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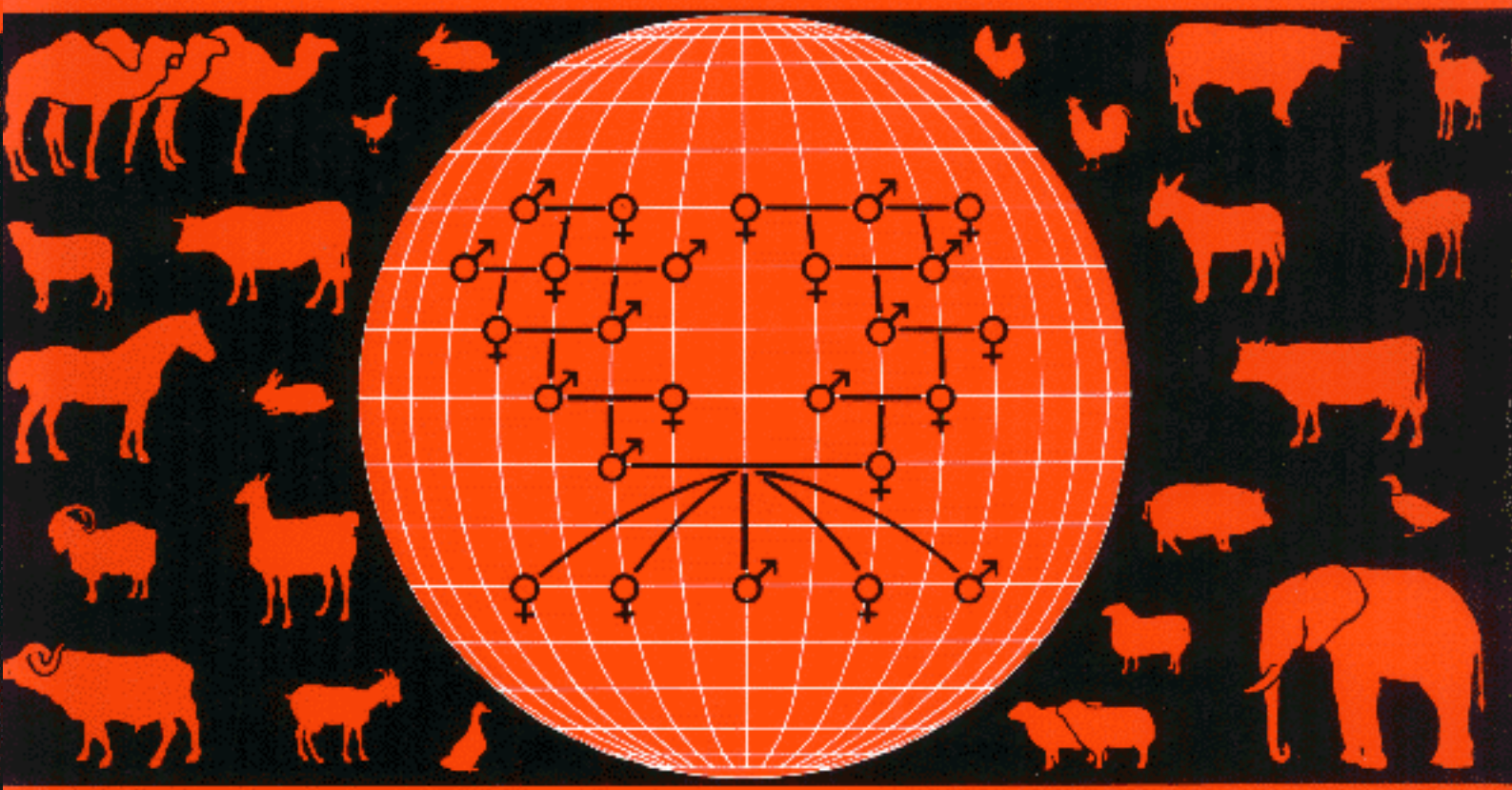

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El Boletin de Informaciôn sobre Recursos Genéticos Animales recibirâ con mucho gusto colaboraciones de hasta 3000 palabras de extensiôn en espanol, francés o inglés. Si son aceptadas, las contribuciones se publicarán en el idioma original. Interesa recibir informes, noticias y notas sobre reuniones, actividades de conservaciôn y evaluaciôn, y cuestiones técnicas. Los originales deberân presentarse mecanografiados a doble espacio y acompanados de un resumen que no supere el 5 por ciento de la extensiôn original. Se aceptan fotografias, pero ûnicamente en blanco y negro y de buena calidad. AGRI también publicarâ resenas de libros sobre recursos genéticos animales. Cualquier intercambio de correspondencia serâ bienvenido.

Todas las contribuciones deberân dirigirse a:

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

EDITORIAL

Identifying and characterizing breeds of livestock is the first unavoidable step of any programme aiming at conserving Domestic Animal Diversity. For this, FAO has for many years developed a Global Database, first established at Hannover University, then, after 1992, moved to Rome, and named the Global Data Bank for Animal Genetic Resources (GDB-AGR). The various solutions used to collect and enter data in this GDB-AGR have been described in AGRI 11 by J. Ruane. Using these data has led to the World Watch List, now published and available, and which is described in this issue (see paper by R. Loftus, p 3).

During the year between these two papers the number of entries has been increased, the total number of breeds from 2047 to 2719, of which 53 % are with population data, as opposed to 38 % one year ago. This first phase has been the result of the Global breed survey implemented with support from UNEP, and using the software developed by the Hannover University based EAAP Data Bank. We consider that the time has come for a new development of this activity. As indicated in the previous editorial, a working group has been constituted to propose a new structure for the GDBAGR. The report will soon be available. Apart from using new and more user friendly softwâre, the new structure will develop a network between the central node at FAO Headquarters, regional nodes operated by regional coordinators, and national nodes collecting and validating the data. The use of new communication media, such as electronic mail, will allow for real interactions between all these levels, even if, for security reasons, only the central node will have the possibility to enter data in the database.

The report from the previous working group on genetic distancing has been reprinted and is available on request.

The next step will be “action”. Action to promote and improve local breeds identified as being particularly valuable, but also action to preserve weaker breeds before they disappear. From the data available, we can say that 390 breeds are at risk, by which is meant that the total population is less than 1000 breeding females. The old debate between supporters of *in situ* and *ex situ* preservation is not closed. However it is clear that something must be done, even if the optimal solution still has to be defined: as shown by R. Loftus, one breed of livestock disappears every week.

INTRODUCING THE FIRST WORLD WATCH LIST FOR DOMESTIC ANIMAL DIVERSITY

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SUMMARY

The recently published World Watch List for Domestic Animal Diversity (WWL-DAD) provides the first comprehensive list of endangered livestock breeds worldwide (FAO/LTNEP 1993). This document will function as a global early warning system to help prevent the erosion of livestock genetic resources. Seven species are covered, namely ass, buffalo, cattle, goat, horse, pig and sheep. Within these species, breeds at risk are defined as critical (The Critical Breeds List) or endangered (The Endangered Breeds List) based on the number of breeding females. Although the statistics for these seven species are still incomplete at the time of going to press, over 390 breeds are already known to be at risk.

