

Quantitative analysis of global veterinary human resources

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Submitted for publication: 25 September 2002

Accepted for publication: 15 May 2003

Summary

This analysis of global veterinary personnel was based on the available quantitative data reported by individual countries to international organisations. The analysis begins with a time series of globally reported numbers of veterinarians, starting in the year 1959 (140,391). In 2000 this number reached 691,379. Of this total, 27.77% of veterinarians were working as government officials, 15.38% were working in laboratories, universities and training institutions and 46.33% were working as private practitioners. The ratio of veterinarians to technicians was 1:0.63.

The global average of resources serviced by each veterinarian was as follows: 8,760 inhabitants; 189 km² of land area and 20 km² of arable land; 1,925 cattle, 242 buffaloes, 87 horses, 1,309 pigs, 1,533 sheep and 20,714 chickens; in abattoirs: 401 slaughtered cattle, 699 slaughtered sheep and 1,674 slaughtered pigs; the production of 336 tonnes (t) of meat, 708 t cow milk and 74 t hen eggs; in international trade: 12 cattle, 23 sheep, 22 pigs, 1 horse, 1,086 chickens, 33 t meat and meat products; 2,289 units of livestock (50 minutes of annual veterinary working time for each unit).

These averages were also analysed according to employment categories. The author also discusses factors influencing veterinary personnel analyses and planning.

Keywords

Global analysis – Human resources development – Information systems – Veterinarian – Veterinary human resources – Veterinary manpower – Veterinary service – Veterinary technician – Veterinary workload.

Introduction

The decisive factor in effective animal health services is the availability of veterinary personnel in terms of quantity and quality. A shortage of qualified veterinarians and support staff can be a serious obstacle to the control of animal diseases, as well as to husbandry and trade in animals and animal products (3). Veterinary human resources are of primary importance for the successful application of strategies, measures and methods to promote, protect and restore animal health. They are the driving force behind the effective transfer of modern technology (based on the results of scientific research) and accumulated experience into general practice.

The purpose of this paper is to try to evaluate the global veterinary human resources situation, using the available data reported by individual countries to international organisations.

The differences in the absolute numbers provided by individual countries were considerable, mainly due to their size. Therefore, this analysis concentrated on a global summary of veterinary personnel only. The average values of selected indicators for each veterinarian reflected, to a certain extent, the workload of veterinarians and the range of joint responsibility for the health of animal populations and the protection of human health from diseases transmissible from animals.

The global information system on veterinary human resources was established by H. Königshofer in 1959, within the framework of a joint venture between the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO) and the OIE (World organisation for animal health). They produced the FAO/WHO/OIE *Animal Health Yearbook* (2), published by the FAO in Rome. In 1996, the OIE in Paris took over this role (8). In 1971, a study relating the number of veterinarians to the domestic animal population

was conducted by Schoenherr and Meyer (9). In 1979, M. Braend (1) published an analysis of the number of veterinarians in relation to the following elements in 93 selected countries (without a global summary):

- livestock units (LUs)
- the human population
- milk and meat production
- gross national product.

This paper represents a continuation of the global analyses for the years 1977 and 1979 conducted by the author, using the available data from that period concerning the number of veterinarians (6, 7). However, this study does not examine further details about the types of employment of these veterinarians or relate these data to the size of the population concerned, or animal production and trade.

Materials and methods

This study employed the available data on veterinary human resources which have been published in relevant international documents. From the first year in which such data were collected, 1959, until the year 1982, veterinary personnel data gathered internationally were limited to the 'total number of veterinarians', published in the *FAO/WHO/OIE Animal Health Yearbook* (2). In 1983, the author, who was at that time the editor of the *Yearbook*, introduced additional criteria to reflect the employment structure of Veterinary Services more accurately. The total number of veterinarians was further divided into the following categories:

- government veterinary officials at central and local levels
- veterinarians working in laboratories, universities and training institutions
- veterinarians working as private practitioners
- other veterinarians.

Simultaneously, the human resources information system was complemented by including the total number of technical personnel, in particular: animal health assistants, animal health auxiliaries and food hygiene technicians. This same system is still in use today.

