with imported semen or bulls, the pace has gathered strength in a few years with the introduction of many half-bred

and three-quarter Holstein bulls to the system. The rate can be measured by calculating the percentage of Holstein genes in the total inseminations carried out. These figures for the ten years 1970-1979 are shown for the Friesian population of Schleswig-Holstein in Western Germany in Table 2. This population represents almost 300 000 inseminations per year.

**TABLE 2**  
**PERCENT HOLSTEIN GENES IN AI IN THE FRIESIAN POPULATION IN SCHLESWIG-HOLSTEIN**

Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
% of Holstein genes	3.3	6.8	12.2	17.5	25.5	31.0	42.4	50.7	58.2	66.7

Source: *Jongeling C. Institut für Tierzucht und Haustiergenetik, Universität Göttingen, GFR.*

In some other countries, e.g. the Netherlands and Great Britain, the trend to Holstein has begun rather later, but is following the same pattern. The figures for the percent Holstein genes in AI in these two countries for the last three years is shown in Table 3.

**TABLE 3**  
**PERCENT HOLSTEIN GENES IN AI IN FRIESIAN POPULATIONS**

	1979	1980	1981
Great Britain	13.6	19.7	26.3
Netherlands	14.8	19.5	37.1

Source: *Jaarverslag KI, CMD, MBO, Netherlands, 1980 and 1981 Breeding and Production Report, Milk Marketing Board of England and Wales, 1982*

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# LES PARCS NATURELS DE FRANCE ET LA CONSERVATION GENETIQUE ANIMALE

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## SUMMARY

National and Regional Parks in France are cooperating in the conservation of rare livestock breeds as follows:

Park	Breed
Volcans d'Auvergne	Ferrandaise cattle
Cévennes	Raïole sheep
Landes de Gascogne	Landais sheep
Marais Poitevin	Poitou ass
Luberon	Rove goat

## RESUME

Plusieurs parcs nationaux et régionaux de France participant au programme de conservation des diverses races menacées suivantes:

Parcs	Races
Volcans d'Auvergne	Ferrandaise (bovins)
Cévennes	Raïole (ovins)
Landes de Gascogne	Landaise (ovins)
Marais Poitevin	Baudet du Poitou (gnes)
Lubéron	Chèvre du Rove (caprins)

## RESUMEN

Los parques nacionales y regionales de Francia colaboran en la conservación de las siguientes razas de ganado en vías de extinción:

Parque	Raza
Volcans d'Auvergne	Ganado vacuno Ferrandaise
Cévennes	Ganado ovino Raïole
Landes de Gascogne	Ganado ovino landais
Marais Poitevin	Ganado asnal Poitou
Lubéron	Ganado caprino Rove

La conservation des ressources génétiques compte aujourd'hui parmi les préoccupations des Parcs Nationaux et des Parcs Régionaux français.

En s'inscrivant dans la politique générale menée par le Ministère de l'Agriculture en faveur des races et variétés menacées, un protocole d'accord a été récemment signé entre la Direction de la Protection de la Nature (Ministère de l'Environnement et du Cadre de Vie) et l'Institut National de la Recherche Agronomique, en vue d'entreprendre certaines actions d'étude et de conservation du patrimoine génétique végétal et animal dans les Parcs Naturels Régionaux et Nationaux.

En tant que gardiens de la qualité et des valeurs du patrimoine, les Parcs Naturels ont pour mission de permettre la réalisation de l'inventaire des espèces animales et végétales, mettre en garde des phénomènes de destruction génétique et participer aux travaux de recherche en vue de la mise en place de conservatoires génétiques. Préoccupés par la mise en oeuvre de systèmes d'utilisation de l'espace valorisant le patrimoine culturel et biologique, ils constituent, à cet effet, des terroirs privilégiés où peuvent être étudiés et conservés in situ, non seulement le matériel génétique en voie de disparition, mais aussi le savoir et les pratiques des éleveurs.

