

NOTICE 1652 OF 2007

Animal Improvement Policy for South Africa



DIRECTORATE
Animal and Aquaculture Production



agriculture

Department:
Agriculture
REPUBLIC OF SOUTH AFRICA



CONTACT DETAILS
DEPARTMENT OF AGRICULTURE

Physical address

Directorate Animal and Aquaculture Production
1st Floor, Delsen Building
Cnr Annie Botha and Union Streets
Riverside, Pretoria

Postal address

Private Bag X138
Pretoria
0001

Tel: 012-319 7424

Fax: 012-319 7570 / 7425

Web: www.nda.agric.za

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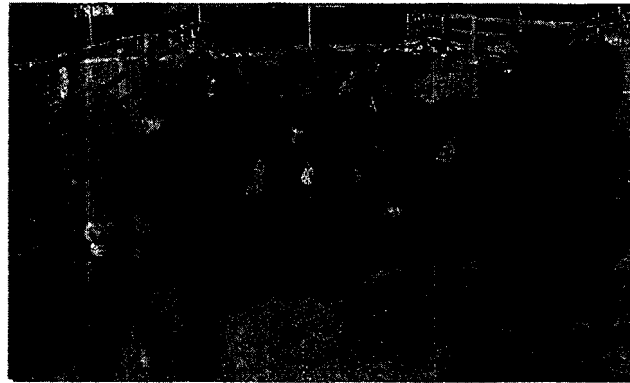
Directorate Animal and Aquaculture Production

Obtainable from

Resource Centre
Directorate: Agricultural Information Services
Private Bag X144
Pretoria
0001

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1. INTRODUCTION

A large portion of animal agriculture in South Africa is dependent on natural veld or planted pastures. Veld and pastures are, in turn, dependent on the country's soil and water resources. The optimal and sustainable use of these natural resources will largely determine South Africa's capacity for lasting food security. Care must therefore be taken to farm with adapted and genetically sound animals that are capable of producing under a variety of conditions. This genetically adaptation of animals to production environments and production systems require significant inputs from animal improvement.

The rate that populations can be improved is compromised by lack of objective definitions of improvement, inadequate understanding of quantitative mechanisms and the development and utilization of selection indices while still maintaining genetic diversity. The primary objectives should be to accelerate the selection response towards efficient and profitable production of healthy, nutritious, and palatable livestock products through enhanced adaptation to different production environments and greater resistance to disease. It is therefore important to develop and use animal recording schemes that are specifically addressing the South African production systems and conditions.

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Proper national recording schemes that collect and verifies appropriate production and reproduction information to enable genetic improvement in the national herd is therefore essential.

The need for a more effective and efficient National animal improvement programme led to a review of the Livestock Improvement Act, 1997 (Act No. 25 of 1977). This review yielded a number of concerns, including, *inter alia*:

- Restriction on the importation of genetic material for registered stud breeders.
- The protection of the local artificial insemination industry and restrictions on local collection and sale of semen.
- The protection of what was seen as an elitist pedigree farm animal industry.
- Support of animal improvement schemes that do not benefit the small-scale and black farmers, particularly in communal settings.
- The absence of provisions in the legislation for the needs and interests of the small farmer.



- Insufficient control over embryo collection and transfer activities.
- Unequal access to information and to genetic material by animal owners.
- Scientific and technological progress has exposed a number of shortcomings.
- Some restrictions disregarded basic individual rights.
- No control over the exportation of genetic material of landrace breeds other than health protocols.

These concerns led to the drafting of new legislation and the Animal Improvement Act was passed in September 1998 after two years of extensive consultation and preparation. The Animal Improvement Act, 1998 (Act No. 62 of 1998) should enable users to make informed decisions and should ensure that suppliers of genetically superior animals and genetic material are bound by norms and standards that will in turn ensure that the genetic material used in South Africa has the potential to maintain or improve production from both food and fibre producing animals.

The Animal Improvement Act, 1998 (Act No. 62 of 1998) retained the following important provisions from the Livestock Improvement Act:

- Control of the identification and use of genetic material that could be used for animal improvement.
- Control over the persons and centres providing animal reproduction services.
- The orderly establishment and maintenance of animal breeders' societies.

The following new provisions were included to address the inequalities in Act No. 25 of 1977 and to ensure that legislation would benefit all owners of farm animals in South Africa:

- Deregulation of the artificial insemination industry without compromising genetic and health standards.

- An extension of the basis for people qualifying for importation of genetic material.
- Provision for more than one registering authority.
- Provision for the registration of import agents.
- Provision for the protection of South Africa's indigenous and locally developed breeds.
- Provision for the registration of embryo collectors as a specialised branch of the industry to bring this into line with international standards.
- Provision for the establishment of schemes relying on a national database to support accurate statistics, animal identification, animal recording and evaluation.

This policy will serve as an information document — as well as a guideline for the implementation of actions linked to Act No. 62 of 1998.

A number of these actions are of critical importance to the long-term stability of the livestock industry in South Africa and should be implemented as soon as possible. These include the monitoring and control of exports of genetic material of South African landrace breeds.

