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TECHNICAL BARRIERS TO IMPORTS OF LIVESTOCK AND MEAT PRODUCTS FROM DEVELOPING COUNTRIES AND PROGRESS IN THEIR REDUCTION UNDER THE PROVISIONS OF THE URUGUAY ROUND AGREEMENTS

CONTENTS

I. INTRODUCTION

1. This document has been prepared by the Secretariat in response to the Group's request at its previous session, to have a report on the technical difficulties faced by livestock exporting developing countries in getting full benefit from the Uruguay Round Agreements (URA) (CCP:ME 95/11, paragraph 27). In collecting and analyzing material on this topic the Secretariat has, as recommended, sought information from appropriate authorities of exporting developing countries.

II. SUMMARY AND CONCLUSIONS

2. Livestock and meat products are important export commodities for a number of developing countries. The review of the material collected indicated the wide range and growing importance of importers' technically orientated trade control measures. This document illustrates that compliance with these requirements can pose considerable difficulties for exporters, particularly those of the developing countries. Thus, although the URA may enhance their opportunities to gain increased access to foreign markets, growing stringency of technical regulations in importing countries may offset the benefits gained from the URA commitments on tariffication and export subsidy reductions.

3. The trend towards growing stringency of technical regulations in importing countries may reflect legitimate concerns about food safety, animal diseases, environment, animal welfare or simply respond to changes in consumers' demand for product characteristics or presentation. However, it may also be supported by protectionist interests in some importing countries. In this regard, increased vigilance is required, particularly as there is no complete record of all technical measures affecting access to livestock and meat markets and, where they are known, their impact may be difficult to assess. Moreover, under the Sanitary and Phytosanitary (SPS) Agreement of the URA, countries are allowed to set their technical regulations above international standards, subject to specified conditions, without obligation to compensate foreign suppliers for the associated additional compliance costs.

4. Even when domestic and foreign suppliers are to abide by the same technical regulations, these may put, by their very nature, the latter at a disadvantage. Moreover, even when a technical regulation responds to a legitimate concern of an importing country and is not a disguised form of protectionism, it may impose a considerable burden on exporters from developing and especially least developed countries. Proposals for alleviation of such burdens have been considered in the URA, especially under the provisions for "Technical Assistance" of the Agreement on the Application of Sanitary and Phytosanitary Measures and the provisions for "Special and Differential Treatment of Developing Country Members" of the Agreement on Technical Barriers to Trade. However, other means for mitigating the impact of technical measures have also been investigated.

III. SIGNIFICANCE OF AND PROSPECTS FOR LIVESTOCK AND MEAT FOR EXPORTING DEVELOPING COUNTRIES

5. Earnings from exports of meat by developing countries amounted to over US$ 5,000 million in 1993, with a further US$ 2,000 million coming from livestock exports. These exports are particularly important for those countries where they represent a significant part of total agricultural exports (see Table 1). The countries listed in the table accounted for over 90 percent of the developing countries' meat exports, mainly effected to developed countries, as these are the largest and most remunerative outlets. However, the developing countries as a whole accounted for only 28 percent of global meat exports in 1994 compared with their share in world production of 47 percent.

6. FAO projections to the year 2000 for the developing countries indicate growth in consumption at 4.5 percent a year, marginally exceeding that in production and pointing to an expansion in their net

imports.[1] These projections take account of the enhanced global opportunities to export meat, arising from reductions in tariff and quantitative constraints on market access and reduced competition from subsidized exports under the URA. Developing countries that have supplies for export could benefit from an anticipated expansion of global import demand. However, the projections do not take into consideration changes that may occur in technical regulations. These changes could be beneficial where an exporting country obtains access to markets for processed products, which previously only took raw meat, thus enabling a lift in prices paid to producers and generating higher export earnings. However, increases in the stringency of trade regulations could have the opposite effect and may virtually cut off a country's access to some markets. Thus, better technical performance of livestock exporters may be necessary to sustain an acquired position in external markets.

