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POLICY ISSUES AND OPTIONS FOR THE MANAGEMENT OF ANIMAL GENETIC RESOURCES

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POLICY ISSUES AND OPTIONS FOR THE MANAGEMENT OF ANIMAL GENETIC RESOURCES

I. INTRODUCTION

1. This document addresses current and emerging issues relating to animal genetic resources for food and agriculture that may require international policy and regulatory measures. It sets out the issues and challenges for animal genetic resources, the current international regime affecting the sustainable management of animal genetic resources, identifies policy gaps and other needs, and explores policy options to address these. The document provides a background to the Working Group to assist informed decisions on the finalization of the *Strategic Priorities for Action*, the future work of the Commission on Genetic Resources for Food and Agriculture in the area of animal genetic resources in the context of its Multi-Year Programme of Work, and on the way forward for the Global Strategy for the Management of Farm Animal Genetic Resources. The draft *Strategic Priorities for Action* are presented in the document, *Review of the draft Strategic Priorities for Action*,¹ and the advice of the Working Group on future work in the area of animal genetic resources is sought in the document, *Progress in the implementation and further development of the Global Strategy for Farm Animal Genetic Resources*.²

2. The document builds on the outcomes of the country-driven preparation of *The State of the World's Animal Genetic Resources*, in particular the country and regional consultations held to prepare the *Strategic Priorities for Action* and various linked studies. *The State of the World* process has provided key strategic information and confirmed the serious and ongoing decline of the diversity of animal genetic resources. The process has stressed the need to build capacity within developing countries and countries with economies in transition for the management of animal genetic resources in order to provide food security and sustainable development. The conservation of a wide base of animal genetic resources is necessary to provide global food security, and assist to secure human well-being, through the ability to develop and adapt these resources to respond to changing environmental and human requirements. Given the strong interdependence of countries on animal genetic resources, the issue is of international importance and hence there is a need to secure appropriate prioritisation of issues concerning animal genetic resources within international policy.

3. In many cases, national policies and regulatory frameworks for animal genetic resources are still partial and ineffective. Policy and legislative development is required to address the dynamics that are shaping the sector, and deal with increasingly complex emerging issues, such as an increasing focus on consumer affairs, food safety and food standards, response to diseases (animal diseases proper and animal diseases that can pass to humans), the ethical treatment of animals, increasingly sophisticated biotechnology, as well as the assessment and mitigation of the environmental impact of the livestock sector. A further area that requires examination is the framework for the exchange of animal genetic resources among countries, including the trade and animal health regulations that affect such exchange. The increasing role of intellectual property rights in the sector requires taking into account the need to secure fair and equitable benefit-sharing, the rights of indigenous and local communities, particularly pastoralists, and the role of their knowledge systems.

¹ CGRFA/WG-AnGR-4/06/4.

² CGRFA/WG-AnGR-4/06/7.

4. In developing countries an increasing demand for animal production is driving rapid structural change in the livestock sector. Without proper management, including spatial and physical planning aspects as cities expand into previously agricultural lands, there will be major risks for human health and the sustainability of production. Social and economic policies need to aim at ensuring equity for rural populations in the process of change, so that they are enabled to build up, in a sustainable way, their productive capacity to supply goods and services of increasing quantity and quality to expanding national economies, and meet growing consumer demands. In a time of rapid change and growing privatization, national planning will also need to ensure the long-term supply of public goods, such as public health, biodiversity maintenance, and clean air and secure water supplies. There will inevitably be trade-offs between different policy goals at national and international level. The management of animal genetic resources will need to be balanced with the other goals, and short- and long-term policies are required for the sector, in the larger cross-sectorial planning framework. International policy development should assist national policy efforts for the management of animal genetic resources and ensure that national interests are balanced and common international interests are addressed appropriately.

5. Issues that will be addressed in this document include: global conservation priorities; the distinctive characteristics of animal genetic resources in the context of the special nature of the food and agriculture sector, when compared to both wild natural resources and plant genetic resources; facilities for exchange of animal genetic resources and related elements such as zoo-sanitary measures and priorities within food safety and disease prevention; access to animal genetic resources and equitable benefit sharing in relation thereto; technological development; and proprietary interests in animal genetic resources. There are also a number of issues, both extant and emerging, that may require international policy action to ensure the appropriate prioritisation of the conservation, sustainable use and development of animal genetic resources in the context of the overall portfolio of international instruments. This need is referred to in general terms within the draft *Strategic Priorities for Action*. Therefore, the Commission may wish to develop more detailed activities in its future work on animal genetic resources, in defining the way forward for the Global Strategy, and in the context of its Multi-Year Programme of Work.

