

# **THE DEVELOPMENT OF VETERINARY PUBLIC HEALTH IN WESTERN EUROPE, 1850-1940**

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## **Introduction**

Many aspects of public hygiene that are enjoyed today were developed during the course of the nineteenth century. Sanitary measures, such as waterworks, sewerage, garbage disposal, and food inspection, that are more or less taken for granted in the western world, are often virtually unknown in many underdeveloped countries. This is one of the reasons why the origin and development of public health services is an important theme in general history. During the past few decades, an international network has developed that consists of many historians, sociologists and physicians who have studied various aspects of public health care in the past (Goudsblom, 1986; Labisch 1998; Porter, 1994; De Swaan, 1988). Within this well-established discipline, attention to issues of veterinary public health has thus far remained rather limited, in spite of the fact that there is a considerable overlap between the public health care provided by physicians and veterinarians. This is particularly true with respect to zoonoses and the quality control of food of animal origin. Much attention has been paid to the role of physicians and chemists in safeguarding food quality and hence in improving public health (Hanssen & Wendt, 1965; Hutt & Hutt, 1984). The contribution made by veterinarians to food quality control is, however, often underestimated (Rosser, 1991).

The history of veterinary public health has predominantly been recorded by veterinarians. Pioneers in the field, such as Schwabe (1984) and Steele (1978), have described developments from antiquity onwards, whereas Grossklaus (1991) and Schönherr (1990) have studied scientific and technical progress in veterinary public health throughout the last century. These studies mainly deal with the recognition of animal disease problems as they have affected public health, and with the establishment of

national and international organisations. They pay little attention to the development of meat hygiene and the related social and economic factors.

In essence, a modern society cannot function properly without a well-developed veterinary infrastructure, within which the production and supply of safe foods of animal origin is one of the main tasks. This infrastructure, as we know it today, is usually taken for granted by society; public attention generally only focuses on it in the event of food poisoning scandals. The availability and supply of safe and sound foods, such as dairy products and meat, as a matter of course has only been established through a slow and laborious process. What are the main elements that constitute this veterinary infrastructure? The oldest and most important ones are veterinary state supervision, state veterinary services and laws pertaining to cattle disease and zoonoses control. These measures gave veterinarians important responsibilities for maintaining animal health and helping to maintain livestock production. A second important element is the extensive network of practitioners who supply primary veterinary care. Further to these elements, the veterinary infrastructure requires well-organised professional associations and literature, research institutes, legal protection of the profession and institutionalised education. Finally, all veterinary tasks involving food hygiene, such as scientifically and legally based meat inspection, should be mentioned. Before veterinarians were able to carry out these tasks and the responsibility for these tasks were entrusted to veterinarians, both the process of professionalisation and the scientific progress of veterinary medicine was necessary (Fisher, 1997; Swabe, 1997).

In order to obtain a greater insight into the way in which modern meat hygiene developed in Western Europe, particularly in the Low Countries, during the period between 1850 and 1940, this paper will focus on two issues. Firstly, it will explore which social groups played a significant role in the process of instituting the sanitary reform of the municipal meat supply by establishing mandatory meat inspection by expert veterinarians and developing public slaughterhouses. Secondly, it will examine the role of the local and national authorities. How did the authorities direct their policy between the economic interests of meat producers and butchers on the one hand and the care for the urban environment and protection of consumer's health on the other? Theoretically, these questions concerning the development of meat hygiene cohere with the broader problem of the

modernisation of society, the formation of the modern welfare states (Ashford, 1988; Porter, 1994), and of collective sanitary provisions and the so-called 'civilising offensive' (Goudsblom, 1986; De Swaan, 1988). This offensive was initiated and guided by the elite and was aimed at bringing lower social groups to a higher cultural level and promoting the civic spirit. It is interesting to examine the extent to which meat hygiene played a role in the civilising offensive. Firstly, a review of the social-economic and ideological context of the meat supply during the period 1850-1940 will be given. On the basis of this, the increasing need to involve mandatory meat inspection and public abattoirs in the meat supply chain can be explained.