IV. SANITARY AND OTHER TECHNICAL BARRIERS AFFECTING INTERNATIONAL TRADE IN LIVESTOCK AND MEAT

1. Definitions

7. Importers' requirements that relate to the characteristics of a product, including its presentation, or to its production process, are considered here to be "**technical requirements**". For livestock and meat, they cover mainly quality characteristics, (e.g. the content and character of muscle and other tissues), conditions for product description or presentation, (e.g. labelling and packaging) and specifications on consignment procedures. Importers' requirements related to food safety aspects are also of prime importance. Requirements may be those contained in standards, defined as documents "approved by a recognized body, that provides ... rules, guidelines or characteristics for products or related processes and production methods ..."[2]. When compliance with such requirements is mandatory under national regulations, they become "**technical regulations**" and part of a nation's trade control measures (TCMs). Such measures may pose severe difficulties for exporters, especially as their modification may require international negotiations. For this reason, they are the material of international agreements, including the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) and the Agreement on Technical Barriers to Trade (TBT). Technical control measures receive prime attention in this document.

2. The UNCTAD Coding System

8. An attempt to classify TCMs has been made by UNCTAD with the establishment of a coding system of Trade Control Measures[3], from which the number, variety and content of technically oriented measures may be gauged. This system covers measures of all types ranging from tariffs to technical measures. It comprises eight categories coded according to their nature which are further subdivided according to their purpose. Tariffs proper are the first, and para-tariffs, the second of these categories, while the other six cover non-tariff measures (NTM), including the "technical measures" category, which has, as its major subdivision, "Technical Regulations" comprising:

- Product characteristics requirements
- Marking requirements
- Labelling requirements
- Packaging requirements
- Testing, inspection and quarantine requirements
- Information requirements
- Technical regulations n.e.s.

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[1] "The Impact of the Uruguay Round on Agriculture", FAO, 1995.

[2] "Agreement on Technical Barriers to Trade", Annex 1, which is an integral part of the *Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations*, signed at Marrakesh, 15 April 1994.

[3] United Nations Conference on Trade and Development, *Directory of Import Regimes, Part I: Monitoring of Import Regimes*, 1994, United Nations, New York (UNCTAD/DMS/2/Rev 1), p. 10.

9. However, technically orientated measures are also to be found in almost all categories. For instance, licences may be conditional on compliance with specific technical requirements, e.g. licences to import cattle on proof of their freedom from named diseases. Such technical measures apply, in particular, to "sensitive products", which are often considered as a subheading in each category and which are coded according to their purpose including those

- to protect human health
- to protect animal health and life
- to protect plant health
- to protect the environment
- to protect wildlife
- to control dung abuse
- to ensure human safety
- to ensure national security
- for purposes n.e.s.

10. Information from over 100 countries has been compiled in the UNCTAD Database on Trade Control Measures[4]. Completeness of the data that have been assembled varies between topics. The database is most deficient in the area of technically orientated measures and, especially when related to the protection of the environment. For example, the records do not contain health and safety measures stipulated by EC countries[5]. However, despite the incompleteness of its coverage, the UNCTAD Database on Trade Control Measures provides 3,959 records of non-tariff measures applied to agricultural products. Of these, 40 percent were technical regulations and standards, three-quarters of them dealing with health and safety. Trade in meat and livestock would be affected by a considerable number of these regulations, as well as by others coded as referring to "sensitive product categories".

3. Rising stringency of importers' requirements

11. The stringency of importers' technical requirements reviewed above is likely to tighten in response to a variety of pressures, including rising concerns about food safety or animal contagious diseases and, in the higher income countries, environmental and animal welfare issues. Protectionist pressures from the domestic livestock industries may also play a role. These aspects are reviewed in some greater detail below.