2. DEFINITIONS / GLOSSARY OF TERMS / ACRONYMS

As this policy document has been developed to support the Animal Improvement Act, 1998, relevant definitions in the Act have been included:

'animal' means a kind of animal or an animal of a specified breed of such kind of animal which has in terms of section 2 been declared as an animal for the purposes of the Act;

'animal breeders' society' means a group of persons promoting the breeding, the recording or registration, the genetic improvement and the use of a kind of animal or an animal of a specified breed of such kind of animal, determining and applying breed standards, recommending in its sole discretion the recording or registration of an animal or a specified breed of a kind of animal bred in or imported into the Republic, and who is registered in terms of section 8 (7) (a) (i);

'animal improvement' means the scientifically based identification of genetically superior animals by means of the integrated registration and genetic information system or in a manner approved by the registrar and the discerning use thereof to improve the production or performance ability of the animal population in the interest of the Republic;

'Breed' means a population of animals which produces progeny possessing a high degree of genetic stability as evidenced by identifiable uniformity in breed standards and performance;



'breeder' means the owner of a breeding female animal at the time of natural or artificial conception or at the birth of progeny;

'centre' means premises registered in terms of section 8 (6) (b) for the collection, evaluation, processing, packing, labelling, storing and sale of semen, embryos or ova, as the case may be, of certain kinds of animal;

'Department' means the Department of Agriculture in the national government;

'donor animal' means an animal which has been approved in terms of section 8 (6) (c) for the collection of genetic material;

'Embryo collector' means a person who collects, evaluates, processes, packs or stores genetic material, or who carries out the artificial insemination or the transferring of ova or embryos into recipient female animals and who is registered as such in terms of section 8 (6) (a) in respect of the kind of animal for which he or she has completed the prescribed course of instruction;

'export' means to take out or send an animal or genetic material from the Republic to a country or territory outside the Republic or to cause an animal or genetic material to be so taken or sent out;



'genetic material' means ova, embryos, semen and any other material originating from an animal through which the hereditary factors of such animal can be transferred;

'Import' means to bring an animal or genetic material from outside the Republic into the Republic or to cause an animal or genetic material to be so brought into the Republic;

'import agent' means a person who imports genetic material on behalf of another person and who is registered as such in terms of section 8 (6) (a);

'integrated registration and genetic information system' (INTERGIS) means the computer system that has been established in co-operation with the Department to integrate the pedigrees and performance data of animals;

'landrace' means a specified breed of a kind of animal indigenous to or developed in the Republic;

'registering authority' means an animal breeders' society or a group of animal breeders' societies which is registered as such in terms of section 8 (7) (a) (ii);

'Registrar' means the officer designated as Registrar of Animal Improvement in terms of section 3;

'Regulation' means a regulation made under this Act;

'scheme' means a scheme established in terms of section 20;

'Semen collector' means a person who collects, evaluates, processes, packs or stores semen, or who carries out the artificial insemination of an animal, and who is registered as such in terms of section 8 (6) (a) in respect of the kind of animal for which he or she has completed the prescribed course of instruction;

Additional definitions not in the Act:

'Cloning' is a process whereby an animal is duplicated by inserting nuclei extracted from cultured somatic cells taken from the donor animal into egg cells that have had their original nucleus removed. This process is called Somatic Cell Nuclear Transfer (SCNT).



'Transgenic animal' is an animal with genes — either from the same species — or another species that were introduced to the oocyte by way of a process in the laboratory prior to fertilisation

ACRONYMS

AnGR	Animal Genetic Resources
ARC	Agricultural Research Council (of South Africa)
FAnGR	Farm Animal Genetic Resources
FAO	Food and Agriculture Organisation of the United Nations
ICAR	International Committee for Animal Recording
INTERGIS	Integrated Registration and Genetic Information System
NDB	National Database
SASB	South African Stud Book and Livestock Improvement Association
SCNT	Somatic Cell Nuclear Transfer (Cloning)
SOW	State of the Worlds Animal Genetic Resources

3. PROBLEM STATEMENT

- The Animal Improvement Act was passed in September 1998 and the regulations were finalised in 2002 — after almost four years of extensive evaluation and dialogue that included testing those controlling the establishment of other registering authorities and the registration of donor animals.
- One of the shortfalls of the process — was a lack of a holistic policy on animal improvement — to support legislation and regulation — and to serve as a

guideline document for the implementation of activities and services aimed at the improvement of animal production at all levels.

4. OBJECTIVES

The objectives of the policy are to:

- Facilitate poverty alleviation through the sustainable utilization of animal genetic resources within the framework of the Animal Improvement Act, 1998 (Act 62 of 1998).
- Promote and support the identification, evaluation, breeding and use of genetically superior animals to improve the production and performance of animals used for food, agriculture, sport and recreation.
- Promote the sustainable use of Animal Genetic resources (AnGR) as a major contributor to National food security.
- Facilitate the conservation of animal genetic resources for food and agriculture.
- Facilitate reduction in the risk of disease transmission through animal improvement.
- Strive for a globally competitive animal production sector.



Instruments for a National Animal Improvement Policy:

- Accurate information (including, but not limited to statistics, pedigree information, animal recording and evaluation, animal health etc.)
- Animal Improvement Act, 1998 (Act No. 62 of 1998)
- Animal Identification Act, 2002 (Act No. 2 of 2002)
- Efficient and Effective enforcement of legislation
- National animal improvement schemes.
- A National Advisory Committee for Animal Genetic Resources and Improvement.