RESUME

La Liste Mondiale d'Alerte pour la Diversité des Animaux Domestiques (WWLDAD) fraîchement publiée présente la première liste détaillée et complète des races d'animaux domestiques en danger au niveau mondial (FAO/LJNEP). Ce document est sensé servir de système d'alerte pour aider à freiner l'érosion des ressources génétiques animales. Sept espèces sont prises en compte, à savoir ânes, buffles, cheval, chèvre, mouton, porc et vache. Au sein de ces espèces, les races menacées sont classées comme "critiques" ou "en danger" selon le nombre de femelles reproductrices. Bien que les statistiques pour ces sept espèces soient encore incomplètes, il est certain que plus de 390 races sont menacées.

1.0 INTRODUCTION

The development of settled agriculture and animal husbandry has, over the centuries enabled humans to achieve high population densities - a prerequisite for cultural development. Consequently hunter gatherers have been gradually replaced by agriculturalists and their livestock have proliferated to occupy a greater range of habitats than those occupied by any other single extant animal species. Of the enormous number and range of species known to exist, humans have domesticated a mere handful for their use. These were first husbanded in the Fertile Crescent around 10,000 years ago and have gone on to generate a dearth of intra-species diversity in response to environmental and artificial selection. The evolution of these livestock is not a static but a dynamic process, new breeds are continuously being generated, sometimes at the expense of older ones.

This biological diversity enables productive agriculture to be carried out in a wider range of environments than would be the case for a more genetically uniform population. It allows more rapid genetic progress to be made, and consequently a quicker response to unforeseen challenges. A cursory glance at the number of breeds domesticated within each species quickly demonstrates the extent and range of domestic animal diversity (DAD) present, with an estimated 78 ass, 62 water buffalo, 783 cattle, 313 goat, 357 horse, 263 pig and 863 sheep breeds worldwide (Table 1).

Much of this DAD is now under threat from a number of sources. In the developed world the pursuit of higher production targets has narrowed selection goals resulting in the increased reliance ona small number of breeds to meet food and agriculture requirements. In the developing world the extensive use of artificial insemination (AI), the intensification of agriculture and the indiseriminate crossbreeding of local breeds have had their toll. Coupled with natural disasters, frequent wars and changing technologies, these factors have erroded the indigenous gene pool at a rate that far outstrips its possible regeneration.

To date concern for rare and endangered breeds has been most marked in northern countries where there has been a history of specialized livestock production. Due to a lack of resources and education most developing countries have, with some exceptions, not been in a position to encourage the use of, or monitor indigenous resources. Consequently the inventories and status reports so essential to the conservation of local livestock have been lacking on a global basis. To fill this information deficit FAO, in collaboration with the Technical University of Hannover, established a Global Databank for Animal Genetic Resources in 1991.

One of the main objectives of the Global Databank has been to document and characterize livestock breeds from seven major species (RUANE 1993). The first edition of WWL-DAD is based on this data and proposes to monitor endangered breeds and to alert national and regional authorities as to the dangers inherent in the loss of such breeds (FAO/L1NEP 1993). Although the statistics are incomplete at the time of going to press, the message of the first edition is quite clear - almost one third of DAD is now under serious threat, without more immediate action much of this component of biodiversity will be irretrievably lost.

2.0 STRUCTURE AND SCOPE OF WWI.-DAD

Seven species are covered in the first edition of WWL-DAD: ass, buffalo, cattle, goat, horse, pig and sheep, although the final aim is to cover the 30-40 species used for food and agriculture. Chapter 1 provides introductory information on the structure and purpose of the document and puts forward guidelines on how to conserve DAD at the national and regional levels. Additional sections in this chapter outline the reasons why DAD should be conserved as well as providing information on the origin and domestication of livestock species.

Chapter 2 introduces the regional structure of WWL-DAD. Breeds are categorized as critical - those on the verge of extinction, and endangered - those known to exist only in dangerously low numbers. Breed lists and statistics are presented within the six regions used by FAO for organizational purposes: Africa, Asia and the Pacific, Europe and the former USSR, Latin America and the Caribbean, the Near East and North America. Each regional section opens with an outline of the area's geography, demography and agro-ecology, highlighting special factors that have had an influence on the development of breeds. This cursory information is followed by breed descriptive lists which summarize available data on the region's threatened breeds.

A further chapter provides details on how and why domesticated breeds become extinct (The Extinct Breeds List), giving over 200 examples of breeds already known to have vanished. Finally a list of the 2 750 or so breeds currently in the Global Databank for Animal Genetic Resources is presented. This list is on a country by country basis and provides an opportunity for local experts to compare and contrast it with their lists.

Throughout the document *readers are encouraged, through an enclosed correspondence pro forma to fill in any information gaps.* This is emphasised as being of critical importanee to WWL-DAD as breeds are dynamic by their nature and it is often difficult to achieve a clear consensus. It is hoped that by encouraging readers to contribute further details future editions of WWL-DAD will provide a fuller picture of the status of the worlds breeds.