12. The most evident reason for a tightening in import requirements is the growing **concern about food safety** arising from:

- disquieting occurrences of food related illnesses, such as those caused by salmonella infection[6];
- increased concern about residues in foods from various sources, including residues of agricultural chemicals;
- lack of assurance that innovations in food production and processing are not detrimental to food safety, for example, the administration to animals of hormones and related substances;
- speculation that certain diseases (for example bovine spongiform encephalopathy or BSE), as yet not recognized as transmissible to humans, may be so transmissible.

13. Each of these considerations has already triggered the adoption of measures which have a considerable impact on trade in meat and livestock. Some of these measures have also been the subject of extensively publicized disputes between trading partners. Further, their effects are likely to grow as regulations are modified to address food safety concerns. A particularly significant example is the move

[4] Described in the UNCTAD, 1994, ibid.
[5] Ndayisenga, F. and Kinsey, J., 1994, "The Structure of Non-tariff Trade Measures on Agricultural Products in High-Income Countries", *Agribusiness*, 10 p 289.
[6] In Germany 141 000 cases were reported in 1993 and in the United Kingdom 34 000 (*Animal Health yearbook, 1993*, p 134).

away from traditional inspection procedures toward more targeted risk management through such procedures as the application of Hazard Analysis and Critical Control Point (HACCP), a topic touched on in Annex A. In addition, there are pressures to reduce the permitted levels of additives and residues of health significance and to increase the list of such compounds, for example by the addition of newly developed agricultural chemicals. However, URA commitments, especially those embodied in the SPS Agreement, have provided internationally accepted mechanisms for addressing these matters, including criteria for justifying technical regulations and related dispute settlement procedures.

14. Technical regulations are also being expanded to cover not only the product but also the **processes of production**; these, too, have already given rise to international disputes[7]. This trend may also be noted in the inclusion of requirements related to **environmental or animal welfare concerns**, illustrated by the dispute over tuna fish caught by methods that endangered dolphins.

15. Continued efforts to control and reduce health related risks in production and trade in meat products also tend to generate more stringent technical requirements. Target levels for freedom from disease in animal production units, for example, are being raised in many importing countries to reduce the **risks of infections and other causes of ill health depressing animal performance**. However, these countries would also seek to reduce such risks associated with imports by expanding the list of diseases and conditions for which veterinary certificates are required[8]. Similarly, the tightening of specifications for the composition of meats purchased by the processing business and the move from visual assessment methods to instrumental tests are reflected in the elaboration of new standards and technical regulations.

16. The growing stringency of technical regulations may have considerable spill-over effects on international trade and cause a contraction in the volume of transactions. The resulting loss in global welfare will be offset to a certain extent by improvements in consumer welfare resulting from reduced health risks. However, as long as the technical regulations can be justified on scientific grounds, put differently, as long as they are not favoured for their **protectionist effects**[9],any accompanying reduction in welfare must be acceptable. Nevertheless, moves to reduce the more obvious forms of agricultural protection, intended by the URA, may tend to increase the protectionist attraction of technical regulations. At the same time, however, the protection provided by some existing regulations is being weakened, as they may no longer be tenable under URA commitments. For instance, the SPS Agreement's requirement for measures to be based on scientific evidence may result in exporters challenging some of the importers' technical regulations. Moreover, the SPS Agreement's provision for recognition of "pest and disease-free areas" will offer the possibility for a non-entirely pest and disease-free country to gain access to some importers' markets, provided effective official control can be demonstrated. This has been the case for some exporting countries in Latin America with areas free of foot-and-mouth disease (FMD). In order to offset such losses of protection, it is conceivable, however, that protectionist interests in importing countries may support the elaboration of other technical regulations.

17. Thus, increased vigilance is required for a number of reasons, including the following:

- It appears that, even now, there is no complete record of all of the technical measures affecting market access. It is, therefore, not possible to provide a global review of how they are changing and what their impact on welfare may be.
- Negotiation of expansion of market access through the revision of technical measures is difficult.
- By allowing WTO members to set their technical requirements above levels in international standards, the SPS Agreement may allow these requirements to be used as protectionist barriers,

[7] Examples related to meat include the specification of transport of animals to slaughter, detailed requirements based upon humane slaughter methods, and restrictions on post-slaughter cooling procedures (just one example being for poultry carcases).

