

From the Marshall plan to present day prosperity: veterinary medicine in the Netherlands 1945–2000

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Introduction

For a long time, veterinarians used to do their work rather inconspicuously. The inner circle of the veterinary world was virtually unknown to the public. However, due to the recent outbreaks of BSE and swine fever and the changing human-animal relationships, public attention is increasingly being focused on veterinary medicine. The public interest in the profession has also grown due to the increasingly important role that animals play in present-day western society (Fogle, 1999). Along with this growing public interest in veterinary medicine, the concern for the societal responsibilities, position and image of veterinarians has also increased. Throughout the past two decades, the veterinary profession has become the subject of study for several other disciplines (Lawrence, 1991; Swabe, 1999). Inevitably, these studies also focus on the long-term development of veterinary sciences, the veterinary profession and policy, veterinary traditions, and thus also the history of veterinary medicine. As an integral part of the history of sciences, veterinary medicine has thus far only received limited attention. Veterinary history studies have predominantly focused on institutional history and biographies (Brumme, 1997; Brumme and Schäffer, 1993), while these were often written to provide a functionalist account of veterinary professionalisation. Recently, more attention has been paid to the social and political history of veterinary medicine (Brumme and von Mickwitz, 1997; Fisher, 1998; Schäffer, 1998). In this paper, the development of Dutch veterinary medicine in the second half of the twentieth century will be explored. During this period, the Netherlands developed to a modern welfare state. The history of veterinary medicine will be examined within that societal context. The issues of post-war reconstruction, restoration and growth of livestock production, veterinary public health, differentiation and specialisation, faculty and education, and feminisation of the profession will be dealt with respectively.

Post-war reconstruction

On May 5th 1945, the Netherlands was liberated. Apart from the human tragedy and casualties, a considerable part of the infrastructure, agriculture and industry had been devastated (Koolmees, 1998, 2000a). When the Dutch government returned from exile in London, it was confronted with a disrupted country. Of all the allied countries in Western Europe, the Netherlands had suffered the most as a consequence of the war. The material war-damage amounted a total of 25 billion Dutch guilders. For the agricultural sector the damage was estimated at 700 million guilders. More than 6,000 farms had been destroyed. The most urgent problem with which the authorities were confronted after the harsh 'Hunger Winter' of 1944–1945 was that of food supply. With the aid of foreign countries, the food supply was restored soon after the war and in the course of 1946 the worst local devastation was repaired. The political economy was aimed at exports and industrialisation and characterised by scarcity and sobriety. Under these conditions, the restoration of the infrastructure proceeded and production in all economic sectors was restored surprisingly quickly. However, the main export markets for Dutch products, particularly Germany and the Netherlands East Indies had disappeared. This resulted in shortages on the balance of payments. Like many other European countries, the Netherlands could no longer afford to pay for the necessary imports of raw materials, foods, capital goods, machines, etc. from their gold reserve and export income. In the course of 1947, a total economic collapse was feared (Anon., 1954; van der Hoeven, 1997).

On June 5th 1947, the United States Secretary of State George C. Marshall (1880–1959) held a lecture about the recovery of post-war Europe at Harvard University. Here, for the first time he outlined the main principles of the European Recovery Plan (ERP), now known as the 'Marshall Plan'. The message was quite simple. 'Europe's requirements for the next three or four years of foreign food and other essential products – principally from America – are so much greater than her present

ability to pay, that she must have substantial additional help or face economic, social and political deterioration of a very grave character' (Anon., 1954). The Marshall plan was launched to restore the economies by removing essential shortages and promoting international economic co-operation in Europe. In the period 1948–1952, the Organisation for European Economic Cooperation (OEEC), which administered the Marshall plan divided 14.6 billion dollars of American aid among 17 countries. The Netherlands received 1.1 billion dollars (7.7%) of this amount. The Marshall plan provided the Netherlands with foreign currency and investments, enabling it to pay for imports that were indispensable for economic recovery (van der Hoeven, 1997).