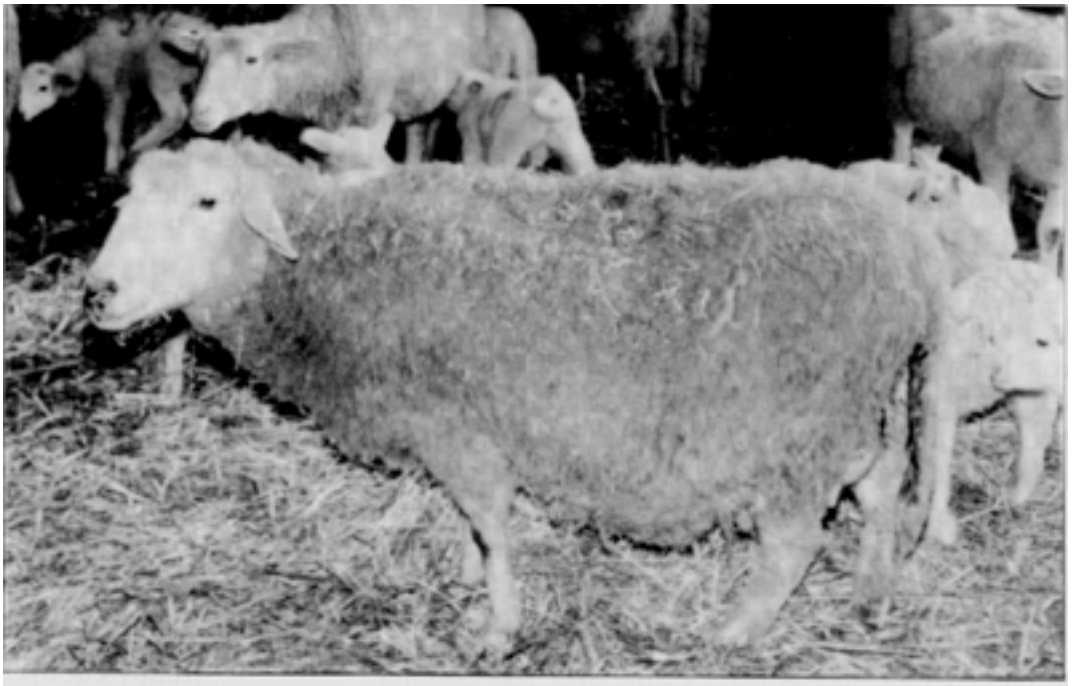
3.0 PRELIMINARY FINDINGS

An analysis of the Databank and a summary of the information in WWL-DAD are given in Tables 2.1 and 2.2. The Tables show 2 719 entries in the Databank, with population size data for 1433 or 53% of these. Of the proportion with available population data, over 390 or 27% are elassed as at risk of loss, based on the criteria for defining a breed as critical (less than 100 breeding females) or endangered (less than 1,000 breeding females).

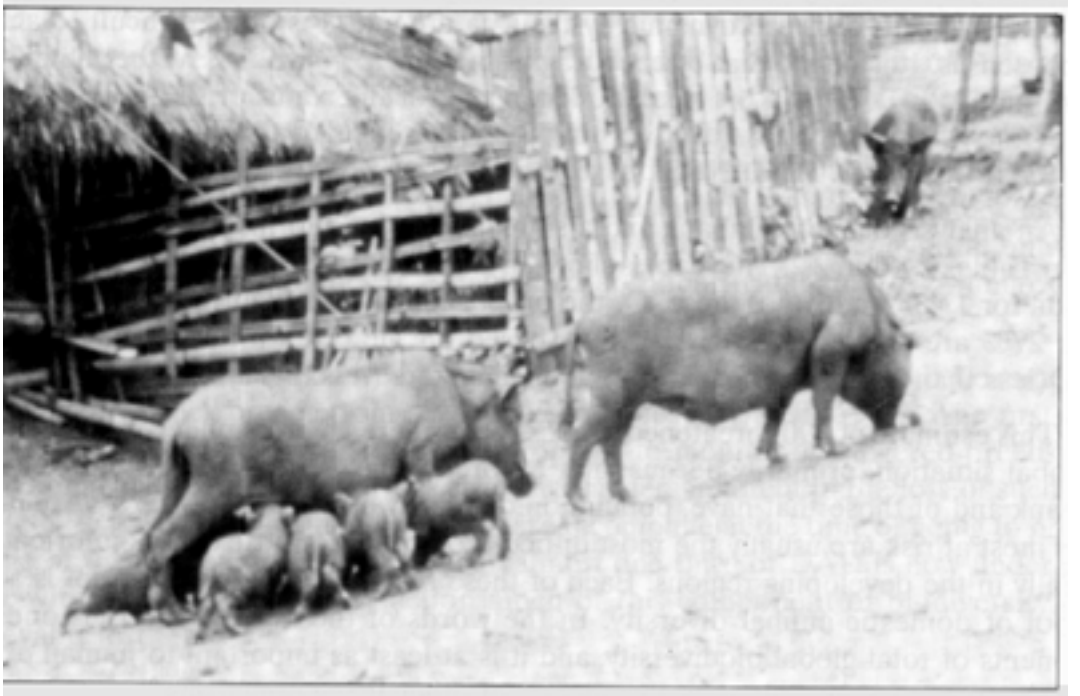
This estimate of 390 threatened breeds is considered a gross under-representation of the global situation, primarily because not all breeds have been entered into the Global Databank and of those that have, population data is available for only 53%. Additionally, breeds most at risk are usually the most difficult to obtain accurate census information on, especially in the developing regions. Each of these breeds that become extinct is a loss to the pool of domestic animal diversity. In the words of the WWL, "DAD is one of the components of total global biodiversity, and it is at least as important to human existence as the components contributed by the species of other living organisms."

-Table 2.2 indicates that most endangered breeds (274) lie within the European region. This reflects both the early emphasis on breed development here (hence the greater number of clearly defined breeds), and also the greater availability of population data for European breeds - a breed survey has been ongoing in Europe for over 10 years (SIMON & BUCHENAUER 1993), whereas that for the rest of the world was initiated only 2-3 years ago. A full inventory of all European breeds has recently been published and the reader is referred here for further information on this region (SIMON & BUCHENAUER 1993).

There are a number of breeds belonging to the 20 or so remaining domesticated animal species not yet ineluded in the WWL-DAD. Some of these may also be at risk, further increasing the figures. Consequently a more realistic estimate of the world situation might be obtained by extrapolating the 27% of breeds at risk (estimated from breeds with population size data) to cover the 4,000 breeds thought to exist. This gives a figure of over 1,000 breeds currently under threat of extinction. If only 5% of these are being lost per year then *the average rate of breed* loss *could be about 1 breed per week.*



The highly prolific Olkuz sheep - still exists in dangerously low numbers despite its exceptional fecundity



An example of village pigs, similar to those once found in Haiti

Bakosi cattle now found only in dangerously low numbers in southern Cameroon

Caracu cattle - once threatened with extinction, now used as a popular dual purpose breed in Brazil

4.0 BREEDS OF INTEREST

In addition to the obvious technical information provided, the Global Databank and, more specifically the World Watch list serve as a platform to identify interesting "new" breeds currently of small population size, yet of potential value to the world at large. Of major concern is that many of these breeds may become extinct before they have been properly characterized. The arguments for conserving them are many, aside from maintaining a certain critical mass of biodiversity to act as insurance for future generations, many local breeds harbour qualities which make them readily usable in todays context. Some of the following examples indicate that given appropriate documentation and characterisationindigenous resources can contribute towards sustainable agricultural systems for future use.

The Olkuz sheep (Plate 1), native to the southern region of Poland have declined dramatically in numbers in recent years. Repeated crossings with Romney Marsh in the 1960's combined with adverse economic conditions in the 1980's which made sheep farming less profitable, have resulted in the loss of most purebreds. One of the main features of the breed is its exceptional prolificacy, which when coupled with its excellent mothering abilities give an average fecundity of about 180%. The recent documentation of the plight of Olkuz sheep resulted in the purchase of a number of breeding stock from local farmers by the Animal Breeding and Genetics Department of Cracov Agricultural University. These are being maintained in a single purebreeding nucleus flock and will be selected and improved for future use.