6. The document also addresses areas in which it may be necessary to establish, within the *Strategic Priorities for Action* and in the future work of the Commission on animal genetic resources, appropriate relationships with institutions that affect the conservation, development, use and exchange of animal genetic resources. These include the Convention on Biological Diversity (CBD), the World Organisation for Animal Health (OIE), the World Intellectual Property Organization (WIPO), the World Trade Organization (WTO) and others. Therefore, this document examines specific regulatory and policy issues that may require the attention of the Commission and the Working Group, as well as extant and emerging issues that may require synergy with other international authorities and institutions with specific roles and mandates.

II. SPECIAL CHARACTERISTICS OF ANIMAL GENETIC RESOURCES AND THE LIVESTOCK SECTOR

The importance of animal genetic resources

7. The importance of animal genetic resources has been described in depth in the draft of *The State of the World's Animal Genetic Resources*, which is presented in the document, *Review of The State of the World's Animal Genetic Resources*.³ The following is a brief summary of key points.

³ CGRFA/WG-AnGR-4/06/3.

8. Possessing a diversity of animal genetic resources at the local level facilitates the reduction of risk to livestock keepers from the consequences of changing environmental circumstances, extreme weather conditions or, on a wider regional scale, through the potentially damaging effects of climate change. Particularly for small-scale farmers, breeds may meet their needs and reduce vulnerability deriving from climatic conditions, feed availability variation, predation and other factors. Further, food security is also provided because animal genetic resources provide a direct food source in times of crop failure and general rural husbandry practices provide employment to farmers and other people within rural communities. Beyond this, the conservation of a diverse range of animal genetic resources has the potential to contribute to the reduction of risks on a global basis and thereby help to provide security to meet the increasing needs of the global population for animal products and services.

9. Although the human population is rapidly increasing, available agricultural land is finite. The maintenance of animal genetic diversity provides a means to enable wise use of the land and other natural resources available by exploiting the capability and adaptability of species and breeds. In the developed world, high priorities for the use of animal genetic resources tend to concentrate on selecting breeds for their production traits. This focus has resulted in the development of highly specialised breeds with a concomitant loss of locally adapted breeds and a loss of genetic diversity within commercial breeds themselves. Without intervention, the shrinking genetic reservoir will be insufficient to provide resources to meet present or future needs for food security. Thus, the present trend of reduction is not sustainable.

10. Locally adapted breeds may have less impressive production capabilities compared to specialised breeds, however they tend to be highly efficient in the use of local resources. Their functional and adaptive traits can contribute significantly to long term sustainability. Locally adapted breeds are essential for the sustainable exploitation of various production systems and environments. These breeds tend to retain significant genetic diversity and give farmers and pastoralists the option to select appropriate characteristics in response to changes in both the environment and human requirements. Where exotic breeds selected for high production characteristics have been introduced into the high stress production environments that prevail in many developing countries, they often fail to produce consistently or even survive. Continued use and development of locally adapted breeds may often be the best choice, particularly in developing countries, for the reasons given, but also because such countries cannot afford the inputs required to sustain breeds developed for the high input production systems operated in much of the developed world.

11. Countries are highly interdependent, with respect to animal genetic resources. Animal genes, genotypes and populations have spread all over the planet since ancient times, through the diffusion of agriculture and the prominent role of livestock in human migrations. Animal genetic resources have continued without interruption to be developed and improved by pastoralists and farmers, both inside and outside the historic centres of domestication. Moreover, animal genetic resources have been systematically exchanged for the last 500 years, deepening this interdependence. In global terms, most food and agricultural production systems worldwide depend on livestock originally domesticated elsewhere, and breeds developed in other countries and regions. These unique features of domestic animals need to be taken into account in ensuring the fair and equitable sharing of benefits deriving from them, and in tailoring the development of future policy and regulatory measures.

12. Breeding capacity is weak in developing countries, and without intervention at many levels in the areas of effective characterisation and monitoring, human and institutional capacity, developing conservation and breeding strategies, policy and regulatory frameworks, *etc.*, the current threat to the survival of local and indigenous breeds is inevitably going to escalate.

13. Population growth and urbanisation have led to soaring global demand for livestock products, and the globalization of trade has created new challenges for attempts to halt acceleration of diversity loss. These challenges include the increasingly rapid and global spread

of disease, the marginalisation of the rural poor in terms of access to markets and services, and the impact of the priorities biased in favour of short-term economic growth in the commercial sector rather than the long-term security of food resources and the facilitation of inter- and intra-generational equity. These challenges must be met in order to maintain development and open markets but at the same time secure sustainable use of animal genetic resources, which necessarily requires to maintain genetic diversity to face the unknown future. It is also essential to ensure that livestock keeping communities are enabled to continue to contribute to the maintenance and development of animal genetic resources for their own benefit and as a contribution to national economic development, and to maintain the internationally shared pool of animal genetic resources. This is supported at the international level by the Commission on Sustainable Development in Agenda 21, through its emphasis on the conservation of animal genetic resources; by the parties to the CBD, who in 1996, supported the Global Strategy for the Management of Farm Animal Genetic Resources; and by the World Food Summit in 1996, where governments agreed to a Plan of Action that contains commitments, objectives and actions aimed at addressing food security and rural development. A fundamental element within that plan of action is the development and improved use of livestock resources. The conservation and improved sustainable use of animal genetic resources also contributes significantly to the Millennium Development Goals, especially *Millennium Development Goal no.1: Eradicate Extreme Poverty and Hunger*; and *Millennium Development Goal no.7: Ensure Environmental Sustainability*.

