

FUTURE APPROACHES NEEDED TO ENSURE THAT VETERINARY EDUCATION MEETS SOCIETAL DEMANDS

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Summary: The future approaches needed to ensure that veterinary education meets societal demands encompass multiple areas over and above the most common fields of activity for the veterinary profession such as, for example, veterinary service delivery in urban areas and the animal production sector. The multiple involvement of the veterinary profession was also emphasised by the Director General of the OIE during a seminar on “Challenges in responding to new international and societal demands on the veterinary profession” at the 28th World Veterinary Congress, indicating that in recent years the OIE has been expanding its role with regard to influencing the objectives and missions of the veterinary profession.

The veterinary profession is, by definition, an art dealing with all issues of animals and their relationship with the environment.

Certain species such as companion and production animals are in some instances favoured on account of demand.

Companion animals are the group of animals which human beings choose to make their lives more bearable and often to mitigate the impact of negative emotions.

In the case of production animals, veterinary professionals are called upon to conduct both therapeutic and production related activities. Therapeutic interventions by veterinarians are the most common involvement, but it is the veterinary profession’s responsibility to educate producers to use veterinary professionals also to improve animal productivity. Feeding and handling of different animal species, including marine animals, play an increasing important role in production efficiency while animal welfare and traceability have also been added as the responsibilities of veterinarians. The veterinary profession must therefore be ready to meet this new demand. Consumers are increasingly demanding that animal welfare be treated as a priority as they consider that good animal management practices add value to the products they consume. Closely linked to animal welfare is traceability for identifying the origin of a product from the producer, the manufacturer and the retailer for the benefit and assurances of the consumer. This also requires a shared responsibility between official and private veterinarians who must work in tandem to ensure guarantees for food safety.

The OIE plays an important role together with training institutions, international and regional cooperation agencies (e.g. IICA², FAO³, and PAHO⁴) to equip the upcoming veterinary generation to meet the new demands.

Key words: education – veterinary medicine – animal welfare – traceability

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 2 IICA: Inter-American Institute for Cooperation on Agriculture
 3 FAO: Food and Agriculture Organization of the United Nations
 4 PAHO: Pan American Health Organization

Introduction

The approaches needed to ensure that veterinary education meets societal demands is a complex matter as it encompasses so many areas with high expectations from the profession. The aim of the paper is therefore to firstly address as impartially as possible, those areas in which there is a demand for professional veterinary services following responses to a questionnaire sent to the OIE Member Countries¹ although it is accepted that the information is not complete and mistakes will almost certainly be made in some cases. Secondly, the focus will be placed on those areas of greatest interest for the international trade in animals and animal products.

The analysis for the demand for veterinary professionals was based on the countries' contributions in the OIE questionnaire, completed by additional information such as the deliberations at the 28th World Veterinary Congress² on "Challenges in responding to new international and societal demands on the veterinary profession". It has to be agreed that, in issues involving the human-animal interface, the OIE plays an important and guiding role in many fundamental areas, including veterinary education. The response of 97 countries (listed in [Appendix I](#)) is therefore acknowledged with appreciation as well as additional data directly provided by the OIE.

Some of the OIE Member Countries may have perceived the questionnaire and the rationale behind it as having no direct relationship with the agenda of the 74th OIE General Session (21-26 May 2006) during which it was presented. However, we can not propose new concepts that are in many cases paramount, unless the focus of education is known. We have to provide answers to the questions on what influence do other relevant sectors have on decisions pertaining to guiding education, or how to successfully determine whether postgraduate veterinary students are in harmony with the culture and needs of each country and how able are they to adapt to change? There are thus a number of aspects that need to be addressed to assist in avoiding too many errors when addressing this issue.

1. Definitions

The veterinary profession is, by definition, an art dealing with issues of animals and their relationship with the environment by prioritising certain animal groups on account of demand, such as companion animals (pets), or animals used for production purposes, either for work or for food production (e.g. horses, cattle, zebu, fish, etc.). The term 'issues of animals' includes not only areas related to diseases or causes of harm, but also to areas related to the relief of human trauma, toxins, deficiencies, etc.