The Bakosi cattle breed, a variety of West African Dwarf Shorthorn, found in the Bangemo region of Southwest Cameroon is now disappearing rapidly due to the increased cultivation of commercial crops such as coffee. Local farmers are no longer prepared to maintain the breed as it tends to damage the coffee crop. These cattle are highly trypanotolerant but, like many of the West African Shorthorn breeds are rapidly decreasing in numbers. Through WWL-DAD this breed has been identified as under serious threat and efforts are now underway to maintain a pure herd. Subsequently animals can be properly characterized and levels of trypanotolerance ascertained.

The Caracu cattle breed of Brazil (Plate 2) represents another example of a local breed almost driven to extinction. Earlier this century the introduction of zebu cattle, mainly from India resulted in a dramatic reduction in the numbers of this breed. Subsequently, positive research results called attention to the breed to such an extent that it now represents one of the most popular Criollo breeds in Brazil (DA SILVA et al,1992). Caracu cattle have been shown to be superior to many imported breeds under local conditions and are now used extensively as a dual purpose breed.

Not all breeds have been this fortunate. In the early 1980's more than 1 million Haitian pigs were slaughtered by the US government in its campaign to prevent the spread of African Swine Fever from Hispaniola to North America. By 1983 the countries' pigs were extinct (MACKENZIE,1993). These pigs functioned as the peasants bank, they stored the tiny surplus of nutrition generated by subsistence agriculture and yielded dividends in the form of piglets which could be sold or eaten. Furthermore they were used as a form of sacrifice in voodoo tradition to seal a contract. Attempts to regenerate the pig population in the region with more productive "western" pigs have largely failed as local peasants cannot afford the high management costs associated with these breeds.

Even a cursory glance at the range of environments - socio-cultural, geographical and economic - in which domestic animals have been bred, is enough to make clear the huge wealth of biodiversity that humankind has created. Our responsibility now is to ensure that what is of value is not lost to future generations.

Plans to expand the number of breeds covered in WWL-DAD include coverage of the wild relatives of many of the domestic breeds, and of the many types of "micro livestock" husbanded

across the globe. Species such as the Gaur of Northern India, thought to be resistant to foot and mouth disease may become extinct before such traits are properly investigated. Other examples include the Bearded Pig *(Sus barbatus barbatus)* of Borneo (Plate 3), adapted to nomadic frugivory (fruit eating) and consistent population movements in response to rainforest fruiting activity. This species provides 60-90% of total harvest of wild meat in Sarawak which in terms of the cost of replacement by livestock makes an annual contribution of $40 million to the local economy. These pigs are now under threat as their environment is being destroyed by logging and the severe hunting pressures imposed on the species (CALDECOTT & CALDECOTT 1985).

Future editions of WWL-DAD will serve to highlight the plight of such species and to alert regional and national organizations to the value in conserving DAD. In the long term the WWL-DAD will be developed as a distributed network. Users across the globe will be able to input information on domestic animal breeds and have it validated. Interested parties, whether they be breeders, conservation workers or policy-makers, will be able to access a wealth of information on the rare, endangered and valuable breeds created by humankind over 10 000 years of domestication.

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TABLE 1
Breeds at Risk - By Species

SPECIES	ON FILE	WITH POPULATION DATA	AT RISK*
ASS	78	17	11
BUFFALO	62	28	1
CATTLE	783	446	112
GOAT	313	133	32
HORSE	357	175	81
PIG	263	141	53
SHEEP	863	493	101
TOTAL	2719	1433	390

** Estimated from breeds with available population data*

TABLE 2
Breeds at Risk - By Region

REGION	ON FILE	WITH POPULATION DATA	AT RISK*
AFRICA	297	110	9
ASIA & PACIFIC	746	302	51
EUROPE & FORMER USSR	1058	847	274
LATIN AMERICA & CARIBBEAN	165	77	23
NEAR EAST	284	56	3
NORTH AMERICA	169	41	30
TOTAL	2719	1433	390

** Estimated from breeds with available population data*

JAPANESE NATIVE LIVESTOCK BREEDS

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SUMMARY

This paper discusses the conservation of native livestock breeds in Japan. These include native Japanese horses, cattle and goats, and domestic Japanese fowls. To best conserve the genes of these genetic resources it is necessary to keep them in the form of (a) live animals and (b) cryogenic storage of sperms, oocytes, embryos, cells, chromosomes and genes. Even that Japanese native livestock are also important as living'museums', it is further desirable to conserve them as live animals. However, there are many problems with conserving all of these breeds in a live form because of their low economic value in the market. For this reasons, it is necessary to combine this with the raising of animals for other purposes such as sale of products, tourist attractions in national parks, zoos and sightseeing farms, educational tools in agricultural schools and experimental animals.

RESUME

Cet article présente le programme pour la conservation des races de bétail locales au Japon. Ceci concerne les races locales de chevaux, de vaches de chèvres et de volaille. Pour conserver les gènes de ces ressources génétiques il est nécéssaire de les maintenir en l'étatd de (a) animaux vivants et (b) stock congelé s de semence, ovocytes, embryons, cellules, chromosomes et gènes. Vu leur importance comme musées vivants, il est nécéssaire de les conserver sous forme d'animaux vivants. Toutefois ceci est difficile du fait de leur faible valeur économique. Pour cette raison il est nécéssaire d'associer l'élevage de ces animaux avec d'autres activités telles que la vente de produits, les attractions touristiques dans les parcs nationaux, les zoos ou les fermes réserves, les outils éducatifs dans les écoles et les fermes expérimentales.

1.0 INTRODUCTION

Few indigenous livestock species have their origin in the ancient Japan. The majority were at one time or another imported from abroad. The first imported stock was introduced prior to the Edo era (before 1603) when the country was virtually sealed off from the outside world. No livestock was introduced in the Edo era after that. The term 'native livestock' is used here since these breeds have been in Japan for a long time. Since there are no breeds the same elsewhere in the world, their breed names are commonly used.

Current Japanese livestock breeds can be divided into three groups according to origin. Firstly, there are various native livestock and domestic fowls which either existing or were introduced to Japan before the Edo era, and some of which have survived up to the present. Secondly, there are dairy cattle, pigs, sheep and poultry which were imported from after the Meiji restoration (1868). Thirdly, there are beef cattle which are the product of crossbreeding between native livestock and cattle breeds imported after the Meiji restoration.

Japanese native livestock and poultry in the first category includes a) native horses (Hokkaido pony, Kiso pony, Taishu pony, Misaki pony, Tokara pony, Miyako pony, Yonaguni pony and Noma pony); b) native cattle (Mishima and Kuchinoshima cattle); c) native goats (Shiba and Tokara goats) (Table 1.); and d) Japanese domestic fowls (e.g. Hinaidori, Minohiki, Kurokashiwa, Onagadori, Totenko, Koeyoshi, etc.,) (Table 2).

This paper discusses the conservation of native livestock breeds in Japan.