Dans le domaine animal, étant donné la pluralité des systèmes concernés, les Parcs constituent des structures de grand intérêt pour coordonner les actions de conservation engagées, en tenant compte des unités régionales :

- en tant que structure permanente d'animation et de négociation, ils font appel aux éleveurs et organismes de développement afin de susciter la constitution de groupes ayant des objectifs communs d'utilisation et de gestion de la population (cas du Parc Naturel Régional des Volcans d'Auvergne pour la race bovine Ferrandaise et du Parc National des Cévennes pour la race ovine Rairole);
- en tant que structure de développement local, ils permettent de rechercher le prolongement d'intérêts économiques que peut entraîner la mise en valeur des espèces menacées (ex. : porc Corse et transformation charcutière, Baudet du Poitou et procréation de géniteurs asins pour les pays du Magreb);
- en tant qu'outil pédagogique, ils poursuivent auprès du public une mission de sensibilisation, d'information et d'animation (troupeau ovin Landais dans le cadre de l'Ecomusée de Marquéze du Parc Naturel Régional des Landes de Gascogne; Baudet du Poitou dans le cadre d'une asinerie expérimentale dans le Parc Naturel Régional du Marais Poitevin).

Enfin, s'étant assigné de contribuer à la conservation des stocks génétiques du patrimoine français, certains Parcs se doivent de réaliser eux-mêmes l'implantation de troupeaux de races autochtones en situation sur leur territoire pour assurer :

- le maintien d'un système traditionnel d'utilisation pour les races ayant chargé leur système de production et qui risquent donc, à terme, de perdre certaines de leurs aptitudes;
- la survivance de races spécialisées dont le débouché traditionnel disparaît, et qu'il s'agit de réintégrer dans un nouveau type d'utilisation : création d'un troupeau pépinière de chèvres du Rove dans le Parc Naturel Régional du Luberon, avec comme double objectif la sauvegarde de la race et la défense de l'environnement (entretien de pare-feux);
- des opérations de sauvetage in *extremis* d'animaux menacés de sortir des circuits de reproduction, solution transitoire, les animaux pouvant par la suite être, replacés chez les éleveurs.

Le suivi scientifique et technique des actions entreprises en matière de sauvegarde des races animales, réalisé depuis l'automne 1980 dans les zones méditerranéenne, pyrénéenne et aquitaine, a permis d'établir ce premier bilan qui doit s'inscrire dans la stratégie nationale de lutte pour la conservation de notre patrimoine génétique.

# CATALOGUING OF POULTRY STOCKS IN NORTH AMERICA

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## SUMMARY

1. "Catalogue of Poultry Stocks held at Research and Teaching Institutions in Canada" is available in its annual 14th edition.
2. "Research Animals in Canada", a publication of the Canadian Council on Animal Care, now includes all of the information from the poultry catalogue, along with descriptions of mammalian research stocks.
3. Somes' well known registry of American poultry stocks has been revised (1981) as an "International Registry on Poultry Genetic Stocks"; it includes contributions from sixteen countries.

## RESUME

1. La quatorzième édition annuelle de l'inventaire des stocks génétiques avicoles des institutions de recherche et d'enseignement du Canada" est parue.
2. La publication du Conseil canadien pour les soins animaux intitulée "Les animaux de recherche au Canada" comprend désormais, outre la description des stocks génétiques de mammifères utilisés pour la recherche, l'Ensemble des informations figurant dans l'inventaire des stocks génétiques avicoles.
3. Le célèbre catalogue Somes des stocks génétiques avicoles d'Amérique révisé en 1981 est publié sous le titre "Catalogue international des ressources génétiques avicoles" qui comprend des contributions de seize pays différents.

## RESUMEN

1. Está a la venta la 14 a edición anual del "Catalogue of Poultry Stocks held at Research and Teaching Institutions in Canada" (Catálogo de razas de aves de corral existentes en las instituciones de investigación y enseñanza del Canadi).
2. "Research Animals in Canada" (Animales para investigación en el Canadi), publicación del Consejo Canadiense para el Bienestar de los Animales Domesticos, incluye actualmentetoda la información del catálogo de aves de corral, junto con descripciones de las razas de mamíferos que son objeto de investigación.
3. El conocido registro de Somes de las razas de aves de corral americanas ha sido revisado y publicado (1981) con el título "International Registry on Poultry Genetic Stocks" (Registro internecional de razas genóticas de aves de corral) e incluye contribuciones de 16 países.

Inventories of poultry genetic resources existing in North America continue to be revised and enlarged. There are three catalogues currently in print - two from Canada and one from the United States.