For this reason, veterinary education is a branch of science that train students to be able to address these issues, and at the same time to research and venture into areas not covered by these issues to enhance their contribution to the society.

Although it is very difficult to include all the sectors in which the veterinary profession may play a role, these sectors should at least include activities in areas that involve veterinary professionals, including those dealing with animals, where the primary concern is to ensure their health and welfare. They should also include the activities of veterinary professionals in the production sector as well as within specialised technologies especially food technology, which relates to animals and their products to guarantee relevant aspects of food safety, as well as the treatment and inspection of animals prior to slaughter. In addition, veterinary professionals working in the area of specialised technologies have a responsibility to guarantee the state of health of animals prior to slaughter and inspecting the establishments of origin. For this reason, the responsibility of veterinary professionals goes beyond the mere direct contact with an animal.

The responsibilities definition and related actions of veterinarians emphasise clearly that the veterinarian has an important and decisive role in the prevention of zoonoses, since most of the recent emerging diseases in humans, originated from animals.

2. Veterinary professionals for urban areas

A crucial responsibility of veterinarians is to maintain the world's animals in good health and to protect wildlife and to prevent the transmission of zoonoses to humans [2]. It has been documented that more than 60% of human diseases originate in animals thus emphasising the important role to be played by the veterinarian.

The demand for veterinary professionals to care for companion animals has traditionally been very high in some regions, such as in Europe and the United States of America, where it is one of the main sources of work for veterinarians. However, the demand for veterinary professionals in production sectors has tended to fall sharply, in particular due to economic pressures in many countries, causing professionals to migrate

¹ Questionnaire on "Future approaches needed to ensure that veterinary education meets societal demands" (available from the OIE).

² The 28th World Veterinary Congress was held in Minneapolis (USA) from 16 to 20 July 2005

to urban areas. While this was not necessarily the cause, it was indeed the effect. Another important factor to be considered is the increasing importance being given to the care of companion animals in markets whose buying power has risen steadily over the years. However, in general, veterinary activity was often associated with tending to animals in the field, curing horses, etc., historically because of the value of horses as working animals and for transporting people and commodities, although later cattle became more important due to their commercial and food production value, together with sheep, poultry, pigs and fish.

There is a strong trend, world-wide, towards treating pets and all animals in general, even wild ones, more humanely.

Another consideration is the steadily growing number of female veterinarians in practice, who are exerting increasing social influence (50% or more of students entering university are women). In general, female veterinarians prefer to work with companion animals. An important factor is also the financial advantage of small animal and companion animal practise relative to practices dealing with production animals only.

3. Veterinary professionals in the production sector

An important factor that has emerged as a discouraging consideration for future professionals to enter rural practice, is the lack of training of veterinarians that can cater to all a farmer's needs, rather than on an *ad hoc* basis, resulting in producers regarding veterinarians as an expense rather than an investment. This applies mainly to countries using extensive farming production systems and not in intensive farming production systems.

Even though many veterinary schools in the world have guided the veterinary profession in a new direction, it is true to say that, historically the primary task of a veterinarian has been to tend to the health of animals, especially animals with commercial value. In this respect, horses were the first species to be favoured, because of their usefulness in days past. Later, when the major nutritional properties and abundant supply of cattle were realised, they were incorporated into the activities of veterinarians, and in many countries of the world they are now a primary production animal with cattle breeding contributing a major share to the economies of these countries. An increasingly important area is also commercial fish farming, which calls for professional attention and involvement by veterinarians for example such as in Chile where veterinarians are intensively involved in commercial fish farming. Other equally important terrestrial animal species which require the participation of veterinarians are pigs, poultry, etc.

The conventional perception has therefore always been that a veterinarian is a doctor of veterinary medicine, watching over and guaranteeing the health of an animal or group of animals, in a farm, a zone or the entire country and, when circumstances dictate, the veterinarian takes a leading role in guarding against the spread of a zoonotic disease.