2.0 DESCRIPTION OF NATIVE LIVESTOCK AND MAIN DOMESTIC POULTRY

2.1 Hokkaido Pony

Hokkaido ponies are native horses found in Hokkaido, the northernmost island of Japan. They are raised mainly along the. Pacific *coast* of Hokkaido. Their body size is medium and withers height is 130-135 cm. Because of their strong legs and stamina, they were used extensively for both farm and road work. In order to keep their purity these breeds have been registered by the Association of Native Ponies since 1979. They are commonly called "Dosanko".

2.2 Kiso pony

Kiso ponies are native horses of medium size bred in the basin of the Kiso river in Nagano prefecture. Since the Meiji era, this breed was influenced very much by national improvement plans and the number of pure Kiso ponies has fallen sharply. After 1945, the breeding of Kiso ponies was carried out using the few surviving pure bred ponies and in 1976, the registration of this breed, conserved by the Kiso Pony Conservation Group, began.

2.3 Noma pony

This breed is found in Ehime prefecture. They may have originally been reared on the islands of the Inland Sea for the purpose of transportation. Their body size is the smallest of all the native horses. They are maintained in the farm park managed by the City of Imabari and used for hobby riding by children.

TABLE 1.
Major Japanese native livestock breeds

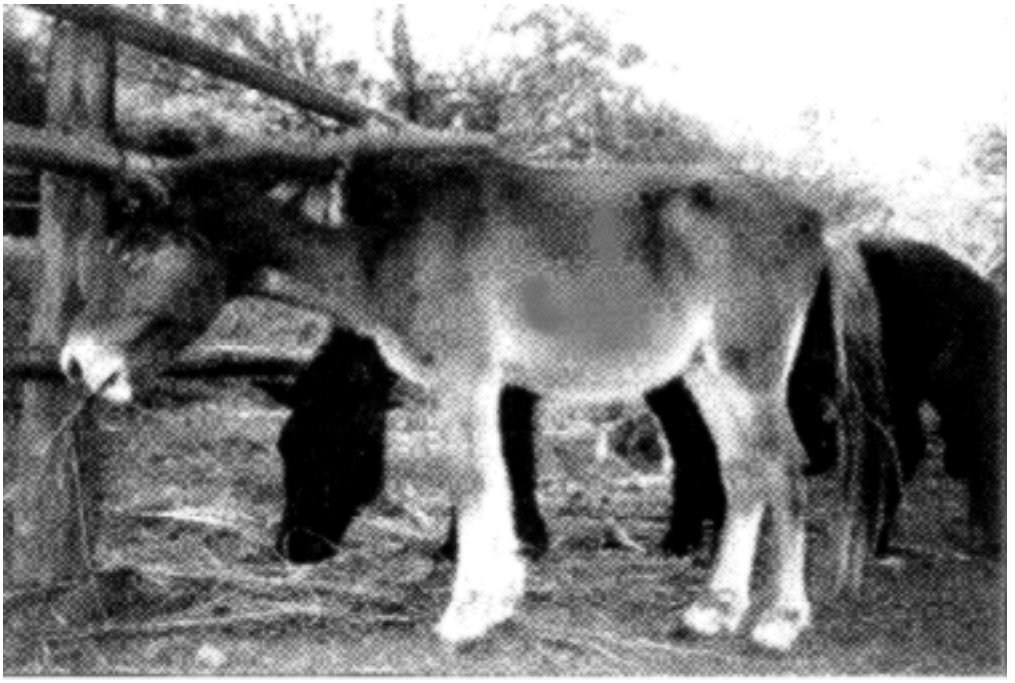
Species	Name of breed	Area where raised
Horses	Hokkaido Pony	Hokkaido
	Kiso Pony	Nagano
	Noma Pony	Ehime
	Taishu Pony	Nagasaki
	Misaki Pony*	Miyazaki
	Tokara Pony*	Kagoshima
	Miyako Pony	Okinawa
	Yonaguni Pony	Okinawa
Cattle	Mishima Cattle*	Yamaguc
	Kuchinoshima	Kagoshimahi
	Wild Cattle	
Goats	Shiba Goat	Nagasaki
	Tokara Goat	Kagoshima

** Designated as national treasure.*

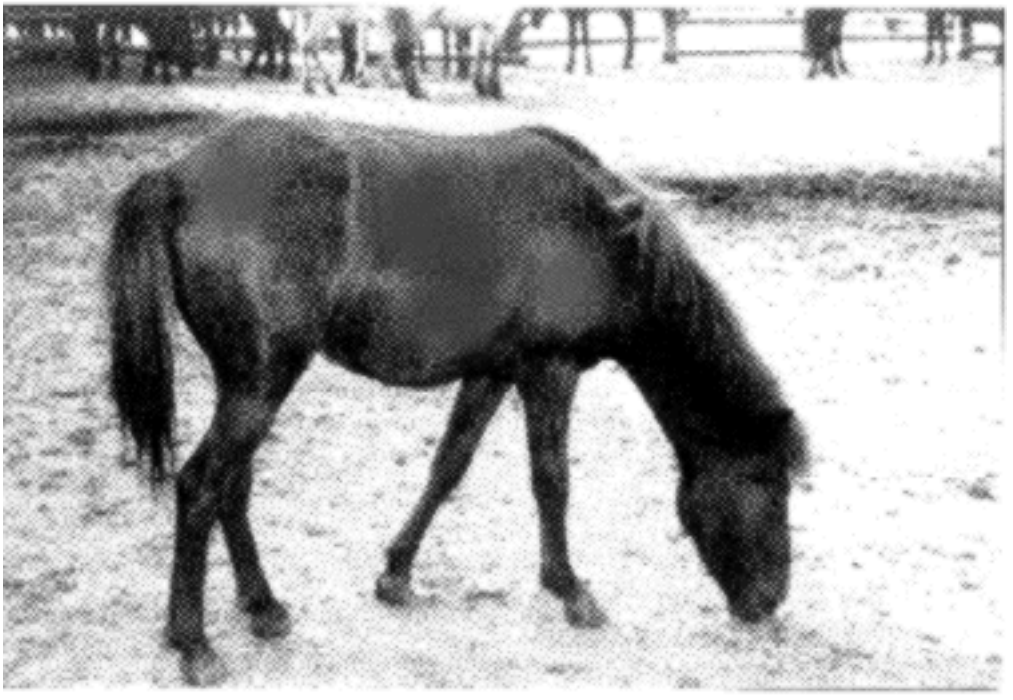
TABLE 2.
*Major Japanese domesticated birds **

Name of breed	Area where raised
Chabo	Chiba, Gunma, Kanagawa, Kumamoto,
	Osaka, Saitama, Shizuoka, Tokyo
Hinaidori	Akita
Jidor	Mie, Kochi, Gifu
Jitokko	Kagoshima
Kawatiyakko	Mie
Koeyoshi	Aomori, Akita, Iwate
Kurogashiwa	Shimane, Yamaguchi
Minohiki	Aichi, Shizuoka
Minohikichabo	Kochi Onagadori Kochi
Satsumador	Kagoshima
Shamo	Aomori, Akita, Chiba
	Kochi, Ibaraki, Tokyo
Shokoku	Mie, Kyoto, Shiga
Toumaru	Nügata Totenko Kochi
Ukokkei	Hiroshima, Kagawa, Mie
	Osaka, Tokyo, Yamaguchi
Uzurachabo	Kochi