The data on veterinary personnel from 1996 onwards were collected as previously, by using a common OIE/FAO/WHO questionnaire, but published only by the OIE in *World Animal Health* (8). For the time series from 1959 to 2000, data on the global numbers of veterinarians were used from both yearbooks, i.e., the *FAO/WHO/OIE Animal Health Yearbook* published by the FAO and *World Animal Health* published by the OIE.

Not all reported data were complete or had been systematically updated. Some reports were only estimates. The summary data were significantly influenced by the countries with greater

numbers of veterinarians, such as the United States of America, the former Union of Soviet Socialist Republics (USSR), and the People's Republic of China. Some countries sent more than one report, for example, Malaysia (for the Peninsular, Sabah and Sarawak), and the United Kingdom (for Great Britain, the Channel Islands, the Isle of Man and Northern Ireland), thus increasing the number of reports. Other influences on these data included reports from newly emerging independent countries, due to the division of former geographic entities (e.g., the former USSR).

For more detailed analysis, the year 2000 was selected. However, not all countries sent relevant reports for that year. To obtain the most complete global data possible, the most recent reports available from those countries before the year 2000 were used to substitute the missing information. In addition, statistical publications from the FAO on animal populations, production and trade were used to calculate the different global average values (ratios) per veterinarian. These publications included the *FAO Quarterly Bulletin of Statistics* (4) and the FAO Statistical Databases (FAOSTAT) (5).

The following criteria were selected for analysis:

- the number of inhabitants
- the total land area
- the number of animals
- the number of slaughtered animals
- the volume of livestock production
- the numbers/volume and value of internationally traded live animals and animal products.

Also included among these criteria were livestock units, calculated using the following conversion rates: cattle (not including dairy cows) = 0.5; dairy cow = 1; buffalo = 0.5; horse = 1; mule or ass = 0.5; camel = 1; pig = 0.2; sheep or goat = 0.1; chicken = 0.01; other poultry = 0.01.

In all, 26,897 data on veterinary human resources were processed; 3,353 of these came from the period 1959 to 1982, and 23,544 items from the period 1983 to 2000. The software employed for the data processing included EPIZOO, version 4.0, a software package developed by the author for analysing information on animal health and diseases (www.cbox.cz/vaclavkouba/).

Results

To trace the development of global veterinary human resources over the years, a time series was produced for the period from 1959 to 2000 (Table 1). The series started in 1959, with 140,391 veterinarians reported, this figure reached 565,500 in 1995, and in 2000 there were 548,660 reported veterinarians in the world (this figure does not include the number of veterinarians in Russia or the People's Republic of China, who

Table I
Global numbers of veterinarians (government, private and total), as reported by individual countries from 1959 to 2000

| Year | Number of country reports | Reported number of veterinarians in government and private practice | | | Reports missing from these major countries |
|------|---------------------------|---|------------|---------|--|
| | | Total | Government | Private | |
| 1959 | 107 | 140,391 | | | C |
| 1960 | 106 | 151,255 | | | C |
| 1961 | 112 | 143,650 | | | C |
| 1962 | 103 | 150,297 | | | C |
| 1963 | 107 | 161,702 | | | C |
| 1964 | 116 | 161,921 | | | C |
| 1965 | 123 | 173,736 | | | C |
| 1966 | 126 | 201,434 | | | C |
| 1967 | 131 | 203,645 | | | C |
| 1968 | 137 | 210,614 | | | C |
| 1969 | 141 | 227,016 | | | C |
| 1970 | 141 | 232,437 | | | C |
| 1971 | 151 | 240,912 | | | C |
| 1972 | 152 | 236,874 | | | C |
| 1973 | 153 | 253,881 | | | C |
| 1974 | 156 | 260,734 | | | C |
| 1975 | 156 | 264,081 | | | C |
| 1976 | 157 | 259,727 | | | C |
| 1977 | 161 | 272,464 | | | C |
| 1978 | 162 | 284,314 | | | C |
| 1979 | 164 | 291,582 | | | C |
| 1980 | 163 | 303,992 | | | C |
| 1981 | 166 | 319,203 | | | C |
| 1982 | 160 | 337,128 | | | C |
| 1983 | 116 | 240,404 | 65,930 | 79,026 | C, USSR |
| 1984 | 136 | 260,711 | 96,372 | 81,581 | C, USSR |
| 1985 | 151 | 289,969 | 100,057 | 104,679 | C, USSR |
| 1986 | 154 | 310,441 | 110,577 | 107,957 | C, USSR |
| 1987 | 160 | 333,424 | 118,909 | 124,426 | C, USSR |
| 1988 | 165 | 359,501 | 125,087 | 138,481 | C, USSR |
| 1989 | 166 | 383,933 | 130,782 | 145,317 | C, USSR |
| 1990 | 165 | 403,924 | 120,642 | 166,545 | C, USSR |
| 1991 | 169 | 436,701 | 132,342 | 185,615 | C, USSR |
| 1992 | 156 | 417,463 | 128,662 | 181,908 | C, R |
| 1993 | 135 | 552,331 | 144,888 | 228,697 | R, F |
| 1994 | 110 | 520,263 | 141,317 | 215,676 | R |
| 1995 | 132 | 565,500 | 154,126 | 229,956 | R |
| 1996 | 140 | 524,342 | 151,529 | 206,761 | C, R |
| 1997 | 152 | 527,074 | 125,173 | 219,692 | C, R |
| 1998 | 145 | 530,626 | 153,995 | 226,699 | C, R |
| 1999 | 128 | 490,668 | 156,344 | 212,286 | C, R, USA |
| 2000 | 136 | 548,660 | 149,561 | 260,923 | C, R |