### **Meat consumption**

From the middle of the nineteenth century onwards, there was a gradual transition from a traditional rural society to a modern welfare state. This process of modernisation was accompanied by characteristic changes including strong population growth, urbanisation, economic growth, industrialisation and a gradual rise in the standard of living. These changes caused a shift in the food consumption pattern, among others an increase in meat consumption. This was particularly the case in industrialised countries like Great Britain, France, Belgium and Germany, where the situation of the working class improved. The British market was crucial to meat exporters, and the removal of custom barriers after 1842 provided a powerful incentive for potential suppliers. Due to extensive livestock farming, new transport possibilities and innovations in cooling and freezing technology, meat exports from sparsely populated countries, such as Argentina, the USA, New Zealand and Australia to Europe, increased. A large-scale international meat trade consequently developed (Diederiks et al., 1994; Perren, 1978). Within Europe, countries like Denmark and the Netherlands specialised in dairy and meat exports. As a result of increasing domestic demand for meat and ample opportunities for meat and meat product exports, cattle breeding and meat production in the Netherlands expanded from 1870 onwards. This was realised by intensive livestock farming based on the use of fertilisers, increased animal feed production, developments in cattle breeding, the organised struggle against animal diseases and improved veterinary care.

Akin to the more industrialised neighbouring countries, a quantitative and qualitative improvement in diet occurred in the Netherlands and the democratisation of meat consumption gradually began. In this sense, democratisation means that meat was no longer an exclusive food for the rich, but that sufficient meat and more different kinds of meat were consumed by the majority of the population (Den Hartog, 1980). Between 1850 and 1930, the annual per capita meat consumption in the Netherlands increased from 27 to 50 kg. Beef consumption doubled between 1850 and 1900; from then on pork became the main constituent of the total meat consumption. In the course of the nineteenth century, increased scientific knowledge of the chemical composition of food and the need for different nutrients became available. Food of animal origin was considered more nutritious than vegetable foods. Meat and bread were believed to be the main components of a healthy diet. In the second half of the nineteenth century, food scientists stated that 90 kg of meat per year was the minimum quantity to guarantee optimum nutrition; this was the amount included in soldiers' diets. From 1918 onwards, less emphasis was placed on meat consumption and a more varied diet was advised under the maxim of 'a little bit of everything, but not too much of anything'. The recommended amount of meat dropped from 90 to 45 kg annually.

It is interesting to see the kind of ideas that existed about the relationship between health, welfare and meat consumption between 1850 and World War I. In 1847, the Dutch chemist Gerrit Jan Mulder pointed out that the lack of proteins of animal origin in the one-sided diet of the working class and poor resulted in a bad health and a lack of physical strength. The physician E.C. Büchner stated that a population deprived of meat would become weak and hence, produce moderate labour and soldiers. In England, the level of meat consumption remained high throughout the entire nineteenth century. This was noticed with envy by other European countries. The seemingly effortless manner in which Great Britain created its enormous Indian Empire was contributed to the high meat consumption of the British and the vegetarian diet of the Indians. Due to their consumption of meat, the Englishmen were thought to have more physical power, endurance and intelligence. In his well-known handbook on meat inspection, Robert von Ostertag also stressed the importance of meat in the diet to maintain productivity. He cited sources that stated that the weakness, low industriousness and effeminacy of men from Southern

Italy were related to their very low level of meat consumption. Although less extreme, these ideas still persisted during the period 1900-1940. (Fig. 1)



Fig. 1

Advertisement from the 1930's to promote meat consumption (De Vee- en Vleeshandel 51, 1966, 306)

For instance, it was argued that European nations with the highest meat consumption had not only generated the most successful colonists, but had also produced the most technological innovations. The future thus belonged to the meat eating nations. (Brouwer, 1946; Büchner, 1855; Koller, 1941; Von Ostertag, 1899).

## **Meat supply**

Such notions provide an explanation for why not only food scientists, physicians and veterinarians, but also politicians, economists and military attached great importance to a high level of meat consumption. This would promote physical and mental health, thereby positively affecting productivity. Consequently, societal authorities insisted on more meat being included in the diet. A prerequisite to this was improvements in both the quantity and the quality of meat. A review of the meat supply reveals that the soundness of meat, particularly cheap meat that was usually consumed by the working class people, left much to be desired. Before the emergence of urban societies with cattle and meat markets, consumers provided themselves with meat. In the countryside, home slaughtering remained common until well into the twentieth century, when refrigeration was introduced into households. In most cities, animals were slaughtered by butchers in small, privately owned butcheries. From the late Middle Ages, the slaughtering, selling and inspection of meat was regulated by butcher guilds and the local authorities. After the French Revolution the guilds were abolished, and local meat inspection and meat trade regulations were disregarded. From around 1870 onwards, population growth and urbanisation went hand in hand with an expanded network of these small butcheries, where slaughtering often took place under poor hygienic conditions. The city Utrecht, for instance, with a population of about 100,000 in 1890, had 144 registered private butcheries and 370 'shops' where meat was sold, and a market for cheap meat and sausages. In addition, meat from knackers' yards was marketed or processed into pies and sausages and sold to labourers and the poor. Often this involved meat from animals infected with anthrax, tuberculosis, trichinosis and tape-worms, as well as meat from animals that had died. A mere four inspectors were appointed to carry out meat inspection (Koolmees, 1997).