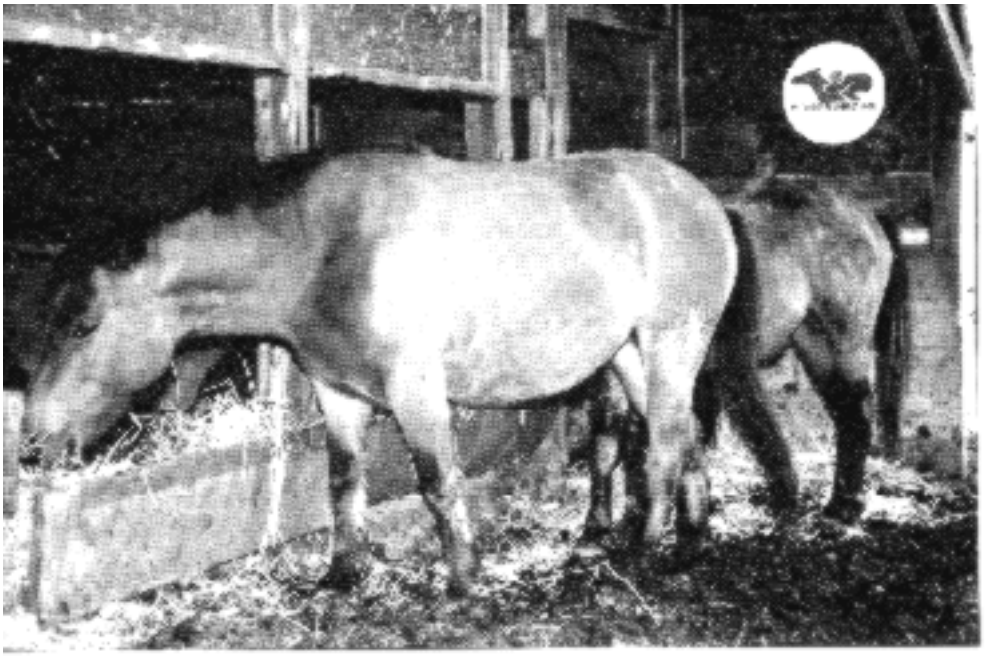
** Designated as national treasure.*



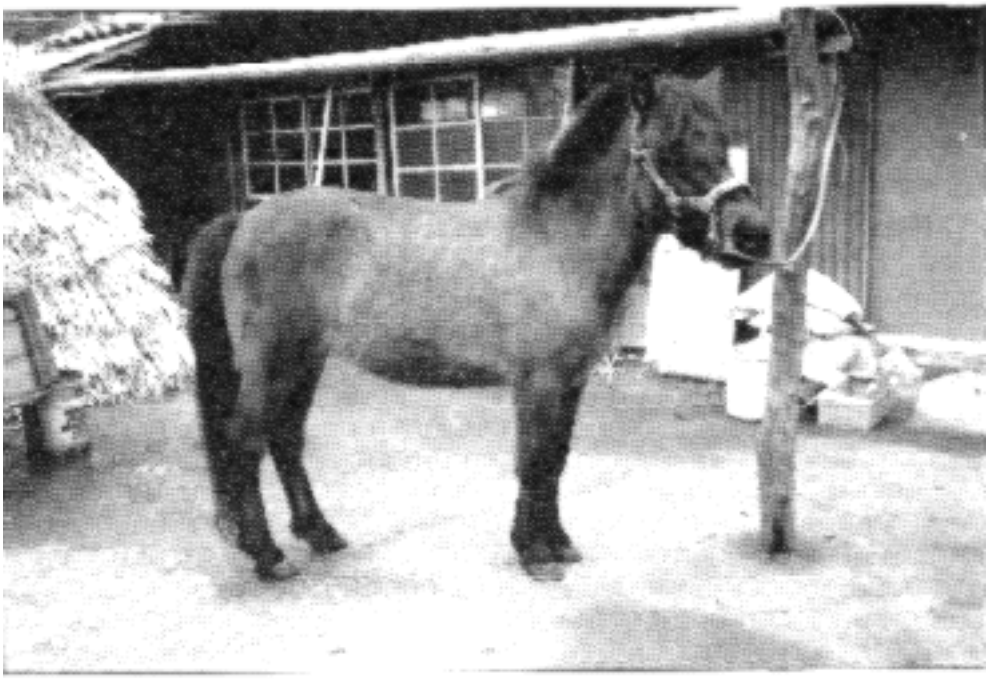
Tokara Pony



Noma Pony



Kiso Pony



Taishu Pony

2.4 Taishu pony

Taishu ponies are kept in Tsushima island in Nagasaki Prefecture. They are smaller than normal horses but have strong legs and feet. Taishu ponies were of great use in Tsushima for transportation among isolated villages connected only by narrow paths over steep slopes, but they are now rarely used for such work. The Taishu Pony Conservation Group in Tsushima plans to use these ponies not only for riding but also as a tourist attraction.

2.5 Misaki pony

Misaki ponies graze at the national park in Cape Toi in Miyazaki prefecture. They are native horses of medium size and withers height 130-135 cm. They are known as 'wild horses' and they are popular with visiting tourists. In 1953, this breed was designated as a natural treasure.

2.6 Tokara pony

This breed is found in the Tokara Islands in Kagoshima prefecture. The body size of the pure breeds kept in the islands is medium and withers height about 115 cm. They used to be widely used for cultivation, drafting and as a power source for crushing sugar cane. Nowadays, they are also raised in the mainland of Kagoshima prefecture for conservation purposes.

2.7 Miyako pony

Miyako ponies are reared in Miyako island in Okinawa prefecture. Their withers height is about 120 cm. The numbers of this breed is the smallest of all the native horses. Miyako ponies serve as tourist attractions and educational tools in agricultural schools. 2.8 Y®saagunf poany

This is a minor breed, similar to the Miyako pony, from the Yonaguni islands in Okinawa prefecture. The withers height is 110-120 cm. These ponies are unique in that they graze in the same pasture as cattle.

2.9 Mishima cattle

Mishima cattle are raised on Mishima island, northwest of Hagi in Yamaguchi prefecture. Since they have not been affected by breeds imported during the Meiji era, they are considered to have retained the characteristics of Japanese native cattle. It is said that this breed produces high quality meat, with fine marbling. However, their growth rate is inferior to modern breeds. Though they are said to have a good temper for farm work, they are no longer used for that purpose.

2.10 Kuchinoshima cattle

Kuchinoshima cattle are distributed as wild cattle in Kuchinoshima island in Kagoshima prefecture. This breed originated from domestic cattle that escaped from cattle farms on the island in 1918. Their withers height is about 120 cm.