C: People's Republic of China
 USSR: Union of Soviet Socialist Republics (dissolved in 1991)
 R: Russia (from 1992)
 F: France
 USA: United States of America

did not submit reports that year). The trend expressed in the time series regression line was $y = -19,575,310 + 10,047.53 x$. A sharp decrease in the 1983 number was due to a fall in the number of reporting countries, and the sudden cessation of reports from the USSR. (Reports were received from the People's Republic of China only between the years 1993 and 1995.) This decrease can also be attributed to changes in the information system used to collect these data and changes in veterinary employment structure (Fig. 1).

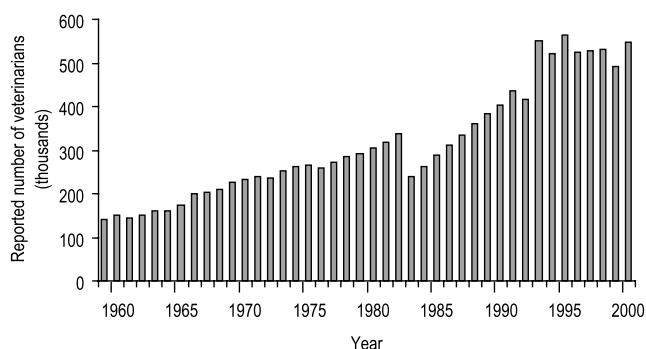


Fig. 1
Development in the total number of veterinarians as reported by individual countries, global figures from 1959 to 2000

The growth in the reported numbers of private veterinarians was much faster than the relatively slow increase in the number of government veterinarians, despite the fact that greater government supervision and more rigorous preventive and disease control measures were required, due to the rapid increase in trade which facilitated the spread of infectious diseases as never before (Fig. 2).

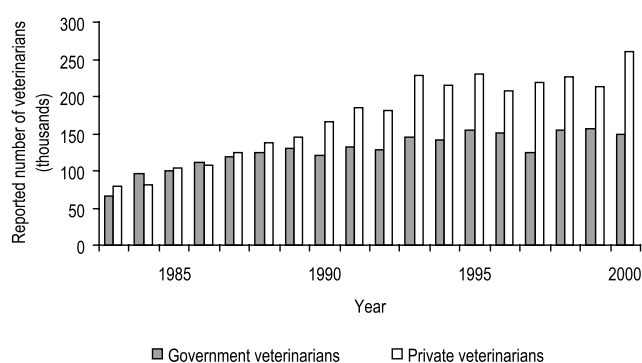


Fig. 2
Development in the numbers of government and private veterinarians, global figures from 1983 to 2000

The global number of veterinarians reported from 136 countries in the year 2000 (not including the estimated numbers from those countries which did not send reports for that year) reached 548,660, and the number of veterinary technicians was 344,533 (Table II). The ratio of veterinarians to technicians was 1:0.63.