5. POLICY TO ADDRESS THE PROBLEM

5.1 To achieve the objectives of the animal improvement policy, a supportive regulatory framework is essential. The regulatory framework needs to remain user friendly and geared towards national goals. Legislation should also be used to facilitate the development of specific activities — for example, trade in landrace breeds or a national animal recording and improvement schemes. It is, however, important to monitor such activities to ensure that they do not become counter-productive. Close liaison with stockowners, farmers, agricultural non-government organisations, research institutions, tertiary

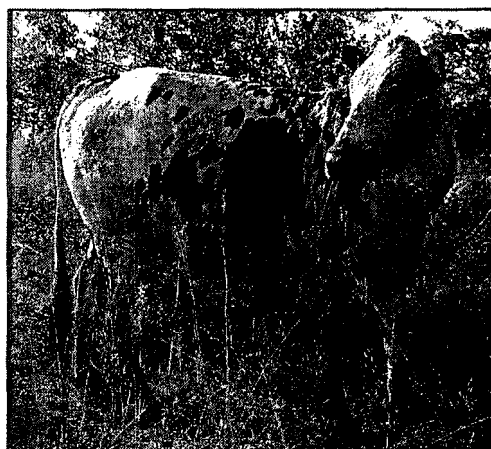
education facilities, parastatals and the industry is the most effective way to monitor both activities and legislation.

In developing a policy, the following were taken into consideration

5.1.1 Animal Science Principles

To improve animals in an efficient and effective manner, there needs to be a harmonious balance between the animal, the environment and production inputs. Sound animal science (incorporating husbandry, biodiversity, scientific information and genetic principles) includes:

- Recognising the fact that breeding stock and many production systems rely on natural grazing (veld), especially in the case of beef cattle and small stock, but a large portion of production animals also rely on supplementary feed resources to be able to comply with economic demands.
- The possibility of Animal Improvement being less noticeable without sound natural resource management and good nutritional practices.
- Matching animals with the production environment and the capabilities of the stockowner.
- Reduction in disease transmission to ensure effective animal improvement.
- Ensuring that the animals live in an environment that is as stress free as possible — and that they are cared for as effectively as possible.
- The optimal use of appropriate genetic practices and principles — including sound selection objectives, accurate genetic parameter estimates and effective modelling.



5.1.2 Animal Performance Recording

Sustainable development of more productive and efficient livestock herds will be required to increase livestock production. This will involve both identification of immediate tactical management activities to improve production and productivity (output per unit of input) of current herds, as well as re-establishment of long-term strategic programmes for comparative evaluation and continued genetic improvement of livestock. In both cases, accurate and consistent decision based on objective information and a thorough understanding of the key input-output relationships involved in livestock production will be required. Recording of livestock performance is required to provide information for sound decision-making and to establish key input-output relationships. It is also particularly important to

provide the comprehensive and consistent information that is necessary to fairly compare different germplasm and to support long-term genetic improvement towards an appropriate bio-economic development objective.

Benefits from sustainable farm animal improvement will accrue to:

- Farmers — through increased income, better risk management and the maintenance of a vital expanding rural economy;
- Consumers — through improvements in quantity and quality of animal products at affordable prices, and
- Government and the Nation through enhanced national food security, more favourable trade balances involving animal products and feed grains, and greater social and environmental stability.

5.1.3 Indigenous and Locally Developed/Adapted Breeds

South Africa has a variety of indigenous breeds of farm animals originated in eastern and northern Africa and moved southwards with migrating nomads to enter South Africa about two thousand years ago. In the process, they travelled through areas rife with animal diseases and parasites adapting to and settling in a variety of biomes. Some early settlers saw the potential of the hardy ecotypes and began farming with identified types such as fat-tailed sheep and the laterally horned Sanga cattle. Selection for uniformity and specific characteristics led to the establishment of recognised breeds such as the Afrikaner sheep and the Afrikaner cattle.

A number of these early breeds still exist and some, such as the Nguni and Afrikaner cattle and the improved Boer goat, have been commercialised. However, other breeds have become severely depleted in numbers due to continued crossbreeding and replacement by exotic breeds. Adapted breeds were also used to develop hardy composites for increased production from the veld in specific biomes, the Dorper sheep and the Bonsmara cattle breeds being typical examples that were developed for a specific purpose. All these breeds are classified as landraces; indigenous and locally developed breeds closely linked to a country by way of name, local content, breeding programs and origin.

Global concern over the loss of diversity in the world's farm animal genetic resources, along with a growing awareness of the real value of adapted, minimum care breeds for sustainable animal agriculture off natural vegetation, led to the emergence of a world market for these breeds. The international popularity of the South African Improved Boer Goat, Dorper sheep and Bonsmara cattle breeds are examples of this trend.

Care must, however, be taken to ensure that the rights of the owners and breeders are taken into consideration, particularly where animals and genetic material are exported. In addition, there could be a potential risk of losing breeders' rights by the registration of a patent on an identified gene or, possibly, animals in another country. The export of Landrace breeds and developments in the field of animal breeding patents must therefore be monitored.