2.11 Shiba goat

Shiba goats are native small white goats found in the Goto islands in Nagasaki prefecture. Their withers height >about 50 cm. They have horns but no wattles. They can produce kids throughout the year. The average yearly kid production >about 1.8 per female goat.

2.12 Tokara goat

These are found in the Tokara Islands in Kagoshima prefecture. They are considered to have been introduced from Okinawa prefecture. Because of crossbreeding between Tokara goats and Saanen goats, the number of pure Tokara goats is falling. They are strongly resistant to Filariosis cerebrospinalis. Intersex is not seen in this breed.

2.13 Hinaidori

Hinaidori are raised in Akita prefecture and seem to have originated from crossbred of Shamos and indigenous chickens in the Akita area. They are famous for their good quality meat, which is used in 'Kiritanpo', a famous dish of Akita prefecture.

2.14 Minohiki

This breed is bred mainly in Aichi and Shizuoka prefectures. The general appearance is beautiful and graceful. They have many long saddle feathers and their tail feathers are also long.

2.15 Kurokashiwa

Kurokashuwa are raised in Yamaguchi and Shimane prefectures. This breed has a graceful appearance with many long tail feathers. This breed of chicken is considered to sing very beautifully.

2.16 Onagadori

Onagadori, famous for their long tails, are found in Kochi prefeeture. As a result of mutation, the tail feather of the male grows to abnormal lengths, the longest recorded being 12 meters.

2.17 Totenko

Totenko are raised in Kochi prefecture. The name of Totenko means east sky red; 'to', 'ten' and 'ko' means 'east', 'sky' and 'red' respectively. This name developed because when the sun rose in the east sky, these birds would sing very beautifully.

2.18 Koeyoshi

Koeyoshi are raised in Aomori prefecture and also sing, with a register slightly lower than that of the Totenko.

3.0 MAINTENANCE OF NATIVE LIVESTOCK BREEDS AT PRESENT

At present, the rearing of many native Japanese breeds is largely done as a hobby of a few individuals who keep small numbers of animals for their own interest. Additionally some National Parks keep several breeds. The circumstances in their maintenance and rearing differ for each breed.

Horse breeding associations and conservation groups are active in conserving horses with some financial support from national and local governments. Mishima cattle are conserved by an association in their home island. In the case of goats, several laboratories belonging to agricultural research institutes or universities keep goats to use as experimental animals. In their original breeding area, however, the number of goats has fallen dramatically. The breeding of Japanese domestic fowls is largely done as a hobby by a few individuals who keep only small numbers for their own interest.

There are many problems with conserving all of the above breeds in a live form. For example, they have low economic value in the market and are presently used for non-economical uses. Other problems include:

a. All of the native livestock are presently being reared by people of relatively advanced age. There is a fear that the techniques of rearing these animals will gradually disappear as these people pass away.
b. Most of the native livestock are reared by a few farmers in small numbers. One problem in the maintenance of live animals in small numbers is the avoidance of inbreeding and genetic drift, which can cause changes in gene frequency.
c. Most of the native livestock are kept by private individuals as a hobby, not primarily as genetic resources. Another major problem is whether the farmers who keep these animals have enough supplementary income to enable them to continue with activities. In such circumstances the survival of all these breeds is in doubt.

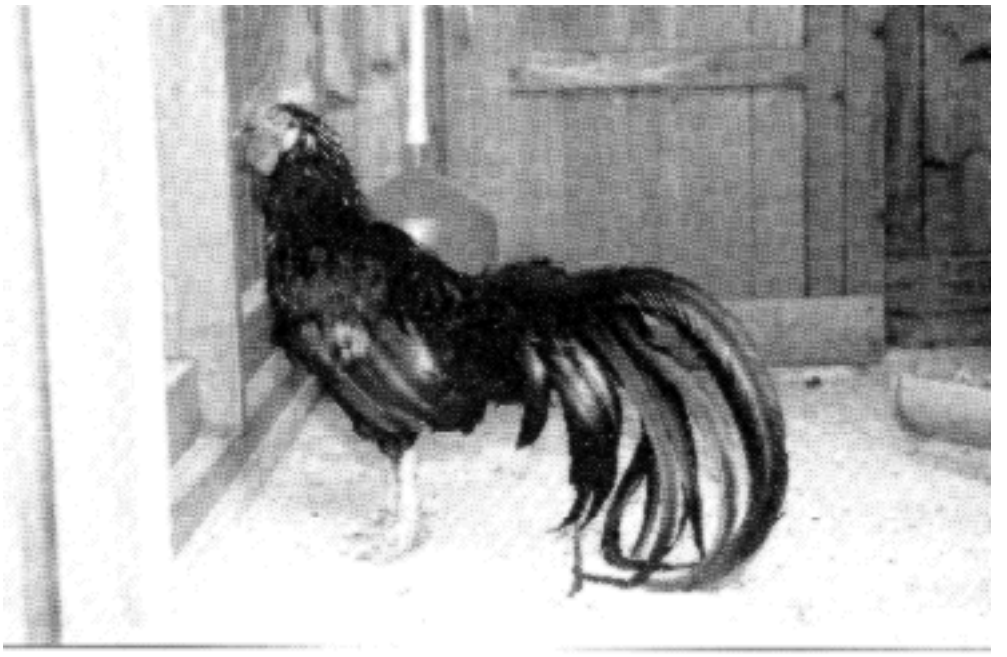
4.0 SUGGESTIONS FOR FUTURE ACTIVITIES

To conserve the genes of native livestock, it is considered necessary to keep them in the form of a) live animals and/or b) cryogenic storage of sperms, oocytes, embryos, cells, chromosomes and genes. Both methods has advantages and disadvantages.

Cryogenic samples which are successfully collected and frozen can be saved permanently and, not with standing any accidents in the storage system, remain available in exactly the same condition as at the time of their sampling, at any time in the future. Frozen collection is very expensive initially, but the costs associated with equipment maintenance, such as liquid nitrogen