The "Catalogue of poultry stocks held at research and teaching institutions in Canada" is now available in its fourteenth annual edition (1981). Copies can be obtained without charge from the above address. The catalogue lists and describes 116 breeding stocks kept by public institutions and includes chickens, turkeys, domestic and Muscovy ducks, domestic and Canada geese, guinea fowl, ring-necked pheasants, and Japanese quail.

The Canadian Council on Animal Care, a quasi-governmental organization, has published a new edition (1981) of its "Research Animals in Canada". It is a computerized descriptive list of research animal breeding stocks including both mammalian and avian species. Beginning several years ago, the editors of this publication and of the catalogue of poultry stocks began to integrate the two, and that job has been successfully completed. The research animal inventory now incorporates all of the information from the Canadian catalogue of poultry stocks. To avoid duplication of effort and to achieve a wider audience, it has been agreed that publication of the catalogue of poultry stocks will cease with the 1981 edition and that henceforth only the annual "Research Animals in Canada" will be prepared and published. Copies are available without charge from Canadian Council on Animal Care, 1105 - 151 Slater Street, Ottawa, Ontario K1P 5H3, Canada.

During 1979-80, the Canadian poultry inventory was expanded through a survey of hobbyists, middle-level, and industrial stocks that are privately owned. Results of the survey have not yet been published in full, but they indicate that erosion of Canada's poultry genetic resources has been extreme, and that measures to preserve remaining genetic diversity are urgently needed.

A new edition (1981) of Dr. R.G. Somes' well-known registry of poultry stocks has been published in the United States. It is entitled "International Registry of Poultry Genetic Stocks" and is available at US\$ 3.00 as Bulletin 460 from Storrs Agricultural Experiment Station Publications, University of Connecticut, Storrs, Connecticut 06268, USA. The new registry lists chicken, turkey and Japanese quail stocks held by institutions and individuals in the United States and in sixteen other countries. Material from the Canadian catalogue described above is included in its entirety. Other countries contributing are Brazil, Denmark, Finland, France, Germany, Hungary, Japan, The Netherlands, Norway, Poland, South Africa, Spain, Sweden, Switzerland, and the United Kingdom. The American publication is more than an information source on existing stocks; it also includes a list of known genetic traits and gene symbols, chromosome maps for the three species, and a description of breeds, varieties and plumage colours.

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# MODEL PROGENY TESTING PROGRAMME FOR DRAUGHT IN THE HARIANA BREED

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## SUMMARY

Six institutional herds in northern India with a breedable female population of about 900 are cooperating in a progeny testing programme for the improvement of draught ability in the Haryana breed.

## RESUME

Six élevages gouvernementaux du nord de l'Inde ayant une population femelle fécondable d'environ 900 têtes ont été retenus pour un programme expérimental visant à améliorer l'aptitude à la traction de la race Haryana.

## RESUMEN

En la India septentrional seis rebaños pertenecientes a instituciones con una población de unas 900 hembras de cría cooperan en un programa de pruebas de progenie para mejorar la capacidad de tiro de la raza Haryana.

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<sup>1</sup> Present address: Central Sheep and Wool Research Institute, Avikanagar (Via Jaipur), Rajasthan 304501, India

The Haryana is one of the most important cattle breeds in India. It is widely used in the Indo-Gangetic plains as a dual-purpose (draught-milk) animal. Ninety-seven percent of smallholders' farm power is provided by bullocks; they are used for field operations as well as for transport of farm produce to market. No systematic scientific studies have been made to evaluate the work efficiency of our well known draught animals. Therefore the present programme has been undertaken.

The scheme is run by the Government Livestock Farm, Hissar (Haryana) in cooperation with four livestock farms in Uttar Pradesh and one in Bharatpur (Rajasthan) in collaboration with the National Dairy Research Institute, Karnal, and Haryana Agricultural University, Hissar. The six cooperating herds number about 900 breedable females, from which, allowing for infertility and mortality, it is expected to produce annually 200 male and 200 female progeny at the age of 3 years.

The aims of the scheme are: the conservation of the Haryana breed, the improvement of its draught ability and milk yield, and genetic studies on work efficiency. To this end body weight, body measurements and conformation score will be taken on all animals every 6 months up to 3 years. Milk yield, lactation length, service period and calving interval will be recorded for cows.