However, in the past few decades, veterinarians have embarked into areas of production, successfully competing in activities in those fields which were previously considered to be reserved for example to the profession of agricultural engineer but which in terms of their specialist nature, pertain to both professions. Feed for the various animal species, even marine species, plays a decisive role in production efficiency, and veterinarians are well trained in the physiological requirements of animals and the possible responses to different types of food supply. Moreover, in many cases animal feed can represent a source of harmful contamination to both animal and human health. Veterinarians therefore play an important role in these areas.

Today, the challenge extends over a wide range of sectors. In choosing this subject as a Technical Item for the 74th General Session, the aim of the OIE was to guide the profession, education institutions responsible for training new professionals and the official and private technicians, towards the new vision of the veterinary profession's role.

This role was chosen not by veterinarians but by consumers, starting in markets with high purchasing power and then extending throughout the world. As can be seen from the responses of Member Countries to the questionnaire, consumers are no longer satisfied merely with knowing that the product they are about to buy is safe to eat, but are demanding to know the history of the product from the birth of the animal from which the product was derived, to what food it ate and the lifestyle it led; what treatments it received during its lifetime and with what products, how it was handled, where and under what conditions it was slaughtered (animal welfare), and so on —a series of details which, until only recently, were considered superfluous.

The reason is three-fold:

- consumers have increased purchasing power and with it they are willing to pay for products that they perceive as safer for their health;
- with general improvements, human life expectancy has increased and so has human susceptibility to disease;
- in a desire to arrive at products acceptable to consumers, producers and industry have made investments which they must recover as quickly as possible. These investments are linked to the management of production animals.

Although it would not be possible to elaborate at length on the many aspects associated with the title of this presentation, two of these issues namely, the responsibilities of veterinarians and their training to meet societal demands, are highly topical and have been properly addressed in only a very few instances.

Veterinary education in the world has a mandate from society which goes beyond its own priorities, but also generates them. It must satisfy societal demands and, to do this it has to determine the demand, which goes beyond the professional scope to embrace the end user, which, in this societal world, is people in society. This demand is being adapted to satisfy not just people's tastes (which would be easy), but rather requirements for protecting them in a changing lifestyle that inevitably brings with it even greater demands. In response to this, the veterinary profession must remain informed, and teaching institutions must be able to respond and react rapidly to changes and new veterinary requirements.

If it is acknowledged that previously well established concepts have changed in a continuously-evolving world (for example, wild animals now playing a prominent role in zoonoses, such as wild fowl and their migrations). Member Countries must therefore associate training in veterinary education institutions with public health centres and with sectors that study wildlife and their migrations as humans are the target of zoonotic diseases.

In summary:

- veterinary training must be increased, which will call for postgraduate courses that meet societal demands;
- training institutions must accept that education plays a major role in life expectancy;
- pathogens are increasing all the time and this is related to selection pressure from drugs;
- wild animals need to be controlled in the same way and the behaviour of humans themselves and their tendency to plunder the environment.

In certain instances where veterinary education institutions decide on their own curricula, they now find themselves out of line with societal demands, and therefore delay the incorporation of relevant subjects into veterinary practice. The survey clearly indicated a lack of consultation with other sectors involved, even though this would be beneficial for training new professionals. The survey also indicated that more than six years are needed to change a curriculum which is too long a timeframe in a fast-changing world.

3.1. Animal welfare

Judged from responses to the questionnaire, the veterinary profession has fortunately started to take on board animal welfare, given the interest and importance of this subject in the modern world.

Even though this interest in the welfare of animals, both domestic and wild, began with groups of people that had nothing directly to do with the treatment of animals, except companion animals, this interest has spread gradually but permanently to include consumers of red and white meat. This has resulted in the veterinary profession in many countries to already incorporate animal welfare into their statements on professional ethics.

With the changes that have taken place in the world, the marketing of animals and animal products is increasingly governed by these concepts. This aspect has also received increased attention at recent General Sessions of the OIE and in text incorporated into the *Terrestrial Animal Health Code* and the *Aquatic Animal Health Code*. In his address at the seminar held in conjunction with the 28th World Veterinary Congress, Dr Wilson [3] indicated that there are two very useful definitions on the concept of animal welfare. The first defines animal welfare as “the state of an animal as regards its attempts to cope with its environment” and secondly “animal welfare comprises the state of the animal's body and

mind, and the extent to which its nature (genetic traits manifest in breed and temperament) is satisfied”.