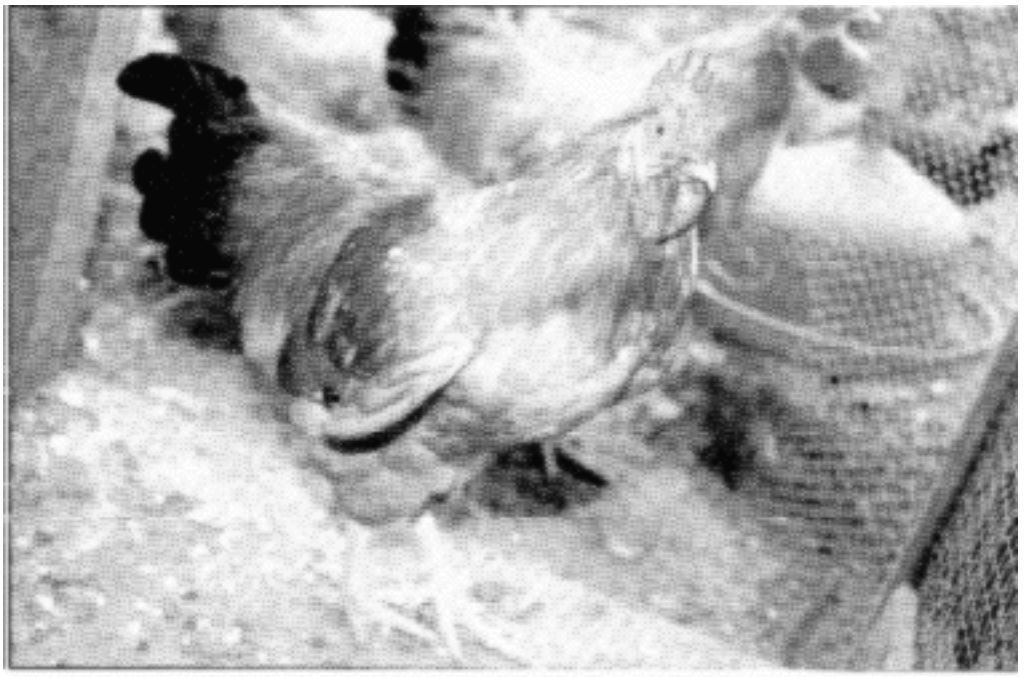
Toienko

Onagadori

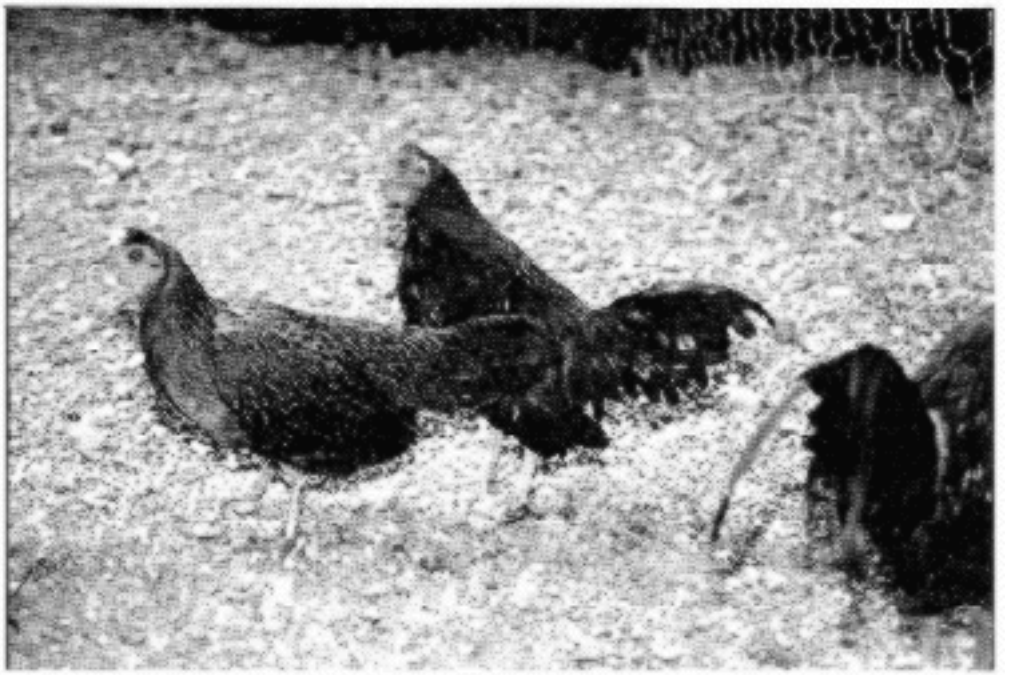


Kurokashiwa

Satsumadori



Minohiki



Jidori (Koshi)

supply, are low. In the animal section of the MAFF (Ministry of Agriculture, Forestry and Fisheries) gene bank project, we are endeavoring to collect sperms from all native animal breeds and for cryogenic storage [3-5]).

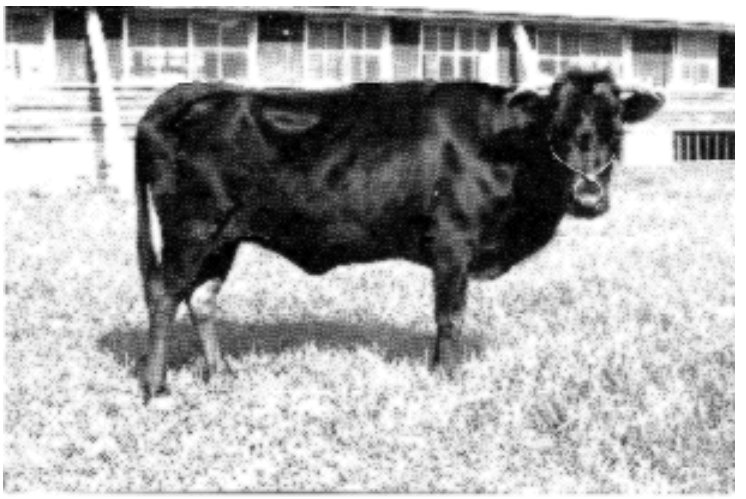
However, live animal conservation has a number of advantages over frozen cryo-preservation: a) cultural-historical reasons, b) the ability to investigate topical or new traits in the population any time, and c) maintaining public awareness of the existence of the breed and interest in its frozen material. Cryogenic storage can not satisfy aesthetic and cultural needs in the same way as live animal conservation, such as when animals with unique features are admitted by people. Nowadays many children are remote from primary food production and many children in urban areas have little or no opportunity to interact with animals. The conservation of live native livestock provides solutions to these problems.

5.0 CONCLUSIONS

Since the late 1950's, considerable changes have taken place in the status of the different breeds of livestock reared in Japan. A very small number with high economic value have come to dominate the stock in Japan, while some breeds which constituted native livestock breeds reared in local regions have become extinct or fallen to the level of trace populations. In ancient times there seems to have been a large number of native livestock breeds than at present, and some have became extinct due to their uneconomical nature. While some of these breeds are not economically valuable at present, it would be a gross squandering of valuable genetic resources to let them become extinct simply because of economical factors. For example, the Duroc boar, which did not appear in the statistics of livestock population prior to 1972, now constitutes about 50% of the pig population. This suggests that this breed had superior qualities which were not thought economically valuable at that time.

In the future, due to changing circumstances in livestock production and animal products, genetic variations which exist in native breeds may become highly valuable.

Many native breeds have played an important role in the history and development of their local areas. These breeds should be conserved as much as possible. As regards Japanese native livestock, it is important to train young people who are interested in native livestock. Furthermore, we should appeal to public opinion to obtain subsidies in order to help farmers promote production which incorporates planned programs of conservation of native breeds.



Mishima Cattle

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