It is clear that under these circumstances consumers were left almost unprotected from fraud and the adulteration of meat and meat products, and the calamities that followed, were almost inevitable. This was even more the case since the chain between producers and consumers became longer, more complicated and extended beyond the reach of the eye by the development of a large-scale international meat trade and meat industry.

Poor hygienic conditions characterised meat and sausage processing due to a lack of hygiene awareness. Furthermore, a major impediment to the re-introduction of meat inspection was that veterinary research findings initially supported the conviction that meat from diseased animals was not harmful to humans. The increasing amount of butcheries represented a nuisance for the citizens. The transport and slaughtering of animals, as well as the storage and transport of offal within the city walls, deteriorated the urban environment. From 1850 onwards, numerous outbreaks of trichinosis and meat poisonings occurred, infecting hundreds and killing dozens of people. Consequently, local and national authorities were increasingly confronted not only with complaints about the filth and problems that butcheries caused in the urban centres, but also about the poor quality of the meat offered (Van Daalen, 1987; Poulussen, 1987). The mass outbreaks of meat-borne diseases alarmed the authorities and clearly demonstrated the need for meat hygiene control. From 1850 onwards, governments in Western Europe were more or less forced to pay more attention to a public health policy related to the meat supply.

### **The role of hygienists**

Improvement of the urban environment and meat trade and meat inspection regulation became a regular issue in local and national politics. Increased meat production and consumption necessitated a large-scale supply of sound meat. However, radical measures with respect to organisation and hygiene were needed to accomplish this. A programme was available which contained the two key factors for effective meat inspection: mandatory inspection by professional veterinarians and centralised slaughtering in public abattoirs located on the outskirts of towns. Well before the 1860s, health boards had already come to this conclusion. In fact, at the end of the eighteenth century, the well-known Paris Council for Public Hygiene had drawn up such a programme, and mandatory meat inspection in public slaughterhouses had been recommended by both the French chemist Antoine Lavoisier and the German physician Johann Peter Frank. Inspired by the body of thoughts of the Enlightenment and the French Revolution, these scientists formulated comprehensive programmes for sanitary reform in order to improve public health. Realisation of such

programmes would require active state interference for the general welfare by means of a centralised bureaucracy. These ideas of the French hygienists were published among others in the *Encyclopédie méthodique* and spread rapidly among the bourgeoisie. The local and national health boards that were established in France around 1800, and in which the bourgeoisie was well represented, tried to realise public health programmes (Fowler la Berge, 1975; Moreau, 1916).

Following the French example, health boards were established in most larger towns in Belgium from 1848, and in the Netherlands from 1854 onwards. Within these boards the so-called hygienists, a group of progressive physicians, engineers, physicists, chemists, lawyers, veterinarians, and civil servants, played a predominant role. Their great accomplishment was to turn public health into a political issue. From the middle of the nineteenth century onwards, the hygienists wanted to improve the poor social conditions of a large part of the population. They tried to realise this by means of professionalisation and a scientific approach to public health care. Local and national health boards served as their forum. The spread of hygienic awareness led to a change in the attitude of local and central authorities who gradually took more trouble to improve public hygiene (Houwaart, 1991). Due to their knowledge in the field of food hygiene, veterinarians participated in these health board from the outset. Together with physicians, veterinarians, as a new group of professionals, contributed significantly to the creation of the social infrastructure in the field of public health (Koolmees, 1997).