South Africa's Landrace breeds should be marketed with pride and with a guarantee on lineage and genetic soundness. This can only be successful if breed societies, registering authorities, service providers and traders in farm animal genetic material work together to provide the necessary certification on positive identification, performance, and pedigrees through regular randomised parentage testing.

5.1.4 Other Breeds

South Africa also has a wide variety of exotic breeds that have adapted to local conditions over a period of time, often to such an extent that they are more suited to conditions on the subcontinent than to those in the countries of origin. These breeds have played a major role in the livestock industry. Examples include the Holstein and Jersey dairy cattle breeds, numerous beef cattle breeds, the Merino sheep breed and the SA Warm Blood and Thoroughbred horse breeds. They are equally important and should be promoted and used in a responsible way to ensure that they are matched with production environments and requirements of local farming systems.

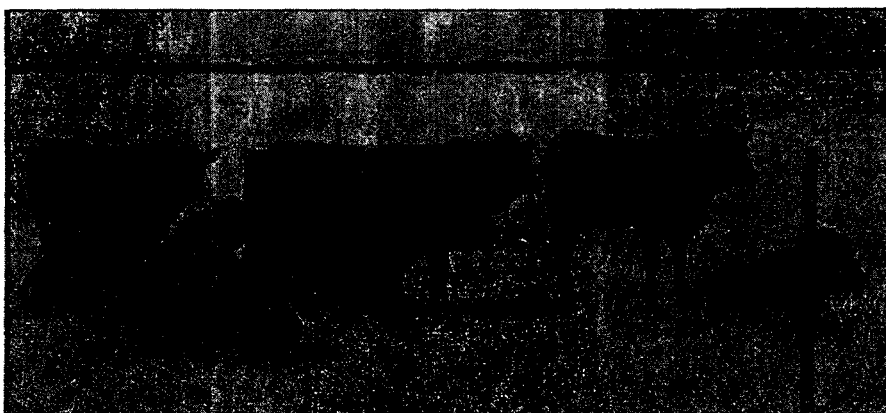
5.1.5 Animals included in the policy as per regulation as prescribed

- All farm animals (animals used for food and agriculture purposes)
- Game animals used for (Game ranching and production systems)
(See 5.2.12)
- Animals used for sport and recreation

5.2 Recommended policy options

5.2.1 National Survey of Animal Genetic Resources

There is an urgent need for accurate statistics and information about breeds, numbers, locality, production systems and the management skills of stockowners, breeders and producers. Reliable statistics and information are needed to assess



the current status of genetic resources in South Africa and to facilitate more effective and strategic planning and management at all levels. Data will be stored on the national databank (INTERGIS) as part of the National Animal Recording Schemes. This information will also facilitate the identification of breeds that have been eroded or depleted to the extent where in situ and ex situ conservation actions may be necessary. This should be complemented by a domestic animal genetic resources information system.

The census should be co-ordinated by an identified National co-ordinating institute — and should include contacts/co-coordinators in all the Provinces. As data on pure breeds and breeds in the sector involved in animal recording and evaluation is stored on the INTERGIS and is therefore scrutinised and accurate, the initial survey should concentrate on animals in the rural/traditional developing areas — and on the breeds traditionally used in these areas. Local knowledge and practices relating to animal breeding and improvement must be included in such surveys.

An initial survey of AnGR has been completed and will be linked to a country report on the state of animal genetic resources in South Africa that is being prepared for submission to the FAO as part of the initiative to draft a report on the State of the Worlds Animal Genetic Resources (SOW). The survey should be repeated as part of a National Agricultural Census every five years. This action will also link with South Africa's responsibilities with regard to international agreements and commitments such as Sustainable Development and the management of Farm Animal Genetic Resources as well as Agro Biodiversity within an eco-system.

5.2.2 National Advisory Committee (NAC) for Farm Animal Genetic Resources and Improvement

Effective and efficient management of FAnGR requires a concerted effort including technical expertise from a range of team players. A national advisory committee consisting of a range of suitably qualified and experienced people is required in order to achieve sustainable animal improvement. This committee could assist the Registrar by providing recommendations and advice on key issues such as the improvement of farm animal genetic resources, the sustainable use and conservation of these resources and on institutional support and policy issues. To be effective, the NAC needs to be formalised and recognised by the Department of Agriculture.

The NAC should include representatives from the following:

- Department of Agriculture
- Agricultural Research Council (ARC)
- Registering Authorities
- Representatives of Advisory/Management Committees from each of the animal improvement schemes
- Game farming sector
- Relevant Professional bodies (e.g. South African Society for Animal Science, SA Veterinary Semen & Embryo Group)

5.2.3 Animal Recording Schemes

There are a number of reasons for the official establishing Animal Recording Schemes. The key characteristics of the different types of recording are presented in Table 1. The structural requirements, primary uses, beneficiaries and organisational requirements of animal recording will differ depending on the particular objectives.