The special requirements of the animal genetic resources sector in international policy

14. In order to assess the needs of animal genetic resources in international policy and regulation, it is not only necessary to define the unique characteristics and needs of the animal genetic resources sector but also to assess the special characteristics of the agricultural sector and take into account the differences between plant genetic resources and animal genetic resources. Because of the varied array of national and international policies and regulations that affect the agricultural sector, there is a need to review these instruments in order to assess whether intervention may be required to secure the effective conservation, sustainable use and development of animal genetic resources. Without appropriate action by international bodies within the agricultural sector, policies deriving from other sectors, with broad general mandates and hence unlikely to address the specific needs of the animal sector, may adversely affect the management of animal genetic resources, the various stakeholders in the sector, and their contribution to food security and sustainable development.

The unique aspects of the animal genetic resources

15. The special characteristics of animal genetic resources are described in detail in the *The State of the World's Animal Genetic Resources* and the *Strategic Priorities for Action*.⁴ Animal genetic resources are managed to satisfy basic human needs, to provide an array of ecosystem services, and for economic development. As such their sustainable use, development and conservation are embedded in complex and extensive economic, social, commercial and regulatory structures at national and international level. Wild animal genetic resources, in contrast, are largely conserved for different reasons, such as maintenance of ecosystems, and aesthetic reasons, and are largely managed in protected areas. In some cases, wild resources have commercial value for tourism and potential food, medicinal and other applications, but these are not necessarily affected in the same complex way by multi-objective national and international policies, as is the case with animal genetic resources.

⁴ CGRFA/WG-AnGR-4/06/4, para 9.

16. Although there are some references to the importance of conserving animal genetic resources in international instruments, there is insufficient specificity beyond general policy statements or general regulatory provisions. International co-ordinated approaches are thus required across a wide spectrum of issues. Many of these are proposed to be dealt with in the *Strategic Priorities for Action*, but their effective implementation may need support from an international instrument within the context of other priorities created by existing international policy and regulation. Without such support, animal genetic resources and the livestock sector may remain a poor relation to subjects already dealt with in global regulations. Examples of issues that might require specific agreements include: approaches to characterisation, inventories and monitoring for animal genetic resources, technical veterinary protocols and disease and food safety regulation, mechanisms for exchange, genetic impact assessments, and global mechanisms for capacity-building and institutional support for general policies in relation to animal genetic resources.

17. To an extent, the International Treaty for Plant Genetic Resources for Food and Agriculture, which necessarily deals exclusively with plant genetic resources, provides a precedent for further regulatory action at the international level. It recognises the strong interdependence of countries on genetic resources for food and agriculture, and seeks to facilitate wide access to such resources to ensure food security. However, the sustainable use, development and conservation of animal genetic resources requires intrinsically different strategies to the conservation of plant genetic resources covered by the Treaty. It is essential to fully appreciate the specific characteristics of animal genetic resources and the distinctions with plant genetic resources in order to design measures to protect them.

The distinction between animal genetic resources and plant genetic resources

18. At a fundamental level, both animal genetic diversity and plant genetic diversity are required, in order to facilitate adaptation to changing agricultural, ecological, anthropogenic and climatic circumstances. In addition, there are some similarities in approaches to the management and protection of animal genetic resources and plant genetic resources. However, there are distinct biological, practical, institutional and market-driven differences that require a unique policy approach:

- The essential differences are epitomized in the two approaches to breeding. Farm animal breeders focus on individual animals within populations rather than selection between populations, whereas the focus of the plant breeder is on plant varieties that have specific phenotypic traits that distinguish them from other varieties. This aspect dictates the manner in which international measures affecting intellectual property and other proprietary interests are regulated and also has relevance to the issue of equitable benefit-sharing.
- Significant biological differences require different approaches to conservation, breeding and use. Thus with animals there are much longer generation intervals, lower reproduction rates, and higher costs in evaluating genetic characteristics in progeny than with plants. This factor affects approaches to the international harmonization of technical standards and issues concerning exchange mechanisms.
- In terms of centralized national and international structures in place to conserve animal genetic resources, there are very few professional gene repositories and very few *ex situ* collections in existence. In some areas, such as poultry, pig and dairy cattle there are moves to build up private collections. This is in sharp contrast to the institutionalized management of plant genetic resources, particularly in developed countries. Without centralized structures, the necessary coordination of conservation is not possible, coordinated approaches to exchange may be impeded, and the insurance of back-up conservation facilities and coordinated responses to disaster may not be in place.