Table II
Global structure and numbers of veterinary personnel, as reported by 136 countries for the year 2000 (not including estimated data from countries which did not submit a report)

| Structure of veterinary human resources | Number | Percentage of total |
|--|----------------|---------------------|
| Veterinarians | | |
| Government officials (central, local) | 149,561 | 27.26% |
| Veterinarians at laboratories, universities, training institutions | 63,789 | 11.63% |
| Private practitioners | 260,923 | 47.56% |
| Other | 74,387 | 13.55% |
| Total | 548,660 | 100.00% |
| Technical personnel | | |
| Animal health assistants | 114,838 | 33.33. % |
| Animal health auxiliaries | 79,159 | 22.98% |
| Food hygiene technicians | 45,620 | 13.24% |
| Others | 104,916 | 30.45% |
| Total | 344,533 | 100.00% |

The global number of veterinarians reported by individual countries for the year 2000 (including the most recently available figures for those countries which did not submit actual reports) reached 691,379 (Table III). This number is more realistic, as it includes virtually every country in the world. The reported number of veterinarians in government service was 192,020 (27.77%). The number of veterinarians employed by laboratories, universities and training institutions was 106,303 (15.38%), whereas the number of those in private practice was 320,346 (46.33%) (Fig. 3).

Table III
Global numbers and categories of veterinarians, as reported by individual countries for the year 2000 (including the latest previous data from countries which did not send actual reports)

| Category of veterinary employment | Number | Percentage |
|---|----------------|----------------|
| Government officials (central, local) | 192,020 | 27.77% |
| Laboratories, universities, training institutions | 106,303 | 15.38% |
| Private practitioners | 320,346 | 46.33% |
| Others | 72,710 | 10.52% |
| Total | 691,379 | 100.00% |

The global average numbers of inhabitants and the total land area per veterinarian, in the year 2000, were as follows:

- 8,760 inhabitants
- 3,713 people depending for their livelihood on agriculture
- 1,907 people economically active in agriculture
- 189 km² of land
- 20 km² of arable land suitable for crop production
- 2 km² of land under permanent crop cultivation (Table IV).

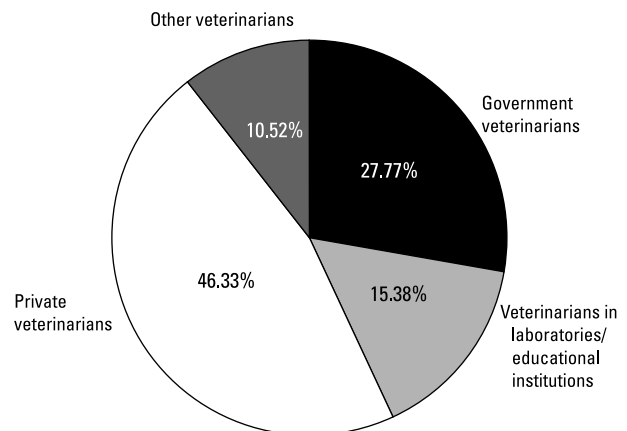


Fig. 3
Pie chart of the numbers of veterinarians in government service, in laboratories, universities and educational institutions, in private practice and elsewhere, global figures for 2000

The global average numbers of animals per veterinarian in the year 2000 were as follows:

- 1,925 cattle
- 242 buffaloes
- 87 horses
- 1,309 pigs

Table IV
Human population and land area per veterinarian, global figures for the year 2000

| Indicator | Total figure | Average figure per (category of) veterinarian | | | |
|--|---------------|---|------------|---------------------------------|---------------------|
| | | Total | Government | Laboratory/ Private institution | Private institution |
| Human population | | | | | |
| Total | 6,056,710,000 | 8,760 | 31,542 | 56,976 | 18,907 |
| Those involved in agriculture | 2,567,001,000 | 3,713 | 13,368 | 24,148 | 8,013 |
| Those economically active in agriculture | 1,318,629,000 | 1,907 | 6,867 | 12,404 | 4,116 |
| Land area (in km ²) | | | | | |
| Land area | 130,505,160 | 189 | 680 | 1,228 | 407 |
| Arable land area | 13,691,100 | 20 | 71 | 129 | 43 |
| Area under permanent crop cultivation | 1,324,050 | 2 | 7 | 12 | 4 |

- 1,533 sheep
- 1,033 goats
- 20,714 chickens (Table V).