Restoration and growth of livestock production

At the end of World War II, livestock numbers as well as the number of pets had significantly decreased in the Netherlands. Consequently, there was not much work left for veterinary practitioners. This situation improved quickly when veterinarians became involved in the restoration of the food supply. The government devoted much attention to the reconstruction and modernisation of the agricultural sector in general and livestock production in particular. Consequently, about 1.0 billion guilders from Marshall aid were used to fund several projects in the agricultural sector in order to increase the food supply as well as exports. Due to imports of animal feed, crop seeds, fertilisers, tractors and other machinery, animal production increased from 1948 onwards (Fig. 1). Apart from international co-operation imposed by measures stemming from the Marshall Plan, the economic recovery of the Netherlands was further stimulated by trade liberalisation within the Benelux (1948

and EEC (1958) framework. Livestock production and meat exports were strongly stimulated by the 1964 EEC Directives 64/432 on EEC trade in live pigs and bovines and 64/433 on fresh red meat. Between 1950 and 1990, animal production constituted between 60–70% of the total agricultural product. In the 1960s and 1970s, much emphasis was put on intensive livestock production systems. Further specialisation and mechanisation of agriculture and food industry resulted in a spectacular growth of meat, milk and eggs production. Due to environmental regulations on nitrogen output, fixed milk quotas and public criticism on industrialised farming and its negative consequences for animal welfare, livestock numbers started to decrease in the late 1980s until the present day (Knibbe, 1999). This trend is likely to continue due to increasing strict environmental and EC veterinary-sanitary regulation and public and political concern for food safety and welfare of production animals.

From the early 1950s onwards, increasing animal production brought about some fundamental changes in veterinary medicine. Several veterinary institutes and research programmes were established and financed. Agriculturists and veterinarians played an important role in the scientific research of modern livestock production systems, particularly regarding the exponents of factory farming namely pigs and poultry. Veterinary research focused on animal feeds, new housing systems, breeding, artificial insemination, blood-typing and vaccination. Animal husbandry was rationalised by labour-saving mechanisation and an increase in scale. The concentration of large groups of production animals and the increase in scale that accompanied industrialised intensive livestock farming, involved a higher risk of outbreaks of animal diseases. Consequently, the post-war rise of herd-health management brought about a shift from a curative to a preventive approach for veterinary practitioners (Offringa, 1981; Renkema, 1995).

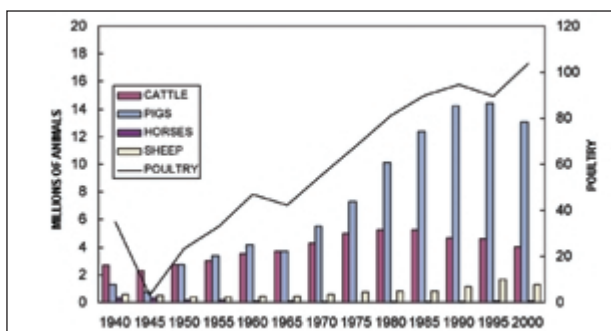


Figure 1: Development of livestock (in millions) in the Netherlands in the period 1940–2000. (Sources: 1899–1994 *Vijftienveertig jaren statistiek in Nederland in tijdreeksen*. CBS, 's-Gravenhage 1994, 66; Internet site CBS, The Hague; C. Offringa. *Van Gildestein naar Uithof. 150 jaar diergeneeskundig ondewijs in Utrecht. Faculteit der Diergeneeskunde, Rijksuniversiteit Utrecht. Vol. 2. Utrecht 1981, 184*).

Control of livestock diseases

The organised campaigns against livestock diseases were an impressive achievement of post-war Dutch veterinary medicine. The fight against bovine tuberculosis had already begun before the war on a local level, especially in the Province of Friesland where the Friesian Cattle Health Service had been active since 1919. In addition to the Friesian Health Service, ten Provincial Animal Health Services were established in the period 1946–1947 with the primary objective of combating livestock diseases.

These services were set up as farmer-based organisations financed by the government and through a levy on milk. Farmers participated in the boards of the services, which were headed by veterinarians (Hofman, 1996).