[8] An example of analysis of this topic is provided by: Hafi, A., Reynolds, R. and Olives, M., 1994, "The economic impact of Newcastle disease on the Australian poultry industry, ABARE Research Report No. 94-7.

[9] General Agreement on Tariffs and Trade, 1979, "Report by the Director General of the GATT", in *The Tokyo Round of Multilateral Trade Negotiations*, p 62.

raising the transaction costs of imports if frequent recourse has to be made to the URA dispute settlement process.

18. Thus, developing countries have reason to be concerned about the impact of technical regulations on international trade in meat and livestock and it is desirable to support efforts to minimize their use and mitigate their negative effects.

V. DIFFICULTIES FACED BY MEAT EXPORTING DEVELOPING COUNTRIES AND PROPOSALS FOR THEIR MITIGATION

1. Difficulties encountered

19. Many of the technical regulations passed by importing countries are likely to respond to food safety, to consumers' requirements over product characteristics or to other legitimate concerns. In most cases, domestic producers will be required to abide by the same regulations as those imposed on foreign suppliers. Even in such cases, regulations may put the latter at a disadvantage compared to the former. For example, the shortening of mandatory product shelf-life standards may have a stronger negative impact on foreign than on domestic suppliers, especially for products such as fresh and chilled meat, as a longer period would probably be required for exporters to make such products available to retailers in the foreign markets than for domestic suppliers. Similarly, impositions of a maximum duration for live animal transportation may also turn to the disadvantage of foreign suppliers, given the greater distance that is likely to separate them from the importing markets, compared to local producers. In this connection, the question on whether such measures are of a "protectionist" nature should be gauged against the scientific soundness of these regulations and judged against their necessity to achieve a legitimate objective.

20. However, even in cases where there is evidence that the measures are not disguised forms of protection, developing exporting countries are likely to face considerable difficulties in complying with them, for a number of reasons. Disparity of conditions existing in most exporting developing countries and those prevailing in their respective import markets is vast and difficult to overcome (Table 2). Levels of incomes and standards of living in many meat exporting developing countries are far below those in their main markets, typically among the developed countries and high-income developing countries. Developing countries exporters are handicapped especially by:

- the small scale of export operations;
- the necessity to apply separate treatment to products destined to foreign and domestic markets in order to comply with major differences in technical requirements abroad;
- the scarcity, low performance and high costs of support services;
- high risks of diseases and infestations.

21. Some examples illustrate the effects of these differences and the difficulties faced by exporting developing countries. The domestic meat market in these countries is often supplied with meat from livestock slaughtered the same day without use of refrigeration. One consequence is that meat for export would have to come from animals slaughtered and handled in facilities specifically constructed for this trade. Similarly, arrangements to store and transport the meat under refrigeration would be, on the whole, only required for exports. Exports of meat to the European Community from Kenya, Madagascar and Swaziland, for example, were reportedly constrained in recent years by the lack of EC approved slaughter houses[10]. Constructing and running such facilities is particularly burdensome where the volume of throughput is highly variable and rarely reaches the design capacity of the plant. This is frequently the case for beef slaughter plants, especially those that depend on livestock raised on arid or semi-arid land. These problems shed light on why the bulk of exports of many of the countries in Table 1 goes as livestock rather than meat.

[10] Matthews, A., 1994, Journal of Agricultural Economics, 45, page 184.