Table V
Livestock populations per veterinarian, global figures for the year 2000

| Indicator | Total number (in 1,000s) | Average number per (category of) veterinarian | | | |
|-----------|--------------------------|---|------------|-------------|---------|
| | | Total | Government | Laboratory/ | Private |
| Cattle | 1,331,137 | 1,925 | 6,932 | 12,522 | 4,155 |
| Buffaloes | 167,035 | 242 | 870 | 1,571 | 521 |
| Horses | 60,187 | 87 | 313 | 566 | 188 |
| Mules | 14,036 | 20 | 73 | 132 | 44 |
| Asses | 43,341 | 63 | 226 | 408 | 135 |
| Camels | 18,970 | 27 | 99 | 178 | 59 |
| Pigs | 904,673 | 1,309 | 4,711 | 8,510 | 2,824 |
| Sheep | 1,060,195 | 1,533 | 5,521 | 9,973 | 3,310 |
| Goats | 714,175 | 1,033 | 3,719 | 6,718 | 2,229 |
| Chickens | 14,321,000 | 20,714 | 74,581 | 134,719 | 44,705 |

Unfortunately, global data on companion animals, which form an important part of the workload for veterinarians in private practice, were not available.

The global average numbers of animals slaughtered in abattoirs during the year 2000 per veterinarian were as follows:

- 401 cattle
- 699 sheep
- 284 goats
- 1,674 pigs (Table VI).

Table VI
Slaughtered food animals per veterinarian, global figures for the year 2000

| Indicator | Total number (in 1,000s) | Average number per (category of) veterinarian | | | |
|-----------|--------------------------|---|------------|-------------|---------|
| | | Total | Government | Laboratory/ | Private |
| Cattle | 277,445 | 401 | 1,445 | 2,610 | 866 |
| Sheep | 483,255 | 699 | 2,517 | 4,546 | 1,509 |
| Goats | 106,653 | 284 | 1,024 | 1,850 | 614 |
| Pigs | 1,157,069 | 1,674 | 6,026 | 10,885 | 3,612 |

The global average volume of livestock production during the year 2000 per veterinarian was as follows:

- 336 tonnes (t) of meat in total
- 82 t beef/veal
- 11 t mutton/lamb
- 6 t goat meat

- 130 t pork
- 65 t poultry meat
- 708 t cow milk
- 74 t hen eggs (Table VII).

Table VII
Livestock production per veterinarian, global figures for the year 2000

| Indicator | Total volume in tonnes (t) | Average volume per (category of) veterinarian | | | |
|---------------|----------------------------|---|------------|-------------|---------|
| | | Total (t) | Government | Laboratory/ | Private |
| Total of meat | 232,572,774 | 336 | 1,211 | 2,188 | 726 |
| Beef/veal | 56,588,394 | 82 | 295 | 532 | 177 |
| Mutton/lamb | 7,611,814 | 11 | 40 | 72 | 24 |
| Goat meat | 3,802,747 | 6 | 20 | 36 | 12 |
| Pork | 89,610,731 | 130 | 467 | 843 | 280 |
| Poultry meat | 44,705,717 | 65 | 230 | 421 | 140 |
| Cow milk | 489,813,622 | 708 | 2,551 | 4,608 | 1,529 |
| Hen eggs | 51,269,203 | 74 | 267 | 482 | 160 |

The global average numbers and values of internationally traded live animals during the year 2000 per veterinarian were as follows:

- 12 cattle (US\$6,004)
- 23 sheep (US\$1,146)
- 22 pigs (US\$1,844)
- 1 horse (US\$2,562)
- 1,086 chickens (US\$1,119) (Table VIII).

Table VIII
Numbers and value (in United States dollars) of internationally traded live animals per veterinarian, global figures for the year 2000

| Indicator | Total figure | Average number per (category of) veterinarian | | | |
|----------------------|---------------|---|------------|-------------|---------|
| | | Total | Government | Laboratory/ | Private |
| Number | | | | | |
| Cattle | 8,343,580 | 12 | 43 | 78 | 26 |
| Sheep | 15,966,008 | 23 | 83 | 150 | 50 |
| Goats | 2,080,778 | 3 | 11 | 20 | 6 |
| Pigs | 15,297,700 | 22 | 80 | 144 | 48 |
| Horses | 307,313 | 1 | 2 | 3 | 1 |
| Chickens | 750,740,000 | 1,086 | 3,910 | 7,062 | 2,344 |
| Value in US\$ | | | | | |
| Cattle | 4,150,838,000 | 6,004 | 21,617 | 39,047 | 12,957 |
| Sheep | 792,271,000 | 1,146 | 4,126 | 7,453 | 2,473 |
| Goats | 77,965,000 | 113 | 406 | 733 | 243 |
| Pigs | 1,274,719,000 | 1,844 | 6,638 | 11,991 | 3,979 |
| Horses | 1,771,521,000 | 2,562 | 9,226 | 16,665 | 5,530 |
| Chickens | 773,715,000 | 1,119 | 4,029 | 7,278 | 2,415 |