Irrespective of the above definitions, some countries however consider animal welfare to be the full responsibility of human beings as the superior species which at the same time allows humans to do as they see fit with the different species, for whatever end. With the cultural delay and atavism of certain ancestral customs in the world, a clash is bound to occur between the concepts of welfare and traditional customs.

The OIE has a dual responsibility in this matter. The first is production and food safety, which is a responsibility it has already assumed. Secondly, the OIE needs to provide guidelines on the application of animal welfare in areas which are controversial because of the customs of the different cultures (based on the answers to the questionnaire). This ties in fully with the standards adopted at the 73rd General Session¹ of the OIE on the transport of animals by land and sea; the humane slaughter of animals for human consumption and the killing of animals for disease control purposes. Within these three areas, substantial changes have already taken place. The OIE has adopted a guide on humane slaughter [1] that has revolutionised these concepts ranging from the reception and penning of animals, through to transport and finally slaughter. One of the conditions stipulated by countries purchasing beef meat is for the humane treatment of slaughter animals. The work by Dr Grandin [1] includes an excellent and detailed guide for achieving this. Veterinary education in the world is taking this on board more than before as are veterinary professionals working in this area.

Another concept that has gained scientific credibility is that of animals being *sentient*, which by definition imply that they are capable of feeling pain, disease, hunger, cold, heat, etc., as well as the sensations emanating from this. It is essential for veterinary education to acknowledge this concept and for it to be made compulsory in their curricula, as the concept has already been incorporated into the work methodology of the various members of society and of the veterinary profession. In addition, emphasis should be placed on the responsibility of veterinary educators, to ensure that people responsible for companion animals or for commercial or sporting establishments, acknowledge animal sentience as a reality which will expedite the process of world equivalence on the application of animal welfare. The national Veterinary Services of Member Countries should take a lead in this for example and as stated by the survey respondents, by introducing accreditation systems. It should also be included in post-graduate curricula, to ensure the necessary acknowledgement. However, judging from the responses to the questionnaire, the long timeframe often required to change curricula, might retard the process.

3.2. Traceability

What is traceability? It is the process used to determine the origin of a product for human consumption, guaranteeing, by means of an organised and standardised procedure, the origin and quality of the final product, as well as its safety as a foodstuff. In the sector involving animals, products and human being, the emphasis is placed on a product's standard of quality, including the aforementioned organised process of traceability.

By analogy, traceability can be described as the capacity to document the history, use and location of a specific item and it also implies a process which could be analysed.

With traceability, as was the case with animal welfare, the consumer has played the determining role in setting traceability into motion.

In the past, traceability was analysed according to its isolated components, using obsolete methods (different components, such as biological and chemical components and heavy metals were traced). Isolated microbiological agents were sought (zoonoses), physical and chemical agents (pollution, etc.), handling at the producer establishment, etc. All factors would, if they still had to be analysed in the aforesaid manner, make it unconceivable to trade an animal or product for sale.

According to the survey data, food safety is increasingly taking into consideration all the phases in the process from production to retailing (“from farm to fork”).

This also provides crucial information for official or private veterinarians with a key tool for preventing zoonotic diseases, even in cases where there are no animals with clinical signs. In this area,

¹ The 73rd OIE General Session was held from 22 to 27 May 2005

too, the private veterinary profession must contribute to the various aspects of disease prevention and take into account chemical and physical agents, which can seriously affect human health.

The control, prevalence and spread of food safety risks are dynamic processes, which constantly evolve in search of better solutions to address emergencies or respond to the occurrence of new factors. The requirements to address new diseases that may not have clinical manifestations, also call for the development of controls of end products that rule out such risks. The same approach applies to physical and chemical agents; pharmaceutical products or growth promoters and elements derived from environmental pollution.

Changes in animal husbandry systems and in the feedstuffs or supplements supplied are factors to also be taken into account, since they can play a decisive role. Veterinary education must therefore also take into account these variables which are determined by changes in demand.