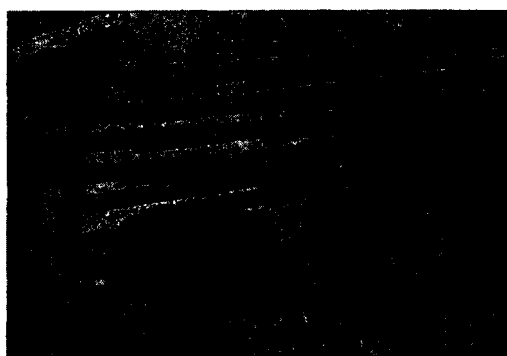


TABLE 1: Types of Animal Recording and their General Characteristics

Characteristic	Primary Uses	Main Beneficiaries	Participants
Animal Recording to establish baseline performance	Identify opportunities and challenges Meet international reporting obligations	Government and the Nation	A broad sample of farmers
Animal Recording to compare production alternatives	Identify best management procedures Farmer education	All Farmers Consumers	A few carefully selected farmers
Animal Recording for genetic improvement	Genetic improvement Provide superior breeding animals to industry Better farmer organisation	All Farmers Consumers Rural communities	Seed stock producers and multipliers Eventually many commercial farmers to validate results
Animal Recording for animal management	Better individual animal management Better farmer organization Increased production and productivity	Participating farmers Consumers Rural communities	Initially a few farmers, eventually the majority

One important role of government and industry is to allocate scarce public resources to areas of greatest potential benefit. This role can be fulfilled effectively only if adequate information is available to support the decision-making process. Livestock recording schemes are an important source of information about the livestock sector and can identify areas of greatest opportunity within the sector.

The establishment of animal performance recording schemes in rural communities can serve as a platform for economic and community development. The organizational structures to support animal recording schemes will provide useful opportunities for educational programs; development of co-operative, value-based marketing schemes and the emergence of a more informed and assertive rural population. In addition, efficient and effective animal recording programmes could aid in disease surveillance and traceability systems (effective risk management).

The importance of sustainable livestock practices to realizing food security and maintaining environmental integrity provides additional motivation for livestock recording. Meeting the demands of increasing livestock production while maintaining environmental integrity requires information on the interrelationships involved in livestock production and quantification of how livestock production impacts on the environment. Livestock recording can provide such information and allows agricultural agencies to take leadership in developing livestock production systems that are productive, environmentally responsible and sustainable.

Livestock recording data and results also provide additional opportunities for enhancing research and development capacity through technology transfer and training. Almost all animal breeding research in South Africa use information collected through recording systems.

Accurate data including basic information on owners and location of keepers, animal identification, matings, births, parentage, breed composition, weights, management and nutritional status information, feed intake, quantitative and qualitative carcass traits, tolerance of parasites and diseases, measured and scored conformation traits, as well as derived and adjusted values (e.g. daily gain) and breeding values of the different beef cattle breeds can be used to identify and trace superior animals in registered and non-registered herds. This data can be processed into useful information to broaden the reference base of specific breed evaluations, comparisons and future predictions.



A National Animal Recording Schemes/National Database for all animals used for food and agriculture should be declared in terms of the Animal Improvement Act, 1998 (Act No. 62 of 1998).

This scheme will enable all Breed Societies to comply with the regulations of the Act by downloading pedigree and other basic data onto a national database. The information will then be available for policy making and national breed evaluations that would include both registered and non-

registered animals which are mainly in the hands of emerging farmers.

Although the National database will uphold the principle of owner/breeders rights and the originally submitted raw data will be the property of the respective breeder, breed society or registering authority. — Any data or information on the INTERGIS may not be used for any purpose without the written permission of the owner, namely, the Department, or a designate of the Department.

5.2.4 Control over the Import of Genetic Material

Genetic material should be imported to facilitate biodiversity conservation, for the improvement of existing resources or for the establishment of new cattle populations. Care must be taken to ensure that imports will be beneficial in order to avoid dumping. To ensure that dumping does not take place and that genetic material is imported in accordance with the policy, a number of regulatory provisions are suggested, namely that no new breed of animal(s) is considered for recognition and import before carrying out a detailed risk assessment including a biological impact study. This includes a literature study as well as on-farm trials where justified and where the risk factor can be controlled effectively. A limited amount of genetic material may be imported to carry out on farm trials but no material should be sold for commercial purposes until the study is completed and the animal has been registered in terms of the animal improvement Act, 1998 (Act No. 62 of 1998). Only genetic material of recognized animals may be imported as prescribed.

It is important to monitor progress with new breeds and this should be done on a regular basis. Should it be shown that no progress or no commercial use has been made with a new breed, it should be removed from the list of recognized breeds. The National Advisory committee and the body responsible for the National Database (INTERGIS) should advise the Registrar annually on such matters.

All applications for importing the genetic material of recognized breeds should be subject to the minimum breed standards of the respective breed society or breeders club. Breed Societies and breeders clubs will therefore assume more responsibility for the improvement of their respective breeds by ensuring that only the best material is imported. In the case of semen imports, only donor animals that have been screened and approved will be registered on the Department of Agriculture import database. In order to verify parentage and to confirm identity, information on imported animals should include a DNA profile conforming to the guidelines of the International Society for Animal Genetics (ISAG) and the



International Committee for Animal Recording (ICAR). Breeders importing genetic material from such animals should have the assurance that it has the potential for improving the local gene pool.

Dairy cattle semen constitutes most of the semen imports and concern remains over the possible import of surplus dairy bull semen at prices below that of locally available alternatives. The compulsory registration of import agents in terms of the Animal Improvement Act, 1998 (Act 62 of 1998) should maintain a system of self regulation that prevents the import of large quantities of redundant semen.