22. The difficulties entailed in providing support services for livestock and meat industries, such as pest and disease control, are also largely a reflection of levels of income that constrain levels of demand for services and the capacity of these countries to supply public goods. This point is illustrated by the scarcity of veterinarians and their assistants in many developing countries compared with developed countries, instanced in Table 2. The paucity of sanitary infrastructure in the livestock sector afforded by some developing countries not only reduces control over the occurrence and spread of diseases, but it can also threaten the international acceptability of veterinary certificates issued by a country, which are an essential accompaniment for exports[11]. Further, difficulties of exporting developing countries could well be exacerbated by reductions in public expenditure on veterinarian services under many structural adjustment programmes (SAPs). Of course, these same arguments would justify the establishment of technical requirements by importing countries.

23. The trend for importers to tighten their technical requirements usually obliges many exporting developing countries to use additional equipment whose cost has to be entirely charged against the meat for which it is required. Such equipment can add considerably to the exporter's fixed costs that have to be spread over far less throughput than in the major importing and exporting countries, thus raising relative costs per ton of exports. This is illustrated by a study of the United States Department of Agriculture[12] which showed that the cost of implementing an HACCP system to ensure food safety was virtually the same for all meat plants, irrespective of their scale of operation. One conclusion of this study was that, were they all required to use an HACCP system, the small plants could be put out of business.

2. Possibilities for alleviation

24. The provisions regarding special and differential treatment for developing countries in the URA address some of the difficulties mentioned in the previous sections. In particular, there are provisions in both the TBT and SPS Agreements, suggesting that the special needs of developing countries be taken into consideration by other countries in framing their technical regulations, standards and conformity assessment procedures to avoid unnecessary obstacles to exports from developing countries[13]. Under these provisions, WTO members are also committed to encouraging and facilitating the active participation of developing country members in the relevant international organizations.

25. Provision of **technical assistance** to developing countries is also specified in these Agreements. Notably, importing countries are to consider providing technical assistance to enable exporting developing countries to fulfil importers' requirements, particularly where doing so involves substantial investments (SPS Article 9 and TBT Article 11 which includes the specification of priority to the needs of least-developed countries). However, the foregoing provisions do not oblige members to actually provide special and differential treatment or technical assistance, even when it is recognized that importers' requirements can impose serious burdens on developing countries. For instance, the burden placed on an exporter by the importer's requirement for the level of a herbicide residue in meat to be less than one part in 10 million, could be reduced by the importer contributing to the costs of compliance certification. The burden could be even nullified by waiving the requirement for certification for those areas in exporting countries where the use of the herbicide is negligible.

26. The provision whereby exporters can seek acceptance of products from areas within their territories that are claimed to be pest-or disease-free areas or areas of low pest or disease prevalence

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[11] The OIE provides for international cooperation in these matters and its recommendations are compiled in its Animal Health Code publication.

[12] Williams, R., Zorn, DJ. 1994. New Inspection Programme for the Nation's seafood. Food Review, 17(2), 32-35.

[13] Agreement on Technical Barriers to Trade, Article 12 and the Agreement on Application of Sanitary and Phytosanitary Measures, Article 10.

(SPS Article 6) will be especially advantageous for developing countries. However, the benefit of this approach could be increased if it were extended to other localized phenomena, such as the occurrence of contamination and residues. Developing countries would benefit from such extensions enabling waivers from applying onerous testing and control procedures for substances that are highly unlikely to be found in specific locations. This is illustrated by the fertilizer usage in plant production, also shown in Table 2, which indicates that levels of application of agricultural chemicals in many developing countries are far below those in developed countries as a whole.

27. From the foregoing it would seem that many exporting developing countries are likely to continue to encounter severe difficulties in complying with even the most essential requirements of importing countries. Thus, further action would be needed if these countries are to expand their participation in international trade. Major areas for attention would include:

- assembly of comprehensive data on technical requirements, standards and regulations likely to affect trade in livestock and meat, so as to improve the flow of information to exporters;
- improvements in the performance of disease control programmes that will reduce their cost;
- design and implementation of cost-efficient strategies for reducing the levels of risk exposure to those tolerable in import markets. An approach such as the HACCP should enable exporters and importers to apply more appropriate and effective measures in eliminating hazards;
- development, adoption and acceptance of testing technologies that seem to offer substantial cost savings. These could well reduce the burden of testing livestock and meat samples to ensure compliance with importers' requirements and provide reliable, low cost, analyses of product composition;
- expanding the "transitivity" of approvals, whereby one importer's acceptance of an exporter's meat trade arrangements would be accepted by other importing countries as sufficient to fulfil their own requirements;
- additional action to alleviate the cost disadvantages of small scale exporters and new entrants to the international market, including schemes for their preferential access to import markets, on grounds of smallness as well as their low income levels, akin to access to the EC market for beef from the African, Caribbean and Pacific (ACP) countries under the Lomé Convention.

28. The Group may wish to assist in the monitoring of the difficulties faced by meat exporting developing countries by:

- supporting proposals for governments of importing countries to assemble and release more comprehensive information on trade control measures related to meat and livestock and specifically those that are technically orientated;
- requesting that members continue to provide the Secretariat with examples of their difficulties, additions to compliance costs and proposals for alleviating these;
- requesting the Secretariat to continue to assemble and analyze information on problems and actions in this field, in liaison with the relevant international organizations, and to report on the results to the Group at future Sessions within its regular reviews of developments under the Guidelines for International Cooperation in the Livestock and Meat Sector.

ANNEX A

Risk Assessment

29. The Agreement on the Application of Sanitary and Phytosanitary Measures defines risk assessment as:

> "The evaluation of the likelihood of entry, establishment or spread of a pest or disease within the territory of an importing Member according to the sanitary or phytosanitary measures which might be applied, and of the associated potential biological and economic consequences; or the evaluation of the potential for adverse effects on human or animal health arising from the presence of additives, contaminants, toxins or disease-causing organisms in food, beverages or feedstuffs" (Agreement, Annex A).

30. The risk assessment approach and the required evaluation methods have recently received considerable attention and are an integral part of the work of Codex Alimentarius and of the Secretariat of the International Office of Epizootics. In particular, this approach is reflected in the Codex Alimentarius "Recommended International Code for Hygienic Practice for Fresh Meat" and in its "Recommended International Code for Ante-mortem and Post-mortem Inspection of Slaughter Animals and for Ante-mortem and Post-mortem Judgement of Slaughter Animals and Meat"[14].

31. These codes include the recommendation that their application be embodied in a Hazard Analysis Critical Control Point (HACCP) plan, utilizing risk analysis. The Commission has also considered and endorsed a report on its use of risk assessment (ALINORM 93/37). In its review of this report the Commission stressed "the importance of communicating the outcome of all risk analysis work undertaken by Codex to those *developing countries* that did not have the measures to carry out such activities"[15].

32. The International Office of Epizootics has provided for the eventual inclusion of a chapter on risk assessment in its International Animal Health Code: Mammals, Birds and Bees (1992). It also devoted the December 1993 issue of its Scientific and Technical Review to 17 papers on "Risk analysis, animal health and trade". This issue includes examples of the application of risk analysis.

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[14] Codex Alimentarius Commission, (1993), *Codex Alimentarius Volume Ten, Meat and Meat Products including Soups and Broths*, FAO and WHO, Rome.

[15] Report of the Twentieth Session, (1993), Document: ALINORM 93/40, para. 69.

Table 1: Exports of livestock, meat and all agricultural products-selected developing countries [1/] averages 1989-1993