Twenty bulls will be taken for evaluation each year. Frozen semen will be distributed at random across the six farms, so that contemporary progeny of at least three bulls will be available at each farm. The work efficiency of the 20 bulls will also be tested. Semen will be distributed at the rate of four doses per conception. An additional 20 000 doses per bull will be stored for future use.

Attempts to use the breeders' herds under Central Herd Registration units at Rohtak and Ajmer as well as in Mahendragarh and Bhiwani will be made. If this collaboration is possible, then 50 percent of the breedable cattle population of the six institutional herds will be used for mating to top ranking sires to generate young males for future breeding. An adequate number of breeders' herds (30-40 000 cows) will be incorporated in the programme; at this stage increasing the number of young sires under evaluation will be contemplated.

Five sons (bullocks) of each sire selected at random will be tested for draught capacity by the following measures, after training them at 2-2 1/2 years of age:

- i. Pulling power in individual bullock carts (standardized) with pneumatic tyres and loads increasing from 500 kg to 800 kg (distance covered on different types of roads in specific time).
- ii. Pulling power to be judged by dynamometer.
- iii. Field work with standard single mould-board plough at depths of 6, 8 and 10 inches (area covered in specific time).
- iv. Lactic acid production, ventilation rate and oxygen consumption estimated at half-hourly intervals from blood samples drawn after working as at (a) and (c) above.
- v. Estimation of gross efficiency =  $\frac{\text{Work accomplished}}{\text{Energy expended}}$
- vi. Energy expended
- vii. Physiological reactions in terms of rectal temperature and pulse rate.

(Items (d) and (f) to be recorded at the inception and end of specified job/s for testing work efficiency.)

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# SABRAO ANIMAL GENETIC RESOURCES WORKSHOP 1981

## SUMMARY

The second SABRAO Animal Genetics Workshop was held in Kuala Lumpur in 1981. The conclusions and recommendations are reproduced here; they contain many useful ideas which have general application to the documentation and evaluation of genetic resources. The importance of standardization in the methods of data collection is emphasized.

## RESUME

Le compte-rendu des travaux du deuxième atelier sur les ressources génétiques animales organisé par la SABRAO en 1981 A Kuala Lumpur a été publié. Les conclusions et recommandations de l'atelier reproduites ici contiennent de nombreuses idées intéressantes et susceptibles d'application générale en matière de documentation et d'évaluation des ressources génétiques. L'accent est mis sur l'importance de l'uniformisation des méthodes de collecte de données.

## RESUMEN

En 1981, se celebró en Kuala Lumpur el segundo Seminario de la SABRAO sobre Genética Animal y se publican ahora sus actas. Las conclusiones y recomendaciones se reproducen aquí hay en ellas muchas ideas útiles que son de aplicación general para la documentación y la evaluación de los recursos genéticos. Se hace hincapié en la importancia de uniformar los métodos de recolección de datos.

In 1979 the Society for Animal Breeding Researches in Asia and Oceania held a workshop on animal genetic resources in Tokyo. Its proceedings were published in 1980 by the Tropical Agriculture Research Center, Tsukuba, Japan. These proceedings include all the working papers (largely country reports) together with conclusions and recommendations.

On the occasion of the Fourth International Congress of SABRAO held in Kuala Lumpur in 1981, a second workshop on animal genetic resources was included and its proceedings are being published. Its conclusions and recommendations have a wide relevance and are reprinted here.

## CONCLUSIONS

1. It would be quite unrealistic to expect major changes in the status of the animal genetic resources of the SABRAO region since the First Workshop in 1979, and the papers and discussions at this Workshop have further emphasized the conclusions of the First.

2. In particular, the papers and discussions at this Workshop have highlighted:

- i. The inadequate definition of breeds or strains in some species: for example, are the swamp buffalo, the “nondescript” cattle, the Kambing Katjang goat or the chicken and duck populations between and within different countries genetically distinct, so that they can be considered separate strains?
- ii. The inadequacy of available data on comparative evaluation of the breeds and strains of the region.
- iii. The need for careful definition of terms, such as documentation, evaluation and adaptation.
- iv. The need for specific and accurate definition of the environment in which any documentation or evaluation is made.
- v. The need to assess the relative value of different strains or crosses in terms of necessary inputs as well as outputs, and of lifetime performance.
- vi. The need for evaluation in the village environment.
- vii. The importance of relating evaluation studies to further utilization of superior populations, that is, to the development of breeding programmes.
- viii. The need to use documentation and evaluation studies to determine when conservation may be needed.