5.2.5 Export of genetic material from Landrace and locally adapted breeds

There is a growing international demand for South African Landrace breeds and it is important to ensure that the flow of benefits from such markets reaches all levels and that the rights of breeders are recognised. In terms of the Convention on Biological Diversity (CBD), South Africa has sovereignty over its genetic resources, including the names of breeds. Therefore, intellectual property rights should be vested in South Africa.

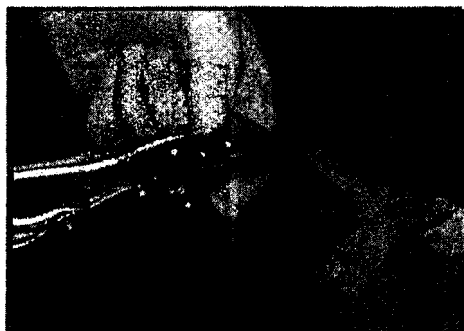
As there are efforts to revise the intellectual property system in South Africa, it may be necessary for a consultation process to decide whether patenting of live animals or genetic material should be permitted. In the interim, it is important to monitor exports as effectively as possible and to ensure that only quality genetic material leaves the country. Exporting of sub-standard genetic material will jeopardize future markets and be counter productive as far as broadening the access to these markets. This implies participation in the National Schemes together with a proper assessment of the genetic value of individual animals prior to application for export. All exports of landrace and locally adapted breeds should be monitored by way of authorizations that precede any veterinary export permit. Only genetic material that complies with the relevant minimum breed standards should be exported. Detailed procedures are set out in the regulations of the Animal Improvement Act, 1998 (Act No. 62 of 1998).

5.2.6 Development of Composite Breeds

Composite breeds offer an alternative breeding system that is generally competitive with crossbreeding, and is easier to manage, regardless of herd size. Composite populations (breeds) offer a procedure that is more effective than continuous crossbreeding for using genetic differences among breeds to achieve and maintain optimum performance levels for major bio-economic traits on a continuing basis. This includes traits such as growth rate and size, composition of gain, milk production climatic and nutritive adaptability, and age at puberty.

Before composite breeds can be recognised in terms of the Act, it is important to have breeding plans that is based on scientific principles to ensure long term stability of the breed.

New composite breeds must also be subject to a biological impact study that includes a detailed submission on how the breed is to be established and stabilized. Guidelines are obtainable from the office of the registrar.



Regular monitoring of locally developed composite breeds is also necessary as these can qualify for Landrace breed status. Accurate identification and recording on the National Database will therefore be a prerequisite. The breeds should also be evaluated by a competent scientific authority for possible genetic impact on relevant indigenous breeds and populations.

5.2.8 Registering Authorities

The Animal Improvement Act, 1998, makes provision for more than one registering authority – provided the breed society or group of breeders' societies applying for such recognition can comply with the regulations that have been structured to ensure that international standards are not compromised in any way. Regulations include the certification of the recording system to ensure that such systems will comply with norms and guidelines to download all the information needed onto the National Database. The Principle of more than one registering authority is therefore endorsed by this policy only if the necessary requirements are met.

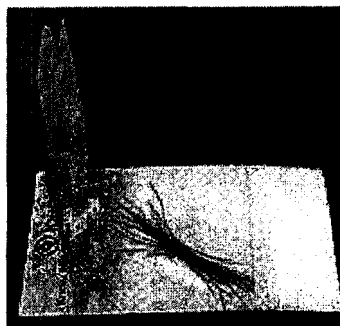
5.2.9 Collection and Sale of Animal Genetic Material

(a) Certification of donor animals

It is important to have a system whereby donor animals and genetic material can be certified for both health and genetic purity and quality. Ideally, all donor animals should comply with South African and International standards — but this would require all genetic material to be collected at a certified centre. Material for local use must also be collected at a certified centre — must meet the necessary guarantees on health and genetic quality.

(b) Certification of collection centres

Centres where genetic material is collected for export purposes should comply with International standards. The regulations controlling such centres need to be reviewed from time to time and in close cooperation with the relevant stakeholders to ensure that all standards are complied with.



(c) Certification of collectors

A collection involves working with the animal for a longer period that could include minor intrusions, it is important that all collectors be evaluated and registered as being competent to carry out the necessary procedures. This is particularly important when it comes to the collection of embryos — and all those doing embryo and semen collection should be registered. Veterinarians should not have a blanket exemption from this registration, as they are not trained adequately during the normal curriculum. In addition, collection should not be limited to veterinarians; individuals with specific training could be utilized.

(d) Promoting user confidence

Registration and certification provide the user with confidence and allow the regulatory authorities to monitor and evaluate animal improvement effectively. In addition, this would facilitate the provision of other services by regulatory authorities, including possible disease surveillance.

(e) Partners

Partnerships between animal scientists and veterinarians should be encouraged as embryo collection in particular involves breeding inputs and the combination of the two disciplines will benefit the end user.

(f) Cloning (Somatic cell nuclear transfer)

While cloning may not become common practice, the process has application in the conservation of endangered breeds and the replication of animals with exceptional performance (e.g. milk production).

Cloning is seen as an embryo collection application and, as such, should be done by suitably qualified and registered persons at reputable laboratories and certified embryo collection centres.