This set of requirements leads to an on-going and organised control which, when carried out in an orderly and systematic way, whilst at the same time providing safety guarantees, also lowers costs and increases the viability of control procedures. It is possible to effectively prevent multiple risks, or to identify them in different ways, by means of actions including appropriate health measures to combat specific pathogenic germs and risk mitigation in the production process, especially when changes need to be made to implement improvements.

Veterinary training institutions will need to adapt training curricula on food safety taking into account new trends and also guidelines and recommendations such as those developed by the OIE.

This training will need to distinguish between the phases of production, processing, retailing and consumption, all of which phases have undergone profound changes:

- The production of animals has been subject to differing systems aimed at producing animals earlier, in terms of their growth and finishing.
- Processing has been 'cleaned up', promoting a chain with simple but efficient controls (HACCP¹). As indicated, humane slaughter completes this phase of processing animals into products, in a "safer" way and with an evident benefit for the production component.
- In recent years, retailers have sought to promote their products, by demonstrating the quality of the products they are selling using certified controls.
- Consumers have changed their customs and habits, owing to the increase in international trade, enabling them to choose feedstuffs from anywhere in the world. Today it is common for consumers to buy ready-made food products.

In conclusion, all of this could be said to have led to changes in mass production and consumption, also globalising their impact and future repercussions.

General requirements are made for the first phase of production control, but for the second phase of transformation, monitoring and evaluation processes are increasing significantly. In the second phase, laboratories play an important role in support of these controls, as they are able to determine consumption constraints that are not detected during the previous phase.

Whereas, in industrial development, HACCP processes are the responsibility of the various industries, the procedure for determining the quality of the different types of end product, is the responsibility of the veterinarian in the specific industry who must be qualified to interpret such quality. This has led to the need for a close relationship between two veterinary sectors that were previously very distant. The first is field veterinarians who are responsible for inspecting animals, their feed and environment. The second is veterinarians working in industry, who can use many of the elements that field veterinarians provide to guide their own actions on end products, and vice versa. So, it can be seen that nowadays those responsible for a production system are also responsible for the quality of the products provided by the system and here the veterinary professional plays a very important role. This is to verify that the controls carried are, firstly valid; secondly that they are objective and uniform; and, lastly, that there is a sequence of satisfactory controls, as a guarantee of the actions carried out. This obviously also relates to veterinary education.

Official veterinarians are responsible for the safety of the end product, from the standpoint of its health and hygiene controls.

1 HACCP: Hazard Analysis Critical Control Point

In the production sector, activities are directed towards ensuring that producers are accountable for the products they deliver to industry, although in many cases they do not comply. For this reason, the participation of an official or private veterinarian can help to enhance these guarantees and also to guide and control the actions of producers as accountable for their products.

All this has increased the participation of official or private (accredited) veterinarians, closing the circle which, with the inclusion of manufacturing managers, makes it possible to certify the health, hygiene and quality of the end product. Many countries have gradually been harmonising these various aspects in order to produce satisfactory results not only for retailers, but also for consumers. The veterinarian's role in the production and manufacturing phases should also be standardised, so as to ensure that the interpretation of the results are consistent and complies with international regulations. There is therefore a clear need to harmonise standards and procedures to rule out the possibility of differing interpretations. In this area, an important role is played by training in veterinary education institutions.

In summary, it is necessary to reaffirm what a number of publications have already confirmed —that it is imperative to adopt uniform rules on traceability and for these rules to be confirmed by the competent authorities, both the OIE and the CAC¹, which will guarantee objective regulations for all involved on a matter of growing importance.

3.3. Responsibility of official and private veterinarians

As indicated above in relation to animal welfare- and traceability related activities, the veterinary profession must acquire the capacity to meet the said demands. For this, university training institutions and specialist groups should be responsible for incorporating all the training elements for animal welfare and traceability, which have gradually been integrated into the demand for international trade in animals and animal products.

The official veterinary sector is responsible for control processes in production and industry, and to a lesser extent in retailing the end product.