- Exchange of animal genetic material occurs less than in the case of plant genetic resources, and the arrangements for development and exchange of genetic material and use of animal genetic resources are not as well documented as they are for plant genetic resources. Thus, further information is required before the components of international policy and legal measures can be precisely identified.
- The movement of animal genetic resources is limited by sanitary regulations designed to protect the health of national animals and also limited by the high costs of movement and transport. Clearly the transport of live animals is a more complicated affair than the transport of seeds. Live animals have a greater propensity to be vectors of disease. There are also welfare considerations in the husbandry, slaughter, transport and reception of animals. These considerations are increasingly being raised in the international institutional and regulatory context.

19. There are also key global institutional differences. First, the International Treaty on Plant Genetic Resources for Food and Agriculture already provides an agreed international framework. No such specific agreement is in place for animal genetic resources, although there are provisions that have indirect impacts on exchange, through the regulation of zoo-sanitary or biotechnological aspects in other agreements. In consequence, although many lessons can be learned from the text of the plant genetic resources sector, there is a need to create international policy and regulatory measures specifically designed to deal with animal genetic resources.

III. POLICY ISSUES AND OPTIONS FOR ANIMAL GENETIC RESOURCES

Characterisation, inventory and monitoring

20. Attempts to characterise breeds of animal genetic resources face practical difficulties, in contrast to well-defined plant varieties. This problem causes difficulties for maintenance of diversity, through responsive monitoring systems and through effective exchange systems that protect source interests, and permit equitable benefit-sharing. Harmonised, effective and uniform approaches to characterisation are essential to support sustainable use and conservation strategies of animal genetic resources, particularly at supra-national levels. Essentially, an animal breeder focuses on particular animals within a breed, and there can be extensive genetic and phenotypic variation within a breed. Thus there may be no clear distinction between offspring of different breeding programs, because of the wide general variation in the genotype.

21. Breeding laws in many countries are generally designed to improve breeds. Breed associations and herd books, in which breeds are registered, play a key role in breed classification, characterisation, monitoring and reporting, in addition to development and conservation. In order to create uniformity in the characterisation and monitoring of animal genetic resources and to facilitate exchange, a harmonised or model approach is required. It could include guidelines, policies or standards operating globally in relation to herd books, and other types of registration.

22. Further, in order to strengthen the approach to characterisation and inventory, the possibility of a global system linking ownership rights in breeds (derived from herd book registration within international guidelines, policies or standards) to trademark registration of products with specific characteristics.

23. The draft *Strategic Priorities for Action* deals extensively with the harmonisation of characterisation and monitoring, however, the incidental measures referred to herein may require further international measures. For effective implementation, the provisions in the *Strategic Priorities for Action* may need international regulatory support, especially to secure a robust and harmonised approach.

Conservation and sustainable use

The current position

Global trends indicate that about 20% of breeds are at risk of extinction. The lack of specification in this statement derives from the inadequate available data, which is a symptom of the problems arising from the lack of a harmonised approach to the monitoring, characterisation and thus conservation of animal genetic resources diversity. Both animal genetic resources and wild species face similar threats from the impact of climate change and loss of suitable habitat, along with other pressures on habitats and species. Thus some strategies to preserve wild species, such as community conservation programmes and the ranching of rare wild species to provide populations capable of sustainable harvesting, etc., are also well suited to preserve animal genetic resources. However, in many instances the problems faced by domesticated species and wild species differ significantly, and strategies to conserve these aspects of genetic diversity may conflict. Necessarily, species components of animal genetic resources are developed and adapted and continue to adapt directly through anthropogenic influences, and their habitats are similarly influenced and often specifically managed. This is in contrast to many free-living wild species that live in ecosystems that are often self-sustaining with little human influence. Thus there may be conflicting desires to maintain primary “natural” habitats free of human influence at the expense of suitably managed habitats for *in situ* conservation of animal genetic resources, and vice versa. It also implies that the conservation of animal genetic resources directly depends on the capacity of farming communities to provide for their livelihoods, and thus there are strong linkages with other policy areas, including socio-economic policies, the provision of basic services, etc. These conflicting strategies are not resolved by current international policy and regulatory measures.