The global average volume and value of internationally traded animal products during the year 2000 per veterinarian were as follows:

- 33 t meat and meat products (US\$64,662)
- 3 t beef/veal (US\$5,563)
- 1 t mutton/lamb (US\$3,135)
- 3 t pork (US\$5,176)
- 9 t chicken meat (US\$8,779) (Table IX).

Table IX
Quantity (in tonnes) and value (in United States dollars) of internationally traded animal products per veterinarian, global figures for the year 2000

| Indicator | Total figure | Average number per (category of) veterinarian | | | |
|---------------------------|----------------|---|------------|-------------|---------|
| | | Total | Government | Laboratory/ | Private |
| institution | | | | | |
| Quantity in tonnes | | | | | |
| Meat and meat products | 23,083,787 | 33 | 120 | 217 | 72 |
| Beef/veal | 1,858,276 | 3 | 10 | 17 | 6 |
| Mutton/lamb | 864,621 | 1 | 5 | 8 | 3 |
| Pork | 2,300,211 | 3 | 12 | 22 | 7 |
| Chicken meat | 5,915,086 | 9 | 31 | 56 | 18 |
| Value in US\$ | | | | | |
| Meat and meat products | 44,705,815,000 | 64,662 | 232,819 | 420,551 | 139,555 |
| Beef/veal | 3,845,812,000 | 5,563 | 20,028 | 36,178 | 12,005 |
| Mutton/lamb | 2,167,134,000 | 3,135 | 11,286 | 20,386 | 6,765 |
| Pork | 3,578,863,000 | 5,176 | 18,638 | 33,667 | 11,172 |
| Chicken meat | 6,069,528,000 | 8,779 | 31,609 | 57,096 | 18,947 |

The global average number of LUs per veterinarian was 2,289. The number of LUs for each government veterinarian was 8,242 and per veterinarian in private practice, 4,940 (Fig. 4).

When dividing the total annual working time of all veterinarians (that is, 48 working weeks, each week comprising 5 working days, each day comprising 8 working hours, multiplied by the global number of veterinarians) by the global number of LUs, then, in theory, each unit would require a very approximate, average annual working time of 50 minutes. The estimate for government veterinarians would be 14 minutes, whereas for those in private practice, it would reach 23 minutes.

Discussion

These results have to be understood as estimates only, and very approximate representations of reality. Not all countries sent in

up-to-date reports. The data from several countries were inexact, due to the following:

- deficiencies in reporting and administration systems
- changes in information gathering systems
- varying interpretations of the indicators, etc.

However, the term 'veterinarian' was well defined as 'a person who has graduated from a university-level veterinary school'. The data on veterinarians working as government officers were supported by the documentation required for their salaries on the national payroll. Correspondingly, the data on veterinarians in non-governmental categories were less exact. Data on 'other veterinarians' were not reported uniformly. This category included the following sub-categories:

- veterinarians employed in co-operatives
- veterinarians employed by private livestock companies
- veterinarians employed in the food processing, pharmaceutical and other industry sectors
- veterinarians working in the army
- veterinarians working abroad
- veterinarians working part-time
- veterinarians who were not currently practising because they were working in non-veterinary jobs, retired, unemployed, etc.

The first comparable analysis of global veterinary human resources was conducted for the year 1977. This analysis presented the following averages per veterinarian:

- 11,623 inhabitants
- 1,908 people who were economically active in agriculture
- 11,143 production animals (mammals)
- 4,413 slaughtered animals (mammals)
- 14,587 ha permanent meadows, pastures and arable land
- 3,984 LUs.

The average working time per unit of livestock was estimated at 30 minutes annually (6). Comparison of these values with those from the year 2000 demonstrates the progress that has been made in global veterinary human resources capacity.