However, the private veterinary profession must also share in this responsibility, by means of accreditation. It is however necessary to have training facilities for acquiring the necessary expertise, to enable private veterinarians to replace official veterinary professionals in certain phases. Another reason is that many private veterinary professionals are permanently placed at production sites and sometimes visit them regularly, putting them in a better position than official veterinary professionals, who must take the initiative of travelling to establishments, in many cases based on the producer's past record. In both cases, the responsibility of official or private veterinarians must be recognised by all the sectors involved.

Veterinary training institutions including professional veterinary associations and regulatory organisations, therefore have a responsibility to incorporate these demands into the training curriculum. Accreditation should facilitate the entry of a larger number of veterinary professionals into food safety aspects related to human health, as well as to the health of farm animals.

The concept of early detection and rapid response in the whole national territory through a relevant public/private network of veterinarians is also crucial for the OIE mandate. Surveillance methods have to be introduced in all curricula.

4. Answers from the countries to the questionnaire

In conclusion the most significant survey results emanating from the questionnaire, are briefly described. It appears that the countries were interested in exploring the aspects that make the training of veterinary professionals applicable, not only in the technical sectors, but also in economic sectors. Also important is the relevance of the livestock sector in the different countries, and the OIE's importance in various fields. All of these considerations have guided the analysis.

The **focus of veterinary education** in the countries indicate that 80% of the themes that are given precedence for the training of future veterinary professionals are large animals, small animals (pets) and short-cycled farm animals, as well as studies on food safety. Next come the aspects of public administration and animal welfare.

Training curricula are established primarily by universities and secondly by Ministries of Education.

1 CAC: Codex Alimentarius Commission

In the main, **veterinary education** is public and free of charge, followed by private fee-paying education and lastly by mixed fee-paying education. Veterinary education is both theoretical and practical.

In general, **no courses are taught in foreign languages** in the countries, but **foreign students are admitted**.

The share of livestock production in the economy is moderate in many countries (45%), with the number of countries where the share is high (27%) being not much larger than the number of countries where it is low (23%).

The great majority of countries (87%) **export animals and animal products**.

The principal animals exported are: cattle (58% of countries), poultry (55%), pigs (48%), equidae and sheep (43%). The principal export products are meat (72% of countries) and wool, skins and hides (65%). Only 31% of countries export semen and embryos.

The livestock sector participates in the **governing boards** of veterinary colleges in 31% of countries. The official veterinary services participates in governing boards in 40% of countries and the participation of professional veterinary associations is similar (40% of countries).

Veterinary students are in demand mainly for Official Veterinary Services, for animals reared for food, and for processing and safety of animal-derived food.

The answer to the questions on **veterinary education and societal demand** in terms of **technical competence and number of professionals**, is that they are satisfactory (between 70% and 80%). By contrast, satisfaction of demand for **biotechnology** is negative (56%). In general, public demand for **animal welfare** is being met (60%).

The great majority of the countries (80%) have **postgraduate education** and mostly it is fee-paying (in 70% of countries). In the order of priorities, the main areas where there are specialisation courses are large animals, pets, food safety, short-cycled farm animals and biotechnology.

There are **specialist groups** in most countries, mainly in the areas of large animals, short-cycled farm animals, pets and food safety. In this section, as in the second part of the preceding one, no percentages are mentioned because they are not comparative but rather specific to each country.

There is **financial support for postgraduate training** at the public level (50% of countries) and at the private level (40%).

In most countries (70%), **education includes familiarisation with OIE standards** (this is an unexpectedly high percentage).

The great majority of countries (86%) believe that **OIE Collaborating Centres should help to design public and private veterinary training** (this percentage is also surprisingly high, because it is given greater precedence than the previous answer, even though it might be complementary).

More than 90% of the countries consider it **important for the OIE to develop guidelines for a world and regional policy to harmonise and improve veterinary education**.

5. Conclusions

The veterinary profession is in a period of its existence where it must play a prominent role. Judging by the small proportion of veterinary professionals in the various countries of the world according to the survey, this prominent role can be expected to increase substantially in view of the importance of food for human health and, above all, the enormous range of domains for which the veterinary profession is responsible. This only increases the responsibility of stakeholders including the official and private veterinary profession and veterinary education institutions who must be the first to realise their new role. Veterinary education institutions especially must be prepared to rapidly include these new activities in their curricula.