A five-year nation-wide programme was launched to eradicate tuberculosis in 1951. This programme was facilitated by a Tuberculosis-Law that was adopted by Parliament in the same year. According to this law, farmers were prohibited from keeping bovines unless they joined an Animal Health Service. A fund was established to compensate the farmers for losses they suffered by slaughtering the animals, which gave a positive tuberculin-test reaction. Over a five-year period, the cattle breeders' organisation collected 50 million guilders through the extra levy on milk. The Government decided to spend an identical sum of money from the Marshall-plan on tuberculosis eradication. Millions of animals were tested and thousands were slaughtered. The campaign turned out to be a complete success, the incidence of tuberculosis was reduced from about 30% in the wartime period to 0.2% in 1956. The confidence of the farmers was won over by this success and the Health Services enjoyed considerable higher prestige among farmers. Apart from tuberculosis, the Animal Health Services proved to be very efficient and successful in organising campaigns against other livestock diseases like brucellosis, foot and mouth disease, warble fly, swine fever, *Salmonella pullorum* and Newcastle disease. An outbreak of foot and mouth disease was successfully eradicated in 1953 by a new vaccine developed by Dr. H.S. Frenkel (van den Born, 1954; Frenkel, 1954).

The development of intensive livestock production and the organised campaigns against animal diseases changed daily work for practitioners. The same goes for the function of veterinarians active in research and management in the post-war period. The campaigns brought along a lot of diagnostic and preventive work for practitioners, as well as the introduction of antibiotics and new types of veterinary drugs like sulfonamides. Next to the increasing employment in veterinary practices, more than 50 vets were appointed to the Provincial Animal Health Services. Apart from some minor outbreaks of contagious diseases, such as tuberculosis, brucellosis, and foot and mouth disease, these epizootics were kept under control until the late 1990s due to close cooperation between the State Veterinary Service, the Provincial Animal Health Services and the Central Veterinary Institute at Lelystad (Anon., 1971; Zuijdman et al., 1962).

The development of animal production and exports of foods of animal production proved to be quite successful and contributed considerably to

the national income during the 1970s and 1980s. However, by that time more and more critics argued that the limits to mass production in the livestock industry had been reached. Both the livestock industries and the veterinary profession were faced by challenges of concerned consumers, animal rights activists, and environmental lobbyists. Dutch veterinarians have shared in the poor image of factory farming and the meat industry. They were and are still seen as having been active in increasing animal production, but passive with regard to the negative effects of intensive farming and animal welfare. In 1997–1998, the Netherlands was confronted with a severe epidemic of classical swine fever. Due to the non-vaccination policy of the EU the Dutch authorities had to rely on a stamping out policy. As a result hundreds of thousands of healthy piglets were killed, while the same numbers of infected or suspected pigs had to be destroyed. Apart from the economic damage, which was estimated at 3.5 billion guilders, the epidemic resulted in broad public criticism on intensive pig farming in certain areas of the country and on veterinarians who had to kill healthy animals. It also led to tensions and concern within the veterinary profession, particularly between practitioners of the pig farmers and official veterinarians responsible for the stamping-out policy. It became clear that today animal health and welfare, consumer and environmental protection all have to be taken into account in livestock production as well as economic factors (Anon., 1998; Blokhuis et al., 2000; Koolmees et al., 1999; Pluimers et al., 1999).

The swine fever epidemic negatively influenced the image of animal production in general and pig farming in particular. Discussions on animal welfare and sustainable animal production brought about a change in the policy concerning livestock production. The Dutch government issued several measures to further reduce livestock numbers. In Fig. 1 it can be seen that since 1985 the number of cattle decreased while the amount of pigs dropped since 1995. Today, many Dutch veterinarians consider lower livestock numbers as a threat to the profession.

Veterinary public health

Veterinary public health became increasingly important during the period described due to a higher consumption of and an increasing international trade in foods of animal origin. Until the 1960s, the traditional concept of meat inspection proved to be quite successful. In the 1940s and 1950s Dutch veterinary authorities were satisfied with the way in which meat inspection had developed since the