This kind of analysis can provide a comparative basis for planning in human resources development, that is, for identifying future educational needs. For this purpose, it is also necessary to analyse influencing factors. Among these influencing factors are the following:

- the size and structure of animal populations
- the average size of herds and flocks
- the prevailing systems and technologies for livestock production

This sub-programme, using the data structure of the *FAO Production Yearbook*, calculates the following indicators:

- 1) average number of animals per territory unit
- 2) average number of animals per inhabitant
- 3) average number of animals per veterinarian
- 4) total number of livestock units
- 5) average number of livestock units per territory units
- 6) average number of livestock units per inhabitant
- 7) average number of livestock units per veterinarian
- 8) average number of territory units per veterinarian
- 9) average number of inhabitants per veterinarian

Enter choice number: 7

INPUT DATA:

Territory, time? world, 2000

| | |
|---|----------------------------------|
| Number of cattle total, dairy cows, buffaloes | ? 1331137000,229926000,167035000 |
| Number of horses, mules/asses, camels | ? 60187000,57377000,1897000 |
| Number of sheep, goats, pigs | ? 1060195000,714175000,904673000 |
| Number of chickens, other poultry | ? 14321000000,1126000000 |
| Total veterinarians | ? 691379 |
| Government veterinarians | ? 192020 |
| Private veterinarians | ? 320346 |

Livestock units rates:

a) Conversion rates 'a':

Cattle (without dairy cows) = 0.5; dairy cows = 1; buffaloes = 0.5; horses = 1; mules/asses = 0.5; camels = 1; sheep = 0.1; goats = 0.1; pigs = 0.2; chicken = 0.01; other poultry = 0.01.

b) Conversion rates 'b':

Cattle = 0.7; buffaloes = 1; horses = 1; mules/asses = 0.8; camels = 1.1; sheep = 0.1; goats = 0.1; pigs = 0.25; chicken = 0.01; other poultry = 0.01

Which conversion rates do you wish? Rates 'a' or 'b' or other ones 'o'? a

Results:

Territory: world Time: 2000

Total livestock units = 1582626176

| | | |
|----------------------------|---|--------|
| Total veterinarians | = | 691379 |
| Governmental veterinarians | = | 192020 |
| Private veterinarians | = | 320346 |

Average number of livestock units per veterinarian

| | Veterinarian | Governmental veterinarian | Private veterinarian |
|-----------------|--------------|---------------------------|----------------------|
| Livestock units | 2289 | 8242 | 4940 |

Fig. 4
An example of how to calculate the number of livestock units per veterinarian, using EPIZOO computer software (version 4.0, subprogram 11.11)

- the use of animals in agricultural work and for transport
- the situation in regard to animal health and diseases (particularly infectious diseases) and those programmes which have been established to control them
- the extent of veterinary involvement in:
 - a) the keeping of companion animals
 - b) the control of zoonoses
 - c) food hygiene
 - d) animal husbandry, etc.
- the use made of auxiliary personnel
- the ratio between preventive and curative practice
- the ratio between veterinary services in rural areas and those in urban areas
- the organisation and management of the Veterinary Service concerned and the legislation relevant to the Service
- the availability of diagnostic laboratories, transportation and material and financial resources
- the availability of education and training facilities
- the expected cost/benefit of veterinary human resources, etc.

Additional influencing factors include:

- the living standard of the human population
- the level of economic development of the country
- the technical competence and experience of animal owners
- the volume of national trade in animals and animal products
- the volume of exports/imports of animals, etc.

Conclusion

Calculating the average values of selected criteria per veterinarian can be useful for comparative studies when assessing the ability of the Veterinary Services concerned to cope with animal health problems and in planning for future human resources. However, it is difficult to make an objective

comparison of the different veterinary personnel situations in different countries. Every country has different veterinary personnel conditions and needs, is at a different stage of development in its Veterinary Service, and employs a different structure of veterinary staff categories (often mutually overlapping). Therefore, the impracticability of setting a fixed and uniform international quantitative standard for Veterinary Services should be recognised.

However, a correct assessment of veterinary human resource requirements is nonetheless essential for meaningful predictions and planning in regard to the development of veterinary staff and for decisions on the future numbers, types, capacities and programmes of educational and training institutions.