3. The documentation forms drafted at the First Workshop are suitable for computerization, but they have not yet been widely used. This is partly because of distribution problems, partly because of their own complexity, and some modifications will be needed.

## RECOMMENDATIONS

1. That the following definitions be adopted:

- Documentation means collation of available data on individual breeds, strains or crosses.
- evaluation means comparison under the same conditions of contemporary animals from different breeds, strains or crosses, with collection of objective data on them.
- Adaptation means ability to survive and reproduce in a given environment. Research should be done on defining characters which might predict adaptation to particular environments, and guidelines established for measuring them, for example, simple field measurements for heat tolerance, tick and disease resistance.

2. That methods of data collection be standardized. Draft forms for this purpose were prepared at the First Workshop. These will require modification, but they should first be tried as they are, suggestions for amendment being sent, with the completed forms, to the Chairman of the Animal Genetic Resources Expert Committee.

3. That trial of the forms be done in one of two ways:

- i. Distribution to various centres within each country through a country delegate, and return through that delegate.
  - ii. Completion at a workshop of interested workers in the animal field, convened within each country by a delegate. The cooperation of the Animal Production and Health Commission for Asia (APHCA) or some other body might be sought in providing funds for such workshops.
4. That these trials of the documentation forms should be completed within 12 months from the date of this meeting (8/5/81).
- 5.. That modifications to be considered for the documentation forms include:
- i. Simplification, with possible drafting of a form specifically for field use, in the light of any experimental designs developed through Recommendation 6.
  - ii. Provision for cross-referencing to cover evaluations, as the present forms relate to only one breed, strain or cross.
  - iii. Provision for more specific definition of inputs.
  - iv. Provision for inclusion of total lifetime performance, to encourage recording beyond early ages.
  - v. Better definition of production systems.
  - vi. Inclusion of annual death rates, as well as reproduction rates, to enable estimates to be made of intrinsic rate of increase.
  - vii. Addition of “synthetic” to the categories “indigenous” or “exotic” at the head of each set of forms.
6. That a special committee be appointed to develop designs and guidelines for the conduct of evaluation studies in field (village) populations. This committee should consist of members each of whom would develop a design (or designs) for one species, reporting to a convener who would collate, re-circulate, and finally submit to the Chairman of the Animal Genetic Resources Expert Committee. Suggested members of the special committee are:
- D.J.S. Hetzel (poultry) - Convener - Australia/Indonesia  
 P.N. Bhat (dairy) - India  
 A. Quartermain (pigs) - Papua New Guinea  
 C. Chantalakhana (buffalo) - Thailand  
 H.N. Turner (sheep) - Australia  
 S. Sivarajasingam (beef cattle) Malaysia  
 Abdul Wahid bin Suleiman (goats) Malaysia
7. That particular attention be paid to the evaluation of buffaloes, ducks and pigs, as work on these has lagged behind that on other species. In particular, swamp buffalo from different countries might be compared under different feeding and management conditions, together with crosses between swamp buffalo and river buffalo such as the Murrah.
8. That estimates of genetic distances among native populations of the SABRAO region be encouraged, so that a sound, objective definition of the existing breeds and strains within each species can be obtained. For example, there should be analysis of biochemical and immunological markers, and later, DNA sequences.
9. That mechanisms be sought for collaboration with suitable laboratories to implement Recommendation 8. The studies could include monitoring currently unknown gene flows from exotic to native populations, for example, of New Guinea pigs.
10. That to implement Recommendations 8 and 9 a committee be appointed, under the chairmanship of Dr. Ian Franklin, with Dr. S.G. Tan as a member, and with power to co-opt.
11. That selection within indigenous breeds be used as a method of improving production.
12. That when exotic breeds or crosses are imported into any country, there should be objective evaluation of them, to give guidelines for the future.

13. That action be taken to exchange laboratory genetic material between SABRAO countries for silkworms, lac insects and honey-bees.

14. That within the SABRAO region efforts be made to standardize the use of breed names, taking those of Mason's "World Dictionary of Livestock Breeds" as a basis. Publications should list the source of genetic material as well as the breed names. (Reference: I.L. Mason - A World Dictionary of Livestock Breeds, Types and Varieties. Technical Communication No. 8 (Revised) of the Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh. Second (Revised) Edition, 1969. Commonwealth Agricultural Bureaux, Farnham Royal, Bucks., England.)