enactment of the Meat Inspection Act in 1922. Meat inspection became much more effective, because of centralised slaughtering under professional supervision. The health status of animals had improved considerably since 1922 and home slaughtering decreased. The authorities were also convinced that the incidence of meat poisoning had dropped. However, a severe outbreak of *salmonella* in the warm summer of 1959 changed this optimistic attitude. It became clear that *salmonella* was present not only in livestock but also in animal feed, seagulls, pigeons, animal faeces and water, in short, in the whole environment. As for slaughtering, larger production units became operative, and the speed of slaughtering lines increased, resulting in less time for adequate inspection. As a result much emphasis was placed on the introduction of strict hygiene codes to increase the standard of hygiene in the meat production chain. However, despite these measures infections transmitted by meat continued to occur in the 1970s and 1980s. The effectiveness of the traditional post-mortem meat inspection based on incision, palpation and visual inspection was discussed in veterinary literature from the 1980s onwards. Keywords were scaling-up, more uniformity in inspection methods, lower inspection expenses, and a rational employment of inspection personnel (van Knapen, 2000; Koolmees, 2000b). One of the main problems with which inspectors were faced were diseases like *salmonella* and *campylobacter*, which do not necessarily produce clinical illness or pathological lesions. For these diseases a more appropriate and flexible system of inspection is required, based on risk assessment of critical points at all stages of the production chain of food of animal origin (from stable to table). Modern inspection requires transfer of data on the health status of groups of animals from veterinary practitioners responsible for their care, to their colleagues in the abattoir or meat plant. In essence, safety comes down to a continuous evaluation of risks for the consumer (Berends and van Knapen, 1999). In the face of increased competition, higher inspection charges and regulations, there have been major structural changes in slaughtering. The Fresh Meat (Hygiene and Inspection) Regulations based on European Community Directive 91/497, in which strict hygiene and structural standards were set, have been influential. Many small slaughterhouses and public abattoirs could not comply and lost their 'EC approved', status and their licence to export meat. These could no longer compete with large-scale private slaughterhouses and were closed down. Larger units proved more cost-efficient and were quicker to incorporate new technology. As a result of the replacement of public abattoirs by private slaughterhouses in the

Netherlands, more than one hundred job opportunities for veterinarians as directors and deputy directors of these abattoirs have been lost to the profession (Koolmees et al., 1999).

Despite recent efforts to improve the meat inspection system, the public image of producers and veterinarians involved in meat production is now somewhat negative due to recent scandals in the meat industry. Debates about meat safety in light of the BSE crisis, culminating in the recent French-British 'Beef war' and fraud in animal feed production in France and the Low Countries, continue to affect public opinion. The authorities are forced to take public action, but knowledge about health risks is often limited. As long as consensus among scientists and objective information from scientific research is lacking, policy making proves to be difficult. Consequently, public concern regarding food safety is nourished; a concern that is frequently exploited by the media and anti-meat lobbyists.

Companion animals

In the second half of the twentieth century, veterinary practice was further expanded with companion animals. In contrast to production animals, pet animals became a more successful and popular domain of the market for veterinary services during the last decades. This development started in the late 1950s when veterinary practice was extended with the care for companion animals, and was only hampered temporarily by a rabies outbreak in 1962. Due to a strong economic growth, the number of pets, particularly of cats and dogs, increased from then on. In addition, social and demographic change in society, particularly the individualisation, loneliness and the proportional increase in elderly people stimulated the amounts of pets. It is estimated that about 1.4 million dogs, 2.2 million cats, 6.0 million songbirds, 5.0 million fish, 1.7 million rodents and 6.0 million reptiles and amphibians are kept in the Netherlands. Today, 50% of the six million households in the Netherlands include a pet animal. It is estimated that companion and production animals together constitute a total of about 160 million animals. This amount effectively means that there are 10 animals for every Dutchman. Within the pet population there have been gradual changes. For instance, the amount of dogs decreased in the 1990s, while the number of cats, reptiles and exotic animals are still increasing. Many people can afford pets and are willing to pay more and more money for their health care and well being. Often this includes expensive treatments. Consequently, the importance of pets for veterinary practitioners increased significantly. Today,

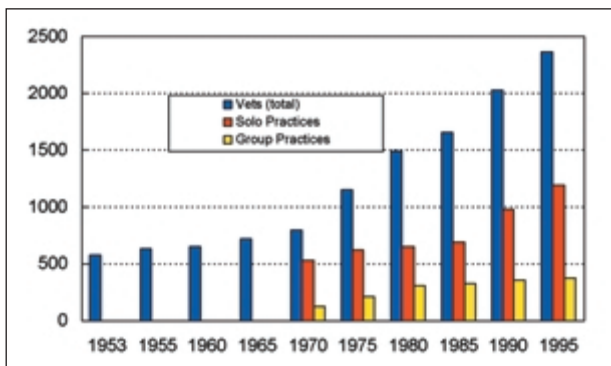


Figure 2: Total number of veterinarians, solo- and group practices in The Netherlands in the period 1953–1995. (Source: L. Nauta: *Dierenarts-associaties in Nederland. Doctoral thesis, Senior College, Section Social Sciences, Groningen 1996, 8–9*).

about 45% of the labour time of the total number of practitioners is spent on pet animals. Most companion animal practitioners work in solo practices but there is a growing tendency for group practices (Fig. 2). This shift in veterinary practice strongly stimulated specialisation within the veterinary profession (Endenburg, 1991; Lumeij et al., 1998).