The author recommends that the following data be included in future international veterinary information systems:

- the number of ‘accredited veterinarians’ who issue official certificates, on behalf of the government, for national and international trade (i.e., who play a key role in preventing diseases spread through trade)
- the number of women veterinarians
- the number of veterinarians in specific professional fields
- the number of newly graduated veterinarians.

The results of this type of analysis can provide a departure point for the future international evaluation of veterinary human resources development, as well as for the orientation of comparative studies required for national veterinary staff planning.

Analyse quantitative des ressources humaines vétérinaires dans le monde

V. Kouba

Résumé

Cette analyse des ressources mondiales en personnel vétérinaire se fonde sur les données quantitatives fournies par les différents pays aux organisations internationales. Dans un premier temps, l'auteur fait état du nombre de vétérinaires recensés au niveau mondial, qui est passé de 140 391 en 1959, au début de la série chronologique considérée, à 691 379 en 2000. Dans cet effectif total, 27,77 % étaient des fonctionnaires, 15,38 % travaillaient dans des laboratoires, des universités ou des établissements de formation et 46,33 % s'étaient installés à leur compte. Le rapport entre les vétérinaires et les techniciens était de 1 pour 0,63.

Le champ de compétence de chaque vétérinaire s'exerce en moyenne sur 8 760 habitants, un territoire de 189 km² et 20 km² de terres arables ; 1 925 bovins, 242 buffles, 87 chevaux, 1 309 porcins, 1 533 ovins et 20 714 poulets ; l'abattage (en abattoir) de 401 bovins, 699 ovins et 1 674 porcins ; la production de 336 tonnes (t) de viande, 708 t de lait de vache et 74 t d'œufs de poule ; le commerce international de 12 bovins, 23 ovins, 22 porcins, 1 cheval, 1 086 poulets, 33 t de viande et de produits carnés ; 2 289 unités de cheptel (50 minutes par an et par unité du temps de travail du vétérinaire).

Ces valeurs moyennes ont également été analysées par catégorie d'emploi. En outre, l'auteur étudie les facteurs qui influent sur les analyses et la gestion du personnel vétérinaire.

Mots-clés

Analyse globale – Charges de travail du vétérinaire – Développement des ressources humaines – Systèmes d'information – Ressources humaines vétérinaires – Services vétérinaires – Techniciens vétérinaires.



Análisis cuantitativo del personal veterinario en el mundo

V. Kouba

Resumen

El autor describe un análisis de los recursos humanos veterinarios en el mundo, realizado a partir de las cifras que los países han ido comunicando a organizaciones internacionales. El análisis parte de una serie cronológica del número total de veterinarios de los que se tiene constancia en el mundo desde 1959 (140.391). En 2000, esa cifra se elevaba a 691.379 veterinarios, de los cuales un 27,77% trabajaba en servicios oficiales, un 15,38% en laboratorios, universidades y establecimientos de formación y un 46,33% lo hacía por cuenta propia. El cociente entre veterinarios y técnicos era de 1 a 0.63.

En cuanto a los recursos que cada veterinario cubría, se obtuvieron los siguientes promedios mundiales: 8.760 habitantes por veterinario; 189 km² de superficie y 20 km² de tierra cultivable; 1.925 bovinos, 242 búfalos, 87 caballos, 1.309 cerdos, 1.533 ovinos y 20.714 pollos; el número de sacrificios en matadero se cifró en 401 bovinos, 699 ovinos y 1.674 cerdos por veterinario; la producción fue de 336 toneladas (t) de carne, 708 t de leche de vaca y 74 t de huevos de

gallina; en cuanto al comercio internacional, a cada veterinario correspondieron 12 bovinos, 23 ovinos, 22 cerdos, 1 caballo, 1.086 pollos y 33 t de carne y productos cárnicos; por último, había 2.289 unidades ganaderas por veterinario (50 minutos anuales de servicios veterinarios por unidad).

Esos promedios fueron analizados asimismo por categorías de empleo. El autor describe además los factores que influyen en los análisis y la planificación del personal veterinario.

Palabras clave

Análisis mundial – Desarrollo de los recursos humanos – Recursos humanos veterinarios – Servicios veterinarios – Sistemas de información – Técnicos veterinarios – Volumen de trabajo de la profesión veterinaria.



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