The Convention on Biological Diversity

24. The CBD provides a foundation of principles relevant to the conservation and sustainable use of animal genetic resources: the conservation of biological diversity; the sustainable use of its components; the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources and the facilitating of access to genetic resources; the support and maintenance of the practices and traditional knowledge of indigenous and local communities; the creation of protected areas; the balance between *ex situ* and *in situ* conservation; and the establishment of funding facilities. The CBD, through decisions II/15 and V/5, recognizes “the specific nature of agricultural biodiversity, its distinctive features, and problems needing distinctive solutions”, but has no specific focus on animal genetic resources. There are, however, supportive principles, in the Convention itself and in a number of decisions (such as: III/11, IV/6, V/5, VI/5, VII/3 and VIII/23).

25. The CBD seeks to preserve all biological diversity. However, wild genetic resources and agricultural genetic resources require different and sometimes conflicting strategies. The balance between *ex situ* and *in situ* approaches is also different for domesticated and wild species. Additionally, some aspects of biodiversity may be emphasised as greater priorities for protection than others, unfortunately often to the detriment of animal genetic resources. The CBD priorities are weighted to preserve wild species.⁵ To date, there is little evidence that the Convention has provided an impetus for the development of the policies for animal genetic resources. A balancing of approaches is required, to secure that national conservation policies integrate priorities of both wild and domestic species. In order to secure appropriate prioritisation for animal genetic resources, international agreements and policies specifically designed to

⁵For example, the emphasis for identification and monitoring in Article 7 of the CBD and Appendix 1 is on *wild relatives of domesticated or cultivated species*.

harmonise strategies for the sustainable use and conservation of animal genetic resources, may be required.

26. Model agreements for bi-lateral and multi-lateral management of transboundary breeds may also be required. Furthermore, whereas the CBD generally favours *in situ* conservation, the considerations for animal genetic resources are different from wild species, which may be best suited to conservation in their natural habitats. Thus, for animal genetic resources, the balance of *ex situ* and *in situ* measures needs to be evaluated, in addition to securing strategies for local and international exchange to enrich and strengthen genetic diversity.⁶

In situ conservation approaches

27. *In situ* methods are best suited to facilitate the development and adaptation of animal genetic resources to environmental and climatic factors, as well as to evolving production methods. In certain situations whole landscapes, including traditional practices carried out therein, may need protective measures, in order to effectively conserve and facilitate the development of animal genetic resources.

28. The CBD provisions dealing with *in situ* conservation are helpful in this respect. They can be construed to support protected areas in which breeds/populations are maintained, and traditional agricultural landscapes in which animal genetic resources and their habitats are managed by indigenous or rural communities. However, conflicts in national priorities between the objective to maintain wild, and the need to maintain domestic species and populations, may continue, and opportunities for synergies may be lost.

29. Furthermore, in order to support the *in situ* conservation of animal genetic resources, particularly in the developing world, there is a need to strengthen breeding capacity, and to maintain ongoing breed improvement, to enable local and indigenous breeds to survive and to contribute to people's livelihoods. In this context, measures may need to entail the provision of financial support, incentives, secure tenure, and assistance with technical breeding support and with market entry knowledge. Although there are provisions in international policy supporting such actions in principle, in Agenda 21 and in the WSSD, etc., there may be a need to consider supporting policies at the international level.

Ex situ conservation approaches

30. Animal genetic resources conservation and sustainable use necessarily require a strong *ex situ* component, through both *in vitro* and *in vivo* strategies. First, in contrast to wild species that depend upon specific ecosystems, the human adapted environments required for animal genetic resources may be established elsewhere in comparable zones, enabling *ex situ, in vivo* approaches. Second, *in vitro* approaches, such as the establishment and management of national, regional and global gene banks, support the conservation, characterisation and development of genetic material. Technical systems of cryo-storage of such material can secure the long-term durability of genetic diversity that may be lost *in situ* through disease, epidemics, genetic drift and genetic bottlenecks, and environmental and other factors. Where these operations are managed or regulated at the international level, there can be some assurance of uniformity of approach to the conservation of genetic diversity and coordinated responses to disaster scenarios.

Animal disease and conservation

31. Responses to epidemics in domestic animals can, without precise, coordinated and informed strategies, have a deleterious effect on the maintenance of animal genetic resources. Because of the lack of uniform characterization criteria, un-coordinated approaches and a failure

⁶ CGRFA/WG-AnGR-4/06/Inf. 6

to emphasize the conservation of animal genetic diversity, there is a risk that a national or regional response to an epidemic or threat of disease may involve culling of a variety of breeds and populations at risk. International measures may need to be developed to ensure that rare genetic resources are protected from such activities, or that epidemic protection deploys alternate strategies where possible.