The OIE should provide guidelines on the relevant aspects of continually evolving standards. International and regional cooperation agencies (e.g. IICA, FAO and PAHO), are responsible for supporting these new concepts and expanding the range of recipients and promoting their usefulness.

The governments of Member Countries will be the chief disseminators of these concepts, incorporating into their regulations the necessary measures on animal traceability and welfare, as regulations for the production chain.

The procedures for the application of animal traceability and welfare must be harmonised.

Until the veterinary profession demonstrates to producers its impact on business profitability, it will continue to be only a service profession and a tool for validating production. However, if it takes an active leadership role, the veterinary profession will become indispensable.

Companion animals will continue to compete with the production sector for veterinary professionals and this could end up jeopardising rapid and appropriate adaptation to the new standards on surveillance, and lead to a dwindling supply of veterinary professionals in rural areas.

In the production chain, the end user (consumer) has come to take a decisive role, and producers and all the other links in the chain must take on board the consumer's prominent role.

Farmers must be trained, informed and controlled by veterinary professionals on the biological or chemical products to use on their animals. Veterinary professionals must therefore be trained in communication techniques, which is a responsibility of educative institutions.

Wild animals are having an ever greater impact on the spread of animal diseases and zoonoses. Action in this field is essential.

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.../Appendix

1 CVP: Standing Veterinary Committee of the Southern Cone

COUNTRIES THAT HAVE REPLIED TO THE QUESTIONNAIRE

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|-------------------------------|-------------------|---------------------------------|
| 1. Albania | 34. France | 68. Peru |
| 2. Algeria | 35. Georgia | 69. Philippines |
| 3. Argentina | 36. Ghana | 70. Poland |
| 4. Australia | 37. Greece | 71. Portugal |
| 5. Austria | 38. Guinea Bissau | 72. Romania |
| 6. Azerbaijan | 39. Guyana | 73. Saudi Arabia |
| 7. Bangladesh | 40. Hungary | 74. Singapore |
| 8. Barbados | 41. India | 75. Slovakia |
| 9. Belarus | 42. Indonesia | 76. Slovenia |
| 10. Belgium | 43. Ireland | 77. South Africa |
| 11. Benin | 44. Italy | 78. Spain |
| 12. Bolivia | 45. Japan | 79. Sudan |
| 13. Bosnia and
Herzegovina | 46. Kenya | 80. Sweden |
| 14. Botswana | 47. Korea | 81. Switzerland |
| 15. Brazil | 48. Kyrgyzstan | 82. Taipei China |
| 16. Brunei | 49. Laos | 83. Tajikistan |
| 17. Bulgaria | 50. Latvia | 84. Tanzania |
| 18. Burkina Faso | 51. Lesotho | 85. Thailand |
| 19. Canada | 52. Libya | 86. Togo |
| 20. Chile | 53. Lithuania | 87. Trinidad and Tobago |
| 21. Colombia | 54. Luxembourg | 88. Tunisia |
| 22. Congo | 55. Macedonia | 89. Turkey |
| 23. Costa Rica | 56. Malaysia | 90. Turkmenistan |
| 24. Côte d'Ivoire | 57. Moldavia | 91. Ukraine |
| 25. Croatia | 58. Mongolia | 92. United Arab Emirates |
| 26. Cyprus | 59. Morocco | 93. United States of
America |
| 27. Czech Republic | 60. Myanmar | 94. Uruguay |
| 28. Denmark | 61. Namibia | 95. Uzbekistan |
| 29. Dominican Republic | 62. Nepal | 96. Vanuatu |
| 30. El Salvador | 63. New Caledonia | 97. Vietnam |
| 31. Eritrea | 64. New Zealand | 98. Yemen |
| 32. Estonia | 65. Nicaragua | 99. Zimbabwe |
| 33. Finland | 66. Pakistan | |
| | 67. Paraguay | |
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