### **Editorial Footnotes**

(a) Copies of the "Proceedings of SABRAO Workshop on Animal Genetic Resources in Asia and Oceania" are available from Tropical Agriculture Research Centre, Ministry of Agriculture, Forestry and Fisheries, Yatabe, Tsukuba, Ibaraki 305, Japan.

(b) Copies of the documentation forms are available from the Chairman of the SABRAO Expert Committee on Animal Genetic Resources, Professor J.S.F. Barker, Department of Animal Science, University of New England, Armidale, NSW, Australia.

(c) Copies of the "Proceedings of the Second SABRAO Workshop on Animal Genetic Resources" held in Kuala Lumpur in May 1981 are available from Dr. T.K. Mukherjee, Head, Department of Genetics, University of Malaya, Kuala Lumpur, Malaysia.

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## NEWS ITEMS

### **INTERNATIONAL CENTRE FOR GENETIC ENGINEERING AND BIOTECHNOLOGY**

An International Centre for Genetic Engineering and Biotechnology is being planned by the United Nations Industrial Development Organization, whose address is P.O. Box 300, A-1400 Vienna, Austria. It is intended that the Centre will be a worldwide forum for scientists and technologists and provide training and research facilities for developing countries. The location of the Centre is expected by the end of 1982.

### **INTERNATIONAL UNION FOR CONSERVATION OF NATURE**

The International Union for Conservation of Nature has set up a Genome Conservation Specialists Group as part of their Species Survival Commission. As a first task they are compiling a list of existing collections of frozen germ cells of endangered species and their close relatives. Items for inclusion in the list should indicate taxonomic name in Latin; type of fixation and storage; kind of cells; date, age and sex of donor; owner; person taking the samples; quantity and quality of samples; predicted period of storage; location and person or institution responsible. This information should be sent to the Chairman and Vice-Chairman of the Group, who are Professor B.N. Veprintsev, Institute of Biological Physics, USSR Academy of Sciences, Pushchino, Moscow Region 142292, USSR, and Dr. C. Polge, Institute of Animal Physiology, Animal Research Station, 307 Huntingdon Road, Cambridge CB30JQ, England.



## REPORTS OF MEETINGS

### STRATEGY CONFERENCE ON BIOLOGICAL DIVERSITY

A Strategy Conference on Biological Diversity was held from 16-18 November 1981 in the USA, which was sponsored by a number of US organizations, including the Department of State, Department of Agriculture, Council on Environmental Quality, Science Foundation, Agency for International Development and others. The Proceedings have been published by the Department of State (Publication Number 9262). It carries the texts of papers and also the recommendations of Panels concerned with Plants, Animals, Aquatic Species, Microbial Resources and Ecosystems. The animal panel made recommendations on both domestic and wild animals; on the former it recommended the establishment of an International Board of Animal Genetic Resources to provide technical assistance for the co-ordination of national programmes into international programmes to conserve and use animal germplasm resources. The other recommendations followed closely those of the FAO/UNEP Consultation on the subject in 1980.

### INTERNATIONAL SEMINAR ON SHEEP AND WOOL RESEARCH AND PRODUCTION

This seminar, held in Islamabad, Pakistan, 14-16 March 1982, was organized by the Pakistan Agricultural Research Council (PARC), and supported partly by the Australian Development Assistance Bureau. One of its recommendations was that "A well represented and broadly based committee with powers to coopt foreign experts should be constituted by PARC". Its first term of reference should be to "collect and analyse information on the characteristics of indigenous sheep breeds and their wool with special reference to different uses".

### 33RD ANNUAL MEETING OF THE EUROPEAN ASSOCIATION OF ANIMAL PRODUCTION

At the 33rd Annual Meeting of the European Association of Animal Production in Leningrad from 16-19 August 1982, a preliminary report was presented in the Commission on Animal Genetics from the Working Party on Animal Genetic Resources in Europe, by K. Maijala (Finland), chairman of the group. Survey forms had been sent to each country, and the replies indicate that there are about 1200 'country populations' of cattle, sheep, goats, pigs and horses. About 200 of these were considered to be endangered, although some had a counterpart elsewhere. Most countries have started conservation, with the government assuming major responsibilities, but there were also many private organizations acting in the field. Live animal, frozen semen and frozen embryos were methods being used.