Exchange

Background

32. Effective and harmonised procedures for exchange, free from unnecessary barriers, are essential to support the sustainable use, development and conservation of animal genetic resources. These are also important for genetic improvement and adaptation, and to enable countries to have access to diverse genetic resources for food security and sustainable development. However, national and regional approaches are far from uniform, and the impact of the regulations, economic policies and mechanisms affecting the exchange of animal genetic resources is not well understood. These policies and mechanisms include those dealing with pricing, investment, subsidies, breeding support, animal disease protocols, national veterinary regulations and standards, animal welfare requirements, intellectual property rights and food safety standards. There are also international measures within the portfolio of the World Trade Organisation, that seek to harmonise many aspects of potential trade and exchange impediments, which have a bearing on the exchange of animal genetic resources. Ideally, the totality of such measures should be reviewed, to ensure that there are mechanisms in place that take into account the relevant aspects of animal genetic resources. Consideration may need to be given to wider harmonisation of the issues described below, to secure animal genetic resources that the interests of animal genetic resources are adequately prioritised.

Current direction of exchange

33. Most current exchange appears to take place from developed to developing countries, and is driven by short-term economic development, rather than conservation and long-term food security interests. Conversely, exchange in the other direction may be impeded in some cases by higher national animal welfare and zoo-sanitary standards in developed countries, which can act as barriers to developing countries through, *inter alia*, the cost of meeting those standards. If this is the case, the conservation, sustainable use and development of animal genetic resources may be affected, for example, through the encouragement of the introduction of exotic breeds into the developing countries, without providing incentives or facilities for the development and adaptation of indigenous and local breeds.

Zoo-sanitary issues

34. Zoo-sanitary and animal welfare issues are increasingly dealt with at the regional and international level and can affect the ability to exchange animal genetic resources significantly. However, with a lack of awareness of the need to conserve the diversity within animal genetic resources, and with no specific international mandates to prioritise this aspect, these measures will respond to other interests, to the exclusion of animal genetic resources. Whereas it is necessary to prevent the spread of disease and to maintain animal welfare standards, exchange can be impeded by related technical standards. Such measures should not become trade-distorting. Furthermore, developed countries may apply higher standards than developing countries. This is likely to facilitate exchange of genetic resources from developed countries to developing countries, but may restrict the movement of, *inter alia*, animals from developing to developed countries, through increased costs and through the complexity of bureaucracy.

Animal welfare issues

35. There are international welfare provisions in place for endangered wild species in trade, pursuant to the Convention on International Trade in Endangered Species of Flora and Fauna. These concern the manner in which live species of animals are transported, and the manner in which they are received in the country of destination.

36. National animal welfare standards are rapidly becoming established, particularly in developed countries, dealing with animal husbandry, slaughter and transport. These are prescribed in policies, regulations and in voluntary labelling schemes. At the regional level, the European Union has enacted a number of regulations dealing with these issues. High welfare standards may be desirable for ethical reasons, but may also add cost to farm animal production, beyond the capacity of developing countries. These approaches can therefore exclude developing countries from export into such markets, and reduce the incentive or the ability to conserve diverse animal genetic resources.

Genetic impact assessment

37. Effective exchange maintains a balance between supporting open markets and the application of precaution. Genetic impact assessments, if developed, would provide mechanisms to fulfil the need for precaution on the transmission of animal genetic resources across national and regional boundaries. Without international harmonisation, such assessments may be driven by commercial rather than conservation priorities, and could constitute technical barriers to trade, especially if they constitute bureaucratically complex and economically insurmountable barriers to developing countries.

38. There are harmonizing provisions in some instances. With the development of genetic modification technology beginning to have an impact on animal genetic resources, there may be a need for countries to take into account the manner in which living modified organisms are exchanged pursuant to the Biosafety Protocol of the CBD.

International regulatory and institutional approaches affecting exchange

39. The WTO's Agreement on the Application of Sanitary and Zoo-sanitary Measures (SPS) is the principal relevant international instrument in the context of exchange of animal genetic resources. The Technical Barriers to Trade Agreement (TBT) is also relevant in relation to some technical standards dealing with animal welfare, and other matters that affect exchange. It operates in a similar manner to the SPS, as it harmonises technical standards that affect trade. In principle the WTO's multilateral trading regime facilitates the exchange of animal genetic resources, and the SPS seeks to harmonise zoo-sanitary derogations from the free-trade provisions within the WTO portfolio.

40. The SPS primarily approaches derogations from the open market requirements, by reference to internationally approved standards. The World Organisation for Animal Health (OIE) is the main standard setting body for animal health and the *Codex Alimentarius* Commission is the main standard-setting body for food including animal products. The SPS permits members to choose not to use the relevant international standards. However, where national requirements result in a greater restriction of trade than the prescribed standards, scientific justification must be provided, to demonstrate that the relevant international standard would not provide the appropriate level of health protection. Thus, the SPS requires an assessment of actual risk, in respect of a member state's method of applying food safety and animal health regulations. It also requires transparency to ensure that there are no disguised barriers to trade within unilateral standards. In consequence, it is a measure that operates to harmonise exchange measures with minimal trade restriction, and should in principle support the exchange of animal genetic resources. However, with the onset recently of a number of animal

related epidemics (by example: avian flu and foot and mouth disease), standards set by many developed countries have, in practice, constituted barriers, particularly for developing countries, and thus movement of species and breeds from developing countries has been restricted. The OIE and the *Codex* may wish to make provision in their current programmes of work, to facilitate the exchange of animal genetic resources in a manner which supports the *Strategic Priorities for Action*.