### **Veterinarians and meat hygiene**

In the first half of the nineteenth century, there was essentially no scientifically-based meat inspection in Western Europe. Hardly any veterinarians were involved in meat inspection. The untrained meat inspectors that were appointed in the larger towns were entirely committed to empirical knowledge. From 1850 onwards, veterinarians involved in health boards advised on all matters concerning veterinary public health due to their specific knowledge of zoonoses and their ability and training in recognising diseased animals. They focussed on a scientifically and legally based form of meat inspection, research on meat poisonings, humane slaughtering methods, and regulations for the collection and destruction of

waste from slaughterhouses and butcheries. However, physicians played a predominant role in these boards. In their view, veterinarians lacked scientific knowledge and were responsible for healthy livestock only. Therefore, the protection of the public health, including meat inspection, should remain in the competent hands of physicians. Initially, it was mainly physicians who wrote about the subject meat hygiene. Nevertheless, in various countries, a number of veterinarians started to publish on the subject, claiming this new field of professional activities for themselves. In their books and articles, these authors stressed the importance of veterinary medicine for society as a whole. They argued that it was important not only for a prosperous livestock industry, but also because of its value in safeguarding the healthy quality of foods of animal origin, and thus the workforce of the working class (Koolmees et al., 1999; Von Reeken, 1861). Sticker (1890-91) spoke for the veterinary profession when he argued that the theoretical aspects, as well as the practical execution, of meat inspection should be part and parcel of veterinary activities since the emergence of meat inspection had coincided with the emergence of veterinary medicine. According to him, it was veterinarians who extended the science of meat inspection, while the practical execution of meat inspection is equal to the pathological anatomy of animals. Finally, he argued that meat inspection should belong to the veterinary sphere because it supports animal disease control, also carried out by veterinarians. The efforts of veterinarians to gain veterinary public health as a new field were strongly supported by the different national veterinary medical associations. Such associations were established, for instance, in Denmark (1807), Switzerland (1813), the Netherlands (1862), Belgium (1864), Germany (1864), France (1879) and England (1883) (Grimm, 1968; Mammerickx, 1987). In the Netherlands, a comprehensive report on the (bad) state of meat inspection was published in 1894 by the Dutch Veterinary Medical Association. (Fig. 2)

The veterinary associations recognised the potential for job opportunities in meat inspection services and public slaughterhouses and a possible broadening of the legal basis of the veterinary profession. These claims, however, required a scientific basis of meat inspection.

DE KEURING VAN VEE EN VLEESCH  
IN NEDERLAND.

R A P P O R T

UITGEBREIDT DOOR

het Hoofdbestuur van de Maatschappij ter bevordering der  
Veeartsnijckunde in Nederland

INHOUDENDE

de resultaten van het onderzoek naar den  
toestand der keuring van vee en  
vleesch hier te lande.

TE WEGE  
J. L. BELJERS  
1894.



Fig. 2

Title page of the report on meat inspection in the Netherlands, published in 1894 by the Dutch Veterinary Medical Association.

After the foundation of veterinary schools at the end of the eighteenth century, veterinary science developed. In these schools research was conducted on questions related to the transmission of animal diseases by the consumption of meat from infected animals. Research findings soon showed that meat from animals infected with cattle plague posed no threat for human health. More and more cases where meat from diseased animals was consumed without any detriment to human health were described. This led to the one-sided conviction that all meat from animals suffering from different diseases was not harmful to humans. If only such meat was heated

long enough, no danger could occur. Thus, research findings at veterinary schools initially led to a drawback in the care for a proper meat inspection.

The standing of meat inspection as a veterinary discipline increased, when the scientific backgrounds of several diseases related to meat consumption were discovered one after the other. Firstly, there were the findings in the field of parasitology. The cycle of tapeworms was discovered in the 1860s and, by incision, meat inspectors were able to conduct a preventive control. (Fig. 3) The occurrence of parasites declined, especially where trichinella control was instituted. From 1880 onwards, meat hygiene research obtained a more scientific character and bacteriological meat research carried out in slaughterhouse laboratories ensued. (Fig. 4) The pioneering work of Louis Pasteur (1822-1895), Robert Koch (1843-1910) and others, such as Auguste Chauveau (1827-1917), Otto Bollinger (1843-1909), August Gärtner (1848-1934), Emile van Ermenghem (1851-1932), Daniel Salmon (1850-1914), Jan Poels (1851-1927), and their discoveries in the field of bacteriology, including the aetiology of meat poisonings, were decisive for the further development of meat inspection. Between 1890 and 1900, a number of meat-borne pathogens were isolated (Van Logtestijn et al., 1987; Mossel & Dijkman, 1984; Von Ostertag, 1939). The veterinary and medical debate and disagreement over the 'germ-theory' and the precise aetiology of those diseases that were seen as a threat either to human or animal health lasted for decades. The major subject in this debate was bovine tuberculosis, of which the aetiology was a matter of scientific dispute until the 1920s (Romano, 1997; Worboys, 1992).