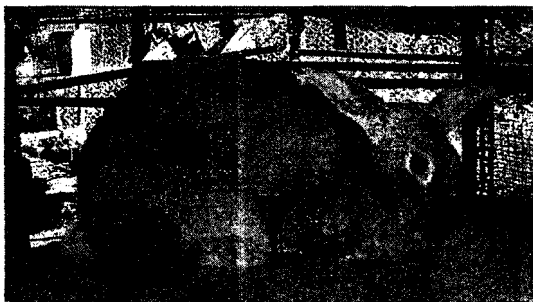
Cloned animals will pose no problem as far as registration is concerned as approved systems make provision for such recordings.

Care should, however, be taken to ensure that cloning does not compromise biodiversity. The term cloning is also too broad and the process should be rather referred to as Somatic Cell Nuclear Transfer (SCNT).

(g) Transgenic animals

Transgenic animals are produced by introducing certain genes into the oocyte of an animal. These genes are then incorporated into the DNA of this oocyte. As this involves the modification of the genetic structure of the animal, the relevant provisions of the Genetically Modified Organism (GMO) Act, 1997 (Act No. 15 of 1997) should be applied in such cases.

5.2.10 Conservation of farm animal genetic resources



There are important differences between plant and animal genetic resources and these will need to be reflected in any conservation strategy to be developed. In contrast to seeds, animal genetic resources are much more difficult and expensive to store *ex situ* in the form of semen and ova. For some species,

such methods have not even been satisfactorily developed. Scientists tend to agree that, at present, the best way of saving animal genetic resources is by means of sustainable utilization.

(a) Ex situ conservation

The global increase in the human population is leading to increased demands for land and animal protein. This increased demand for land may lead to the marginalization of certain farm animal genetic resources and pose a threat to their future survival. Due to the increased demand for animal protein different selection strategies have been adopted to increase production that will result in genetic drift and a decrease in genetic diversity. In view of these possible threats the development of a repository of cryopreserved germplasm should be considered. Such a repository can be used for:

- Emergency backup for regenerating populations after disease outbreaks
- A source of genetic diversity for breed society use
- Germplasm for new line/breed development
- A source of DNA for molecular studies

The initial cost for setting up the infrastructure and facilities for the *ex situ* storing of germplasm such as semen and ova will be very expensive. However, the maintenance of cryopreserved germplasm will be significantly cheaper than maintaining *in situ* populations.

(b) In situ conservation

In situ conservation is regarded as a collective word for keeping (1) animals in their natural or pure state, (2) sustainable utilization and (3) global or commercial adaptation.

Traditional communities are the custodians of indigenous breeds for many centuries and they tend to keep animals in a "pure" state. The animals fulfil religious, ritual and subsistence purposes. Hence the genetic material they conserve is not influenced by the modern breeding programmes, artificial breed standards or pressure from commercialization. Modern agriculture causes livestock breeds to be

dynamic rather than static entities undergoing a continual change depending on the needs and priorities of the breeders or markets.

The concept of sustainable utilization acknowledges that with globalization, many breeds will only survive if they become competitive. Hence there is a need for genetic improvement through selection. Such selection will not result in the loss of the survival and fitness traits that made these breeds attractive in the first place, as long as it is undertaken in this context and with the constraints of the actual production system. This is probably the only strategy that will ensure the long term conservation of livestock genetic resources in the global scenario and is currently propagated in South Africa.

Global or commercial adaptation can be seen where breeds have been moved outside their natural areas and climatic conditions and have been selected for specific characteristics in order to increase their commercial value for specific production systems. An example of such a breed is the Angus that is currently the most abundant beef breed in the world being present on all continents and in varied production conditions. Artificial selection is also very prevalent and may result in peculiar characteristics such as double muscling in the Belgian Blue. Whereas this option makes commercial sense, its role in the in situ conservation of livestock genetic resources in its original state is limited, and where it does occur, it is mostly incidental.

5.2.11 Herds and Flocks of National Importance

An inventory of all FAnGR herds and flocks that could be considered at risk or to be of national importance should be compiled and maintained by the Registrar. The Registrar should advise on the classification as well as possible steps to ensure that the resource is not lost. This would include any privately owned herds and flocks as well. Maintenance of State/Provincial herds and flocks at risk should be seen as a national responsibility.

5.2.12 Game farming



The game industry is playing an increasingly significant role in the livestock industry that it cannot be ignored any longer. In certain marginal areas, farming with certain game species instead of conventional farm animals is becoming very popular, and has almost replaced cattle farming in specific areas in the northern part of the country. Game farming has the potential to provide food and income to farmers and a labour force in the developed and developing sector. The orderly development of this industry, as a viable animal production activity should be encouraged.

There is also a growing wild animal breeding industry — with a need for some form of recording and evaluation. Conventional facilities operating under the Animal Improvement Act can provide such a service.

While legislation makes it possible to declare wild animal species as animals for specific sections of the Animal Improvement Act, relevant National and Provincial Environmental legislation and ordinance should be taken into consideration as well.

An Inter Departmental working group (DEAT, NDA and ARC) should be established to facilitate the development of the game farming industry within an acceptable legal framework that takes cognizance of all relevant legislation, but recognizes the fact that game farming is a legitimate agricultural activity.