41. The multilateral trade regime operated by the WTO is expressly designed to operate consistently with the principles of sustainable use of natural resources (Decision on Trade and Environment), but without a specific consideration of animal genetic resources. Without greater awareness and prioritisation within countries of the need to conserve animal genetic resources, short-term economic interests and other international and national priorities are likely to drive its policies, rather than achieving long-term food security and sustainable development. Thus, relevant aspects of the WTO's portfolio, such as its SPS agreement, may respond to other pressing areas, such as global disease risks, without balancing the need to preserve animal genetic diversity. Similarly, the harmonisation of intellectual property rights pursuant to TRIPS may respond solely to commercial development rather than take into account as well the needs to conserve and exchange animal genetic resources.

42. The OIE has established a working group developing animal welfare standards in five areas that include slaughter, killing of animals during disease outbreaks, animal transport on land, animal transport on sea, and aquaculture. It is suggested that it be useful, in the context of the OIE's remit, that measures proposed by this working group to harmonise animal welfare and disease control requirements, take issues relating to the exchange of animal genetic resources into account.

Veterinary Regulations

43. Veterinary regulations are linked to zoo-sanitary and welfare measures, and are not harmonised with animal genetic resources conservation and sustainable use priorities. There is a need to assess the need and possibility of harmonising standards and veterinary regulations in order to ensure that they support, rather than inhibit, the exchange and sustainable use of animal genetic resources emanating from both developing and developed countries.

Property rights

44. Unlike plant genetic resources, where proprietary interests tend to take the form of intellectual property rights (plant variety protection or patents) over an entire variety, proprietary interests in animal genetic resources may be focused on an individual animal, and thus may be protected by the application of simple property rights. Consequently, most forms of intellectual property rights are not currently as significant in the context of animal genetic resources as they are in the case of plant genetic resources. However, with the constant technological advances in breeding and genetic manipulation in the sector, and new commercial approaches, intellectual property rights may have greater relevance to animal genetic resources in the near future.

45. At the current stage, a comprehensive assessment of the role of intellectual property rights in the use, development and conservation of animal genetic resources needs to be carried out, before any recommendations can be put forward. There are options, current practices and emerging issues, such as the increasing use of patents, which may in the longer term be amenable to harmonisation. For the present, the Commission may wish to develop close working links with the relevant institutions currently responsible for regulatory development of intellectual property rights, in order to ensure that the interests of animal genetic resources and the livestock sector are preserved.

46. There are four types of intellectual property rights that are relevant in the context of animal genetic resources: 1) *geographical indications* - which relate particular products to their geographical origin or location; 2) *trade secrets* - which primarily operate through ordinary proprietary control exercised, *inter alia*, through agreements to retain information, such as breeding and husbandry strategies in the private domain; 3) *trademarks* - which can protect a breed or a product derived from the breed; and 4) *patents* - which protect novel and useful inventions, e.g. transgenic animal material.

Trade secrets

47. In the traditional and the commercial livestock sector, animal genetic resources include the genetic material and the knowledge and technology of its development, in one package. The principal method of protecting ownership in animal genetic resources presently used in the commercial breeding sector, particularly in poultry and pigs, is essentially protected through basic proprietary interests, confidentiality agreements, and agreements which restrict low-grade know-how moving into the public domain.

Trademarks

48. Trademarks are used to protect certain animal products deriving from specific breeds. Trademarks could be extended in their use and perhaps linked to internationally harmonised breed characterisation methods and approaches. Because the trademark protects a mark rather than a process *per se*, trademark protection does not provide any prior art foundation or other protection against patenting of processes relating to the subject matter.

Patents

49. Patents are not currently deployed extensively in the field of animal genetic resources. Several countries have excluded patents for animals expressly in their national law. However, there is increasing use of patents, as the commercial sector further develops gene modification technology and breed research. Necessarily, where investment in research is extensive, the researchers seek protection for the resultant technology. Patents provide that protection. As is the case for traditional knowledge in the plant genetic resources sector, prior art searches in relation to animal genetic resources, particularly where relevant breeds and methods are used in rural communities in the developing world, will not always reveal prior art and traditional knowledge, because of the inherent characteristics of traditional knowledge, and through the lack of effective and dynamic archiving. Consequently, whereas patents may not yet be posing an obstacle to the conservation of animal genetic resources, the position needs to be monitored in this context. Development in the World Intellectual Property Organization (WIPO) Inter-Governmental Committee on Genetic Resources, Traditional Knowledge and Folklore may address such questions, and should be followed closely.