During the second half of the nineteenth century, the traditional empirical meat inspection was transformed into an applied veterinary science. Research findings were published in handbooks and professional literature, and theoretical and practical meat inspection became part of the veterinary curriculum. Special courses for veterinarians and training programmes for lay-inspectors were organised at veterinary schools and slaughterhouses. Some of the handbooks and guidelines used for education and inspection by veterinarians and lay-inspectors in the Low Countries are listed below.



Fig. 3

A Dutch meat inspector at work (G. R. Leighton & L. M. Douglas: *The meat industry and meat inspection*, Vol. 3, London 1910)

- Baillet, L., (1876). *Traité de l'inspection des viandes de boucherie, considérée dans ses rapports avec la zootechnie, la médecine vétérinaire et l'hygiène publique*. Asselin, Paris.
- Baránski, A., (1880). *Praktische Anleitung zur Vieh- und Fleischschau: für Stadt- und Bezirksärzte, Thierärzte, Sanitätsbeamte, sowie besonders zum Gebrauche für Physikats-Candidaten*. Urban & Schwarzenberg, Wien. In 1883 this book was translated into Dutch by F.C. Hekmeijer.



Fig. 4

Bacteriological meat research at the Amsterdam abattoir laboratory in 1900 by the director Dr. D. van der Sluijs and his assistant (Archives of the Department of the Science of Food of Animal Origin, Faculty of Veterinary Medicine, Utrecht University)

- Gerlach, A.C., (1875). Die Fleischkost des Menschen vom sanitären und marktpolizeilichen Standpunkte. Hirschwald, Berlin.
- Greuve, J.K. de, (1846). Handleiding voor landlieden, slagters en veehandelaars, bij het beoordeelen van den gezonden of ziektoestand van het slagtvee, ter voorkoming van de nadeelige gevolgen, die het gebruik van ongezond vleesch en spek voor de menschelijke gezondheid hebben kan. M. Westerman & Zoon, Amsterdam. (Fig. 5)
- Harreveld, H.G. van, (1905). Handleiding voor de vleeschkeuring. J.G. Broese, Utrecht.
- Hertsen, E. van, (1873). De l'inspection sanitaire des viandes de boucherie. H. Boissel, Rouen. (Fig. 6)
- Ostertag, R. von, (1892). Handbuch der Fleischschau für Tierärzte, Ärzte und Richter. Verlag F. Enke, Stuttgart. This book was reprinted many times

**HANDLEIDING**  
VOOR  
**Landlieden, Slagters en Veehandelaars,**  
BIJ HET BEOORDEELEN VAN DEN GEZONDEN OF ZIKTENTYFOESTAND  
VAN HET  
**S L A C T V E E,**  
TER VOORKOMING  
VAN DE NADDELIJKE GEVOLGEN, DIE HET GEBRUIK  
VAN ONGEROND VLEESCH EN SPER VOOR DE  
**MENSCHELIJKE GEZONDHEID**  
ERDEN KAN.  
DOOR  
**J. K. de Greuwe,**  
Rijks-Deserte van de eerste Klasse, erooten rang, en befehdigd  
Meurmeester van het Vee en van het Vleesch te Amsterdam.

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**NIEUWE UITGAVE.**

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Te AMSTERDAM, BIJ  
**M. WESTERMAN & ZOON.**

1846.

Fig. 5

Title page of the manual for meat inspection by the Dutch veterinarian J. K. de Greuve from 1846

DE  
L'INSPECTION SANITAIRE  
DES VIANDES DE BOUCHERIE

PAR

**E. VAN HERTSEN**

Ancien Médecin Vétérinaire du Gouvernement,  
Inspecteur en chef de l'Abattoir de Bruxelles, Président de la  
Société Vétérinaire du Brabant, etc.

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Mémoire couronné par la Société Vétérinaire de la Seine-Inférieure et de l' Eure,  
au Concours de 1869.

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**Prix : 2 francs.**

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ROUEN

IMPRIMERIE DE HENRY BOISSEL  
RUE DE LA VICONTÉ, 55

—  
1873

Fig. 6  
Title page of the treatise on meat inspection by the Belgian veterinarian E. van Hertsen from 1873.