Faculty and education

During the war, the faculty buildings were not destroyed or damaged by bombing. Due to a break in education of almost two years, some 242 students entered the Faculty of Veterinary Medicine at Utrecht immediately after the war (Fig. 3). Neither the staff nor the buildings, equipment or number of patients were suited to such a large number of students. A year later the influx of students slowed, but enrolment continued to remain higher than before the war. In the course of the 1950s, the government spent more money on veterinary education due to

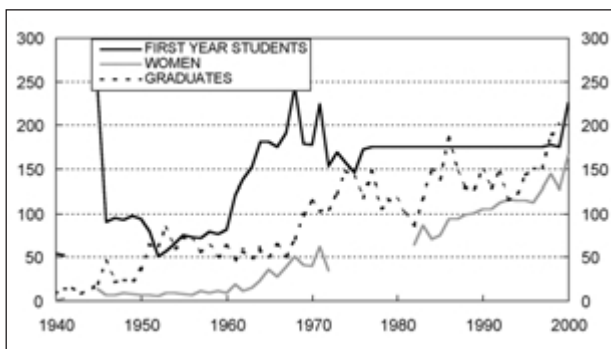


Figure 3: Number of first year students (total number and female) and graduates in the period 1945–2000 at the Faculty for Veterinary Medicine, Utrecht University. (Sources: C. Offringa. *Van Gildestein naar Uithof. 150 jaar diergeneeskundig onderwijs in Utrecht. Faculteit der Diergeneeskunde, Rijksuniversiteit Utrecht. Vol. 2. Utrecht 1981, 255; Diergeneeskundig Jaarboek of the years 1945–2000. Royal Netherlands Veterinary Medical Association*).

a gradual economic growth and animal production. In the 1960s, economic growth accelerated and veterinary practice was expanded with companion animals. During that period, students showed an increasing interest in veterinary medicine, probably due to a significant increase of income of the average veterinarian. As a result of the favourable situation regarding employment opportunities, an increasing number of students entered the faculty (Offringa, 1981).

In 1967 the first clinics of the faculty moved from the city centre to the new university campus 'De Uithof' on the outskirts of Utrecht. Other departments of the faculty followed step by step. In 1988, after more than 20 years, the whole faculty was reunited at its new location. The new clinics were large, well equipped and considered very modern in the 1960s and 1970s. However, the clinics were built during a period of economic growth. The departments that moved in the 1980s were housed in cheaper and smaller buildings due to the lower university budget available. One advantage is that the relatively new buildings were well equipped, in contrast to the clinics. Today, after 30 years, an extensive reconstruction and modernisation of the clinics is being carried out.

From the late 1960s onwards, the new buildings facilitated education for the larger influx of students. In 1974 a *numerus fixus* of 150 students had to be set; two years later this was increased to 175. Between 1976 and 2000 the admission of students remained limited to 175 per year. In September 2000 the *numerus fixus* was increased again allowing 225 students to enter veterinary education. Obviously, the increasing number of students resulted in a growing veterinary potential (Fig. 4). During the post-war period, 12 professors and 6 lecturers taught at the faculty. In 1999, the faculty had 362

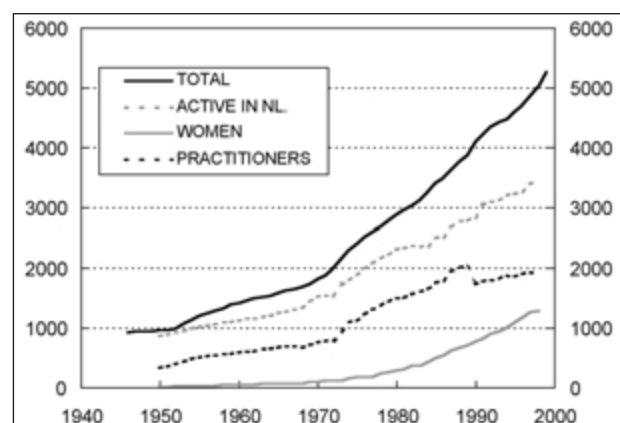


Figure 4: Total number of veterinarians in The Netherlands (including retired veterinarians), the proportion of women thereof, the number of veterinarians that is active in The Netherlands and the number of practitioners in the period 1940–2000. (Source: *Diergeneeskundig Jaarboek of the years 1945–2000. Royal Netherlands Veterinary Medical Association*).

academic staff members, including 28 full-time and 21 part-time professors and 426 non-academic staff (Mathijssen, 1986).