Sui generis rights

50. Although *sui generis* rights over plant varieties have existed for many years under the International Union for the Protection of New Varieties of Plants (UPOV) no such rights exist in the context of animal genetic resources. When classifying components of animal genetic resources, individual animals are emphasised rather than varieties, as with plant genetic resources. Thus a comparison with approaches to *sui generis* rights in respect of plant genetic resources may not be helpful.

51. Furthermore, there are obstacles to the creation of breeders' or livestock keepers' rights on a *sui generis* basis, because breeds and populations cannot be easily distinguished from other breeds and populations on the basis of unique traits such as DNA sequences. However, a *sui generis* system could be developed that relates to registration in a register or herd book (managed

by a breed association by example). However, this might not grant any further rights beyond those conferred by ordinary ownership. An advantage of such a *sui generis* right, rather than the reliance on a trademark, is that registration could constitute prior art and prevent inappropriate patenting.

52. A *sui generis* right for components of animal genetic resources could also be linked to geographical indications in respect of place of origin. This would be particularly useful for indigenous and local breeds and populations.

Material Transfer Agreements

53. In order to facilitate the exchange of animal genetic resources, a model Material Transfer Agreement could be an appropriate vehicle to facilitate responsible exchange with appropriate arrangements for access and benefit-sharing, the obtaining of prior informed consent, harmonised approaches to welfare, zoo-sanitary and veterinary regulations, in addition to impact assessment.

54. An internationally approved model Material Transfer Agreement specifically designed for the exchange of animal genetic resources could reduce bureaucracy, transaction costs and other barriers to trade by the implementation of a uniform and transparent process.

Indigenous and local communities

55. The rights of indigenous and local farmers and pastoralists, collectively and individually, may need specific examination, and further development, because of the crucial role of local breeders and livestock keepers as custodians of a crucial and extensive base of animal genetic diversity. Many farmers and pastoralists operate pursuant to traditional practices, with a tenuous relationship with the land on which the practices take place, as well as with water and other biotic resources. To maintain the role of these communities as custodians of agricultural biodiversity in general, and animal genetic resources in particular, it is often necessary to protect their relationship with the landscape on which their practices are taking place, in view of rapid changes in production systems and land use patterns.

56. Consideration could be given to supporting indigenous peoples' and local community interests in specific contexts. This support could comprise a combination of rights dealing with production, grazing rights, access to markets and services, protection of indigenous knowledge and cultural norms, and recognition of local institutions that support the conservation of animal genetic resources. Thus they would deal with not only rights in animals and their derivative genetic resources, but also with aspects of land tenure and maintenance of traditional and cultural practices. There are a number of ways in which the interests of these communities could be protected, including capacity-building, arrangements to govern access, the securing of prior informed consent and equitable benefit-sharing, concessions for market entry and arrangements to facilitate ease of exchange of genetic resources, and approaches to protected areas designated, *inter alia*, as traditional agricultural landscapes. However, there may need to be appropriate prioritisation to support the practices of indigenous and local communities of importance to animal genetic resources beyond existing initiatives relating to wild biological diversity, and tailored to the specificities of practices relating to animal genetic resources.

CONCLUSIONS

57. Further work to assess the nature of the issues described herein is necessary, to determine the way forward to secure effective sustainable use, development and conservation strategies for animal genetic resources. Any policy and regulatory development at the international level designed to secure the interests of animal genetic resources must also meet the challenge of balancing multiple dynamics including: environmental objectives, food security objectives, the need to maintain open markets and to facilitate trade, zoo-sanitary issues, and interests of indigenous and local communities. Moreover it must also balance strategies within the context of the mandates of other institutions such as the WTO, the CBD and others.

58. With this in mind, the Commission may wish to plan work, pursuant to the *Strategic Priorities for Action*, to examine the impact of these emerging issues, and propose a strategy to best address the needs of animal genetic resources in the current international institutional, policy and regulatory context. Work in this respect could include:

- Reviewing the impacts of existing international policies on the sustainable use, development and conservation of animal genetic resources, with a view to achieve global food security and sustainable development.
- Developing measures to address the interests of animal genetic resources through policy responses. Such policies might include genetic impact assessments; access and equitable benefit-sharing arrangements; capacity-building and funding; material transfer agreements; proprietary interests in animal genetic resources, and harmonised approaches to characterisation, inventory and monitoring.
- Setting global priorities for the conservation, sustainable use and development of animal genetic resources.
- Developing measures for achieving the priorities through policy development and mobilization of resources.
- Establishing joint working relationships with other institutions, to review and coordinate policy and regulatory measures that take into account the specific characteristics and needs of animal genetic resources.