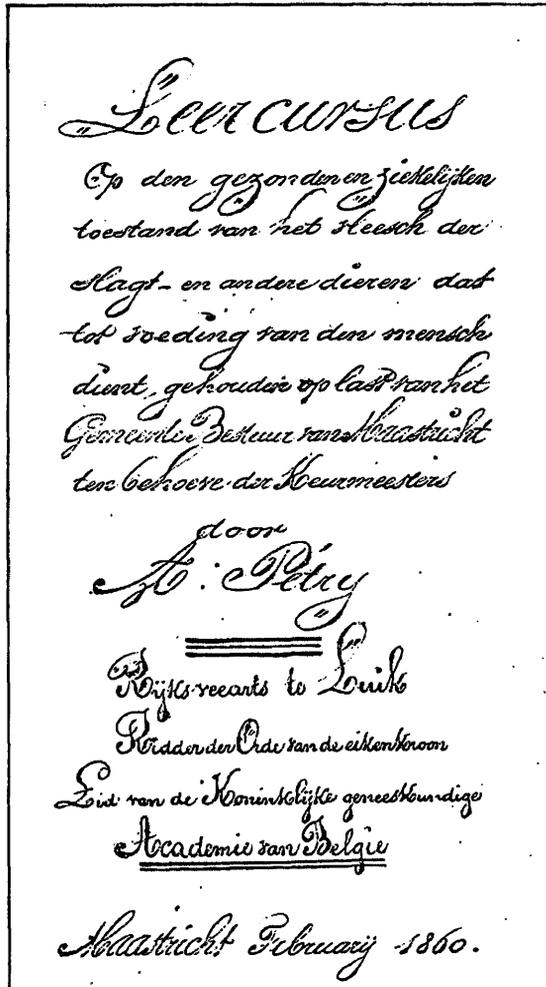


Fig. 7

Title page of a course in meat inspection given by the Belgian veterinarian Antoine Pétri (Maastricht, 1860)

and translated into English and Russian. Until World War II it was the leading handbook on meat hygiene.

-Pétry, A., (1860). *Leercursus op den gezonden en ziekelijken toestand van het vleesch der slag- en andere dieren dat tot voeding van den mensch dient, gehouden op last van het Gemeente Bestuur van Maastricht ten behoeve der keurmeesters*. Maastricht. (Fig. 7)

-Villain, L. & Bascou, V., (1885). *Manuel de l'inspecteur des viandes*. G. Carré, Paris.

National and international associations for professional veterinary food inspectors came into being. Meat hygiene became an important issue for the international veterinary congresses that were organised from 1863 onwards, the Office International d'Hygiène Publique and the Office International des Epizooties (OIE) that were established in Paris in 1907 and 1921, respectively (Schwabe, 1984). All these factors contributed to the development of a professional meat inspection corps in Western Europe. Towards the turn of the century, the extension of the role of veterinarians to public health was gradually accepted by the medical profession and by society as a whole. Veterinarians had succeeded in providing an adequate answer to the mounting concerns for the more strictly public health aspects of the meat trade. The extension of their professional activities was laid down in veterinary legislation. Given that this legislation had a significant impact on the health and physical well-being of the whole of society, it elevated the responsibilities of those who performed the job of enforcing it, above and beyond the charge of just taking care of animal health.

### **Slaughterhouses and 'slaughter-warrant'**

When we compare the implementation schedule of centralised slaughtering in public abattoirs (public or municipal slaughterhouses) and mandatory meat inspection of some West European countries, considerable differences can be identified. From 1795 onwards, attempts were made in a few Dutch towns to establish public slaughterhouses. These attempts, however, failed. As for slaughterhouses, Napoleonic France was the

European leader in this area; until well into the nineteenth century, the Parisian abattoirs (built in 1810-1814) were regarded as exemplary. The butchers of Paris, and later of all larger French cities, were forced to slaughter their animals in the new public slaughterhouses, while the small, privately owned butcheries were all closed down. The French example was followed in some European countries, especially in Belgium. (Table 1) From around 1880, Germany, Switzerland and Austria-Hungary took the lead in building modern slaughterhouses from a technical, as well as a hygienic, point of view. England, Spain, the Netherlands and the Scandinavian countries lagged behind (Linters, 1988; Moreau, 1916). (Table 2)

City	Number	Year	City	Number	Year
Paris	5	1814	Brussels	1	1842
Orléans	1	1821	Liverpool	1	1844
Maastricht (B)	1	1824	Marseille	1	1848
Rome	1	1825	Vienna	2	1851
Lunéville	1	1827	Edinburgh	1	1851
Bordeaux	1	1828	Lyons	1	1852
Rouen	1	1830	Bois-le-Duc (NL)	1	1852
Hasselt (B)	1	1832	Glasgow	1	1853
Toulouse	1	1832	Anjou	1	1855
Venlo (B)	1	1837	Mechlin	1	1856
Geneva	1	1841	Valencia	1	1858
Hamburg	1	1841	Genoa	2	1859

Table 1: Cities in Western Europe where public slaughterhouses were established during the period 1814-1860 (Koolmees, 1997).