	Livestock	Meat	Total	Livestock and meat as share of all agricultural exports
	(..... US$ million .....)			(... percent ...)
BOTSWANA	0	65	65	76
BURKINA FASO	11	0	11	12
CENTRAL AFRICAL REPUBLIC	16	0	16	35
CHAD	36	0	36	31
GUINEA	14	0	14	44
MALI	86	0	86	34
MAURITANIA	38	0	38	97
NAMIBIA	85	39	124	94
NIGER	39	0	39	68
SOMALIA	49	0	49	76
SUDAN	60	0	60	12
COSTA RICA	1	51	52	6
DOMINICAN REPUBLIC [2/]	0	24	24	7
MEXICO	343	37	380	13
NICARAGUA	4	45	49	25
ARGENTINA	9	799	808	12
BRAZIL	7	947	954	11
PARAGUAY	1	76	77	12
URUGUAY	21	245	266	38
CHINA (MAINLAND)	433	716	1,149	12
CHINA (TAIWAN)	1	886	887	42
INDIA	13	85	98	3
KOREA REPUBLIC OF	0	66	66	6
LAOS	21	0	21	69
MONGOLIA	29	30	59	53
THAILAND	4	380	384	6
TURKEY	215	22	237	7
VANUATU	0	4	4	29
VIET NAM [2/]	0	29	29	4
Countries listed:				
- total	1,536	4,546	6,082	13
- as a % of developing	76%	91%	87%	
DEVELOPING COUNTRIES	**2,028**	**5,002**	**7,030**	**8**
DEVELOPED COUNTRIES	**6,838**	**30,657**	**37,495**	**16**
WORLD	**8,866**	**35,659**	**44,525**	**14**

1/ General criteria: either exports of livestock and beef were over $50 million a year, or the excess of these exports over imports was greater than 10 percent of total agricultural exports.
2/ These countries were included to widen the analysis though they did not fall within the statistical selection criteria under 1/ above.

Table 2: Selected economic indicators and fertilizer use in major livestock and meat producing developing countries [1/]

	GNP per caput 1993	Life expectancy at birth 1992	Access to save drinking water 1990	Fertilizer use 1991/92	Veterinary personnel 1993	
					Government veterinarians	Veterinary assistants all
	(..US$..)	(Years)	(% of pop.)	(kg/ha) [4/]	(per million livestock [5/])	
Africa						
Botswana	2,590	68	90	0.6		
Burkina Faso	300	48	70	7.2	3	26
Centr. African Rep.	390	47	24	0.4		
Chad	200	47	57	2.7		
Guinea	500	44	52	2.7	...	...
Mali	300	48	11	7.1		
Mauritania	510	48	66	7.3	3	4
Namibia	1,660	59	47	...	4	38
Niger	270	46	53	0.1	3	74
Somalia	...	49	36	...		
Sudan	...	52	34	7.2	21	20
Central America						
Costa Rica	2,160	76	93	227.6	46	49
Dominican Rep. [2/]	1,080	68	68	67.1		
Mexico	3,750	70	81	62.6	42	0
Nicaragua	360	67	55	27.3	31	70
South America						
Argentina	7,290	71	64	6.1	40	35
Brazil	3,020	66	86	52.7	12	38
Paraguay	1,500	67	79	8.8	40	140
Uruguay	3,910	72	95	60.4	9	19
Asia						
China	490	69	72	304.3	33	375
India	290	61	73	75.2	65	147
Korea Rep.	7,670	71	93	51.7	78	0
Laos	290	51	28	2.8		
Mongolia	400		...	11.5	32	98
Thailand	2,040	69	77	36.5	26	...
Turkey	2,120	67	84	63.8	31	43
Vanuatu	1,230	63	...		20	5
Viet Nam [2/]	170		...			
High-income countries [3/]	...	77	100	116		
United States					25	91
Germany					42	288
Italy					165	0
Netherlands					15	170
United Kingdom					17	58
Average						

1/ General criteria: either exports of livestock and beef were over $50 million a year, or the excess of these exports over imports was greater than 10 percent of total agricultural exports.
2/ These countries were included to widen the analysis though they did not fall within the statistical selection criteria under 1/ above.
3/ World Bank definition.
4/ Hectares of usable land.
5/ The total reported population of cattle, sheep, goats and pigs,exluding poultry.
Sources: WorldBank, Atlas 1995 for column 1.
World Bank, World Development Report 1994, for columns 2 to 4.
FAO, OIE,WHOAnimal Health Yearbook, 1993,for columns 5 and 6.