From the 1970s onwards, the Faculty paid much attention to the accreditation by the Council on Education of the American Veterinary Medical Association (AVMA) and the National Examining Board of the Canadian Veterinary Medical Association (CVMA). In 1973, the Utrecht Faculty was the first European veterinary training institute that was accredited after a visit of this combined team and approval of a self-evaluation report. In 1978, 1985 and 1992 the accreditation was renewed again. From 1985 onwards, the Advisory Committee on Veterinary Training (ACVT) of the European Commission attended the AVMA/CVMA evaluation. In the autumn of 2000 a new evaluation took place. As a result of these evaluations, the curriculum from 1972 was reorganised in 1995 and will be adjusted again in 2001. New departments and chairs were established and more personnel were appointed to handle further specialisation and differentiation within veterinary medicine. Consequently, in the last decade more attention has gradually been paid to veterinary ethics, laboratory animal science, management, communication, service and marketing in the Utrecht veterinary curriculum. Finally, within the context of this historical review it should be mentioned that the Faculty for Veterinary Medicine celebrated the 150th and 175th anniversary of veterinary education in the Netherlands in 1971 and 1996, respectively. In September 2000 the faculty, in a modest way, celebrated the 75th anniversary of its incorporation into Utrecht University (Anon., 2000).

Specialisation and feminisation

As with human medicine, differentiation and specialisation in veterinary medicine continued due to the rapidly changing role of veterinarians in society. For instance, the traditional function of the horse in society changed due to mechanisation, and it is now considered as a companion animal. The differentiation brought about a division in education and practice between curative veterinary medicine of individual companion animals and the horse on the one hand and preventive herd health medicine of large groups of production animals on the other. Herd health management became more integrated with veterinary public health, Good Veterinary Practice (GVP), Integrated Quality Control (ICQ) of the food chain and the Hazard Analysis and Critical Control Points (HACCP) concept.

As mentioned above, the demand for veterinary services increased from the 1960 onwards, resulting in a larger number of veterinarians. For the individual veterinarian it turned out to be increasingly difficult to practice all aspects of the profession. The number of group practices as well as the number of veterinarians per group practice grew (Fig. 2). Within these larger units, further division of labour and species or discipline specialisation was facilitated. However, due to the increasing number of pets, the number of solo-practices also increased. This was mainly the result of market regulation. From the late 1970s onwards, the Netherlands Veterinary Association paid much attention to self-regulation within the profession by means of specialisation. Special programmes of education and research for several veterinary specialists on a national level came into being. At present there are more than 250 veterinary specialists in the Netherlands divided among 17 specialities. Most of these specialities can be obtained by following a four years post-graduate course at the Faculty for Veterinary Medicine at Utrecht. From 1992 onwards attention was paid to veterinary specialisation in a European context. After following certain courses, a veterinary specialist can be registered by the European Board of Veterinary Specialisation (van Sluijs, 1994). Specialisation has been further stimulated by Directive 97/12/EU in which the training and qualifications of the so-called 'accredited' or 'network' veterinarian is described.

The feminisation of veterinary medicine, which seems to be a global phenomenon, also occurred in the Netherlands. In 1930, Jeannette Voet (1907–1979) was the first female veterinary graduate of the faculty in Utrecht. She played an important role in the acceptance of women in Dutch veterinary medicine. The integration of women in all areas of the veterinary profession was a gradual process. Veterinary public health, in particular, proved to be rather conservative in its acceptance of female veterinarians. The number of women veterinarians in the profession increased only gradually throughout the twentieth century. In 1970, women represented not more than 5% of all veterinarians in the Netherlands. As shown in Fig. 3, a significant increase of female students started in the 1970s. The large influx of urban female students that are primarily interested in companion animal and horse medicine is remarkable. The average percentage of female first year students between 1988 and 1992 was 60; over the last 5 years this increased to 70. Between 1988 and 1999, the average percentage of female graduates grew from 35 to 60%. Consequently, the proportion of Dutch female veterinarians increased from 5 to 25% between 1970 and 2000. In spite of this development, the repre-