As a recognized agricultural activity, game farming should have a policy to facilitate the development of the industry at all levels.

5.3 Institutional considerations

5.3.1 The Role of Breed Associations

The term breed association is used here to include both breed societies and registering authorities. Breed associations are often part of the cultural inheritance of many countries. They are regularly criticised by technical people and this criticism relates to the following questions: What do breed associations do?; Are they really needed? and Why have some of them (e.g. In poultry and pigs) disappeared?

Breed associations are recognized in terms of the Animal Improvement act 1998 (Act No. 62 of 1998) as custodians of the respective breeds, and are responsible to see to it that the standards that govern identification, recording, evaluation and improvement of the breed in question are met.

A breed association therefore takes responsibility for a breed and this is both physical responsibility (e.g. administration) and a moral one. It is an obvious source of information for performance specifications, sales, standards, exports and imports, etc.

Breed associations are also reliable body for collecting and recording the ancestry of all animals in the breed for all time. It can thus trace the ancestry of any individual back to the source of the breed and hence ensure its "breed purity". Lastly they should provide a focus for breed promotion for members through sales, field days, demonstrations, conferences, advertising, and so on.



Breed associations in South Africa should also consider a system of stewardship where black emergent farmers can be assisted. Established breeders should consider mentoring one or more emergent farmers to assist with their development into effective and operational producers/breeders. This should be done in a responsible way to ensure that people are not encouraged to farm with animals that are not suited to their production environments and management capabilities.

Although the South African Stud Book and Livestock Improvement Association (SASB) only have the status of a registering authority in terms of the Animal Improvement Act, the association has a proud history of service to the pedigree livestock sector. SASB is also recognized by the International Committee for Animal Recording (ICAR) and is the organization providing herd prefixes and suffixes to the pedigree livestock sector. SASB provides services to most of the Breed Societies in South Africa and can be considered as representing the majority of the Seedstock industry in South Africa.

5.3.2 The Role of INTERGIS

INTERGIS is a computer system that has been developed with public money for the benefit of all stockowners (primary beneficiaries) as well as other interested bodies and institutions (secondary beneficiaries). In addition to its other functions, it will be used for the National Data Bank.

- INTERGIS is already proving to be one of the most efficient animal identification and improvement tools in the world. Considerable time and expense has gone into the development of the program and it should be used as optimally as possible.
- INTERGIS already does and in an increasing way will provide owners, breeders and breed societies with information that can be used to identify animals with genetically superior traits — and to predict trends within breeds to enable the users to make more informed decisions on the use of breeding animals, future breeding strategies and management interventions. It will also be possible to trace animals with unique traits to the herd/flock of origin to facilitate a more effective spread of genetic benefits.
- It is not just a system for registered/pure animals — and could be used to identify superior genetics in hybrid populations as well — provided breeders participated in the relevant recording and evaluation schemes. In this way, INTERGIS could also benefit the poultry and pig industries where hybrids are used more extensively for enhanced production.

5.3.3 The Role of Public Entities

The ARC and other research, development and technology transfer institutions play a key role in animal recording and improvement, ranging from basic research to the management of specific recording and evaluation schemes, the conservation of animal genetic resources and transferring technology to breeders and producers. These institutions should form part of the national initiative to improve animal genetic resources and to conserve these resources through sustainable utilization.

(a) ARC

The ARC and plays a key role in animal recording and improvement — from basic research to the *management of specific recording and evaluation schemes*, the conservation of animal genetic resources and transferring technology to breeders and producers of animal products. The institution plays a leading role in the National initiative to improve animal genetic resources and to conserve these resources through sustainable use.

(b) Universities and Colleges

The universities with agriculture-related faculties, schools and agricultural colleges provide a primary source of research as an activity carried out in conjunction with teaching, education and training. These institutions are therefore an important nucleus for capacity building and curriculum development in livestock improvement. Their role in training agricultural researchers, scientists, technicians and research managers in the understanding and appreciation of the importance of conserving farm animal genetic resources should not be underestimated.

5.3.4 The Role of Organized Agriculture

Organized agriculture in South Africa should endorse this policy as a framework to *facilitate more effective production* through the sustainable use of superior animal genetic material.

The main policy areas concerning the department are clustered around the inherent needs of those engaged in agricultural activities namely:

- Access to and sustainable utilisation of natural resources such as land, water, flora and fauna.



- Capacity to optimally utilise the resources dependent on infrastructure, finance, technology, services and skills development.
- Competitiveness of the individual enterprises and the entire sector relative to that of similarly endowed or competing economies to be addressed through improved efficiency and productivity, free and fair markets and innovation.

- Confidence and stability brought about by objective and effective regulation, by risk alleviation measures, sound customer relations and effective governance of the sector.
- Responsibility underpinned by the sector's strategic role as society's basic food provider, employer of the less skilled, and as social safety net for rural society.

6. REFERENCE DOCUMENTS

- (a) Animal Improvement Act, 1998 (Act No. 62 of 1998)
- (b) Regulations for the Animal Improvement Act No. 62 as prescribed
- (c) Convention on Biological Diversity (CBD)

7. POLICY OWNER

Department of Agriculture, Directorate: Animal and Aquaculture Production