In general, there was a strong opposition to public slaughterhouses from butchers in all West European countries. Having played an essential role in the municipal meat supply for centuries, the butchers feared that the public slaughterhouses would limit their profession considerably. For one thing, they would be forced to slaughter their cattle at the public abattoir under supervision. The competency of municipal authorities to establish a public slaughterhouse and to prohibit private slaughtering, the so-called 'slaughter-warrant', became a politically contentious issue in the nineteenth century. In a number of countries, this matter was settled by a

national nuisance act. Most local authorities hesitated in establishing municipal slaughterhouses due to the large financial expenditure required, possible increases in meat prices, and the question of profitability. Competition for local financing also came from other large and expensive projects in the field of sanitary reforms. In the lengthy debates between supporters and opponents of municipal slaughterhouses, two factions could be distinguished: hygienists with their demand for an adequate meat inspection allied with animal protectionists, and citizens with nuisance complaints about the private butcheries versus a coalition of butchers and meat traders whose independence was threatened by the establishment of municipal abattoirs. At first, economic interests and the objections of the butchers outweighed the arguments concerning public health and pollution put forward by the hygienists. By the turn of the century, the growth of socialism tipped the balance in most West European countries. Ultimately, though, the decision to establish a public slaughterhouse mostly depended on the financial position of the municipality and hence, from general economic fluctuations (Koolmees, 1997).

The enactment of the Dutch Meat Inspection Law in 1919 stimulated the building of public slaughterhouses indirectly, since this act involved hygienic requirements concerning furnishing and equipment of private abattoirs, butcher's shops etc., and the obligation for local authorities to establish a meat inspection service. Many existing privately-owned butcheries could not meet these new requirements, leading the authorities of many cities to build public slaughterhouses in order to institute an adequate meat inspection service. Between 1883 and 1940, the Netherlands were covered by a network of 86 municipal slaughterhouses. Apart from the positive influence of the Meat Inspection Act, it was mainly the favourable financial position of the cities in the period 1922-1929 that contributed to this rapid spread of public slaughterhouses. From the total number of veterinarians, an increasing number found employment in slaughterhouses and meat inspection services. As a result of centralised slaughtering under professional supervision, meat inspection became much more effective. The number of infections with parasites was effectively diminished, tuberculosis was better detected and the number of home slaughterings decreased (Koolmees, 1997).

Country	Year	Number	Inhabitants/abattoir
France	1905	912	45,000
Germany	1903	839	51,000
Austria-Hungary	1908	337	142,000
Poland	1903	330	76,000
Scotland	1908	124	36,000
Switzerland	1905	101	34,000
Belgium	1908	91	74,000
England	1905	84	345,000
Spain	1898	26	711,000
Denmark	1908	11	227,000
The Netherlands	1903	11	464,000
Luxemburg	1903	7	33,000
Norway	1907	3	733,000

Table 2: Number of public slaughterhouses in some European countries and inhabitants/abattoir ratio around the beginning of the twentieth century (Koolmees, 1997).

### State interference

During the second half of the nineteenth century and the first decades of the twentieth century, municipal slaughterhouses developed as public institutions, established at the expense of society, in which butchers were obliged to slaughter their cattle under stringent supervision to protect the consumer from unsound meat, and to put an end to the nuisance and pollution associated with the numerous, privately-owned butcheries. In many West European countries, the supply of sound meat was improved considerably by the network of municipal slaughterhouses and meat inspection legislation. As mentioned earlier, there was a difference between the period in which state control of the meat supply and quality of meat was instituted in various countries. This can be explained by the different political economy that was adopted by each nation. In the nineteenth century, Britain and the Netherlands lagged behind compared to other countries due to the prevailing liberal doctrine of free trade and the restriction of state interference. Attempts by the hygienists to restore regular meat inspection, failed due to the authorities' belief that consumers were their own best food inspectors. As with aid to the poor and other segments of public health care, meat inspection was considered a task best

left to the private sector. Meat inspection was unattractive for another, more practical reason: it would hinder meat exports and free trade in meat and meat products. Due to the increased political influence of socialists, more attention was gradually paid to the responsibility of the central government to implement social legislation as part of the modernisation process of society towards the turn of the century. In the Netherlands, the slaughter-warrant was instituted by the nuisance acts of 1875 and 1901, while the national meat inspection act became effective from 1922 onwards. In Britain, however, attempts to establish meat hygiene legislation on a national level failed until 1966.