sentation of women veterinarians among policy-making officials, leading veterinary authorities and academic staff (particularly at the professorial level) is still quite low. The process of feminisation of veterinary medicine is often explained by an increase in the number of companion animals and horses and part-time jobs or by a different, gender-based attitude towards animals. Another, simpler, explanation is that fewer male students are attracted to veterinary medicine, because they can make more money in other professions. More historical sociological research, including a comparison with feminisation in other sciences and broader society, is necessary to obtain a deeper insight into this phenomenon (Jones, 2000; Koolmees, 2000c).

Concluding remarks

As the tasks undertaken by the veterinary profession are subject to change due to shifts in society, these have become increasingly complicated.

References

- Anon.*: Evaluatie voorkoming, opsporing en bestrijding klassieke varkenspest 1997–1998. Tijdschr. Diergeneeskd. 1998, 123: 545–548.
- Anon.*: Herwonnen welvaart. De betekenis van het Marshallplan voor Nederland en de Europese samenwerking. Ministerie van Buitenlandse Zaken, 's-Gravenhage 1954, 101, 133–138, 196.
- Anon.*: Self-Evaluation Report, Faculty of Veterinary Medicine, Utrecht University. Utrecht, June 2000.
- Anon.*: Veterinary Works in The Netherlands. Veterinary Service, Ministry of Agriculture and Fisheries. Leidschendam, 1971, 112–225.
- Berends, B.R., van Knapen, F.*: An outline of a risk assessment-based system of meat safety assurance and its future prospects. *Vet. Quarterly* 1999, 21: 128–134.
- Blokhuis, H.J., Ekkel, E.D., Korte, S.M., Hopster, H, van Reenen, C.G.*: Farm animal welfare research in interaction with society. *Vet. Quarterly* 2000, 22: 217–222.
- van den Born, J.M.*: The Dutch five years' scheme for the eradication of bovine tuberculosis. In: *Veterinary work in The Netherlands 1953*. Netherlands Veterinary Service, SDU, The Hague, 1954, 59–64.
- Brumme, M.F.*: The emergence of veterinary instruction in the German language area; a preliminary typological study. In: *The origins of veterinary schools in Europe – a comparative view*. Ed. A. Mathijssen, *Veterinair Historisch Genootschap Cahier 2*, Utrecht, 1997, 25–42.
- Brumme, M.F., Mickwitz, G. von, Eds.*: Das Berliner Colloquium 'Veterinärmedizin und Probleme der Zeitgeschichte'. Eine Gegenüberstellung tierärztlicher Erfahrungen in DDR und Bundesrepublik. DVG, Berlin, 1997.
- Brumme, M.F., Schäffer, J.*: Die Entwicklung der Veterinärmedizinhistoriographie in Deutschland. *Argos* 1993, 8: 217–225.
- Endenburg, N.*: Animals as companions: demographic, motivational, and ethical aspects of companion animal ownership. PhD Thesis, Utrecht University, 1991.
- Fisher, J.*: Cattle plagues past and present: the mystery of mad cow disease. *Journal of Contemporary History* 1998, 33: 215–228.
- Fogle, B.*: The changing roles of animals in western society: influences upon and from the veterinary profession. *Anthrozoös* 1999, 12: 234–239.
- Frenkel, H.S.*: Research on foot-and-mouth disease. In: *Veterinary work in The Netherlands 1953*, Veterinary Service, SDU, The Hague, 1954, 43–51.
- van der Hoeven, P.*: Hoed af voor Marshall. De Marshall-hulp aan Nederland 1947–1952. Bakker, Amsterdam, 1997, 9–10, 21, 35, 37, 43–50, 82, 96.
- Hofman, J.*: Het succes van de tuberculose-bestrijding bij rundvee in Nederland, in het bijzonder in de periode na 1945. *Argos* 1996, 14: 143–152.
- Jones, S.D.*: Gender and veterinary medicine: global perspectives. *Argos* 2000, 23: 119–123.
- van Knapen, F.*: Veterinary public health: past, present, and future. *Vet. Quarterly* 2000, 22: 61–62.
- Koolmees, P.A.*: Veterinary medicine in the Netherlands, 1940–1945. In: *Veterinärmedizin im Dritten Reich*. 5. Tagung der Fachgruppe Geschichte der Ve-