### INTERNATIONAL CONFERENCE ON GENE RESERVES

A conference on the function and significance of gene reserves in preserving animal species and breeds was organized by the Hungarian Society of Agricultural Sciences at Debrecen, Hungary, from 6 to 9 September 1982. One hundred participants, mostly from Hungary, included several from Finland, German Democratic Republic, USA, Poland, United Kingdom, the USSR, Bhutan and one from FAO.

The conference opened with general papers including one by I.L. Mason on "The role of protected areas in the in situ conservation of animal genetic resources" which discussed wild and feral animals as well as domestic breeds. The conference then divided into sections on fish, animals for hunting, wild and fur animals and domestic animals. The papers in this last section were mainly on livestock and poultry. Eighteen papers described rare breeds and their conservation in Hungary, and seven were devoted to Polish breeds. In addition, there was a general paper by

Bodó, Dohy and Takics (Hungary) on the reasons and methods for conserving rare breeds; and papers on conservation in Scandinavia (Maijala), Great Britain (Henson) and the German Democratic Republic (Altmann).

Important topics which were raised but not discussed included: the relative advantages of state involvement (as in Hungary) or private initiative (as in Britain), the desirability or otherwise of selecting for breed type or productivity in a conserved rare breed, and the possible use of local, hardy European breeds for improvement in developing countries. There were no final conclusions or recommendations.

The meeting concluded with a visit to the Hortobágy National Park where conservation herds of Hungarian Grey cattle, Hungarian buffaloes, Hortobágy Racka sheep, Mangalica pigs and Hungarian Curly-feathered geese were seen.

The Proceedings of the conference are to be published in Hungarian and in English. The address of the Hungarian Society of Agricultural Sciences is: P.O. Box 451, 1372 Budapest.

## **2ND WORLD CONGRESS ON GENETICS APPLIED TO LIVESTOCK PRODUCTION**

This congress was held in Madrid, Spain, from 4-8 October 1982. During the meetings a Round Table was held on Breeds Conservation. Papers presented included Genetical dynamics of domestic animal populations (J.J. Lauvergne, France); Conservation and genetical studies of Spanish Chickens (J.L. Campo and F. Orozco, Spain); Evolution and adaptation of cattle in Ethiopia (M. Alberro, Spain); Rare and feral domestic animal stocks in Canada and the United States (R.D. Crawford, Canada); Breed conservation in Asia - problems and prospects (J.S.F. Barker, Australia); The role of international organizations in the conservation of the world's animal genetic resources (J. Rendel, Sweden); and Administrative and rational methods of livestock conservation (C.G. Hickman, Italy).

The Congress approved a resolution stressing the need for improved international coordination of the management and conservation of the world's animal genetic resources, and recommended that the Consultative Group on International Agricultural Research (CGIAR), the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Environmental Programme (UNEP) and other appropriate sources make available funds and facilities for an International Bureau of Animal Genetic Resources.

## BOOK REVIEWS AND RECENT BIBLIOGRAPHIES

The Arab Breeds of Sheep Y.S. Ghanem. ACSAD, Damascus and ALECSO, Cairo. 1980. (In Arabic)

This book is a joint publication by the Arab Centre for Studies on Arid and Dry Lands (ACSAD) and the Arab League Educational and Cultural Organization (ALECSO). It is based on information from all the Arab countries (including Somalia), and from the literature, collated by Dr. Ghanem. The book runs to 292 pages and has 372 references, most of them in English. It describes and illustrates 52 breeds of sheep grouped under the headings: Hair thin-tailed, Hair fat-tailed, Hair fat-rumped, Wool thin-tailed, Wool fat-tailed. However several breeds are described separately for different countries, e.g. Nejdi (2), Ouled Djellal (2), Beni Guil (2), DIman (2), Awassi (6), Arabi (3), Barbary (5). So, in fact, the number of different breeds described is nearer 37. Now we need a source of funds to enable this book to be translated and published in English or French.

I.L.M.

### RECENT PUBLICATIONS ON LIVESTOCK (supplied by I.L. Mason)

#### GENERAL

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#### GOAT

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