In countries with a strong tradition of centralisation, state interference in agriculture and public health to improve social and economic welfare was more common. Within the framework of a public health policy aimed at protecting the health of the individual and society, the slaughter-warrant was instituted much earlier. Meat inspection acts also became operative at a much earlier stage in Belgium (1891), Luxemburg (1892), Germany (1903), Sweden and Norway (1895), France and Spain (1905) Austria-Hungary (1908), Switzerland (1909), and Denmark (1911) (Mammerickx, 1967; Von Ostertag, 1910; Theves, 1991). In these countries, state interference increased since national governments were more willing to spend public money on the creation of a social infrastructure, including food quality control (Fisher, 1993; Kestens, 1990; Koolmees et al., 1999).

### **Meat hygiene and the civilising offensive**

Apart from the improvement of the urban environment and the supply of sound meat, municipal slaughterhouses contributed in another way to the so-called 'civilising offensive'. This offensive was initiated by the elite and was aimed at bringing the lower social groups to a higher cultural level; one in which virtues like sobriety, industriousness, orderliness, devotion and morality played a central role. One of the objectives of the offensive was the prevention of cruelty to animals. Further, it was no longer considered appropriate that civilised citizens should be confronted daily with cruel slaughtering scenes. Towards the turn of the last century, a gradual change in mentality concerning man-animal relationships occurred,

resulting in more attention to animal welfare (including that of slaughter animals) among authorities. Slaughtering became invisible, disappearing from the public view to behind the walls of public slaughterhouses.

Animal protectionists drew the public's attention to cruelty to slaughter animals performed by butchers in their butcheries. The usual slaughtering methods without stunning, especially the Jewish method of slaughter, were criticised. Until the turn of the century, traditional methods without pre-slaughter stunning prevailed in most butcheries and slaughterhouses. Veterinarians also paid little attention to animal welfare in slaughterhouses; they were more concerned with realising meat inspection legislation. After 1900, the situation improved markedly by the technical development and introduction of stunning equipment and by the fact that local authorities had to institute regulations for the use of the newly established public slaughterhouses. In most slaughterhouses, in a number of countries in North-western Europe, humane slaughtering methods were introduced in the first decades of the twentieth century. Shooting masks, (Fig. 8) captive bolt guns and spring pistols replaced mallets, throat cutting, pole-axing and neck stabbing. This was due to the propaganda of the animal protection societies and the efforts of the veterinarians appointed as directors of public slaughterhouses. Legislation controlling slaughtering methods was instituted in several national meat inspection acts (Koolmees, 1991; MacNaghten, 1932).

## **Conclusions**

In the course of the nineteenth century, Western Europe bore witness to a gradual change from decentralised slaughtering and inspection in numerous small butcheries to the centralisation of these activities in public slaughterhouses. In initiating and guiding this fundamental change, the so-called hygienists played a predominant role. Veterinarians were represented in the group of hygienists that moulded the social infrastructure in the field of public health care into a concrete form. They contributed to the scientific development of meat inspection, particularly in the field of parasitology and bacteriology. As a new domain of professional activities, municipal slaughterhouses and meat inspection played an important role in



Fig. 8

Shooting mask used at the Amsterdam abattoir (Het Leven Geïllustreerd 12, 1917, 845)

the professionalisation process of the veterinary profession. Under national meat inspection acts, responsibility for a large segment of public health was entrusted to this profession. Arguably, this can be considered the final step in the social emancipation of the veterinary profession.

Local and national authorities were forced to harmonise the economic interest of meat producers with caring for the urban environment and health of the citizens. Confronted with these conflicting interests, governments found a way out by following the advice of health boards to institute mandatory centralised slaughtering in municipal slaughterhouses under professional supervision. Based on the liberal ideology of free trade and self-help state interference in the meat supply chain remained limited in the nineteenth century. From the turn of the twentieth century onwards,

central governments felt more responsible for the supply of sound foods of animal origin and spent more public money in the veterinary infrastructure which was created to improve food quality control.

Meat hygiene and slaughterhouses played an important role in the civilising offensive. Regarding these aspects, this offensive was quite successful, since pollution in the cities decreased, the supply of sound meat improved markedly, and humane slaughtering methods were introduced.

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