- terinärmedizin der DVG am 14–15 November 1997. Ed. J. Schäffer, DVG, Giessen, 1998, 262–275.
- Koolmees, P.A.*: Veterinary medicine in the Netherlands in the post-war period, 1945–1960. In: Zwischen Trümmern und Wohlstand – Veterinärmedizin in der Nachkriegszeit (1945–1960). 7. Tagung der Fachgruppe Geschichte der Veterinärmedizin der DVG am 12–13. November 1999. Ed. J. Schäffer, DVG, Giessen, 2000a, 103–113.
- Koolmees, P.A.*: Veterinary inspection and food hygiene in the twentieth century. In: Food, science, policy and regulation in the twentieth century: International and comparative perspectives. Eds. D.F. Smith and J. Phillips, Routledge, London, 2000b, 53–68.
- Koolmees, P.A.*: De feminisering van de diergeneeskunde in Nederland, 1925–2000. *Argos* 2000c, 23: 125–131.
- Koolmees, P.A., Fisher, J.R., Perren, R.*: The traditional responsibility of veterinarians in meat production and meat inspection. In: Veterinary aspects of meat production, processing and inspection. An update of recent developments in Europe. Ed. F.J.M. Smulders, ECCEAMST, Utrecht, 1999, 7–31.
- Knibbe, M.*: Landbouwproductie en -productiviteit, 1807–1997. In: Nationaal goed. Feiten en cijfers over onze samenleving (ca.) 1800–1999. Eds. R. van der Bie and P. Dehning, CBS, Voorburg en Heerlen, 1999, 37–57.
- Lawrence, E.A.*: Relevance of social science to veterinary medicine. *J. Am. Vet. Med. Assoc.* 1991, 199: 1019–1020.
- Lumeij, J.T., Endenburg, N., Luyten, B.R.*: The percentage of feline, canine, avian and exotic animal consultations in veterinary practice in The Netherlands in 1994 and suggested consequences for the veterinary curriculum and residency programs. *Vet. Quarterly* 1998, 20: 35–37.
- Mathijsen, A.H.H.M.*: De Faculteit der Diergeneeskunde. In: Tussen ivoren toren en grootbedrijf. De Utrechtse Universiteit, 1936–1986. Eds. H.W. von der Dunk, W.P. Heere and A.W. Reinink, G. Schwartz and Rijksuniversiteit Utrecht. Maarssen, 1986, 467–479.
- Offringa, C. Ed.*: Van Gildestein naar Uithof. 150 jaar diergeneeskundig onderwijs in Utrecht. Faculteit der Diergeneeskunde, Rijksuniversiteit Utrecht. Vol. 2. Utrecht, 1981, 188–198, 206–207, 231–236.
- Pluimers, F.H., de Leeuw, P.W., Smak, J.A., Elbers, A.R., Stegeman, J.A.*: Classical swine fever in The Netherlands 1997–1998: a description of organisation and measures to eradicate the disease. *Preventive Veterinary Medicine* 1999, 42: 139–155.
- Renkema, J.A.*: Economisch-historisch overzicht van de Nederlandse veehouderij vanaf de Tweede Wereldoorlog. *Argos* 1995, 12: 59–62.
- van Sluijs, F.J.*: Specialisatie vanuit Europees oogpunt. *Tijdschr. Diergeneeskd.* 1994, 119: 234–235.
- de Kruijf, A.*: De toekomst van het diergeneeskundig beroep. *Vlaams Diergeneeskd. Tijdschr.* 1999, 68: 53–55.
- Swabe, J.*: Animals, disease and human society. Human animal relations and the rise of veterinary medicine. Routledge, London, 1999.
- Schäffer, J., Ed.*: Veterinärmedizin im Dritten Reich. 5. Tagung der Fachgruppe Geschichte der Veterinärmedizin der DVG am 14–15 November 1997. DVG, Giessen, 1998.
- Zuijdham, D.M., Sjollema, P., Oskam, A.A.*: De dierenarts en de georganiseerde dierziektenbestrijding. *Tijdschr. Diergeneeskd.* 1962, 87 (jubileum-aflevering): 53–61.

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Received for publication: 13 August 2001

Accepted in the present form: 5 September 2001